



In Their Own Words:

China's Aerospace Security Strategic Concept

Translations from Chinese source documents

In Their Own Words

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To request additional copies, please direct inquiries to
Director, China Aerospace Studies Institute,
Air University, 55 Lemay Plaza, Montgomery, AL 36112

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China's Aerospace Security Strategic Concept

[中国空天安全战略构想]

Tian Anping Zhang Jianye Et al.
[田安平] [张建业]

People's Liberation Army Press
[解放军出版社]



Tian Anping, a native of Beijing, Hubei, joined the army in December 1974 and graduated from the Army Staff College majoring in military theory, mainly engaged in military theory teaching and research. He is currently a professor at the School of Science of the Air Force Engineering University, a doctoral supervisor with the rank of colonel, a member of the Chinese Military Science Society, a member of the Air Force Strategic Professional Committee, a high-level scientific and technological talent of the Air Force, a gold award for military education, a post allowance for outstanding professional and technical personnel in the army, and a winner of the "Three Qin Talent Allowance" of Shaanxi Province. He has presided over the completion of 5 projects of the National Social Science Foundation (including 1 key project), 3 projects such as the "Tenth Five-Year Plan" and "11th Five-Year Plan" for military scientific research of the whole army, 2 key projects of the graduate students (tutors) of military science of the whole army, more than 30 military theoretical research projects of the Air Force, and won 2 second prizes for outstanding achievements in military science in the "Tenth Five-Year Plan" and "11th Five-Year Plan" of the whole army, 2 military theory awards of Liu Yalou of the Air Force, and more than 20 first and second prizes for outstanding achievements in military theory of the Air Force. His main works include "Military Theory," "Air Force and Modern Warfare," "Aerospace Battlefield and Chinese Air Force," "Air Force Security Development Theory," "Aerospace Integrated Combat Science," "National Aerospace Security Theory," "China's Aerospace Security Strategic Concept," etc., and has written or participated in the completion of more than 20 research reports and published more than 100 academic papers.

According to the idea of defining concepts, analyzing the situation, determining goals and achieving goals, this book involves the basic issues involved in China's aerospace security strategy, including the core concepts of the national aerospace security strategy, the strategic situation facing China's aerospace security, the strategic goals and tasks of China's aerospace security, China's strategic guidelines and principles for aerospace security, China's strategic capabilities for aerospace security, China's strategic means of aerospace security, China's strategic model of aerospace security, China's strategic system of aerospace security, and China's strategic actions for aerospace security. Systematic and in-depth research was carried out. This book believes that the dream of a strong country leads the dream of a strong army, the dream of a strong army promotes the dream of a strong country, and the dream of a strong country and a strong army is supported by air and space security, and China's aerospace security strategy must be guided by the dream of a strong country and a strong army, actively advocate the national security concept of common security, comprehensive security, cooperative security and sustainable security, adhere to the strategic path of peaceful development as the mainstay, strength accumulation as the basis, and military confrontation as the preparation, take positive and appropriate strategic goals as the traction, take scientific and correct strategic guidelines as the criterion, and be based on sufficiently strong strategic capabilities. Relying on the strategic means of combining software and hardware, taking the strategic model of both rigidity and flexibility as the starting point, taking the strategic system supporting the system as the support, and taking the broad spectrum of suitable strategic actions as the guarantee, we will respond to the national demands of the information society and the synchronous arrival of the space age, safeguard and protect the practical needs of the continuous expansion of national interests, and support the bright future of China's security and development.

Responsible Editor: Yan Yongchun
Responsible proofreader: Jiao Jincang
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China's Aerospace Security Strategic Concept

Group leader: Tian Anping

Main Contributors: Tian Anping, Zhang Jianye, Chen Jiasheng, Zhou Linliang, Liang Xiaoan, Li Zongpu, Chen Gang

PREFACE

Today's world is a world of great change, great development and great adjustment; Today's era is an era of calling for grand strategy and writing big ideas. As a carrier for inheriting history, grasping reality and looking forward to the future, strategic ideas directly affect the overall situation of national security and development, and have a bearing on the prosperity and decline of the country and the prospects of its destiny. Looking at the great powers that have prospered in ancient and modern times, China and foreign countries are all closely related to their lofty strategic thinking and correct strategic choices. History shows us that success depends on thinking ahead, and failure is rooted in strategic outdated. To grasp the essence of strategic research lies in predicting storms when the winds of history that overwhelm the will of mankind blow, trying to harness them, and making them available to our own use. This is particularly important for China, which has experienced thousands of years of ancient glory and more than 100 years of modern humiliation, and now has embarked on the road of great rejuvenation and embarked on the road of great rejuvenation and dreams.

The wheel of history always moves forward slowly with human understanding and control of nature, and the scope of national security and interests has always followed the pace of human society. The 21st century is a century in which information and space are intertwined, synchronized hand in hand, and integrated development. Information is intangible, empty and of infinite value. As the most extensive energy storage field and energy release space in human development, aerospace has become an important growth point for promoting national economic development, a key focus for supporting the military force system, and a strategic commanding height for safeguarding national security interests, with its high-altitude posture, vast spatial attributes and inexhaustible rich resources. In view of the tremendous strategic value of air and space and its irreplaceable strategic role in safeguarding national security and development interests, military powers have made every effort to build an integrated air and space, both offensive and defensive, and use high to control low and fast to control slow. In a certain sense, in the information age, national interests lie in the air, national security lies in the air, and national development depends on the space. Enhancing the awareness of danger, being prepared for danger in times of peace, focusing on space and space, imagining the future, and researching and establishing China's aerospace security strategy are the needs of safeguarding national security and development interests in the information age, using aerospace security to support the realization of the "Chinese dream," and striving to shape a "harmonious space" and then promote the construction of a "harmonious world".

China's strategic concept of aerospace security

Our above understanding and thinking are fortunate to be supported by the key projects of the National Social Science Foundation of China. With the care and support of higher-level leaders and organs at all levels, and with the enthusiastic help of many experts and scholars and colleagues from universities and universities, the members of the research group worked diligently and diligently, relying on years of research accumulation in the fields of air-space battlefield, air-space combat and air-space security, and after more than four years of collective research, finally completed the research and writing of the work "China's Strategic Concept of Aerospace Security" and presented this new theoretical achievement to everyone.

In the process of researching and writing the Strategic Concept of China's Aerospace Security, we conducted a systematic study of the basic issues involved in China's aerospace security strategy in accordance with the idea of defining concepts, analyzing the situation, and determining goals and achieving objectives. We believe that the dream of a strong country leads to the dream of a strong army, the dream of a strong army promotes the dream of a strong country, and the dream of a strong country and a strong army is supported by air and space security. China's aerospace security strategy must be guided by the dream of a strong country and a strong military, actively advocate the national security concept of common security, comprehensive security, cooperative security and sustainable security, adhere to the strategic path of focusing on peaceful development, based on strength accumulation and preparing for military confrontation, take active and appropriate strategic goals as the traction, take scientific and correct strategic guidelines as the criterion, take sufficiently strong strategic capabilities as the basis, rely on the strategic means of combining soft and hard, take the strategic model of both rigidity and flexibility as the starting point, and take the systematic supporting strategic system as the support. With a broad spectrum of adaptable strategic actions as the guarantee, we will respond to the national demands of the information society and the synchronous arrival of the space age, safeguard and protect the practical needs of expanding national interests, and support the bright future of China's security and development.

Based on this, we have broken down the book into nine chapters. Chapter I, Introduction. As the opening part of the book, this chapter mainly defines the core concepts of the national aerospace security strategy and outlines the overall outline of the book, answering the questions of "what" and "what"; At the same time, the "why" of studying and establishing a national air and space security strategy was elaborated. It is believed that with the rapid development of the information society and the synchronous arrival of the space era, along with the strong pace of China's peaceful development, national security is facing multiple challenges of expanding the field, expanding space and increasing demand, and studying and establishing China's air and space security strategy is the strategic demand for national security development in the rapid development of the information society and the synchronous arrival of the air and space era, is a practical need for coping with various security challenges and safeguarding the expansion of national interests in the process of realizing the dream of the rejuvenation of the Chinese nation, and is an inevitable requirement for guiding the construction and application of national air and space forces. Chapter Two, the Strategic Situation Facing China's Aerospace Security. The situation is an important basis for formulating strategies.

Focusing on the main characteristics of the current world situation, this chapter analyzes and judges the strategic situation affecting national air and space security from three different aspects: globalization, multipolarization and informationization. It is clearly pointed out that as a major developing country that is rising again, China must take a proactive attitude, seize the historical opportunities brought by the competition in space and space, cope with the major challenges facing air and space security, and continue to write a new chapter of peaceful development. Chapter 3: China's Strategic Objectives and Tasks for Aerospace Security. Goals are the primary element of the strategic system. This chapter analyzes the basis for establishing strategic objectives, puts forward China's strategic goal of "actively shaping a favorable air and space situation, realizing and maintaining national security in the air and space field, and protecting the overall interests of the country from infringement with air and space security," and explores the strategic tasks that must be completed to achieve the goals. Chapter IV: China's Strategic Guidelines and Principles for Aerospace Security. Strategic guidelines and principles are the basic principles of strategic practice. The strategic principles and principles of China's air and space security proposed in this chapter are a comprehensive embodiment of the national security strategy of peaceful development and the national defense and military strategy of active defense in the field of air and space security, covering different stages and links in the process of air and space security strategy, and playing an important guiding role in achieving China's strategic goals of air and space security. Chapter V, China's Strategic Capabilities for Aerospace Security. Capability is the basic foundation of strategy. On the basis of analyzing and evaluating China's strategic capabilities in air and space security, this chapter puts forward strategic measures for China's strategic capacity building of air and space security from three aspects: strength, strength transformation mechanism and military capacity building. Chapter VI: China's Strategic Means of Aerospace Security. Means are the way strategies behave. Based on the analysis of three different means of international cooperation, strength competition and military confrontation, this chapter selects and conceives China's strategic means of air and space security. It is believed that from the perspective of the theme of the times, peaceful development and win-win cooperation should be the primary choice; From the perspective of practical laws, developing strength and consolidating internal strength should be the basic choice; From the perspective of using the bottom line, military means are the means of guaranteeing the bottom, and we must adhere to the bottom-line thinking and be fully prepared to use military confrontation means to safeguard national interests. Chapter VII, China's Strategic Model of Aerospace Security. Patterns are the expression of strategy. On the basis of analyzing and comparing the strategic models of aerospace security of typical countries, this chapter outlines the "active" aerospace security strategic model with "comprehensive security" as the core and "both rigidity and flexibility, internal and external integration, and both attack and defense" as the main content. It is believed that China's strategic model of aerospace security must take into account the advantages of rigidity and softness, the benefits of both attack and defense, and the security of both inside and outside, and it is necessary to promote the construction of China's strategic model of aerospace security from four aspects: strengthening the awareness of air and space security, outlining the correct path of air and space security, optimizing the operation mechanism of air and space security, and tempering comprehensive means of air and space security. Chapter VIII, China's Aerospace Security Strategic System. The system is an important support for strategy. This chapter studies the management system responsible for the decision-

making and operation of national aerospace security, the force system for implementing national aerospace security operations, and the support system for the smooth implementation of national aerospace security, as well as the interrelationship between them, and puts forward the basic ideas for building China's aerospace security strategic system. Chapter 9, China's Strategic Aerospace Security Operations.

China's Aerospace Security Strategic Structure

Action is the concrete application of strategy. This chapter focuses on strategic reconnaissance and early warning operations, strategic deterrence operations, strategic defensive operations, and strategic offensive operations to maintain national air and space security from a military perspective. At the same time, non-military air-space strategic operations were discussed.

The sky is vast, and the strategy is deep. China's aerospace security strategy is a far-reaching proposition of the times, and it is also an extremely challenging and major research task for us. Limited to the author's level of knowledge and ability, it is inevitable that there will be omissions and deficiencies, and I sincerely hope that the majority of experts and scholars will correct them. We also use this book as a brick to introduce jade, so that more people of insight who are interested in space and national security can join our academic imagination and join the historical practice of the great rejuvenation of the Chinese nation.

The authors

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CHAPTER 1 INTRODUCTION

Compared with traditional land security and maritime security, air and space security is a new form of national security. Judging from its historical development, it initially manifested itself as air security. In 1903, the Wright brothers of the United States invented the airplane, human society entered the aviation era, and the security form of the country was transformed from flat to three-dimensional; In 1957, the Soviet Union successfully launched the world's first artificial earth satellite, and human society began to enter the space age. Since the 80s of the 20th century, information technology and aerospace technology have been integrated and developed, an integrated air-space battlefield has gradually taken shape, air-space integrated operations have entered the historical stage of modern warfare, and air security has expanded upward along the vertical space and evolved into air-space security.

The 21st century is a century of information, but also a century of empty space. With its high-level posture, vast spatial attributes and inexhaustible rich resources, the space has become an important growth point for promoting economic construction and development, a key focus to support the military force system, and a strategic commanding height for safeguarding national security interests.¹

History shows us that success depends on thinking ahead, and failure is rooted in strategic outdated. We must fully understand the strategic role of the aerospace field in the progress of human civilization and the development of national security, incorporate aerospace security into the national strategic vision, integrate the strategic study of aerospace security into the scope of national security strategic research, guide the construction of aerospace security forces, build a strategic system for aerospace security, build a strategic shield for aerospace security, and create a harmonious and peaceful space for the great rejuvenation of the Chinese nation.

¹ Xu Qiliang: "The Theory of National Aerospace Security" (Preface), Beijing, People's Liberation Army Press, 2010 edition, p1.

Section 1 National Aerospace Security

National air and space security is a new concept and new issue facing national security in the new stage of the new century, and is also the logical starting point for China's strategic research on air and space security. New concepts are the basis of new ideas and theories, and sometimes new concepts are new ideas and new theories. "Grand strategy," "security strategy," "air supremacy," "air-ground battle," "air-sea battle," "air-space battle," "network-centric warfare," and "global commons," all of these representative strategic ideas and operational theories in a certain historical period all started from concepts and effectively guided and promoted military practice at that time. Therefore, when we study China's aerospace security strategy, we must first clarify what national aerospace security is.

1. The meaning of national air and space security

National air and space security is an extension and expansion of national security in the field of air and space. Therefore, before defining national air and space security, it is first necessary to clarify what security is and what is national security. The so-called safety is "safety" on the one hand and "complete" on the other. If there is no danger, it is safe, and if there is no defect, it is complete. Those who are safe, peace and stability; Whole, complete, preservation also. The former is manifested as an objective state of things: a state of no threat, no danger, and stability, continuous and rapid development; The latter is both an objective state and a subjective act: objectively manifested as a state in which things are intact and intact, and subjectively in a series of actions taken to achieve and maintain an objective state of security. From the perspective of logical relationship, the former is the goal, and the latter is the means to achieve the goal. The so-called national security refers to a state in which the survival and development of a country are not threatened or in danger. This definition has two meanings: First, national security is an objective state in which a country finds itself in the process of its survival and development, that is, a state in which there is no danger or threat. Second, national security is a subjective feeling that reflects the objective state, that is, a sense of security that does not feel dangerous and is not threatened.

National aerospace security is an important part of national security, a state in which the interests of national survival and development are free from air and space threats and no air and space dangers, as well as a series of control actions and measures taken by the state to achieve this state.¹

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p15.

This concept can be understood in three ways:

First, national air and space security is the expression of national security in the air and space field, which echoes land security and maritime security, and while jointly building and strongly supporting the solid edifice of national defense and national security, it also highlights its own inherent special status. Aerospace security is national security, and air and space crisis is national crisis, which has become an important law for the survival and development of the country in the informationized aerospace era.

Second, national air and space security is the unity of objective state and subjective behavior. Objectively manifested as a state in which the activities, rights and interests of the State in the field of air and space are not threatened and there is no danger; Subjectively, it is manifested in the fact that the state does not feel the danger to the air and space and the sense of security that is threatened by the air, and that when the state feels the threat to the air, it takes a series of control actions to reduce or eliminate such threats and safeguard the interests of national aerospace security.

Third, national aerospace security is a game between subject and object. The subject of national aerospace security is the state, and the object is the object that poses a threat to national aerospace security, including other countries (groups, organizations) and the natural world. The game between the subject and object of national aerospace security includes not only the development and utilization of vertical space by the state to enhance its security capability and comprehensive national strength, but also the dialogue and cooperation between the state in pursuit of harmonious air and space and the threat targets, as well as the understanding, avoidance and transformation of the natural world that endangers national aerospace security, and the confrontation and contest between the state and its opponents when encountering air and space security dangers.

2. The scope of national air and space security

The so-called category generally refers to things within a certain range and its boundaries. The scope of national air and space security refers to the scope covered by national air and space security interests and the security matters involved within its borders, that is, security within the boundaries of national interests. From the perspective of the main space and fields involved, the scope of national air and space security is a vertical space based on the ground (land and sea), which mainly includes four aspects: air security, space security, ground security and information security involving the air and space field.¹

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p16~18.

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They are closely related and interact with each other. Space is the "commanding height" of national air and space security, the air is the "main position" of national air and space security, the ground is the "base camp" of national air and space security, and information security penetrates into the ground and space, and affects and restricts the security of other spaces and their platforms.

Air security includes airspace security, public air (high seas, polar and other vertical spaces) security and international route security, which is the embodiment of air and space safety in the aviation field. The core of air security is airspace and aircraft safety. Territorial air security (security of atmospheric space above the territorial land and territorial waters of sovereign States) is the primary and core issue of national air and space security. The airspace of a sovereign state is free from threats and encroachment by other countries, and the state has absolute sovereignty and control over its own airspace and the right to free exploitation and use of its airspace that does not violate international law. Aircraft refers to aircraft that rely on air buoyancy or aerodynamic lift and can only navigate in the atmosphere, usually divided into air buoyancy aircraft (balloons, airships) and aerodynamic lift aircraft (aircraft, gliders, helicopters, etc.). Aircraft of sovereign States may travel freely through their own airspace free from threats and attacks in accordance with relevant domestic laws, and may also sail in the airspace and international airspace of other States within the limits permitted by international law. With regard to the upper limit of a State's airspace, international law stipulates that the height of a State's airspace is the "airspace" reached by the vertical plane above its land boundary and territorial sea line, which shows that the height of a State's airspace depends entirely on the height of the actual control of a sovereign state over its air space, so the exploitation, utilization and actual control of the vertical space above the country's territorial land and sea line and below 100 kilometers from the surface belong to the scope of national sovereignty and security; As an international public airspace shared by all countries in the world, the security status of public air is of great strategic significance to support the expansion of national interests, maintain national security and regional stability, carry out international exchanges and cooperation, and promote world peace and development. In addition, as an air bridge and link for international exchanges, the safety status of international routes is a major strategic issue related to the national economy and people's livelihood.

Space security refers to the security of outer space more than 100 kilometers above the surface of the earth, and is the embodiment of aerospace security in outer space. The core of space security is space orbit safety and spacecraft safety. Space orbit is the trajectory of the center of mass movement of spacecraft, especially orbital spacecraft such as artificial earth satellites and space stations. Orbits have objective, unique and limited characteristics, the available orbital resources in the vast universe are limited, different orbital spacecraft can only operate in their own orbits, if there is orbital crossover or overlap, there is a possibility of collision.

Spacecraft refers to a vehicle that runs along a certain orbit in space and performs tasks such as searching, developing, and utilizing space, usually divided into unmanned spacecraft (satellites, space probes, etc.) and manned spacecraft (manned spacecraft, space stations, space shuttles, etc.). Space orbits and spacecraft security have a double meaning: first, sovereign countries strive to take advantage of technological advantages and spacecraft quantitative advantages, register and use as many orbital resources as possible through international conventions, and ensure that these orbits are not occupied or threatened by other countries; Second, the spacecraft is not interfered with and attacked during launch, operation and recovery. In recent years, China's space industry has developed rapidly, its space capacity has been steadily improved, and the demand for space resources has gradually increased. In view of the prominence of the strategic value of space, the limited orbital resources and the fragility of spacecraft safety, some space powers, especially space powers, currently regard "controlling space" as the focus of national development, and actively develop attack methods against other countries' space-based platforms while steadily improving their own space capabilities. Therefore, how to ensure the safety of space-based platforms has become a common concern of countries with space capabilities, including China.

Ground security involving the field of air and space is the security of ground systems, systems and regions closely related to air and space security, and the core is the safety of the ground system of the air and space platform and the safety of the ground air defense system, which is the embodiment of air and space security on the earth's surface. The ground system of the aerospace platform is a series of ground support facilities and command and control systems related to the take-off, launch, flight (operation) and return of aircraft and spacecraft, including airports, cosmodromes, ground accusation communication systems, ground flight auxiliary stations, etc. The safety of the ground system of the space platform refers to the continuous, stable and efficient operation of the above-mentioned systems and facilities without interference, destruction or destruction. The aerospace system is a complex system, the operation of the aircraft is inseparable from the command and control of the support and accusation system of ground support facilities, the ground as the support and base camp of the aerospace platform, its security to a large extent determines the security of the national air and space field, and then affects the entire national security. The ground air defense system is a national ground defense system established to resist threats from the air and space, including the ground early warning system, the air interception and strike system and its positions, etc., which is the concrete embodiment of the national air and space security interests in relevant areas on the ground. In view of the role of ground-based air defense systems as "shields" in modern national defense and military struggles, they often become the key targets of the enemy's first attack, and their security has a great impact on the overall national security.

Aerospace information security refers to the hardware and software of the aerospace information network with strong security capabilities, in the process of information acquisition, transmission, processing and utilization, data is not subject to accidental or malicious reasons to be damaged, changed, leaked, the system is in a continuous, stable and efficient operation state.

From the perspective of expression, aerospace information security mainly includes electromagnetic security, network security, and related media security; From the perspective of structural form, aerospace information security mainly includes information process security and information system security. Aerospace information process security refers to the national aerospace information system has certain security capabilities, so that aerospace information is in a real-time, accurate, stable and efficient operation in the process of acquisition, transmission, processing and use. Aerospace information system security refers to an integrated aerospace information system composed of an aerospace information support system, an aerospace command and control system, an air-space information combat (weapon strike) system, and an air-space support support system, which has the ability to resist various encroachments and can carry out various air-space security operational tasks continuously, stably and efficiently.

3. The essential characteristics of national air and space security

A feature is an external representation that represents the characteristics of something. As a new field facing national security in the era of information and space, aerospace security not only has the general characteristics of national security concept, but also presents distinctive characteristics that distinguish it from other forms of security. It is mainly manifested in the following three aspects:¹

Aerospace security is related to the survival and development of the country and is a high degree of unity between the security of national survival and development. Survival and development are two aspects of the core interests of the country, which resonate with the same voice, are interdependent and promote each other. Survival is the foundation of development and the support of development; Development is for better survival, a higher level of survival. From the perspective of survival, national aerospace security in the information age has an important and sometimes even decisive impact on national survival security. The outcome of the Kosovo War, which took place at the end of the 20 th century, not only affected the fate of the countries and nations of the Federal Republic of Yugoslavia, but also had a strong impact on the concept of national security in the information age, which forcefully proved the extreme importance of air and space security to the fate of the country. From the perspective of development, with the continuous improvement of human ability to understand and control nature, and after experiencing a long process of first developing horizontal space (land and sea) and then developing vertical space (air and space), when local activities have developed to a certain extent, requiring a larger range of activity space and higher development needs, the problem of the development and utilization of space and the national space security problem has surfaced.

¹ Zhang Honghe: "Paying Attention to Aerospace Security and Actively Responding to the New Challenges of National Security in the Information Age," *Journal of Air Force Engineering University (Military Science Edition)*, 2010, 2, p1~2.

Therefore, national aerospace security is the expansion of ground security in vertical space, a new security form jointly brought about by the needs of national survival security and development security, it is not only national survival level security, but also national development level security, and is a comprehensive security composed of a high degree of unity between national survival security and development security.

Aerospace security covers a wide range of fields and is the integration of multidimensional national security elements. National air and space security involves many elements such as space, strength, means and actions, and is a whole formed by the organic combination of multidimensional security elements. In space, national air and space security involves ground security, air security and space security. The ground is the basic space for human survival, and it is also the support and base camp for the country to march into the air and space; Air safety not only frequently affects ground safety, but also affects whether countries can effectively use space resources to achieve increasing safety efficiency. As a new field for human beings to develop and utilize the universe, space has gradually become a strategic "commanding height" for aerospace security and even national security. In terms of strength, maintaining national air and space security includes military forces such as strategic early warning, command and control, air and space offensive, air and space defense, and air and space support, as well as various non-military forces used by the state for air and space security, such as politics, economy, diplomacy, and culture. In terms of means, maintaining national air and space security includes both military and non-military means, and the integrated use of military means and non-military means is not only the essential requirement of national air and space security, but also an ideal way to achieve the goal of national air and space security. In terms of operations, the maintenance of national air and space security is usually based on air and space military operations, and various non-military operations cooperate with each other in a coordinated and unified operation.

Based on the theme of the times of peaceful development, aerospace security is embedded in an open international space where cooperation and competition coexist. Space means different things to a country than the surface. The surface of the land is composed of land and sea, and countries are divided into landlocked countries, coastal countries and island countries according to their geographical location on the surface, which is obviously not suitable for air and space. Empty space is the infinite extension of land and sea in vertical space. For the world, in addition to the sovereign nature of the limited airspace of all countries, the vast majority of air space is "public space," and a larger range of outer space is also shared by all countries in the world, which undoubtedly endows natural attributes such as the inevitability of air-space links, the convenience of connectivity and the overlap of interests. At present, there are more than 40 landlocked countries, more than 90 coastal countries and more than 40 island countries in the world. ¹In general, there are no maritime security problems for landlocked countries and no land border security for island States.

¹ Data based on the 2013 World Military Yearbook, Beijing, People's Liberation Army Press, 2014 edition.

However, whether it is a landlocked country far from the sea, an island country far from the mainland, and a coastal country connected by land and sea, they all face the same space, and complex interests will inevitably arise in the process of passing through the air. In such an open and wide-area space, any country entering the space means entering the world; Once in the world, its security is not only a problem that a country can control and solve, but a problem related to the international order that requires international cooperation to solve. In short, space is the common space of mankind, should be a peaceful space, resolve contradictions, prevent crises, stop conflicts, contain war, return to the original intention of mankind to explore the sky, strengthen international cooperation in space and space, promote the construction of harmonious space and space, and let space better serve human civilization.

4. The status and role of national air and space security

Throughout the history of human social development, it is actually a history of two-way expansion along the surface and above the surface. Aerospace activities are a great practice for human beings to develop and utilize vertical geographic space. As a huge energy storage field and energy release space, space plays a huge role in the process of national security and development, and promotes human society to enter a new era of global control from space to space.

Aerospace security is an important area of national security. The emergence of air and space security is an inevitable reflection of the continuous expansion of the connotation and extension of the concept of national security, and is a new thing that has emerged with the arrival of the space era. Before the advent of space vehicles, national security was limited to land and sea, and human national security concepts were generally limited to the concern and understanding of land security and maritime security. Based on this national security concept with typical "flat security" characteristics, people's security vision is often "flat," and people's security thinking is often "horizontal". Up to now, the relevant discussions and research results on national aerospace security are not rich enough, indicating that people are relatively unfamiliar with the concept of national aerospace security and have not fully realized the danger from air and space and the importance of air and space security. In fact, as a special manifestation of national security in the field of air and space, air and space security not only exists objectively, but is also of vital importance, and will surely attract more and more people's attention. National security in the information age is an all-round and all-field security system.

Generally speaking, safeguarding the survival, sovereignty, territory, social system and norms, way of life, social, political, economic, scientific, technological, military and other interests of the country and nation is not harmed or threatened, and is within the scope of national security. National security in the modern sense includes not only tangible physical space such as land, sea, and air, but also intangible space such as information, network, and electromagnetic spectrum, and even human thinking and cognitive space. From the perspective of natural attributes, aerospace security is the inevitable result of the upward extension of the traditional security category in vertical space, and is a special form of national security system in the field of air and space. From the perspective of social attributes, aerospace security is the concentrated embodiment of national political, economic, military, scientific and technological security, cultural security and other security forms in the aerospace field. In the information age, national security is inseparable from air and space security, and national security without air and space security is incomplete or even fragile. As an emerging field and an important part of the national security system, air and space security plays a prominent role and plays a huge role.

Aerospace security is a high-end barrier to national survival. Survival and security are the core interests of the country and the foundation and prerequisite for national development. The survival of a country depends on the objective environment on which it depends, as well as the security barrier that guarantees this living environment. • Security barriers, as the basic conditions for the survival of the country, change with the development of the times. From the perspective of military geography, national security barriers mainly include land barriers, maritime barriers and air and space barriers. Land barriers mainly include fortresses, city walls, or mountains, rivers, or land defense corps organized by military forces, typical representatives include the ancient Great Wall of China, the Maginot Line in France and the Barlev Line in Israel; The ocean is originally a natural barrier against the invasion of foreign enemies, but with the conquest and control of the sea by human beings, this natural barrier has lost its meaning, so some island countries and coastal countries have set up shore guns on the seashore, equipped with missiles, and built fleets on the sea, forming a sea barrier with artificial echelon configuration; The emergence of aircraft and air wars has turned the air into an extremely severe danger front, and air power can easily cross all natural dangers on the ground, so a large number of searchlights, radars, fighter aircraft, anti-aircraft guns, ground-to-air missiles and other air defense weapons have appeared, building an air barrier to maintain national security; The development of satellites in the sky and the militarization of space has once again extended the national security barrier upward, and space is no longer tranquil; Since the 80s of the 20th century, with the help of the link role of information technology, the aerospace industry has integrated and developed, making aerospace a unified battlefield, and aerospace has become a high-end barrier to resist air and space threats and maintain national security with its height advantage from a high view, the information advantage of full-dimensional coverage, the advantage of fierce and accurate firepower, and the advantage of flexible and fast mobility.

Aerospace security is a reliable guarantee for national development. National development refers to the growth and change process of a country from weak to strong. As a special form of national security in the field of air and space, air and space security is not only a high-end barrier on which the country's survival depends in the space era, but also a reliable guarantee on which national development must rely. First of all, national development depends heavily on the air. In the information age, the status of the aerospace field is prominent, the role of air and space forces is huge, and aerospace security can not only provide a peaceful environment free from air and space dangers for the internal development of the country, but also provide strong support for the expansion of national interests and the rise of the nation. Second, air and space security is conducive to national development. Aerospace is a strategic focus of a country's science and technology, economy and military development, a strategic industry with high added value and high drive, a sharp weapon for the development of the core competitiveness and comprehensive national strength of a major country, which has a pulling effect on national scientific and technological innovation, economic development and comprehensive national strength improvement, and is conducive to enhancing the core competitiveness of a major country, driving the expansion of the industrial chain, driving the virtual economy and promoting scientific research. Finally, an air and space power is an important choice for the national development strategy. On the one hand, the aerospace field is the most concentrated field of contemporary science and technology, and aviation technology, aerospace technology, new materials and new energy technology, information technology, etc., which are closely related to aerospace technology, are at the forefront of contemporary science and technology development, so the value of strengthening the construction of aerospace security forces is not only limited to providing a platform for aerospace science and technology innovation itself, but more importantly, it has a "cascading" effect on the overall development of national science and technology, which is conducive to leading the overall progress of national science and technology; On the other hand, space and space contain abundant natural resources, including air route resources and space orbit resources, space star mineral resources, solar energy resources, space environment resources, etc. The development and utilization of space resources and the strengthening of space force building can not only obtain huge economic benefits, but also help to affect the overall improvement of the country's comprehensive national strength.

Section 2 National Aerospace Security Strategy

Aerospace security is a major strategic issue facing national security in the informationized aerospace era, and the national aerospace security strategy is a major strategy for planning and guiding national aerospace security affairs.

Clarifying the basic meaning of the national air and space security strategy, grasping the operational characteristics of the national air and space security strategy, and understanding the functions and roles of the national air and space security strategy are the primary issues in the concept of the national air and space security strategy.

1. Definition of the National Aerospace Security Strategy

The national aerospace security strategy is the overall planning and macroscopic guidance of the state for its aerospace field security offices, and is the science and art of the state to realize and maintain its air and space security, as well as to realize and safeguard the overall security interests of the country through air and space security. As a part of the national security strategy, the national aerospace security strategy is the sum of the country's political, diplomatic, military, economic, scientific and technological struggles on vertical space security issues.¹

First, the main body of the national aerospace security strategy is the state, which is the overall planning and macroscopic guidance of the state for aerospace security affairs. In essence, the subject of national security strategy is different from the subject of security. The concept of security subjects is very broad, can be a state or a non-state actor, and its subjects are pluralistic and diverse. The national air and space security strategy is a national strategy, not a strategy of non-state actors or individuals and organizations. Just as the main body of U.S. security strategy is the United States, not NATO, its subject is unique and exclusive. From the perspective of means, since the 90s of the 20th century, with the continuous expansion of national security concepts and fields, security means have shown diversified characteristics. As an important part of national security, air and space security covers more and more contents and scope, involving more and more relevant functional departments, local government departments and even enterprise departments. Under such circumstances, neither government functional departments nor military departments can rely solely on their own strength and means to maintain national air and space security, nor can they complete the overall planning and guidance of national air and space security affairs. It is precisely the comprehensiveness and complexity of aerospace security that determines that the main body of the national aerospace security strategy must be the state, and the planner and formulator of the national aerospace security strategy must be the highest decision-making department of the state. At the same time, as the main body of the national aerospace security strategy, the country and its top decision-makers must focus on the fundamental strategic goal of safeguarding the interests of aerospace security, building a harmonious aerospace order, and promoting the harmonious development of the world, follow the law of subjective guidance and objective reality, achieve a high degree of unity between strategic subjects and objects, and pursue the highest benefits of aerospace security and national interests.

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p139.

Second, the object of the national air and space security strategy is air and space, which is the country's security affairs in the air and space field. There are obvious differences between the national aerospace security strategy and the national aerospace security in terms of objects. The object of national aerospace security only refers to the objects that pose a threat to national aerospace security, while the object of the national aerospace security strategy is the security affairs of the state in the entire aerospace field, which has diversified and typical characteristics, including the country's objective understanding of threats to aerospace security, and the country's initiative to develop and use its security forces to effectively respond to aerospace threats. Space, space and ground have completely different spatial attributes, and the land land owned by a country is relatively fixed, and the safe space is relatively complete; Although national maritime security excludes the territorial sea, contiguous zone, continental shelf and exclusive economic zone, there is still a large amount of space and sea area where interests overlap, and the security space is relatively broad. But whether on land or at sea, its safe plane characteristics are obvious. Aerospace security is the expansion of national security interests in vertical space. Aerospace security is a very broad and complex field, including security in traditional fields such as military security and political security, as well as non-traditional security issues such as air flight safety, space platform security, aerospace public order, and aerospace environment security. In view of the huge space interests in space and space, especially in outer space and adjacent space, the phenomenon of competition and competition between countries in the world for exploitation, utilization and competition is becoming more and more serious, making the phenomenon of overlapping interests of one country and other countries very obvious. Meticulously planning national air and space security affairs and scientifically guiding the practice of national air and space security have become realistic tasks facing the national air and space security strategy.

Thirdly, the purpose of the national aerospace security strategy is security, which is to realize and maintain the country's security status in the air and space field, as well as to realize and maintain the overall security interests of the country through air and space security. While the purpose of any strategy is to achieve and safeguard security interests, the purpose of a national air and space security strategy has a special meaning. The fundamental purpose of the national space security strategic act is to comprehensively use the national security forces and political, economic, diplomatic, scientific, technological, legal and other means with the air and space security forces, especially military forces, as the main body, to carry out rational development, scientific utilization, effective management, legitimate defense and international cooperation of national territorial airspace and public space and space that have a bearing on national interests, through the implementation of effective air and space security operations, to realize and safeguard national security interests in the air and space field, and to ensure the overall security of the country through air and space security. It will enable the country to develop sustainably, stably, healthily and rapidly in a peaceful and tranquil air and space environment. In view of the particularity of the national air and space security field, the diversity of means and the extreme importance of the status and role, it is required that the national air and space security strategic decision-makers must plan and guide the construction and application of the national air and space security forces from the perspective of seeking the overall security interests of the country.

Fourth, the national aerospace security strategy is the science and art that guides the practice of air and space security strategy. In today's era, the competition between air and space is complex and fierce, which poses severe challenges to the survival and development of the country. The continuous development of air and space forces provides the necessary means for countries to maintain their air and space security; The vertical space is vast, providing a broad stage for the national wisdom to plan in the vertical space. As a major strategy for the state to manage space and a science and art to guide the practice of aerospace security, the national aerospace security strategy should, on the one hand, accurately grasp the various complex relationships between subject and object, not only grasp and handle well the relationship between states, but also grasp and handle well the relationship between states and non-state actors; It is necessary to make full use of the relationship of trust, cooperation and harmony between each other, but also to calmly deal with possible suspicion, tension and confrontation. On the other hand, in guiding its strategic practice of air and space security, the state must embody a scientific nature that conforms to objective reality, and at the same time show the artistry of national wisdom and strategy, so that the country's strategic practice of managing space and space can be planned in the curtain and won a decisive victory above the nine heavens.

In addition, as an important part of the national security strategy, the national aerospace security strategy is subordinate to and supports the national security strategy, which is the overall strategy on national security issues and has a guiding and leading role in the national aerospace security strategy, while the national aerospace security strategy is a national level domain strategy and the embodiment of the national security strategy in the air and space field; On the other hand, the national security strategy is the direct basis for establishing the national air and space security strategy, and has a restraining effect on the national air and space security strategic goals, as well as the strategic means and strategic actions to achieve the national air and space security strategic goals, and the national air and space security strategy must be subordinate to and serve the national security strategy. However, the national aerospace security strategy has a special position in the national security strategy system, and the practice of the air and space security strategy under the guidance of the national aerospace security strategy has a major impact on the operation and implementation of the national security strategy.

2. Elements of the national air and space security strategy

The elements of the national aerospace security strategy are the necessary and main factors constituting the national aerospace security strategy system, and it is an objective reflection of the essence of the national aerospace security strategy and its internal laws. Regarding the constituent elements of strategy, the theoretical circles have different research angles, and the induction and description are also different, such as Maxwell and Johnson, former chairman of the US Joint Chiefs of Staff. Taylor believes that strategy includes three elements: goals, methods, and means, and the "Theory of Military Strategy" edited by Fan Zhenjiang and Ma Baoan in China summarizes strategic elements into three aspects: strategic goals and strategic tasks, strategic principles, and strategic means.¹

¹ Fan Zhenjiang and Ma Baoan: A Theory of Military Strategy, Beijing, National Defense University Press, 2007 edition, p8; Yang Yi, ed., Research on National Security Strategy Theory, Beijing, Shishi Publishing House, 2008 edition, p63.

The "Science of Strategy" edited by Peng Guangqian divides the composition of strategy into four major elements: strategic subject, strategic category, strategic purpose and strategic means, in addition, some research results also classify strategic capabilities (strength) and strategic approaches into the category of strategic elements. According to the actual needs of China's aerospace security strategic research, we discuss the national aerospace security strategic objectives, strategic principles, strategic capabilities and strategic means from four aspects.¹

(1) National strategic objectives for aerospace security

Strategic objectives are the primary factor of the national aerospace security strategy system, the behavioral orientation of national aerospace security activities, and the primary link in formulating the national aerospace security strategy. "If you don't set a target, you can't hit the bullseye; If you don't know your goals, you can't develop a successful plan. "The entire process of the national aerospace security strategy from formulation to implementation to adjustment has always revolved around the determination and realization of the strategic objectives of aerospace security; The planning, formulation and implementation of the national aerospace security strategy is to achieve and safeguard the country's security interests in the air and space field from infringement, and achieving such a situation is the ultimate result that the country should pursue in the overall situation of the air and space security strategy. Therefore, the objectives of the national aerospace security strategy are not only the starting point for the formulation of the national aerospace security strategy, but also the final point for the implementation of the national aerospace security strategy. In essence, the strategic goal of national aerospace security is to achieve and maintain national security in the aerospace field through a series of security actions and measures, to ensure that the interests of national survival and development are not encroached upon, and to jointly build a harmonious air and space through international exchanges and cooperation.²

The national aerospace security strategy goal is the superposition of a series of specific goals, which is usually distinguished between the overall goal and the sub-goal as the final result of the national aerospace security behavior in a certain period of time. The realization of strategic goals requires corresponding strategic tasks to be completed. The so-called aerospace security strategic tasks refer to a series of major issues that strategic directors must solve in order to achieve the ultimate strategic goal of aerospace security in the process of national aerospace security strategic planning, such as developing aerospace security capabilities, shaping the aerospace security situation, maintaining the safe operation of the space system, defending territorial airspace from infringement, seizing the superiority of air and space combat dominance, and responding to non-traditional air and space threats.

¹ Peng Guangqian: "Science of Strategy," Beijing, Military Science Press, 2001 edition, p14.

² Dennis Drew and Donald Snow: "Development of National Security Strategy," Wang Huiqing and others, Translation, Beijing, Military Science Press, 1991 edition, p14.

The national aerospace security strategic tasks are not only subordinate to and serve the realization of strategic goals, but also more flexible, and have a stronger guiding and normative role in the specific implementation of national aerospace security strategic actions. The effectiveness of the implementation of the national aerospace security strategic goals and the realization of the established strategic goals depend on whether a series of strategic tasks for aerospace security can be successfully completed.

(2) National strategic guidelines for air and space security

The strategic principle is the core element of the national aerospace security strategic system, the general program guiding the overall situation of the construction and application of the national aerospace security force within a certain period of time, and the reflection of the general principles and policies of the national security strategy in the aerospace field. As the main body and core of the aerospace security strategic system, it mainly stipulates the basic ways to complete the strategic tasks of aerospace security and achieve the strategic objectives of aerospace security. As a bridge and link linking the theory and practice of aerospace security strategy, it plays a direct guiding role in managing the air and space, shaping the situation, responding to and handling crises, safeguarding national air and space security and interests, and conducting and winning air and space wars in wartime. The correct strategic principle is the product of the combination of subjectivity and objectivity, which is based on the strategic guide's scientific understanding and accurate judgment of the subjective and objective factors, conditions, and the trend of development and change, and is a vivid reflection of the strategic guide's subjective guidance ability. With the correct strategic principles, the building of air and space security forces and the development of air and space security operations will have basic observance.

The basic function of the strategic guidelines for aerospace security is to stipulate the direction of development and point out the path for accomplishing strategic tasks, and the key is to grasp the main contradictions. The national air and space security situation is very complex and constantly evolving. Therefore, in guiding air and space security activities, we must be good at grasping the main contradictions, and grasping the key link is to highlight the guidance of the main operational patterns of air and space security. In different historical stages and in different air and space security environments, air and space security tasks are different and the mode of action is different, and the strategic guidelines for air and space security must highlight the guidance of the main patterns. In peacetime, the main task of the aerospace security strategy is to develop aerospace strength, resolve aerospace crises, and shape a favorable aerospace security situation, so the strategic guidelines must highlight the unified planning and guidance of overall issues such as force building, education and training, aerospace layout, and crisis handling. In wartime, the main task of the air and space security strategy is to control the situation and win the war, and the air and space security strategy should emphasize the unified planning and guidance of the air and space military confrontation with air and space attack and defense as the main content.

The second is to highlight the guidance of key issues that have a decisive impact on the overall situation of national air and space security. Focusing on the overall situation and grasping the key are important principles and requirements of strategic guidance. In the field of air and space security, key issues that have a decisive impact on the overall situation, such as the construction and application of strategic early warning, anti-missile and space defense, and anti-stealth aircraft and cruise missile forces in the air-space defense system, and the construction and application of information support and long-range precision strike forces in the air-space offensive system, have a bearing on the overall situation of national air and space security and interests, and are issues that must be paid special attention to and guided by the strategic principles of air and space security. Third, it is necessary to highlight the stipulations on the main methods for resolving the main contradictions in air and space security. The basic content of strategic approaches and their names and expressions are often determined by the main contradictions and the ways and means of resolving them. For example, our army's strategic principle of "luring the enemy to go deeper," "fighting a protracted war," "mainly annihilating the effective forces of the Kuomintang rather than focusing on conservative localities," and the strategic principle of "active defense" after the founding of New China were all formulated in accordance with the main contradictions faced in different historical periods and the ways and means of resolving them. In the field of aerospace security, the strategic guidelines must stipulate the main methods for resolving the main contradictions in aerospace security, or reflect strategic thinking, or express the tactics of struggle, or stipulate the main directions, or highlight strategic priorities, or embody the methods of action, or emphasize the main forms.

(3) National strategic capabilities for air and space security

Strategic capability is the basic element of the national aerospace security strategic system, is the reflection of the country's overall security capability in the aerospace field, and refers to the ability possessed and demonstrated by the country to implement the national aerospace security strategy and achieve the strategic goals of aerospace security based on the existing strategic strength of aerospace security. In different security states, countries face different threats and different requirements for strategic capabilities of air and space security. Peacetime is a relatively safe period, and the strategic capability of aerospace security during this period is mainly manifested in the ability to shape a favorable air and space security situation, including the ability to coordinate the elements of national air and space security, build a national air and space security system, demonstrate the national air and space security strength, curb air and space threats, operate an international air and space security network, and shape a harmonious air and space environment. The crisis period refers to a period of instability between the security period and the war period, and the national aerospace security strategic capability during this period is mainly manifested in the ability to "turn crisis into opportunity," including the ability to play games with opponents in crisis, the ability to use international security networks for dialogue and coordination, and the ability to win the recognition and support of the domestic public.

War is a fierce military confrontation between two opposing sides, the war situation is the objective embodiment of the battlefield military situation and the inevitable result of subjective guidance, the ability of air and space security in wartime is mainly manifested in the ability to control the situation and win, including the ability to compete for and maintain air and space supremacy, the ability to obtain international support, and the ability to win international support. Designing the ability to rehabilitate the aftermath of post-war arrangements, etc.

The formation and development of a national air and space security strategic capability depends on three factors: strength, the mechanism for transforming strength, and the use of strength. Among them, strength is the basis for the formation of national aerospace security strategic capabilities, and is the basic element of sovereign countries in formulating and implementing national security strategies, which refers to the sum of material strategic resources and spiritual strategic resources that can be mobilized to achieve national strategic goals, mainly including basic strength, economic strength, military strength, scientific and technological strength, political strength, diplomatic strength, and spiritual strength. The strength transformation mechanism is the key to the formation of the national aerospace security strategic capability, as an important component of the national aerospace security strategic capability, it is the intermediate link to make the potential static strength play a role and achieve strategic goals, refers to the sum of a series of institutions, systems and operational processes of the country to transform its own aerospace security strength into a realistic aerospace security strategic capability, according to the different functions of the transformation mechanism, the transformation mechanism can be subdivided into different modules such as transformation, configuration, and application; The use of strength is the dynamic operation of strength by strategic subjects, it is a subjective factor that turns strength into capability, it is also the leading factor of the country's strategic capability of air and space security, it plays a decisive role in the development of the strategic capability of national air and space security, and it is the dynamic factor that enables the strength widely distributed on the ground, air, space and information fields to effectively aggregate, fully release, and give full play to its effectiveness.¹

(4) National strategic means of air and space security

Strategic means are the key elements of the national air and space security strategic system, and are the ways and methods for the state to use the national air and space security forces as a whole in order to achieve its established strategic goals of air and space security. It mainly solves the question of what to use to manage the air and space and how to carry out air and space security activities, and is the most practical part of the air and space security strategy. According to the nature and intensity of application, it can be specifically divided into three types: means of cooperation and win-win (or international cooperation), means of competitive game (or competition of strength), and means of military confrontation. International cooperation refers to the coordinated actions taken by countries to create a harmonious space and achieve common security by reaching an agreement or tacit agreement within a certain scope from the intersection of interests, mainly including cooperation in the prevention and management of aerospace crises, cooperation in the construction of mutual trust mechanisms in space and space, and cooperation in the field of non-traditional air and space security.

¹ Yang Yi: "National Security Strategy Theory," Beijing, Shishi Publishing House, 2008 edition, p32~38.

Strength competition refers to a non-violent and non-confrontational competition between different entities in order to obtain a superior position in the field of air and space security, the purpose of which is to create a favorable air and space security environment and situation and win the strategic initiative, mainly including military strength competition, non-military strength competition and comprehensive strength competition with military strength competition as the core. Military confrontation refers to hostilities carried out by military means mainly by the use of force or the threat of use of force by two opposing parties, including military confrontation in peacetime and military confrontation in wartime.

The choice of strategic means is a key link in the national air and space security strategy. Judging from the theme of the times in today's society, peaceful development and win-win cooperation should be the primary choice of national aerospace security strategic means; Judging from the practical law of aerospace security, developing strength and consolidating internal strength should be the basic choice of national aerospace security strategic means; Judging from the bottom line of the use of strategic means, we must be fully prepared to use air-space military confrontation means to safeguard national interests. Responding to air and space crises and winning air and space wars is the bottom line of the national air and space security strategy, and military confrontation, especially war, as the highest means of struggle necessary for the national air and space security strategy, must be carefully built and ready to be used at all times. On the one hand, the strategic means of national air and space security are about the selection and application of war methods and non-war methods in air and space military struggle. The mode of war is the use of air and space military power to determine victory and defeat through direct competition on the air and space battlefield, including air and space warfare of various scales and styles; Non-war methods are military confrontation and struggle methods that do not directly use air and space military forces to engage in a contest of strength, including the deployment, mobilization, exercises, and deterrence of air and space military forces, the display of the performance of high-tech equipment, and the struggle in the fields of military diplomacy, military economy, military science and technology, military culture, and arms control. On the other hand, the strategic means of air and space security are related to the selection and application of actual combat and deterrence methods of air and space military forces. Actual combat is the highest form of using air and space military force, and it is an extreme means used when contradictions are intensified to an irreconcilable degree; Deterrence is the non-war use of air and space military forces, which mainly demonstrates its own strength and determination to use its own strength through the campaign of military force, and produces psychological deterrence to the enemy, so as to achieve the national air and space security goals.

3. Operational characteristics of the national air and space security strategy

In today's era, along with the historical process of the great rejuvenation of the Chinese nation, the air, space and ocean, with their high-end and broad essential attributes, jointly shape the strategic posture required by major powers, and jointly defend the ever-expanding national interests, which has become the theme of China's security strategic planning in the new stage of the new century. Among them, the unique vertical space attribute of air and space determines the huge difference between the strategic operation of air and space security and land and sea, and the characteristics of strategic operation of air and space security are very distinct.

First, the scope of operation research is spatially vast. The sky is vast, first of all, the space is vast. Space is a necessary condition for the existence of space security affairs. Therefore, in considering and planning the national air and space security strategy, we must pay close attention to and fully understand the space characteristics in the field of air and space security. Aerospace surrounds the earth, divided into aviation (inner layer) space and aerospace (outer layer) space, and below 100 kilometers from the earth's surface is air space, and above is space space. Compared with the ground, the air and space are vast and unfathomable, and the air routes, space orbits, and space platforms of different altitudes and longitudes and latitudes not only bring unlimited benefits to the human society living on the ground, but also expand the scope of national security strategic planning from the ground to the vast and boundless universe. On the one hand, the vastness of the national air and space security space determines that the strategic operation of national air and space security must have a broad strategic vision and magnificent strategic thinking, which can be as far as the top and as high as the top; On the other hand, due to the dynamics of the operation of the aerospace platform and the commonality of most of the natural space, it is also determined that the main goal of the national aerospace security strategy can only be air and space control, and cannot and cannot be air and space occupation. Based on its understanding of the natural nature of space and the characteristics of platforms, the United States has defined its space strategy as space control rather than space occupation.

Second, the objects of operation research are diversified in structure. The object (object) of the national aerospace security strategic operation is the country's security affairs in the aerospace field, and the aerospace security affairs are composed of different elements, which determines the diversity of the objects of the national aerospace security strategic operation. For example, from the perspective of the spatial attributes of the space field, there are both country-exclusive airspace such as territorial airspace, and non-exclusive space such as public space and outer space, while the public airspace over the ocean outside the territorial land and territorial sea also has the characteristics of non-exclusivity and co-attributes at the same time, that is, although any country does not have exclusive rights to these airspace, but any country has the same right to use, it is a space where the rights overlap between countries, and these spaces are relative to the sovereign airspace above the territorial land and territorial sea of the country. The scope is much broader.

For another example, from the perspective of the forces relied on to achieve the goal of air and space security, it includes both aviation and aerospace forces, as well as land and sea forces; This includes both military and non-military forces, and so on. All these highlight the diversity of national air and space security targets. It is worth noting that the non-exclusive space in the air and space domain is much larger than the exclusive airspace space, so when considering and planning for air and space security, the state must distinguish between the exclusive and non-exclusive parts of the rights, and must make full use of the rights and fulfill its obligations.

Third, the basis point of operation research is abductive in nature. With the progress of human science and technology, the enhancement of production capacity, the improvement of cognitive level and social and economic development, the basic point of strategic operation of national aerospace security presents the characteristics of continuous expansion from the bottom up and from the inside out. First of all, with the emergence of national security of survival and space, its structure has expanded from horizontal "flat" to vertical "three-dimensional," and national aerospace security has also become an air and space barrier for national land and maritime security, and its unique high-position advantage has achieved its role as a "protective umbrella". Second, in the new century, the role of space as a channel has been strengthened, all countries in the world have strengthened ties and cooperation through the space "corridor," and the process of globalization has been continuously promoted. As a result, when any country develops and utilizes space, especially public space and outer space, it will inevitably have a complex situation of overlapping interests with other countries, competition and cooperation with each other, and national aerospace security has become more expansive and international. Third, driven by economic globalization, the country's development interests are no longer limited to its own country and its surrounding areas, but have expanded to all parts of the world through maritime and air-space strategic channels, and aerospace forces have the advantage of rapid, effective and direct influence on sea, land and air and space far from national territory, which can provide strong support for maintaining the security of strategic corridors and expanding national interests. All these determine that the national aerospace security strategy must raise its vision, look at the whole world, and plan and guide the country's air and space security issues from a higher and broader scope.

Fourth, the operational research means are high-end in technology. Means is the medium through which the subject exerts action and influence on the object, which can be technology or the physical chemical of technology, with high entry barriers and great difficulty. Therefore, the strategic operational means of national aerospace security include many technologies related to the aerospace field, as well as systems and platforms materialized by these technologies.

The national demand for aerospace security has emerged and developed along with the footsteps of mechanization and informationization, and is inherently characterized by high technology of mechanization and informationization. The advent of the space era has made national air and space security a kind of competition in national air and space strength, and its essence is the competition of science and technology. Generally speaking, the higher the technical level, the greater the safety factor and the more guaranteed the safety. In the Gulf War and the Kosovo War, the multinational force and NATO, relying on their absolutely superior air and space forces materialized by aerospace technology and information technology, respectively fought two asymmetric wars against Iraq and the Federal Republic of Yugoslavia, one paralyzing Iraq's war machine and the other subverting a sovereign country. Since mankind mastered space technology and sent the space platform into the air, the competition in science and technology has been particularly prominent in the field of space and space; combat aircraft have developed from the first generation to the fourth and fifth generations; space platforms have developed from satellites to space shuttles and space planes; strategic missiles, air-to-ground weapons have become more and more accurate, and the combat results have become better and better; in particular, the new military changes led by aerospace technology and information technology have been prominently manifested in the shift of the state and the armed forces from mechanization to informationization in human society. The transformation from flat to highly three-dimensional has brought many challenges to national aerospace security, and no country can ignore the comprehensive impact and impact of high-end science and technology on national aerospace security and even national security in the strategic operation of aerospace security.

Fifth, the success or failure of strategic planning is decisive for national security. Aerospace security strategic operation is a high-end activity that embodies the will of the country and represents the future and future of the country in the air and space and information age. From the perspective of space, the strategic operation of aerospace security runs through vertical space and relies on land and sea, which is a unified planning and operation of the whole space and all height, and the results of operation research not only affect vertical space security, but also affect and restrict land security and maritime security. From the perspective of means, the strategic operation of aerospace security generally does not use ultimate means such as military occupation, but mainly through eliminating threat sources or resisting threats, but does not rule out the use of unconventional means or even extreme means to safeguard the core interests of the country under special conditions; Judging from the objects and results of the operation, the strategic operation of aerospace security is invisible in peacetime and visible in wartime, and will tend to the "extreme" more and faster; competition and cooperation in the field of air and space are usually dominated by big powers and powerful countries, and the competitive game between major powers in the field of air and space will not only have a major impact on the world pattern, but will also have an all-round impact on national security and interests, which will bring disaster to the side that loses the game and will inevitably bring heavy damage to the side that succeeds in the game. The above-mentioned characteristics of the strategic operation of aerospace security require that national entities and decision-making organs must broaden their thinking, fully consider the decisive impact of aerospace security on national security, carefully plan for aerospace security from the perspective of the overall situation of national security, and carefully operate and scientifically guide the practice of national aerospace security.

Section 3 The Times Call for China's Aerospace Security Strategy

We are in a special time. This is an era in which space and information intersect, and social informatization is non-stop and continues to develop; The militarization of air and space is advancing at the same time, and it is alone in the high-end. As the main bearer of information and technology and the convergence place for the shift of the national strategic center of gravity, aerospace has a prominent position and huge functions. National security lies in the air, national interests lie in the air, and national development depends on the space. Paying attention to and understanding space and studying and establishing a national air and space security strategy is an inevitable choice to guide the practice of China's air and space security strategy and a strong call for the development of national security in the 21 st century.

1. The national demands of the information society and the simultaneous arrival of the space age

Information and space, as two fields of close connection and integrated development in different media, have become the core components of the national security system in the 21st century. With the rapid development of the information society and the synchronous arrival of the space era, the strategic role of information and space in national security has become increasingly prominent. The national aerospace security strategy is a strategic demand for the rapid development of the information society and the simultaneous arrival of the air and space era.

The information society is developing rapidly. The information society is a society dominated by knowledge, marked by information, based on information technology, and based on the information industry. In the information society, knowledge and information penetrate into all spheres of society, changing human production and lifestyle, and also changing the security status of countries. With the rapid development of the information society, the globalization of the world economy and the integration of social factors have accelerated significantly. Under the influence of information and information technology, exchanges between countries have become more and more frequent, mutual dependence has gradually increased, strategic interests are crisscrossed, lips and teeth are interdependent, and interests and interests are shared, making the intricate pattern of integration and globalization a distinctive characteristic of the times. "Cooperative security," "common security," "strategic partners," "transnational groups" and "joint companies" are all deeply marked by integration and globalization. The safety form is an important symbol of social form, and it is also the "thermometer" that is most sensitive to social form response. In the field of air and space security, though, military security, as always, represents the most of the country

High core interests, but with the rapid advancement of social informatization and economic globalization, the proliferation of technology, the introduction of military products, and cooperative development in the field of aerospace have become indisputable facts: many countries can jointly develop the same weapon, aircraft produced by one country can also be used in the armies of other countries, and even the phenomenon of opposing sides using the same type of weapons produced by the same country in fierce wars has emerged. In this open, globalized and integrated world, consensus must be enhanced through dialogue, contradictions resolved through negotiation and win-win results must be sought through cooperation.

The space era has arrived synchronously. With the rapid development of the information society, the space era has arrived simultaneously.

In the early 20th century, the invention and use of airplanes marked mankind's entry into the aviation era; In the middle of the 20th century, the emergence of satellites and the success of landing on the moon marked the entry of mankind into the space age; Since the 80s of the 20th century, with the rapid development and widespread use of high and new technologies in aviation, aerospace, information and other fields, air and space have been more closely integrated, marking the era of human trans-human space. The aerospace era is the inevitable result of the integration and development of aerospace technology, and aerospace technology is the direct driving force for the formation and development of the aerospace era. As the materialization achievement of aerospace and information technology and the main component of the aerospace system, the aerospace platform has promoted the transformation of the national security structure from a single plane to a vertical three-dimensional form. As an observation platform, the aerospace platform can observe the earth from different distances from hundreds of meters to tens of thousands of kilometers, quickly and massively collect a variety of electromagnetic radiation information about the earth's atmosphere, oceans and land, and directly serve meteorological observation, military reconnaissance and earth resources exploration; As a relay station, it can solve the problems of communication, television transmission and data transmission on the earth's surface, and realize long-distance and even global communication and broadcasting; As a reference point, it can be used for global positioning navigation for land and sea users equipped with signal receivers, or radio beacons can be installed for ground users to carry out radio observations and geodetic surveys. The unique advantages of the aerospace platform in communications, broadcasting, observation, navigation, positioning, transportation, maneuvering, etc., have established the important position of aerospace technology in modern science and technology, and also established the strategic role of aerospace security in national security.¹

National security strategic demands in the informationized aerospace era. In the information age, the air and space domain has become the main concern of national security in space, an important support for national security in terms of technology, and a mainstay of national security in terms of strength. At present, the world powers have entered a new era of development competition, and as the core field of national security in the information age, aerospace has accelerated change, intensified competition, and added value, and the impact on national security and the threat it has brought about have increased significantly.

¹ Xu Qiliang: "The Theory of National Aerospace Security" (Preface), Beijing, People's Liberation Army Press, 2010 edition, p1.

China is a large developing country with a glorious history of exploring, developing and utilizing space and new demands in the face of the new situation and new challenges. Further exploration, development and utilization of space at a new historical starting point is not only a continuation of history, but also a choice for a new era. The national aerospace security strategy in the information age is rooted in the strategic needs of the great rejuvenation of the Chinese nation and is a rational refinement of the country's future survival and development demands. The study of the national aerospace security strategy is to clarify the opportunities and challenges facing national rejuvenation and condense the practical theme of the vertical space expansion of the Chinese nation; The establishment of the national aerospace security strategy is to reflect the country's accurate grasp of the general trend of the development of the times, condense the whole nation's understanding and pursuit of aerospace security into the national will, clarify the goal direction of aerospace security development, coordinate the development and utilization of the aerospace field, promote the expansion of national interests to higher fields, consolidate the brilliant achievements of China's rapid development, and support the great rejuvenation of the Chinese nation.

2. The practical need to safeguard and safeguard the ever-expanding interests of the state

Along with the pace of China's peaceful development, national security is facing multiple challenges of expanding fields, expanding space, and increasing demand. Studying and establishing China's aerospace security strategy is a practical need to cope with various security challenges and safeguard national interests in the process of realizing the dream of rejuvenation.

National interests continue to expand, and security needs have increased significantly. As a rapidly developing regional power, China's national interests have become richer in connotation and constantly expanded. One is to expand to "far" along the horizontal space, and the other is to expand along the vertical space to the "high". Aerospace is an important part of national interests and the main direction for the expansion of national interests. With its natural advantage of covering and overlooking the earth, space plays an irreplaceable role in safeguarding national interests and supporting national development. For example, politically, it can demonstrate the will of the state and enhance the status and role of the state in handling international affairs; Economically, it can promote the development of the country's overall economy while obtaining or maintaining national aerospace interests; In terms of science and technology, aerospace science and technology is at the forefront of contemporary science and technology, which not only represents the national level of aerospace science and technology, but also leads the direction of national science and technology development and promotes the overall leap of national science and technology capabilities; Military air and space interests are mainly manifested in security interests, and air and space security interests are not only the primary need for national survival, but also the basic guarantee for the country to seek development.

As China's national interests continue to expand, the security issues that come with it, such as the safety of energy resources and ocean passages, the safety of Chinese citizens' lives overseas, and the security of space resources, have become increasingly prominent. How to safeguard China's expanding national interests, especially overseas and in the air, has become a major issue that China's security strategy must pay close attention to.

The expansion of national interests requires a good security environment, and a good security environment requires strong support from capabilities and means. As a major strategy for planning and guiding the construction and application of national aerospace forces, the aerospace security strategy is a necessary condition for the development and application of national aerospace security strategic capabilities and the design and construction of an aerospace security environment. In today's world, diplomacy is still the preferred mode for resolving contradictions and disputes between countries, especially major powers, but peace cannot rely entirely on diplomacy, and security is often based on strong capabilities and solid and effective preparations for military struggle. During the period when Lee Teng-hui and Chen Shui-bian were in power in Taiwan, the "Taiwan independence" forces grew malignantly and "Taiwan independence" activities were very rampant, but in the end, the two sides of the strait did not move toward war but toward peace; this was naturally the result of comprehensive struggles in many fields, but it had an important relationship with solid and effective preparations for military struggle and missile tests, joint military exercises, and other loud displays of air and space capability. This is true of the Taiwan Strait crisis, as well as of air-space security and national security. At an important time when China's national interests are constantly expanding and major countries are stepping up their competition for and control of the "international commons" in order to strengthen their high-end deterrence posture and seek global strategic initiative, whether they can protect their interests in local, overseas, space and cyber-electromagnetic space depends to a large extent on whether it has the strong ability to protect it from infringement, especially air and space capabilities. To study and determine the national aerospace security strategy, it is necessary to scientifically coordinate the national air and space capacity building and application, including strategic early warning capabilities, situation shaping capabilities, crisis handling capabilities, long-range maintenance capabilities, air and space defense capabilities, interception and denial capabilities, etc., so as to better serve the national interests.

In addition, national stability and social development are major practical issues facing national security interests under the new historical conditions, and the study and establishment of a national aerospace security strategy is of special significance to coordinating the scientific development of national aerospace forces, better serving the party and government in governing the country, maintaining social stability, and promoting social development. For example, in terms of enhancing the function of national services, we will make overall plans for the capacity building of aerospace force services, provide meteorological, communication, navigation, remote sensing and other data services for social life and production, and provide remote and rapid means of arrival for personnel exchanges and material circulation to meet the new needs of the public in modern life and production; In terms of enhancing emergency rescue functions, make overall plans for the construction of aerospace emergency rescue equipment and facilities, improve the ability to monitor major disasters such as earthquakes, floods, forest fires, meteorites, etc., provide a basis for the party and government to grasp the disaster situation in a timely manner, make rapid decisions and guide disaster rescue, and provide timely and effective support for the material needs, remote evacuation and transfer of personnel in disaster areas, and overseas rescue;

In terms of enhancing the crisis handling function, make overall plans for the construction of air and space forces crisis handling means, improve the air and space platform's ability to detect and monitor terrorist activities, the ability to quickly deliver under various conditions, the ability to strike at low, slow, and small threat targets, and the air security capability of major social activities, so as to provide strength support for the party and government to deal with vicious incidents in a timely and effective manner; In terms of enhancing the social supervision function, we will make overall plans for the social supervision and service functions of the aerospace forces, and take advantage of the high-level view in the air and space field to carry out regular detection, surveillance and verification of national land resources, so as to provide important guarantees for the party and government in anti-smuggling, anti-narcotics, border prevention and control, maritime and traffic management.

3. Strategic ideas to guide the use and construction of national aerospace forces

The basic function of China's aerospace security strategy is to guide the correct use of China's aerospace forces and the scientific development of its aerospace undertakings, and the fundamental purpose of studying and establishing China's aerospace security strategy is to form a strategic understanding of China's strategic value, development law, overall layout and force use in the aerospace field, build a strategic theory of aerospace security with Chinese characteristics, and guide the practice of China's aerospace security strategy.

The objective need to enhance the country's air and space competitiveness and enhance its comprehensive national strength. With the steady development of its comprehensive national strength, China's influence on the world pattern, order and code of conduct is increasing, and enhancing its core competitiveness in important areas of human civilization development has become a major strategic issue that China must face and solve in the process of rapid development. Practice has proved that the emergence of aircraft, rockets and satellites has changed the face of the world, and aerospace forces have become an important force affecting the world pattern, the global economy, and daily life, and a powerful driving force for promoting social progress. The degree of development of aerospace has become an important symbol and a major symbol of a country's status as a major country in terms of science and technology, national defense construction and national economic modernization. The aerospace field has become a new growth point for the country's political, economic, scientific and technological strength and security strength and a strategic commanding height of its core competitiveness in the information age. At present, about 50 countries and regions in the world have aerospace industries of different scales, of which the most developed regions are mainly concentrated in the United States, Western Europe and Russia, which highly coincides with the distribution of power centers and national competitiveness and comprehensive national strength in the world today, which fully illustrates the close relationship between the aerospace field and the core competitiveness of the country.

As a strategic industry with high added value and high driving force, the aerospace undertaking was, is, and will remain the strategic focus of the country's scientific, technological, economic, and military development. The establishment of the national space security strategy is rooted in the strategic need to enhance China's core competitiveness and acts as a scientific guide for the development of China's aerospace industry, which is an objective need to enhance China's core competitiveness and comprehensive national strength.

Developing national air and space security strength is an inevitable choice for safeguarding the security interests of major powers. At present, the world's military changes are deeply developing, the national security environment is undergoing major changes, the position of the aerospace field in national security is becoming more and more prominent, and the influence and role of aerospace security on the development of national security are constantly increasing. In view of the recognition of the huge strategic value of the air and space field, all countries in the world have obviously accelerated the pace of building air and space forces, and the competition for strategic interests in the air and space has become increasingly fierce, forming an air and space strategic pattern in which one superpower dominates, many powers are in dispute, and the crowd is chasing the deer. Generally speaking, the competition in space is expanding from developed countries to developing countries, from traditional technology to high and new technology, and from single domain to cross-domain; aerospace equipment is showing stealth, unmanned, hypersonic and cross-domain characteristics; the form of aerospace forces is undergoing structural changes; and the rights and status of major powers in the field of air and space have become a key factor in determining their international status and winning the initiative in the strategic game of major powers. What merits special attention is that the United States has positioned China as the "only" major power adversary, announced that its strategic focus has shifted to the Asia-Pacific region, pointed its strategic spearhead directly at China, launched and implemented the "Air-Sea Battle," and accelerated the construction of an air-space containment system. In the face of the urgent challenge of squeezing China's status as a great power by air and space superiority, it is urgent to accelerate the improvement of air and space security capabilities that combine actual combat and deterrence. The establishment of a national air and space security strategy is an urgent need to adapt to the development and changes of the strategic game mode of major powers and to deal with the growing threat of air and space security, and is an inevitable choice for coordinating the scientific development and leapfrog upgrading of national air and space security forces, and safeguarding China's status as a major power and overall security.

Strengthening international aerospace cooperation and exchanges is the only way to build a harmonious space. The ability to cooperate internationally and communicate is an important manifestation of a country's strength and a necessary condition for a major country to assume international responsibilities and maintain world peace and development. With the progress of world civilization, human activities have expanded from land and sea to the air, and have constantly advanced to new heights, and space has become an important link for friendly exchanges between people all over the world and an important space for the development of human civilization. At the same time, we should also realize that along with the basic situation of overall stability in the world peace and development today, the haze of war is not far away, and mankind will still face complex and diversified air and space security threats and challenges for a long time.

Practice has proved that the greater the accumulated energy in the aerospace field, the greater the positive effect on the security and development of one's own country, and the greater the negative effect on the security of other countries. If the big and space powers and even the general small and medium-sized countries deliberately build the space into a new battlefield, then the disaster brought by the air and space to human society will be immeasurable; When space and space truly become the window of attack to destroy the world, no country can stay out of it, and no country can defend itself against this threat. Strengthening international air and space cooperation and exchanges, resolving contradictions, stopping conflicts and containing wars have become the common responsibility of the international community. Maintaining air and space security and building a harmonious space should be the common pursuit and good wish of all countries in the world. As an aerospace power with certain strength and foundation, China must have a greater voice and dominance in the field of air and space. The establishment of a national air and space security strategy is an important measure to strengthen China's international core position in the process of shifting its international role from the edge of power to the center of power, and it is also the only way to promote international air and space security cooperation and build a harmonious air and space.

CHAPTER 2 THE STRATEGIC SITUATION FACING CHINA'S AEROSPACE SECURITY

The situation determines the task. The strategic situation facing China's aerospace security is an important basis for establishing China's aerospace security goals, building aerospace security capabilities, selecting aerospace security means, determining aerospace security models, improving the aerospace security system and implementing aerospace security operations.

The situation is inspiring. In the first half of the 20th century, China was still struggling for national independence and sovereignty; In the second half of the 20th century, China had ushered in the dream of a strong country with national rejuvenation. At present, the international situation is changing and the competition between major powers is becoming increasingly fierce, and globalization, multipolarization, and informationization have become distinctive characteristics of the times.

At this important juncture of great development of science and technology, great adjustment of the world, and intensifying competition and threats in the aerospace field, the hardworking, brave and wise Chinese people have once again won the favor and favor of the god of history for themselves. As an ancient people that has been passed down for thousands of years, our ancestors once created a model of multicultural harmony; As a young country that is rejuvenating and rising, we should take a proactive attitude, gain insight into the strategic situation of space and space, seize the historical opportunity of space and space, respond to challenges to air and space security, and continue a new chapter of peaceful development.

Section 1 The Pattern of International Power in the Context of Globalization

Globalization is the basic feature of today's human society, and the main body is economic globalization. As Marx said, "Globalization is first and foremost the globalization of capital and its 'isms'." Driven by global capital, with the formation of a common market, the popularization of information technology and the active or passive involvement of the vast majority of countries, economic globalization, characterized by trade liberalization, production globalization and financial globalization, has become an important content of international exchanges, and the actual process of the "3.0 era" of world economic globalization has erupted like lava, impacting and reshaping the international power pattern with its own great power.

1 The rolling tide of economic globalization

Today, with the continuous development of information technology, commodities and various factors of production flow around the globe at an unprecedented speed and scale, and the economies of different countries are increasingly forming a closely linked whole. The gradual internationalization trend of the originally relatively independent national economy has prompted the economic exchanges of most countries and regions to converge into a globalization process, and the gradual development of the globalization process has brought about the continuous dilution of national differences. This series of interconnected historical processes has subtly changed the economic basis and behavior of global powers.

On the one hand, economic globalization not only strengthens the real dependence between different regions, countries and nations, but also magnifies the possibility of conflicts between them. The torrent of products, resources, capital, science and technology formed by the free flow and dynamic allocation of products on a global scale has broken through the traditional national, ethnic and ideological barriers, and formed a pattern of interests of "you have me, I have you," "blessed and difficult" all over the world. The simplistic handling of international relations between several countries and peoples in the Westphalian era and the secret consultation and arbitrary behavior of a few major powers under the Yalta system have lost their basis for existence. Human society seems to be gradually coalescing into the community of life predicted by liberals. But the contradictions and conflicts between different regions, countries, ethnic groups and ideological groups have not abated.

Economic globalization, which takes the transnational flow of goods and capital as the initial form, has brought about exchanges, collisions and conflicts of spiritual forces, including culture, lifestyle, values and ideologies, which are brewing, stirring and intertwining around the world, and the influence of "butterfly effect" and "chain reaction" is prominent. An honest and devout Muslim may harbor an inexplicable hatred for Americans who have never met tens of thousands of kilometers away, who are whistling in Hamburg or basking in the sun; Two countries may fight over a little resource or a passage on the other side of the globe. The contradiction of "insignificant" and "distant oceans" in the pre-globalization era is brought closer and magnified by globalization or through the lens of globalization.

On the other hand, economic globalization has not only enriched the composition of national power, but also diluted the status of the country in the competition for power. The status of military capability as the main option of national power is fading. From the perspective of factors, the comprehensive capabilities of economy, science and technology, culture and other aspects are constantly being enriched into the new scope of national capabilities; From the perspective of space, emerging capabilities in the fields of public space, cyberspace, and space are becoming a hot concept for national capabilities. Economic globalization has also weakened the dominant position of traditional sovereign countries in handling international issues, bringing about historic changes in the ways and means of national security. Matters within the traditional meaning of national sovereignty are increasingly influenced, monitored and intervened by international organizations, even transnational corporations; The actions of national governments are increasingly constrained in the context of the overall increased influence of world markets; Economic globalization has also had an impact on the relationship between the state and its citizens, and the traditional indisputable ideologies of the nation-state's solid position in the world system, the supremacy of sovereignty, patriotism, and civic identity have been challenged like never before.

For developing countries, economic globalization has brought both immediate and practical benefits and long-term development traps. Economic globalization not only makes it possible for developing countries to use world capital, but also helps developing countries give play to their comparative advantages, expand import and export trade, optimize the allocation of domestic resources, and also helps developing countries introduce advanced science and technology and modern management experience to enhance their comprehensive national strength. Although the political and economic pattern of today's world determines the unequal nature of globalization in terms of level and scope, the relatively weak position of developing countries vis-à-vis developed countries has not fundamentally changed. However, the changes in the relationship of global forces and structural adjustment brought about by economic globalization have already begun to appear.

2. The changes in international power relations in the context of globalization

Changes in international power relations are mainly caused by changes in the subjects of power at the international level and changes in the nature of relations between them. Economic globalization is a component and an important boost to the changes in international power relations, and to a certain extent, economic globalization stimulates, promotes and lays the foundation for the current international power subjects and their relations.

The first is to develop from a single to a diverse, which has prepared conditions for a variety of subjects to pass through the sky and space. Economic relations are a relatively mild and reciprocal relationship. It is also its relatively harmless characteristics that bring the world closer after the collapse of the bipolar pattern. It has not only made the world stage "bigger" and able to accommodate more sovereign states, international organizations, and transnational corporations, but also made the world stage "smaller," made the ties between various actors of different nature closer, and further enriched the content of the world stage.

Second, the shift from confrontation to dialogue has laid the foundation for various forms of space. Since the Napoleonic era, major powers have mostly pursued a confrontational "balance of power" strategy with military competition as the core. They plundered colonies, markets and raw material sources overseas, and fought wars of hegemony among great powers, most notably the two world wars that affected the world. During the period of bipolar confrontation between the United States and the Soviet Union, the world was artificially divided into two camps, antagonistic and hostile to each other, and engaged in competition and confrontation at many levels such as politics, economy, and military, and the air and space fields were the "hardest hit areas." With the disintegration of the Soviet Union and the dramatic transformation of Eastern Europe, the solid ice of ideology has gradually melted, various international exchanges have gradually warmed up, seeking peace, seeking development, and stressing cooperation have become the consensus of the main body of all forces in the world, dialogue has replaced confrontation has become the main way to handle international affairs, and win-win cooperation has become the mainstream tone of aerospace behavior.

The third is to move from scattered to close gathering, which provides a reference for the further development of air-space cooperation in frequency and depth. The interdependence and interconnectedness of actors of different nature around the world have been continuously improved, and at a time when informatization is constantly advancing and expanding, it has been strengthened unprecedentedly. During the Silk Roads and the Age of Exploration, the "serendipitous" ways of interacting with people over thousands of years of distance have been replaced by "close" and "normal" connections such as large ocean-going ships, land lines of communication that are clear day and night, busy air routes, and a constant information network.

For example, the International Space Station project, since its inception to today, 30 years, including the United States, Russia and other 16 countries (institutions) closely cooperated, astronauts from different countries to complete nearly 30 long-term expeditions and more than 10 mid-term expeditions, creating a model of human aerospace cooperation. But also due to the increase of dependence and linkage, the "butterfly effect" and "domino phenomenon" of the international community are more obvious.

3. The adjustment of the international power structure in the context of globalization

The relative weakening of the traditional power centers has shown signs of loosening the existing air and space power order. From the root cause, the ebb and flow of power promoted by economic globalization is the deep-seated reason for the adjustment of the global power structure. The United States has been at the center of the world political arena for so long because it "accounted for about 30 percent of the world's gross domestic product for most of the 20th century, and 50 percent of total world output peaked in 1945." Due to international and domestic problems such as the decline in national debt and social mobility caused by various reasons such as domestic financial and political systems and international policies, the overall strength of the United States has shown a downward trend in the early 21st century. With the deepening of economic and political integration, the EU is no longer satisfied with just playing the role of the little brother of the United States, and is making unremitting efforts in the direction of establishing independent influence and actively promoting multi-party space legislation. Wanting to further become a world political power, Yuben is also actively seeking political independence, and other emerging forces represented by the "BRICS" are growing strongly, and the gap between their demands in the aerospace field and the status quo is particularly prominent. In particular, the rapid development of China's economy has greatly changed the world economic and political pattern. It can be said that the trend of multi-level has become an irreversible historical torrent, and the relative weakening of traditional power centers has become a reality. As a reflection of the international power structure, the norms of power in the air and space realm have also shown signs of loosening.

The main body of global power has been further generalized, preparing the conditions for the establishment of a new space order. For a long time from the Westphalian system to the Yalta system, the protagonists on the international stage were national sovereign states, especially European countries, or even just a few European powers. Other power actors are either absent or disenfranchised, and global power relations are relatively simple. After the formation of the bipolar pattern, the relationship of hegemony and confrontation between the two camps, centered on the relationship between the United States and the Soviet Union, was the main form of global power relations at that time, and space became an important place for the two sides to wrestle.

By the 90s of the 20th century, there were more than 500 intergovernmental international organizations and more than 36,000 non-governmental international organizations. The 20th century has therefore been called the "century of international organizations". The influence of international organizations in global affairs is increasing. In addition, multinational companies have also become an important player in the international arena, taking the whole world as a unified economic space, arranging the country as a "production workshop," optimizing the allocation of resources on a global scale, and some large multinational companies have scientific and technological capabilities, economic strength and political influence far beyond ordinary small and medium-sized countries. All this has prepared the conditions and laid the foundation for the re-establishment of space order.

For China, the context of globalization and the evolution of the current world power pattern make it possible for China to return to the center of the world stage; At the same time, the emerging field of aerospace conforms to the trend of the times of peace, cooperation and win-win cooperation, which is the development of the international power pattern, and provides an important opportunity and key platform for emerging powers to participate in and influence the world.

Section 2 National Security Environment under the Trend of Multipolarization

Multipolarization is a typical trend in the contemporary world pattern, and the core is political multipolarization. Driven by the joint impetus of various factors dominated by economic globalization, the global power base is constantly changing, the international political awakening is rising day by day, and the center of gravity of world power has shifted from west to east, from superpowers to other powers, and from traditional powers to medium-sized and small countries, making the political multipolarity different from the bipolar pattern of the United States and the Soviet Union and the superstructure of the United States a typical trend of changes in global power relations and structural adjustment. This trend has triggered changes in the national security environment, promoted the expansion of national security needs, and has a significant and far-reaching impact on national security.

1. The profound impact of political multipolarity

The so-called political multipolarization refers to the special phenomenon of international power decentralization and polycentricity that has emerged in the world since the collapse of the bipolar pattern in the 90s of the 20th century and before the emergence of the new pattern.

Some rejoice in the trend towards multipolarity as a sign of a bright future for lasting peace for humanity; Others are pessimistic and even predict that "people will soon miss the bipolar era." As far as the reality of the current world political pattern is concerned, the joint participation of multi-nature subjects has become a major phenomenon in international politics, but sovereign countries, especially important powers, still enjoy a special status, and the transitional characteristics of the international strategic pattern are obvious, and this phenomenon has an extensive and profound impact on the national security environment.

On the one hand, the long process of repeated political multipolarity has tempted multiple actors to compete for world power. Benefiting from the relatively stable world situation and the prosperity of the global common market, many small and medium-sized countries,

In particular, some developing countries that were previously isolated from the world have made remarkable achievements, which have contributed to the continuous dispersion of the world's power center of gravity in dynamics. The mainstream will of the international community to seek peace and development has tended to disintegrate the rigid, static, and bipolar confrontation pattern based on the balance of terror, and has also made it difficult to build an absolute unipolar pattern in which the United States is hegemonic by one superpower, and the world has further developed toward the United States, Russia, Europe, China, Japan, and India. From the current point of view, first, the relative weakness makes the United States unable to control global affairs; second, other powerful countries are still incomparable with the United States on the whole; third, the international community has further awakened, not only traditional sovereign states, but also a variety of actors, including international organizations and multinational corporations, are also vying to maximize their own interests in their own ways, and the world is facing a "power crisis" brought about by the surge of "power subjects" and the expansion of the "power vacuum". In the foreseeable future, the possibility of surpassing and replacing the United States as a global power is still slim, and it will take time to establish an international behavior framework widely recognized and supported by the international community.

On the other hand, there are many possible dynamic adjustments in political multipolarity that will prompt existing powers to seek future advantages with existing resources. Political multipolarity points to a possible direction for the development of the current world political pattern, but the stable international pattern has not yet shown signs of solidification. Even if multipolarization has become a reality, the possibility of further evolution in other directions cannot be ruled out. Multipolarity may be stalled by some kind of pressure, or it may be re-imprisoned to a certain power, and even a post-multipolar world does not mean the arrival of a "blissful world" of global governance. In other words, multipolarization has not ended hegemony so far, but has only temporarily suspended the global absolute dominance of the existing hegemony. After all, however, multipolarization has opened the door for human society to peacefully resolve international affairs, making the means of handling various affairs of the international community more flexible, richer in means and more democratic in form.

The trend of the international security situation from a balance of terror to peaceful coexistence, from a single strategic foundation to a multi-strategy with equal emphasis on multiple strategies, and from deterrence and confrontation as the keynote to win-win cooperation as the mainstream is irreversible.

For large developing countries, the greatest significance of political multipolarity lies in providing them with an opportunity and way to integrate into the international community, influence the international pattern, and formulate the international order with less cost and risk. However, political multi-tiering does not mean that the national security situation will be optimized. Taking the initiative to integrate people, actively act, and promote the development and reconstruction of the international community with the growth of its own strength is a basic path. In the face of the dynamically changing international situation, we can not talk about liberal ideals, but we must face the reality of realism. In the process of multipolarization of "a broader global leadership base but also a greater lack of cohesion," the status of traditional national security factors represented by inter-state relations cannot be ignored, and at the same time, non-traditional security issues are intertwined, so that many traditional security issues have non-traditional characteristics, non-traditional security issues have traditional colors, and the dual test and dual demand of national security have become imminent.

2. The transmutation of the national security environment under the trend of multipolarization

Since the 90s of the 20th century, especially after the "9/11" incident, various contradictory factors affecting international security have been further revealed, and the pattern of world power has undergone changes under the trend of political multipolarization, which has had a realistic and significant impact on the security environment of sovereign countries, especially emerging developing countries.

Peace and development remain the theme of the times, setting the mainstream tone of national air and space security. In the mid-80s of the 20th century, Comrade Xiaoping made a scientific judgment that peace and development were the main theme of the times. Represented by the "9/11" incident, there has been a peak of stirring up various ideological trends triggered by globalization led by the West, especially the United States. However, the main contradictions that determine the theme of the times and the main problems facing the international community have not fundamentally changed, but the factors affecting the development and change of the themes of the times have increased than before. In fact, as Brzezinski said, inter-state relations are still a key factor to be considered in national security, and important powers still occupy a superior position in the world power structure. At present, the main contradiction in the international community has evolved into a contradiction between one superpower and many powers, unipolar and multi-level, the essence of which is the struggle between hegemony and anti-hegemony, and the struggle between the needs of the people of the world for peace and development and the self-interested behavior and selfish ambitions of superpowers.¹

¹ Liu Jingbo: "China's National Security Strategy at the Beginning of the 21st Century," Beijing, Shishi Publishing House, 2006 edition, p63.

The power divide brought about by multipolarity and the generalization of power brought about by the global political awakening will force the superpowers to restrain their arbitrary unilateral offensive behavior. Generally speaking, "maintaining peace and promoting development have a bearing on the well-being of the people of all countries, are the common aspiration of the people of all countries, and are also an irresistible historical trend." The development of the trend of world multipolarization and economic globalization has brought opportunities and favorable conditions to world peace and development," and at the same time reserved a window for China's national air and space security.¹

The intention of major powers to regard China as a strategic adversary has been revealed, indicating a tortuous path of national air and space security. With the deepening of reform and opening up, China's comprehensive strength and national status have been qualitatively improved. Economically, the overall scale has continued to grow, continuously surpassing developed countries and ranking second in the world; Militarily, the quality of the army has been continuously improved, and the level of weapons and equipment and the quality of personnel have been steadily improved; Politically, he actively participates in various international and regional affairs, and his global influence is gradually increasing. It can be said that China has become a decisive force in the world, especially in the Asia-Pacific region. The "counterposition" confrontation of major powers directly using us as a potential strategic opponent came ahead of schedule. Due to historical and ideological reasons, the US conspiracy to subvert and evolve China has never disappeared. In the late Cold War, out of the strategic need to balance the Soviet Union, he also briefly cooperated with me partially. However, with the collapse of the Soviet Union and the rapid rise of China, the vice of the United States urgently needing strategic opponents has prompted the dregs of various anti-China thinking in its country to rise, and the remarks calling for containing and "encircling" China on the representative of the "China threat theory" are constantly heard, and marked by the "Air-Sea Battle," the United States directly regards China as an "anti-access" force in the Asia-Pacific region and strives to build a strategic encirclement circle against China, and China and the United States have entered the stage of "counterposition" confrontation from "misalignment" confrontation. The resulting Taiwan issue and peripheral issues may be further complicated, and the inflection point of China's peaceful development and security environment may appear in advance. The "Air-Sea Battle" has shown that air and space will become the high point and a means for the United States to intervene forcefully against us.

Destabilizing factors surrounding the boundaries of interests will persist, increasing the destabilizing factors of national air and space security. China is a country that is developing rapidly in the rapids of globalization, and the expansion of the scope of interests and the lag and gap between the support of interests have been further enlarged, and the existence of national interests has been continuously enriched. Traditional concepts of national interests such as territory and sovereignty are no longer sufficient to cover the rich connotations of national interests. Second, the scope of the existence of national interests has been continuously expanded. For countries that have historically been poor and weak and have recently developed rapidly, the boundaries of interests that were originally confined to the "doorstep" have rapidly expanded to thousands or tens of thousands of kilometers away, and even to the world.

¹ Compilation of Documents of the 16th National Congress of the Communist Party of China, Beijing, People's Publishing House, 2002 edition, p45.

As globalization enters the e-era, the emerging space field represented by outer space has gradually entered the core circle of national interests from the periphery. These problems associated with development will rise and fall dynamically along with the adjustment of the boundary of interests, which are inevitable and cannot be avoided, and we must carefully analyze and carefully plan the many areas involved in national air and space security to prevent them from stirring each other and being used by the enemy.

3. The expansion of national security needs under the trend of multipolarization

In the era of economic globalization and political multipolarization, traditional security and non-traditional security issues are intertwined, some traditional security issues have non-traditional security colors, and some non-traditional security issues have traces of traditional security, which overlap each other in elements, intertwine in means, and penetrate each other geographically, which has become a basic situation facing national security, including aerospace security.

Traditional security requirements are constantly improving qualitatively, and aerospace forces have become a strong support. The so-called traditional security refers to a series of issues around national sovereign security and derived from it since the birth of sovereign states, with military security as the core, mainly from the perspective of the state, considering the political, military, diplomatic, intelligence and other related fields between countries. Supporting national security through military security is the basic idea of traditional security, and the focus of American academics on national security on the threat, use and control of military force is a typical embodiment of this thinking. Even today, when global interests are increasingly integrated, military power and recourse to war remain the most important and effective means of safeguarding national security. Moreover, with the deepening of the integration of high and new technology represented by information technology with the military field, the traditional security requirements of military security have emerged mechanized wars and nuclear wars that are completely different from those of mass destruction, and the characteristics of high speed, precision, and high efficiency are clearly prominent. The informationized strike capability that relies on and occupies air and space superiority is undoubtedly fatal to the armies of third world countries at the level of mechanization and semi-mechanization. The highly developed new air and space military means even theoretically have the ability to instantly "disarm" nuclear weapons, and traditional military capabilities will face the danger of being "cleared," and the country's traditional security needs will continue to improve qualitatively.

Non-traditional security requirements are increasing in volume, and air and space forces have become an effective option. Non-traditional security is a general term for various security threats that people used to distinguish them from traditional security after the Cold War. For States, non-traditional security issues in the typical sense include threats to national sovereignty and territory posed by non-State actors, as well as threats to the survival and development of people and society.

Generally speaking, non-traditional security threats are geographically transnational, sudden in their way of occurrence, associated with traditional security, and diverse in specific patterns, objectively increasing security needs. Moreover, a prominent common feature of these threats is the inefficiency of simple and pure military operations, which forces the traditional security concept centered on military security and the traditional security capability centered on military capabilities to be broad-spectrum and flexible in order to achieve an effective response to security needs of different nature and intensity. In addition, because non-traditional security issues are often rooted in the depths of countries, nations and societies, and the threats they bring are mostly related to the survival and development environment of the entire human race, which is difficult, long-term, and not a one-time achievement, which also makes non-traditional security needs diffuse in time and space, objectively increasing the demand for non-traditional security capabilities. For example, counter-terrorism operations require precise and controllable crackdowns, cracking down on transnational smuggling requires large-scale rapid monitoring, and responding to major natural disasters requires long-term monitoring and early warning and real-time intelligence analysis, but the shortcomings and weaknesses of these traditional security capabilities are precisely the advantages and specialties of aerospace forces, and air and space forces have naturally become an effective force to meet non-traditional security needs, and will certainly play an increasingly important role in more and more non-traditional security fields.

For China, political multipolarity and changes in the national security environment are, first, a major opportunity for China to participate in the reconstruction of the world security environment; Second, aerospace has become a key area for consolidating the national security environment and expanding capabilities, and as an emerging power, it must attach great importance to it, plan carefully, deeply participate in it, and actively act.

Section 3 The Situation of Aerospace Competition in the Process of Informatization

Informatization is the process of information technology being widely applied to political, economic, military and other fields. As the core and important content of the world's new military transformation, informatization in the military field has promoted the historical leap in the form and mode of warfare, and the process of military informationization has given more prominence to the status and role of the air and space field, making it an important factor affecting the strategic situation of national security.¹

¹ Military Informatization Dictionary Editorial Committee: Military Informatization Dictionary, Beijing, People's Liberation Army Press, 2008 edition, p557.

1. The severe test of military informationization

Military informationization, which originated in the field of weapons and equipment, is a comprehensive and revolutionary wave of military systems including military technology, operational thinking, and institutional establishment. In this new military change in the name of informationization, an unbalanced situation has been formed, with the United States as the leader, other military powers catching up in a hurry, and latecomer countries making their own surprising moves, and the country's air and space security is facing a severe test.

On the one hand, military informatization has highlighted the status and role of the air and space field. Military informationization is a product of the development of human science and technology to the current stage, and is the result of the in-depth integration of the military field with science and technology, but the essential nature of military as a means of political subordination has never changed. The life of military operations is always in political necessity. Before the nuclear age, people were often troubled by the lack of military strength to achieve political goals, while the nuclear age exceeded political goals in the context of globalization because nuclear weapons were too powerful. The misalignment of weapon performance and political purpose is its political essence. With flexible, rapid and efficient new quality military capabilities, all countries abandon rigid, static, and inefficient mechanized military forms and replace the urgent need for nuclear military forms that "only destroy themselves," which has become the direct driving force for the transformation of military informatization and the direct driving force for highlighting the status and role of the aerospace field. Military operations under informationized conditions have become more and more dependent on rapid, mobile, and flexible air combat forces, and future informationized warfare will be inseparable from the support of space-based early warning, reconnaissance, and communication systems. With the further promotion of the application of new equipment technology in the field of air and space, the aerospace will gradually enter the midstream of information processing and application from the upstream action of information acquisition and transmission, and will directly participate in the final stage of firepower strikes. With the further development and maturity of aerospace forces, their role in the evolution of the international power pattern will become more important. The United States' attitude of seeking new air and space forces and absolute air and space superiority, and the rush of other major powers to follow suit, has also made us more aware of the international political ecology and the undercurrent under the wind and drizzle, and told us more clearly that the permanent peace of DDR and return to the field and Mafang Nanshan is far from coming.

On the other hand, military informationization has expanded the breadth and depth of air-space competition. With the continuous expansion and deepening of military informatization, the breadth and penetration of information and the core sensitivity of military have enriched and expanded the connotation and extension of national security. In the information age, wherever the needs of national interests radiate, the boundaries of national security stretch.

National interests have risen from land to space, from tangible to intangible, from the real to the spiritual realm, and directly led to the integration of air space and space space to become the commanding height of national security. Due to the special importance of air space and space to the collection, transmission, processing, and application of information in the military field, the struggle for information control rights actually manifests itself and boils down to the struggle for comprehensive air and space supremacy. For countries in the information age, whether it is to survive in the changing international pattern or to seek development in the rushing tide of historical development,

Neither can and cannot turn a deaf ear to the increasingly prominent position and role of the aerospace field. The air-space competition has developed from an expensive game for a few large countries to a Douluo field involving small and medium-sized countries, multinational corporations, scientific research institutions and even some individuals. This phenomenon of "Wang Xie Tang Qianyan in the old days flew into the homes of ordinary people" has further aggravated the complication of the air and space security situation, and further changes in national security in the era of information and space are inevitable.

As far as a major country that is developing rapidly is concerned, the undercurrents and turbulent clouds on the eve of the formation of a new pattern of international politics will inevitably cause national security to undergo various tests in high winds and storms. Although international security competition has tended to be diversified, and although national security capabilities are constantly improving, military security will always be the most critical, core, and indispensable link of national security, and military struggle will always be the most realistic, cruel, and white-hot side of national competition. If there is any balance that can pry the balance of military balance, and even pry the historical wheel of the international pattern and human development, then space must be one of them. In the information age, air and space are the foothold and bearing point of future national security, and they are also the intersection and key point of national security competition.

2. A super diversified competition pattern

In the middle and late Cold War of the 60s of the 20th century, two prominent trends emerged in national security: first, nuclear weapons as a means of war and deterrence gradually weakened from a dominant position; Second, air and space deterrence has become an important factor affecting national security. Countries in different positions in the international power structure have turned their attention to the field of air and space, and the competition between air and space has become an important form of competition among major countries in the world, showing a basic situation of "multi-generation" coexistence at the technological level and overall "imbalance" in the level of strength. At present, superpowers have initially possessed the ability to re-imprison the world pattern under their unipolar absolute superiority by virtue of their air and space superiority, and the pattern of "one super-diverse" air and space competition has begun to appear.

The absolute superiority of the United States. As the "only remaining superpower" in the world today, the United States possesses a strong strength in the air and space field that other countries cannot match. The United States is the initiator of "Star Wars" and has deep accumulation in the field of air and space. After the end of the Cold War, the United States launched the Gulf War, the world's first modern war with the characteristics of integrated air-space operations, and while tasting the sweetness of air and space superiority for the first time, it also strengthened its belief in continuously expanding its air and space superiority. The United States has never relaxed its research and development of space technology, and has successively begun the construction of a new generation of stealth aircraft, military satellites, space vehicles, space-based information networks, and anti-missile systems, and stepped up the construction of a more perfect air and space force system in terms of materials. The United States has further established its national space policy, regarded space as the strategic commanding height for controlling the world, further improved the formation and command mode of the integrated air and space forces, regarded space-based resources as a strategic deterrent equivalent to nuclear resources, repeatedly conducted the "Schriever" exercise with space warfare as the background, pinned its hopes on using space forces to carry out asymmetric strikes against opponents, and demonstrated the independent, strategic, and decisive important role of aerospace forces in the Kosovo War in 1999. It is undeniable that the United States has the most advanced aerospace technology, the best quality of space assets, the strongest aerospace capability, a perfect aerospace technology research and development and application system, the largest production capacity of the aerospace industry, and even the vast majority of spacecraft in orbit are the United States, and the completeness and influence of its aerospace industry chain have penetrated into every corner of the earth, becoming a leading aerospace power and power. On the whole, the United States has gained absolute superiority in the air and space field.

Russia's comparative advantage. As a former superpower, Russia inherited the vast majority of Soviet space assets. With the collapse of the Soviet Union, Russia is slightly "stretched" in the competition of great powers, including in the air and space field, and its air and space capabilities and space potential have declined to a certain extent, which is fully demonstrated in the scientific research process of Russian aerospace equipment. In particular, the field of astronautics, which was proud of the Soviet era, is even more incomparable. The number of Russian spacecraft in orbit is "beyond our means," the level of performance has also seriously declined, and the military space system can only be maintained to a minimum. Although it has gradually become a second-rate space country in terms of size and strength, it does not mean that Russia is willing to be left behind. With the economic recovery in recent years, Russia has redefined its plan to revitalize the space power and reorganize the structure of the aerospace industry. In particular, in the face of the increasing air and space pressure of the United States, Russia is striving to achieve breakthroughs in the air and space field, establishing an air and space defense command to coordinate the construction of air and space defense, and continuously increasing capital investment in the air and space field, and has led the annual space launch list for many years. All indications show that Russia has realized the serious impact of the US monopoly in the aerospace field on its national security and the irreplaceable special status and role of the aerospace field in future national security.

How strong and competitive. In addition to the United States and Russia, the European Union, India, Japan, Israel and other countries are also actively promoting their respective aerospace strategies, and many developing countries have also added personnel to the army of aerospace development. At present, more than 50 countries in the world have developed space systems, more than 20 countries have space launch capabilities, and more than 1,200 satellites, space stations and other spacecraft in orbit. In particular, many military powers regard space control as an important way to seize greater international political capital in order to develop air and space military capabilities to strengthen air and space superiority and national security goals. The United States has long begun to establish an aerospace expeditionary force, which must be "in the air, space, and air, flying, fighting, until victory"; Russia has focused on strengthening the construction of air and space defense forces, and the "Aerospace Force" has become an independent branch of the Russian army; France, Britain, India, South Korea, etc. have established or actively mobilized leading institutions for space forces. Although these countries have a certain gap with the United States and Russia in the level of air and space capabilities, the air and space competition between multiple powers and the complicated situation brought about by it will undoubtedly be a basic situation that major powers will have to face in the future.

3. The deteriorating aerospace ecology

With the development of human science and technology and the ensuing entanglement of interests, the sky is no longer the place to look at Yiyu Chengbi. In the international anarchy, the self-interest and disorder of air-space competition are prominent, and the air-space competition is gradually entering the core field of national interests and the center of the vortex of the game between major powers, and the aerospace ecology has shown a deteriorating trend.

The limited nature of space resources has made the contradiction of air and space competition prominent. Although the sky above human beings seems to be endless, but limited by the stage development of human science and technology, the available resources in a certain period of time are relatively limited. Taking orbital resources as an example, the current latecomer countries that want to enter space are facing the game rules of "first come, first come" and "right seat," and the simple law of the jungle can no longer be applied to the objective reality of the crowd of heroes. The United States and Russia occupy half of the orbital resources, other major countries are gradually increasing their occupation of space resources, and many emerging countries and developing countries that do not fully have technical capabilities are not far behind.

For latecomer countries, in order to participate in aerospace competition, they must first abide by the rules of the space game, coupled with the restrictions of the inherent natural environment of outer space on the use of orbits, the requirements of technology for the number of artificial aerospace equipment, and the large amount of space junk generated after decades of development and utilization, the location resources that can be used to install new aerospace platforms are actually very few. In the long run, the irreconcilable contradiction between the infinity of human needs and the finiteness of space resources will surely intensify.

The diversification of competitors has intensified the intensity of competition in air and space. Since human beings have the ability to enter the sky, the sky has become a contested place for great powers. In fact, competition in the air and space domain is a direct product of the game of great powers. With the continuous proliferation of aerospace technology and the continuous improvement of the level of human science and technology, more and more state and non-state actors are joining the ranks of developing and using space. On the one hand, the air and space domain has become an important part of national interests. The status and role of space assets in international competition and national interests are gradually rising, and the aerospace field is not only a vital area for countries to compete for, but also an emerging space where competition between countries occurs. As the U.S. National Space Security Strategy states in 2011, "Space is critical to national security, critical to the United States' understanding of emerging threats, global power projection, military operations, diplomatic support, and global economic viability," and "an increasing number of state and non-state actors recognize these values of space and seek their own space capabilities or space confrontation capabilities." More than 60 countries and government organizations already own and operate their own satellites, and many commercial companies, research groups and universities have their own satellites. Including more than 1,200 satellites in operation, there are already about 22,000 man-made objects in orbit. Even individual participation has become an important trend in aerospace behavior, and the diversification of competitors in the aerospace field has further complicated the security situation in the aerospace field.¹

The militarization of competitive behavior has multiplied the risk of air-space competition. Judging from objective reality, the military color of competition in the air and space field is getting stronger and stronger. Due to the high-end and core secrecy of aerospace technology, the competition in the aerospace field is inherently military. Coupled with the military-civilian versatility of aerospace technology, there are many phenomena that use the name of "civilian" and carry out "military" in a big way. Although the international community has actively called for the "demilitarization" of air and space, the actions of many countries, represented by the United States, have substantially intensified the militarization and weaponization of the air and space field.

¹ Guo Tuohang translation, "Panoramic Focus: The Latest U.S. Military Strategy——National Security Space Strategy," Beijing, National Defense University Press, 2011 edition, p252-253.

The United States has continuously updated its space development strategy and has promoted and is promoting the research and development of dozens of space weapon platforms in more than 10 major directions, among which the air-space directed energy weapon system, round-trip space vehicle, ultra-high-speed space vehicle, kinetic energy anti-missile system, etc. have made phased breakthroughs. Many other regional powers, such as Israel and India, have also initially possessed or are seeking outer space combat capabilities. Aviation space has long been reduced to a gladiatorial arena for great power wars, and space space is becoming a new stage for great power competition.

Section 4: Challenges and Opportunities for China's Aerospace Security

In the international context of intensifying national air and space threats and competition, air and space threats have increasingly become the direct embodiment and concentrated convergence of many contradictions between developed and developing countries, traditional hegemony and emerging powers. At the same time, air-space competition also provides a rare opportunity and platform for emerging powers to participate in shaping the future strategic pattern, and from this perspective, air-space competition itself is a key point in solving air-space threats. Threats and competition in the aerospace field are both challenges and opportunities.

1. The serious challenges posed by the air and space threat

At present, China's air and space assets have gradually increased, the role of the air and space field in military security has become increasingly prominent, the proportion of air and space security in national security has steadily increased, and air and space security has transitioned from peripheral development interests to core survival interests. Aerospace threats have become a serious challenge that China's national security must face.

(1) Direct challenges to aerospace assets

In different eras, national interests have different characteristics and forms of composition. In the aerospace era, the aerospace field has gradually become a field closely related to the survival and development of mankind, and aerospace assets have become an important carrier of national interests, and the challenges they face are more concentrated and more direct.

First, space-based platforms may be directly attacked by the enemy. Space-based platforms are a key part of information systems and the main targets of enemy strikes. Due to the various space-based platforms operating in outer space, their maneuverability is strictly limited by the laws of orbital motion, mission requirements and the amount of propellant carried, and it is impossible to carry out large-scale orbital maneuvers, coupled with its nature, tasks, orbital parameters and frequency of use are relatively fixed and easy to detect and observe by a variety of means, which are conducive to the enemy's targeted soft and hard attacks. As early as the Cold War era, the United States and the Soviet Union had already launched technical projects to jam, destroy, and capture each other's satellites and other space-based platforms. In the past two years, the United States has frequently carried out X-37B operational tests to test its new technologies such as rapid launch, in-orbit operation, and rapid orbit change, and these technologies have a strong practical combat orientation to traditional space targets with satellites as the main body, posing a serious threat to China's incomplete satellite system.

Second, the air and space information link is easily blocked by enemy interference. One of the important implications of the aerospace system is to provide real-time and accurate intelligence support and information transmission to the entire military system. And this behavior is carried out in the entire electromagnetic space, and the contradiction between the confidentiality of military information and the open nature of space is a difficult problem that all countries are eager to solve. On the one hand, the United States has declared physical space such as space and cyberspace as a "global commons" that can be freely accessed and exited, and at the same time, in its various strategic documents, it has emphasized that the United States will "defend" information security and space security related to its own interests as its national "core interests." This seemingly contradictory act shows its hegemonic ambitions to the fullest. The United States already has the means to carry out the relevant tasks. Even Iraq can "conveniently" purchase GPS jamming equipment from Russia, and the electromagnetic interference, suppression, and control technology represented by the "Schutte" system has developed to a new height, and has spread to the world through its allies, and China's air, space, and ground information links will inevitably face more severe tests in the future.

Third, air, space and ground support systems and facilities may become the focus of enemy attack and destruction. The infrastructure of ground support systems such as aerospace take-off and landing and launch bases, accusation centers, tracking and control stations and communication stations is the foundation and support of aerospace application systems. These targets are fixed and exposed, have obvious characteristics, and are vulnerable to being attacked and destroyed by the enemy in various ways and means in wartime. The US "Air-Sea Battle" has taken the suppression and strike of relevant targets as the "prelude" to our "high-end" operations. The United States continues to promote the technical tests of super-mobile, ultra-long-range, and new air-space strike platforms such as the X-51, and its intention to provide technical support for its air and space hegemony ambitions is clear. If its new air and space strike technology achieves a breakthrough and is used in actual combat, China's vast geographical depth and years of accumulation in the air and space field will be offset or even "zeroed," and the threat is self-evident.

(2) Severe challenges to military security

Military security is a state in which a country is protected from the threat of war, military invasion and military interests. With the rapid development of aerospace technology, the threat posed by air and space threats to military security has been further extended in time, more diversified in form, and further enhanced in capability, posing a severe challenge to the military security of developing countries.

First, space-based reconnaissance and surveillance runs through peacetime and wartime and has become a regular threat to national air and space security. With the development of space technology, space has become a new field of military confrontation. At present, more than 70 per cent of spacecraft in orbit are directly used for military purposes, and almost all of them can serve military operations. It constantly performs reconnaissance, surveillance, early warning, communication, navigation, meteorology and other tasks. According to data, 80 percent of the strategic intelligence of the United States and more than 70 percent of Russia comes from space, and about 90 percent of the wartime communications of the US military completely rely on communication satellites. And not only is the U.S. national intelligence agency constantly conducting "CT" scans of China, but many commercial companies and civil society organizations are also constantly watching China. The US commercial satellite company "followed the film" of China's "Liaoning" throughout the whole process, taking this as its attention-grabbing publicity stunt, so that China's aircraft carrier's important activities such as sea trials, outfitting, and training were in full view to the world through the Internet. In peacetime, space-based reconnaissance and surveillance is a major threat to national security; In wartime, space-based reconnaissance and surveillance will determine the life and death of the entire military system.

Second, the various means of air strikes have become a major real threat to national air and space security. First of all, cruise missiles from air-based platforms have become the "vanguard" of air raid operations. According to statistics, from the Gulf War to the Iraq War, the US military has launched more than 1,700 cruise missiles. At present, cruise missiles have accelerated their proliferation from a small number of countries developing and producing them to countries using most equipment, and their development has accelerated from subsonic speed to hypersonic speed, which will certainly pose a greater threat to national air and space security. Secondly, stealth fighters will become the "main force" of future air raid operations. At present, in Guam and other places around China, the US military has deployed B-2 stealth bombers and F-22 stealth fighters, and plans to produce more than 2,800 F-35 stealth fighters by 2021, and some surrounding countries and regions may be equipped with US-made F - 35 series stealth fighter. Finally, drones will become the "killer weapon" of air raid operations. At present, more than 30 countries in the world have developed and are developing unmanned aerial vehicle systems, with more than 200 models. UAVs can develop a variety of combat capabilities such as ground strikes and air interception, and will play a more important role in air raids.

Third, traditional ballistic missiles are proliferating and have become a serious threat to national air and space security. Ballistic missiles include strategic and tactical missiles. Strategic missiles have global coverage. At present, seven countries in the world have strategic missiles, and five are around us. Japan, South Korea and others also have the potential to rapidly develop strategic missiles. Tactical missiles have the characteristics of long range, fast speed, strong penetration capability, can carry nuclear, biological, chemical and other weapons of mass destruction, low technical threshold, and easy to obtain. At present, 22 countries or regions in the world have been able to develop and produce tactical missiles, and 46 countries or regions have tactical missiles, of which more than 10 are in China's vicinity, and the threat range covers most of China's regions, and some countries' ballistic missiles can cover the entire territory of China. The characteristics of ballistic missiles that are difficult to early warning and surveillance, difficult to detect, detect, and destroy, and difficult to intercept and destroy, as well as the trend of rapid proliferation, have posed severe challenges to the country's future anti-missile operations.

Fourth, new space-based strike weapons continue to develop and will become a potential threat to national air and space security. In the future, space-based weapon systems will mainly use new concept weapons, such as the space-based laser system proposed by the US Air Force, the improved air-space global laser attack system, the ultra-high-speed rod-shaped cluster bomb, and the new high-mobility air-space cross-domain weapon system, which are very likely to become new means of future air-space military struggles.

(3) Major challenges to national security

For national security, which is also a multi-element, multi-field and multi-stage comprehensive security issue, air and space threats pose not only challenges to national security capabilities at the real level, but also major challenges to non-practical levels, including traditional security concepts and future national security space.

The first is to put forward revolutionary requirements for traditional security concepts. At present, in the global political awakening, coupled with the inherent public nature of "public space" itself and its importance to all countries, it is becoming more and more difficult to implement the traditional national security concept with the state as the center, the military as the main means, and confrontation as the basic form. Dialogue and cooperation among various actors, including States, international organizations, transnational corporations and even relevant individuals, have become an important part of national aerospace security strategies. In order to jointly cope with contradictions and threats that are difficult to resolve individually, all countries must strengthen security cooperation in the field of air and space while rubbing and competing. Many countries, including world powers, have begun to engage in selective air and space cooperation. In addition to cooperation with traditional allies, the United States has also strengthened cooperation with so-called "strategic crossroads" such as Russia, China and India. Russia not only dominates the CIS CSTO, but also cooperates with its traditional rival, the United States, which in recent years has been conducting joint manned tests in space.

The practice of cooperation between major countries in the field of aerospace security will inevitably induce subtle changes in the international aerospace security strategy, and then promote the in-depth development of international aerospace security mechanisms and security regulations. Emerging countries that are latecomers should not avoid this development trend of human society, but should also actively seek changes, meet the changes in the world with their own changes, and shape the changes in the world with their own changes.

Second, it poses a real threat to existing national security capabilities. In the more than 60 years since the founding of New China, especially in the more than 30 years of reform and opening up, China's comprehensive national strength has been greatly improved, and its national security capability has continued to develop. However, it should be noted that China has attacked the world's advanced level in the information age on the basis of years of poverty and weakness, and the scientific and technological foundation, organizational system, and capability level of national security are still very imperfect. As the backbone of national security capabilities, military capabilities are also being worked from the level of mechanization and semi-mechanization to the direction of informationization, and the combat capability of the system based on information systems still needs to be perfected urgently. Traditional military capabilities lack the necessary experience to deal with many non-traditional security threats. In the era of information and space, the simultaneous arrival of traditional and non-traditional security threats has brought multiple challenges to existing national security capabilities, which requires us to "break through" and "create" with great wisdom and courage, and to explore a path of aerospace security development suitable for China's national conditions. Otherwise, once unipolar hegemony successfully applies its air and space superiority to great power competition with highly informationized military capabilities, the country's military capability will directly face the danger of being "zeroed." The security dilemma of "man for knives and me for fish and meat" in the era of nuclear hegemony in the 50s of the 20th century will reappear, and the multipolar balance of power will be once again confined to the unipolar world dominated by it, and not only will the pressure for peaceful rise increase unprecedentedly, but even the basic national security conditions may be completely lost.

The third is a potential squeeze on future national security space. The aerospace strategy of the world's major countries has changed from "using space" to "controlling space". Before the 90s of the 20th century, due to the restrictions of international laws and regulations such as the Outer Space Treaty and the restriction of the technical level, the major countries limited their space development to the scope of "peaceful use". After the collapse of the Soviet Union, out of consideration for national strategic interests, the United States, Russia and other countries gradually broke through the shackles of international laws and regulations and public opinion, and began to develop from "using space" to "controlling space". In addition to the National Security Strategy, the Quadrennial Defense Assessment Report, and the National Military Strategy, the United States has specially formulated a series of programmatic documents on relevant strategic space, such as the Cyberspace Policy Review and the National Security Space Strategy, which clearly regard "controlling space" as the primary goal of US aerospace force building, and put forward specific means such as "ensuring access, space surveillance, protection, prevention and blocking". On 13 June 2002, the United States officially announced its withdrawal from the ABM Treaty, clearing the way for its development of space offensive weapons.

In its space force reform plan, Russia has also clearly put forward the goal of "controlling space" construction, and has improved Russia's "space control" capability through practical measures such as developing (strengthening) strategic offensive weapons (strategic bombers), forming "space soldiers," and enhancing strategic missile penetration capabilities. The coveting of these emerging areas of national security by world powers will undoubtedly greatly induce and encourage other countries to participate in the competition for interests, and will undoubtedly form a huge pressure on the further growth of China's security space.

2. The historical opportunity provided by the air and space competition

The air-space threat is a manifestation of the contradictions faced by countries under the current level of scientific and technological development and the international strategic pattern, and even means a concentrated and prominent strategic crisis for emerging developing countries. But crises often breed opportunities. While the air-space threat poses a severe challenge to latecomer countries, air-space competition has also brought historical opportunities that latecomers cannot miss.

(1) It provides traction for the country's scientific and technological progress

Competition is a basic relationship between countries and nations that objectively exists and must be faced, and is also the eternal driving force for their survival and development. For a long time, competition between countries was mainly in the form of military affairs, and contention for territory, sovereignty, resources, etc. was the main content. Marked by the end of the Cold War, the competition between major powers has shifted from direct military confrontation to comprehensive competition in political, economic, scientific, technological, cultural and other fields. It has become the most concentrated and prominent embodiment of the comprehensive game in which major countries spend huge amounts of money.²⁰¹⁰The annual R&D expenditure of the European aerospace industry is 130 Euro millions. And even under the negative impact of the world economic crisis and the domestic economic environment, the US aerospace industry still spends a lot of money on research and development 323.73 billion, accounting for its total output 7.08%, much higher than all industry 3.58% level. Including Boeing, Lockheed Martin, Northrop Grumman and Thor including the world before aerospace 10 Strong enterprises, it is in 2010 The annual expenditure on R&D is as high 241.73 billions.¹

¹ Zhang Zhuo, Ren Yingying, Zhu Huibao: "Development Trend and Enlightenment of World Aerospace Industry," *Aeronautical Science and Technology*, 2012, 2, p72~73.

Aerospace competition is high-end competition backed by the overall strength of the country; in the final analysis, it is a competition in science and technology. The development of science and technology provides support for aerospace competition, and aerospace competition provides traction for scientific and technological progress.

The traction effect of the aerospace field on national scientific and technological progress has been further amplified in a competitive atmosphere. It is mainly reflected in the following aspects. First, aerospace science and technology involves a number of disciplines and technical fields, which has an overall pulling effect on the progress of national science and technology. Among the more than 1,100 new materials developed and used in China in recent years, 80% have been developed and completed under the traction of aerospace technology, and nearly 2,000 aerospace technology achievements have been transplanted to various departments of the national economy, driving the rapid development of almost all the most cutting-edge fields of current science and technology, including computing, control and communications. Second, aerospace competition is a concentrated gathering of existing science and technology, which has a role in structural optimization of national science and technology. The aerospace field is a strict and comprehensive assessment of the overall level of national industry. Moreover, with the development of aerospace technology itself, its technical complexity is constantly increasing, and it is by no means exclusive to the aviation industry sector. Taking China's manned space project as an example, from light industry to heavy industry, from basic science to applied science, from mechanical industry to metallurgical electronics, all of them are involved, without the close cooperation of dozens or even hundreds of disciplines, specialties, technologies, and processes, and even a small part on a spacesuit cannot be produced. Third, aerospace competition has continuously put forward new and higher requirements for the development of science and technology, which has a marked role in promoting the progress of national science and technology. The Global Positioning System (GPS), for example, was originally a project of the U.S. military to provide navigation services and intelligence gathering, nuclear explosion monitoring, and emergency communications services for the U.S. army, navy and air force. After just a few decades of development, today's global satellite positioning system has developed to the third generation, which can provide accurate timing accurate to nanoseconds for dozens of fields around the world, including aviation, shipping, railway, construction, communications, electric power, etc., and the open ordinary civilian direct positioning accuracy generally reaches less than 10 meters, or even reaches 1 meter, and after the use of some auxiliary methods such as differential methods, the accuracy can be further improved to the centimeter level. And this great progress in human science and technology is, to some extent, the beneficiary of the fierce competition between the aerospace powers.¹

¹ China Aerospace Engineering Consulting Center: "Space Economy: The Main Battlefield of Future Space Development," China Space News, 25 July 2008, 4.

(2) It has provided assistance for the development of comprehensive national strength

Comprehensive national strength is the sum of the forces and conditions for a country's survival, development and external influence. The development competition in the modern air and space field and the blood of local wars have proved that air and space forces have become a special and important part of the country's comprehensive national strength, which has a bearing on national status and the overall situation of the world. Aerospace supports the country's national defense force and represents the commanding heights of national competitiveness. For China, which is at a special stage of development, the threats and challenges facing the aerospace field have already affected the country's development and interest space. The air-space competition initiated by superpowers is not only compressing China's development space, but also posing a serious challenge to China's traditional living space. Although China currently has a considerable foundation in the field of aerospace and space, there are still many gaps with the world's advanced level, especially in the context of the current space powers stepping up technological upgrading and upgrading, it is very likely to fall into a new round of technological generation gap, or even cross-generational and superimposed generation gap. China's aerospace undertaking still has many inherent contradictions and problems that restrict development in terms of ideology, resource integration, policies and regulations, technical level, talent reserve, and international exchanges and cooperation. For example, the problem of insufficient independent innovation ability in the aviation field has long restricted the further improvement of China's aerospace power, the core technology represented by engine technology has long been unable to break through the bottleneck of independent intellectual property rights, and the incompatibility between similar development foundation and development requirements has become a prominent contradiction in the aerospace field, which has seriously hindered the development of China's aerospace to a high quality and high level, and if it is effectively solved with new concepts and new measures, it will undoubtedly further enhance China's competitiveness on the international stage.

The importance of the aerospace field also stems from its leadership, cohesion and multiplication in the unity of comprehensive national strength composed of political, economic, military, scientific and technological strength, and many other factors. Objectively, the competition in space has provided a traction goal for the development of comprehensive national strength, and has also created an external atmosphere for the construction of comprehensive national strength. Politically, having a strong air and space force is conducive to enhancing the country's strategic position in the international political arena; Economically, aerospace resources are abundant, aerospace technology is radiant and transformative, and contains huge economic benefits; Militarily, the building of national air and space forces can greatly improve the overall strength of the armed forces, which is conducive to generating and improving the core military capabilities of safeguarding national air and space security interests. In terms of science and technology, the construction of the national aerospace force will certainly promote the development of other related advanced technology groups on the basis of promoting the development of aerospace technology and information technology, and promote the overall leap of the country's scientific and technological level.

(3) It provides an opportunity for the reconstruction of security order

The aerospace field is not only of obvious significance to the progress of national science and technology and the enhancement of comprehensive national strength, but also has a far-reaching impact on the world security order. Compared with the traditional field, the current air-space competition is a disorderly and unequal competition. Especially in space, legally speaking, space as an international public space, all countries have equal access to the right. But in fact, due to the huge gap between the scientific and technological level and comprehensive strength of various countries, there is a great imbalance in the use of space by various countries. The United States, Russia, Britain, France and other space powers have far more extensive and in-depth use of space than ordinary developing countries. However, the current air-space competition at least means that the following realistic opportunities are opportunities to compete. In addition to normal competitive behavior, at present, some countries that do not have the ability to enter space lease orbits and occupy orbits by renting satellites that are about to be scrapped are actively carrying out some space tests with militarized purposes. In the face of these phenomena, countries with a certain aerospace foundation can also adopt corresponding competitive means to respond and more actively develop the ability to enter and use the strategic air and space corridors. The second is the opportunity to affect competition. As long as disorderly competition exists, there will be a variety of interested parties, there will be forces that can unite the weak, and there will be opportunities for latecomers to influence competition. The third is the opportunity to guide competition. The air and space order, which is an important part of the future international security order, has not yet been fully solidified. For countries that are important forces in the international political pattern and have a certain foundation for space development, it is entirely possible to induce the air and space order and even guide the international security order to develop in the direction of multipolarization and in the direction conducive to world peace and the interests of most countries through active planning.

For China, the material and spiritual achievements that have been formed over the years have laid a certain foundation for China to influence the world. China in the 21st century is no longer a bystander of the development and changes of the international community, but an active participant in the international system and a shaper with important influence on many international affairs. China is pleased to see the tremendous progress made by mankind in the field of air and space, but the huge military superiority of individual countries in air and space obviously runs counter to the beautiful vision of air-space harmony and world peace. In today's world, economic globalization and political multipolarization are deeply developed, and air and space competition not only motivates us to be vigilant and excited, but also provides new and more favorable conditions for China to influence the world and participate in the construction of world order. In the face of historical opportunities, China should follow the trend, first, to promote air-space harmony with its own space development. Actively participate in international cooperation on aerospace security, strengthen ties with various aerospace actors, strengthen various forms of air-space exchanges, seek development through harmony, and promote harmony through development.

The second is to promote world harmony with air and space. In the field of air and space, which directly involves China's sovereignty, security and major interests, it is necessary not only to prevent an arms race, but also to prevent the trap of marginalization. As a major country, while taking the initiative to narrow the gap with the air and space powers, it is also necessary to promote the common development of all countries in the air and space field, build the air and space competition into a new platform for international exchanges, promote the development of air and space competition in the direction that conforms to the interests of most countries in the world, and guide the transition of air and space competition to a benign model that conforms to China's interests. Replace confrontation with dialogue, zero-sum with win-win, and unipolarity with pluralism, relying on China's material accumulation and spiritual accumulation in the field of space and space, and build a harmonious world through a strategy of harmony between the sky and the sky.

3. Respond to challenges, seize opportunities, and take the initiative

Today, the process of the great rejuvenation of the Chinese nation has slowly arrived, and the grand picture of the "Chinese dream" is slowly unfolding. At this important juncture of great scientific and technological development and world adjustment, in the face of threats and competition in the air and space field, the hardworking, brave and wise Chinese people have once again won the favor and favor of the god of history for themselves. As a great power, we already have the basic conditions for national rejuvenation; As an emerging power, we will bear the pressure of re-emergence; As an emerging developing country, there is still a huge gap between us and the world's advanced level. Only by meeting challenges can we seize opportunities, and only by facing crises can we reap hope. For China, with the active and appropriate national air and space security strategic goals and tasks as the traction, the correct and effective national air and space security strategic guidelines and principles as the criterion, the strong enough national air and space security strategic capability as the basis, the supporting national air and space security strategic system as the support, the rigid and flexible national air and space security strategic model as the starting point, the combination of soft and hard national air and space security strategic means as the basis, and the broad-spectrum and applicable national air and space security strategic actions as the guarantee. Respond to the national demands of the information society and the synchronous arrival of the space age, safeguard and protect the practical needs of expanding national interests, and support the bright future of national security and development in the space era.

When the winds of history blow, the challenges are great, but the opportunities are unprecedented. As an ancient people that has been passed down for thousands of years, our ancestors once created a model of multicultural harmony; As a young country that is reviving and rising, we must take a proactive attitude and grasp the air and space competition. We will continue to write a new chapter of peaceful development in response to major challenges to air and space security.

CHAPTER 3 CHINA'S STRATEGIC OBJECTIVES AND TASKS FOR AEROSPACE SECURITY

The strategic goals and tasks of aerospace security are the strategic expectations that the country must achieve to achieve and maintain air and space security within a certain period of time and the basic mission of empowering the national air and space forces. Goals indicate the direction, and tasks lead development. China's strategic goals and tasks of air and space security are the trigger for China and millions of aerospace people to solve the problem of facing the air and space security situation.

China's aerospace security strategy must be guided by the dream of a strong country and a strong military, actively advocate the national security concept of common security, comprehensive security, cooperative security and sustainable security, adhere to the strategic path of focusing on peaceful development, based on strength accumulation and preparing for military confrontation, take active and appropriate strategic goals as the traction, take the strategic system supporting the system as the support, build an air and space security shield with force development, shape a favorable air and space situation with system operation, create a harmonious air and space environment with mutually beneficial cooperation, and support the expansion of national interests with air and space forces. Respond to the national demands of the information society and the simultaneous arrival of the space age, and support the bright future of China's security and development.

Section 1 The basis for determining the objectives of the national air and space security strategy

The national aerospace security strategic goal inherits the strategic purpose and follows the strategic task, and has a guiding role in the national aerospace security strategic system. The establishment of China's strategic air and space security objectives must be based on a systematic analysis of the national air and space security situation, and scientifically design and arrangements must be made taking into account factors such as national security strategic objectives, the needs of strategic air and space interests and the level of national comprehensive national strength.

1. Strategic objectives of national security

Aerospace security strategy is an important part of the national security strategy system in the information age, and the establishment of air and space security strategic objectives, as the embodiment of national security strategic goals in the air and space field, must be based on national security strategic objectives. At present, the overall goal of China's national security is to safeguard national sovereignty, security and territorial integrity and ensure the peaceful development of the country. Maintain world peace and regional stability and promote common development. This determines that when establishing strategic objectives for aerospace security, it is necessary to determine the strategic objectives and tasks to be accomplished by the aerospace security strategy from the high plane of national interests, focusing on the strategic needs of national security, and proceeding from the reality of aerospace security. First of all, the air and space security strategy should fulfill the task of safeguarding national sovereignty, security and territorial integrity. China is currently the only major country in the world that has not achieved reunification, and there are certain territorial sovereignty disputes with some of its neighboring countries, which requires that whether it is peacetime rights protection activities or when it is necessary to resort to force to safeguard national interests, air and space forces, as high-end forces in the information age, must be able to provide strong support for crisis management and combat operations. Secondly, with the continuous improvement of China's comprehensive national strength, there is also a need for expansion of strategic interests, requiring air and space forces to quickly arrive, show monetary power, and effectively safeguard the expanding national interests. Finally, the aerospace security strategy should support the realization of the goals of maintaining stability at home and in the neighboring and Asia-Pacific regions, maintaining world peace, and promoting common development.¹

¹ Information Office of the State Council of the People's Republic of China: 2013 National Defense White Paper of China, April 2013.

As a major country in the Asia-Pacific region and a permanent member of the UN Security Council, China has been committed to the cause of world peace and development, and balancing power and upholding fairness and justice also require the growth of just forces. At the same time, with the development of the world security situation, terrorism, ethnic contradictions and social problems have become new areas affecting national security. Aerospace forces have the tremendous effect of real-time perception, rapid response and strong deterrence, which can be used as a powerful means to deal with various crises at home and abroad, and provide strong support for maintaining domestic stability and world peace.

2. National air and space strategic interests

National aerospace strategic interests are the direct basis and intrinsic influencing factor for establishing strategic objectives for aerospace security.

Aerospace strategic interests mainly cover the interests of aerospace development, space resources, space use, and space security. Aerospace development interests are a priority area for the expansion of national strategic interests and the core content of the strategic objectives of aerospace security. The aerospace information system can provide strong information support for the operation of national infrastructure and social production, and improve economic efficiency; The development of aviation and aerospace industrialization will greatly promote the development and innovation of related industries such as information technology, biotechnology, new material technology and new energy technology, and create more employment opportunities and economic benefits for the aerospace field and related fields. Aerospace resources interests are an emerging field for the expansion of national strategic interests and an important part of the strategic objectives of aerospace security. Empty space contains rich resources. For example, in space, human beings have developed and utilized space solar energy resources, space environmental resources, space orbit resources, and space information resources to varying degrees. The rights and interests of the use of space are the guarantee for the expansion of national strategic interests and the basic content of the strategic objectives of aerospace security. At present, when the interests of space and space are crisscrossed, the order of space has not been truly established, and the strong monopoly of major powers still exists, the rights and interests in the use of space have gradually emerged. Aerospace security interests are an important part of national security interests and a basic indicator of strategic objectives for aerospace security. The air and space system can not only provide reconnaissance, communication, navigation, positioning, meteorological and other information support for air and space security operations, and support the entire national air and space security system, but also directly carry out "soft" destruction and "hard" destruction of the enemy's air and space system and the strategic center of gravity of the ground (sea) surface at all times when necessary. To sum up, aerospace security is related to the expansion of national strategic interests, plays an important decisive role in national strategic security, and is the key basis for establishing national aerospace security strategic goals.¹

¹ Yang Xuejun and Zhang Wangxin: "Advantage comes from space——On Space Battlefield and Space Combat," Beijing, National Defense Industry Press, 2005 edition, p39.

3. The level of the country's comprehensive national strength

Comprehensive national strength is a comprehensive indicator to measure a country's economic, political, military, cultural, scientific and technological strength, covering the country's ability to develop all aspects, is the material basis of the country's air and space security capability, and is an important constraint to the degree and level of achieving the national air and space security goals. Economic strength is the basic condition for achieving the national aerospace security goal, and the national air and space security capacity building and the use of air and space forces are all constrained by many economic conditions such as the country's economic development level, resource development and possible investment in personnel. Political strength is a concentrated embodiment of the country's top-level decision-making ability, which is manifested internally as governing the country, rallying internal strength, and planning development, and externally it is manifested in diplomatic games between countries and the assumption of international affairs. The air and space security strategy is also an important part of national political decision-making, and the level of political strength plays an important decisive role in national air and space security. Military strength is the core of national security capabilities, and air and space military strength is the core of national air and space security capabilities. The national air and space military strength, which is mainly composed of aerospace personnel and space equipment, plays a pillar role in achieving the strategic goal of air and space security. Cultural traditions are not only the economic foundation of a certain society and the comprehensive reflection of political and military aspects, but also have a tremendous impact on the economy, politics and military, and a country's security strategic thinking and military strategy, as well as military system, organizational structure, strategic and tactical application, etc., are all branded with cultural traditions. The level of national scientific and technological strength determines the process of updating aerospace equipment and the process of changing the way it is used. In terms of military science and technology, strategic missiles, military satellites, and other combat capabilities have been continuously leaping up; new types of weapons and equipment such as aerospace planes, orbiters, and hypersonic vehicles have continued to appear; directed energy and kinetic energy weapons have been applied to the aerospace field; and high and new technologies such as information technology, new material technology, microelectronics technology, computer technology, and network technology have been continuously combined with aerospace technology; the putting into use of these new and new technologies and new weapons and equipment has had a profound impact on the country's strategic thinking on aerospace security and the way of using air and space forces.

The balance or consistency between strategic goals and comprehensive national strength is the true meaning of strategic planning and the key to the success of the national aerospace security strategy. During the Cold War, relying on its solid comprehensive national strength, the United States launched an air-space competition represented by "Star Wars" with the Soviet Union, which dragged down the Soviet Union, created the world's most powerful air and space forces, won several recent wars dominated by air and space forces, and consolidated the world pattern dominated by the West.

In contrast, the Soviet Union engaged in global hegemony with the United States when its comprehensive national strength was inferior to that of the United States, and in the air and space field, in order to cope with the US "Star Wars" plan, it vigorously developed air and space forces. China's total GDP ranks among the highest in the world, its growth rate is faster than other world powers, and it is one of the five permanent members of the United Nations Security Council politically, but per capita resources and GDP It is low, the ability of scientific and technological innovation is weak, the industrial structure is unreasonable, and the relative strength and influence are still very limited. These factors determine that in the competition in the air and space field, China will be at a relative disadvantage compared with the air and space powers, and the country must rely on its relatively limited comprehensive strength to achieve national air and space security and development and maintain national strategic security, and must establish a corresponding strategic goal of air and space security, not only to avoid losing rare development opportunities due to being too conservative, but also to avoid the "sequelae" and "complications" caused by excessive goals and insufficient strength.

Section 2 Strategic Objectives of China's Aerospace Security

China's strategic objectives of aerospace security should meet the strategic needs of "peaceful development" and building a "harmonious air-space," be in line with the national strategy of peaceful development, and be coordinated with defensive national policies. According to the national security strategic objectives and combined with the foundation of the national aerospace strength, China's air and space security strategic objectives can be positioned as "shaping a favorable air and space strategic posture, realizing and safeguarding national security in the air and space field, and protecting the overall interests of the country from infringement through air and space security". This goal mainly includes the following four aspects:

1. Build an air and space security shield with strength development

At any time and in any field, strength is the basis for winning respect and ensuring security. Building an air-space shield of national security through the development of air and space forces is the primary goal of the air-space security strategy. Judging from the nature of the content, it mainly includes two aspects: air and space non-military forces and air space military forces.

Aerospace non-military forces are mainly aimed at developing the civil aviation and aerospace industry and establishing powerful non-military aviation and aerospace forces.

Through the development and innovation of aerospace technology, we will enhance exchanges and cooperation in aerospace technology and provide technical support for aerospace construction, not only to expand but also to strengthen the national aviation and aerospace industry. While building hard power in civil aviation and space, we should also pay attention to the development of soft power, first, in law, through domestic aviation and space legislation, clearly stipulate the sovereignty and interests of national air and space; Actively promote cooperation in the field of air and space, jointly create a mechanism of mutual trust between air and space, promote the establishment of international fair and just air and space laws and regulations, and create a new order of aerospace security. Second, economically, we should

actively carry out mutually beneficial cooperation, strengthen economic exchanges with all countries in the world, especially the major aerospace powers, provide economic support for aerospace construction, and increase game chips and checks and balances for aerospace security. Third, in terms of law enforcement, actively build and continuously improve the law enforcement functions and mechanisms of public security, national security and other national functional departments in the field of aerospace security, and effectively respond to non-traditional threats to air and space.

Aerospace military forces are mainly used to develop military aerospace and aviation forces. The goal of military space force development is to meet the capability needs of maintaining space access, space utilization, and space asset security. Space access capability is to ensure the right to enter space at any time and the right to enter a specific orbit, and to protect the right to enter space from being denied; Maintaining space utilization capabilities means ensuring that military applications and national utilization activities are not interfered with and destroyed; The ability to ensure the safety of space assets is to ensure that national space assets (satellites, spacecraft, space vehicles, etc.) can operate safely. The goal of military aviation force building is to meet the capability needs of defending the sovereignty of national airspace, ensuring the safe operation of China's aircraft (including military and civilian aircraft, airships, balloons, etc.), effectively resisting the invasion of enemy aircraft and ballistic missiles, being able to use aviation military force to defend national maritime rights and interests and global security, and accelerating the transformation of the air force from air defense to both offensive and defensive and from aviation to air-space integration.

2. Shaping the situation of aerospace security with system operation

The aerospace system refers to the whole formed by the combination of different systems in the national aviation and aerospace fields according to a certain order and internal links, and is the basic form of the function of the national aerospace forces. The operation of the aerospace system is the basic way to transform the air and space security strength into the air and space security capability, and its purpose is to give play to the basic effectiveness of the air and space forces. Shaping the national security situation with the effective operation of the air and space system is one of the important goals of China's air and space security strategy, which is mainly manifested in the support of the effective operation of the air and space system for national infrastructure and the support for the combat readiness and combat of the armed forces.

Effective support for the operation of national infrastructure through the effective operation of the aerospace system. The stable and efficient operation of national infrastructure is a basic requirement for national strategic security in peacetime. At present, the situation of air and space security is becoming increasingly severe, the development of air models, private jets, helicopters and other aircraft, the occurrence of air accidents, air terror incidents, space electronic countermeasures, network human invasion and strike destruction, may have an adverse impact on the security of the sky, and even cause the interruption or even paralysis of the operation of the national aerospace system, thereby seriously affecting the national air transportation, aerial survey, air agriculture and animal husbandry operations and other air activities, as well as communications, media, networks, and detection supported by the space information support system, meteorology, surveying and mapping, navigation and positioning and other activities, which in turn have an iterative impact on other industries and fields, causing great harm to national production and social life. This requires the effective operation of the national aerospace system to ensure the normal operation of the national infrastructure. In the field of aviation, air safety is carried out in cooperation with military forces through air traffic control; Through effective air operation mechanisms, air transportation, aerial survey and other activities are carried out to support national development and construction. In the field of space, through the monitoring, control and protection of space systems, to ensure their safety. Full operation, providing various information support for the operation of national infrastructure, and providing support for national space scientific exploration and space industry development.

The effective operation of the air and space system will provide strong support for the combat readiness and combat of the armed forces. The armed forces are the main body of national security forces, and their basic tasks can be divided into combat readiness tasks in peacetime and combat tasks in wartime. In terms of combat readiness, the effective operation of the air and space system can provide the armed forces with early warning and surveillance, reconnaissance, communications, navigation and positioning, meteorology, geodesy, force projection and other support, and improve the level of military combat readiness. In response to potential threats affecting aerospace security and actual threats that may deteriorate, the state can use the effective deterrence action of the aerospace system to deter opponents and eliminate threats. In the event that deterrence fails, the air and space forces will be quickly transferred to a state of imminent combat; on the basis of seizing air and space supremacy, they will provide full-dimensional information support to the national armed forces, and decisively carry out joint operations supported by air and space early warning and surveillance, air and space information support, air and space blockade, air and space offensive, and air and space defense, and finally win the war.

3. Create a harmonious space environment through mutually beneficial cooperation

Realistically, the huge strategic interests contained in space and space are the source of the fierce competition between countries in the field of space and space.

However, in the long run, only the mutual benefit and win-win results of all countries in the world are in line with the interests of all countries and the pace of continuous development of human society. As one of the permanent members of the UN Security Council, China is also a major country that has integrated into the world and is steadily moving towards the center of the international political and economic arena, assuming more and more international security responsibilities and obligations. Therefore, creating a harmonious air-space environment through mutually beneficial cooperation in space and space is the fundamental goal of China's aerospace security.

The expansiveness of the air and space field has brought many uncertainties to air and space security, and although the national airspace has relative certainty, the regulations on public airspace, especially in the space field, are not perfect. With the increasingly fierce competition for space interests of various countries, a small number of military powers, backed by their powerful air and space forces, seek space superiority in a vain attempt to control space, and bring great obstacles to the peaceful use of space by other countries. Therefore, the security and interests of all countries in space urgently need to establish a regular order to maintain. In his speech at the opening ceremony of the 2013 Boao Forum for Asia, Xi Jinping clearly pointed out: "Peace is the eternal aspiration of the people. Peace is like air and sunshine, it benefits without it, but it is difficult to survive if it is lost. "We must abide by the purpose of safeguarding world peace and promoting common development, actively participate in international peacekeeping, humanitarian relief and exchanges between militaries of various countries, actively promote international air and space security cooperation, create a good air and space security environment for safeguarding the period of important strategic opportunities for national development, and contribute to maintaining regional stability and world peace."

4. Use force to support the expansion of national interests

With the continuous expansion of China's national interests, security issues such as maritime rights and interests, overseas interests, energy resources, and strategic channels have become increasingly prominent. In the face of increasing risks and challenges, we must give full play to the advantages of long-range arrival, rapid maneuver and precision strikes of air and space forces, actively use war and non-war military operations, strengthen overseas use, achieve regional arrival, and take joint actions with other national forces to effectively safeguard national interests from infringement. The effective use of air and space forces to meet the practical needs of expanding national interests is also one of the main goals of China's aerospace security strategy.

In terms of maritime rights and interests, China has rights and interests disputes with neighboring countries such as Japan, the Philippines, and Vietnam, which have become a regular threat to some extent, and need to respond quickly, deal with them in a timely manner, and take the initiative to protect their rights. In terms of overseas interests, Chinese embassies, enterprises, expatriates, students and other groups abroad need the protection of national forces, especially in the event of turmoil or natural disasters in the host country, and even more so when the country where it resides, it needs national military forces to protect overseas economic interests and personnel safety.

In terms of energy resources, the transportation routes of strategic resources such as oil, natural gas, and iron and steel need to be escorted by aerospace forces, especially aerospace military forces, in a timely manner; In terms of strategic corridors, the security of important corridors such as the Strait of Malacca is related to the fundamental interests of national construction and development. These strategic interests continue to expand along with the development of the country, and the special advantages of the aerospace forces, such as the advantages of air and space information, rapid response, high-level mobility,

Strategic projection advantages, etc., can support a powerful "protective umbrella" for the expansion of national interests. At the same time, the competition in the space field is very fierce, the strategic position is becoming more and more prominent, and strategic interests are very important, and it is necessary to strengthen the construction and application of space forces, enhance space information support capabilities and offensive and defensive combat capabilities, ensure the safe operation of the space system, and provide a basis for the expansion of national interests in the space field.

Section 3 China's Aerospace Security Strategic Tasks

Strategic tasks are the work that should be undertaken and completed to achieve strategic goals, and they are the decomposition and refinement of strategic goals. To determine China's strategic tasks for aerospace security, we must closely focus on the realization of China's strategic goals of aerospace security, focus on safeguarding the country's security interests and use rights and interests in the air and space field, and strive to create a safe and harmonious air and space environment. According to the different requirements of the air-space security strategy in peacetime and wartime, the strategic tasks of air-space security can be refined into maintaining the safe operation of the space system, defending the country's territorial airspace from infringement, seizing the superiority of airspace combat superiority, and shaping the national air-space deterrence situation. In addition, non-traditional air-space threats are increasing day by day, which has also become an important part of the strategic tasks of aerospace security.

1. Maintain the safe operation of the space system

The normal operation of the space system is not only the basis for the use of space power, but also the necessity of air power and other forces to carry out air and space safety missions; It is not only related to the function of the military system, but also directly related to the use of national transportation, communication and other infrastructure. Therefore, maintaining the safety and normal operation of national space assets is the primary task of the strategic application of national air and space security forces, which is directly related to national air and space security and even the overall security of the country.

The main content of maintaining the safe operation of the space system is to ensure access. Ensuring access refers to a space activity that launches a spacecraft into a predetermined orbit and makes it operate normally, and is one of the main tasks of space activities. Entering space is realized through space launch, and the space launch mission not only requires a variety of space launch channels and means in peacetime, but most importantly, it has the ability to launch quickly under the conditions of enemy interference, blocking, and strike in wartime, so as to quickly replenish lost or damaged spacecraft and realize the deployment of space equipment or personnel on demand. The second is to carry out all kinds of duty duty. Through various types of duty, ensure the normal operation of spacecraft, ground bases and accusation agencies in orbit, mainly including space information support duty, space surveillance and early warning duty, spacecraft operation control duty, etc. The third is to carry out equipment support for the space system. Space equipment support refers to the general term for the activities of providing space equipment and supporting equipment, special equipment, special fuels, and technical service support for space forces to carry out various space missions under the unified command of the space command and management agency. It mainly includes weapons and equipment support, technical equipment support, and base service support. The fourth is to conduct space exercises. Space exercises (including space military exercises), as an important form of improving the security capability (combat effectiveness) of space forces in peacetime, are also an effective means to explore new types of space security operations (operational styles) in the future. Space military exercises can develop new operational concepts and methods, improve joint operational capabilities for air-space security, maintain space system security, and validate the application of space equipment.

2. Defend the inviolability of national airspace

In the information age, threats from air and space are a major hidden danger to national security, and the threat to territorial air sovereignty is particularly serious. National sovereignty and interests are a symbol of the dignity of an independent country. Whether in peacetime or wartime, defending national sovereignty and interests has always been the most important task of national air and space security operations. The threat to China's airspace has never been eliminated, and the airspace along the coast and in disputed areas (sea areas) is still frequently subject to reconnaissance and invasion from the air, especially the proposal and implementation of the US Asia-Pacific rebalance strategy and the "Air-Sea Battle," which has made the air-space threat from the sea direction more complex and severe. Judging from the international security situation facing the country at present and for some time to come, although the global and Asia-Pacific security situation has generally tended to be stable, there are still many uncertainties.

Various political, economic, and security contradictions in the international arena, as well as geographical, ethnic, and religious contradictions, are intricate, hegemonism and power politics are still important factors affecting national security, local wars and chaos are occurring one after another, and major terrorist incidents continue to occur. Judging from the current actual threats, not only the issue of territorial sovereignty and integrity, but also the ownership of maritime islands and maritime rights and interests are becoming increasingly prominent, the security of energy resources and transportation channels is gradually emerging, and the protracted issue on the Korean Peninsula may pose indirect and direct threats to China's security environment and national interests. The country still faces diverse, multi-directional, multi-modal air threats. Therefore, safeguarding the security of national airspace and preventing all kinds of invasions and provocative activities from the air and space are the core tasks of national air and space security operations.

In particular, with the rapid development of aviation, aerospace technology and information technology, the air and space security forces have higher technical content and stronger security functions, and their role as a barrier to national air and space security and even the overall security of the country is more significant. Make use of the air-space reconnaissance system, the air-space strike force, and the air defense combat force to closely monitor the activities of air-space threat targets and their related forces, so that when signs of enemy threats are discovered, timely warnings, rapid responses, and timely sorties can be made to effectively prevent threat targets from entering the national airspace. As an important strategic force of the country, the aerospace forces must provide a strong security guarantee for safeguarding the sovereignty, interests and resource security of the country's territorial airspace.

In addition, protecting public air security in areas of national vital interest is also one of the important tasks in the strategic application of air and space security forces. Maintaining the air security of these airspaces can ensure the smooth flow of maritime and air strategic transport lines, ensure the personal safety of its citizens, the entry of national strategic resources into the country's economic and trade smoothly, and ensure that polar scientific investigations are not interfered with, and at the same time, it can also demonstrate the national air and space strength and form a certain deterrent to potential opponents. Therefore, we should actively promote international exchanges and cooperation in the field of public airspace and promote the construction of relevant laws and regulations in the field of public space; Establish a national law enforcement mechanism in the public air domain to provide a basis for the use of air and space forces to maintain public air security; Strengthen cooperation between civilian air forces and military forces, and maintain public air security in areas of national interest with appropriate air and military forces for patrols, exercises, escorts, etc.

3. Shaping the national air and space deterrence situation

Aerospace deterrence posture refers to an air-space situation formed by various aviation and aerospace resources and forces in accordance with a certain layout form and architecture, which has a certain deterrent power against the enemy. Air and space deterrence is different from previous and other deterrents in that it is a new type of deterrent based on positional superiority, technological superiority and force superiority. The core of air and space deterrence is to use and control air and space, use air and space force deployment and actions as the transmission medium to produce deterrence, curb and stop the war ambitions of potential and actual opponents, prevent threats from air and space, ensure the sovereign security of one's own airspace, and safeguard the security interests of the country in public space and space.

Deterrence is a normal means of strategic use of air and space forces, and shaping the national air and space deterrence posture is an important task in the use of national air and space forces. The state has a strong air and space force in peacetime, and has built a sound rapid response and operation mechanism of air and space forces to form a credible air and space deterrence posture, which can not only deal with various non-military air and space threats, but also curb military provocations from aviation and space, and achieve the goal of surrendering without a fight. With the extensive application of information technology in the field of air and space, the effectiveness of air and space combat has been further enhanced, and air and space threats have become the most realistic and frequent threats facing countries in peacetime and wartime. Not only is the wartime space-space confrontation very fierce and is the main form of military confrontation in informationized local wars, but also a series of air-space contests in peacetime, such as reconnaissance from the air and space, and competition for space orbit and spectrum resources, directly threaten the country's security and development interests. Building an air and space security force system that integrates air and space, is both offensive and defensive, integrated in system, and has complete functions, and formed a favorable national air and space deterrence posture has become the task of national daily security operations in peacetime.¹

4. Seize superiority in air and space operations

Aerospace military forces are the core means of maintaining national air and space security, and air and space control is the key to the success or failure of air and space security operations.

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2009 edition, p212.

Aerospace control mainly includes the right to control information and the right to control space and space, which are interrelated, mutually restrained, and indispensable. Under the conditions of informationization, the right to control information has become the strategic commanding height of military struggle, and the gains and losses of the right to control information often determine the victory or defeat of a war. The high-level aerial view of the air to the ground and space to the air makes air supremacy, especially the right to control space, an important guarantee for obtaining the right to control information. Therefore, a key task in the strategic application of air and space forces is to seize the superiority of air and space combat supremacy and firmly grasp the air and space supremacy and information control of war.

Air and space supremacy is the unity of air supremacy and space supremacy. Air supremacy, also known as air superiority, refers to the control of a certain air space by a belligerent's party for a certain period of time. Douhet, the founder of the theory of air supremacy, also clearly stated in his treatise "Air Supremacy," "Gaining air supremacy means victory, being defeated in the air, and losing air supremacy is the ultimate defeat." Heaven supremacy refers to a certain degree of control that a belligerent's party has over a certain area of outer space for a certain period of time. As early as the 60s of the 20th century, then US President Kennedy predicted that whoever controls space will control the earth. The seizure of supremacy can ensure one's full and free use of outer space resources, while preventing and restricting the use of outer space resources by the adversary. Practice has proved that the informationized battlefield is a battlefield dominated by air, space and information. In a certain sense, only by seizing air and space supremacy can we obtain the right to control information, the sea and land, and grasp the initiative in war. Conversely, if the air and space supremacy is lost, it will be difficult to guarantee other control rights. Therefore, in view of the major military threats facing the country in the future, it is the common task of air and space military forces and non-military forces to allocate air and space forces in advance, actively prepare for military struggle, and seize and maintain air and space supremacy and information supremacy in future wars.¹

5. Responding to non-traditional air and space threats

Non-traditional security threats mainly refer to unconventional and occasional air and space threats in non-war conditions. According to the main body of the accident, non-traditional air-space threats can be divided into two categories: aircraft threats and non-aircraft threats. Aircraft threats include illegal encroachment by aviation and spacecraft or mistaken aviation restricted areas, hijacking of aircraft by extremists, accidents caused by individuals flying aircraft, launching aircraft or ballistic target attacks, etc.

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2009 edition, p216.

For example, the incident of the German young Rust piloting the plane to land on Moscow's Red Square, the "9/11" terrorist attack at the beginning of this century, and the successive crashes of Malaysia Airlines passenger planes since 2014 have caused a huge sensation in the world, especially the "9/11" incident, which not only caused huge economic losses and casualties to the United States, but also caused the US government and its people to suffer psychological trauma and humiliation that are difficult to heal. Non-aircraft threats include activities that threaten the safety and functions of aerospace vehicles, such as sabotaging aircraft and aerospace facilities causing aerospace security incidents, carrying out electronic attacks on our aerospace targets, and cyber attacks. The interference and destruction of aerospace vehicles may be intentional by adversaries or extremists, or it may be caused by some accidental factors. For example, in the Iraq war, cruise missiles and guided bombs of the US military were interfered with and flew into Turkey and Iran, which was an air threat caused by accidental factors for Turkey and Iran. As the various threats faced by the country, especially the threat of terrorist attacks, gradually increase, the methods and means tend to diversify.

With the development and proliferation of aviation, space and information attack technologies, as well as the gradual opening of China's low-altitude airspace, the country is facing increasing non-traditional security threats to air and space. In recent years, the international impact caused by non-traditional air and space threats has been huge, ranging from chaos in national aerospace order to direct national dignity and security. Responding to non-traditional security threats from the air and space has become a strategic task for maintaining national air and space security. Due to the variety and randomness of non-traditional security threats from the air, it is very difficult to prevent. In view of different strategic environments, regions, interest needs, international relations and other conditions, it is an urgent need to deal with non-traditional air and space threats to strengthen the use of comprehensive forces with aerospace forces as the main body and the participation of other forces, improve laws and regulations, formulate practical action plans, and organize air and space forces to conduct exercises according to the action plans to improve their ability to deal with non-traditional air and space threats.

CHAPTER 4 CHINA'S STRATEGIC GUIDELINES AND PRINCIPLES FOR AEROSPACE SECURITY

Correct strategic practice comes from correct strategic guidance, and correct strategic guidance is embodied in correct strategic policies and principles. The strategic guidelines and principles of aerospace security have an extremely important position as the basic basis and code of conduct that must be followed in the construction and operation of aerospace security forces for a certain period of time. Scientifically determining the strategic principles and principles of aerospace security is a problem that must be solved in China's strategic research on air and space security, and is also a need to correctly guide the practice of China's air and space security strategy.

As a major developing space power with influence and responsibility in the international community, China should "be prepared for danger in times of peace and actively defend; Well prepared, well shaped; Scientific operation research, effective control; Information leads, system wins" as the basic policy that should be followed in the implementation of space security in a certain period of time, and "air and large integration, both offensive and defensive; Rigidity and softness help each other, and intimidate me at the same time; overall planning, military-civilian integration; Independence, cooperation and win-win; As the law and standard of strategic behavior in aerospace security, we guide the air and space security capacity building, means selection, mode selection, system construction and action implementation according to the situation, take into account internal and external considerations, exploit strengths and avoid weaknesses, and seek advantages and avoid disadvantages.

Section 1 China's Strategic Guidelines for Aerospace Security

The strategic guidelines for aerospace security are the basic guidelines that the state must follow in implementing the aerospace security strategy within a certain period of time. It stipulates the direction and objectives for the construction and operation of aerospace security forces, and is the basic basis for planning, guiding, organizing and implementing air and space security operations. Based on a comprehensive analysis of the strategic environment facing China's aerospace security, the characteristics and laws of the development and application of the world's aerospace forces, the strategic goals and tasks of China's aerospace security, and the current situation and possible trends of China's development in the aerospace field, we believe that China's aerospace security strategy should establish "be prepared for danger in times of peace and actively defend; Well prepared, well shaped; Scientific operation research, effective control; Information-led, system-winning" strategic principle, which is a comprehensive embodiment of the national security strategy of peaceful development and the national defense and military strategy of active defense in the field of air and space security, covers different stages and links of the strategic process of air and space security, and is the basic observance of China's air and space security strategic practice.

1. Be prepared for danger in times of peace and actively defend

In his speech at the first meeting of the Central National Security Commission on April 15, 2014, President Xi Jinping pointed out: "At present, the connotation and extension of China's national security are richer than at any time in history, the field of time and space is broader than at any time in history, and internal and external factors are more complex than at any time in history. "We must enhance our awareness of hardship, be prepared for danger in times of peace, consolidate our internal strength in a relatively peaceful international security environment, and prevent and eliminate possible air and space threats through active defensive actions." For the sake of the unprecedented, to cure the chaos. "Thinking of danger in times of peace and actively defending against it are the primary contents of China's strategic air and space security policy.

Being prepared for danger in times of peace is an ideological prerequisite for active defense. "Be prepared for danger in times of peace, be prepared, and be prepared." Enhancing our awareness of hardship and being prepared for danger in times of peace is a major principle that we must always adhere to in governing the party and the country, and is also the strategic guiding ideology that our country's air and space security must always follow.¹

¹ 15 April 2014, On Sunday, Xi Jinping delivered a speech when he presided over the first meeting of the Central National Security Commission.

With the continuous intensification of air-space competition and the marked increase of air-space threats, the impact of air-space security on the overall security of the country is increasing day by day. Although the reason why Iraq's territory is shattered, the Yugoslav government is falling apart, the Afghan people are ravaged, and the Libyan regime is in ashes, although it is closely related to its loss of air and space security, in the final analysis, it is due to its security concept of ignoring air and space in the past in peace. In today's world, due to the increasing competition situation of various countries in the aerospace field and the increasing uncertainty in the development of international relations, it is obviously more difficult to think about "danger" and "danger." In order to truly "be prepared for danger in times of peace," we must attach importance to the continuity of strategic issues; this continuity not only stems from profound insight into historical and practical issues, but also from scientific judgment of future development; we must fully estimate some possible sudden changes and their impacts, and strive to find a link between them and the historical development trend. As "Zhou Yi" said: "Those who are in danger, those who are in place; The dead, the ones who keep them alive; Those who are chaotic have their rulers. It is the old gentleman who is safe and does not forget danger, survives without forgetting death, and cures without forgetting chaos. It is the safety of the body and the country can be guaranteed. "

Preparedness is an important part of active defense. "Everything is predetermined, and if it is not foreseen, it will be abolished." Precautionary preparedness is based on forward-looking thinking and scientific judgment on national air and space security threats and challenges, and taking various preventive measures and actions in advance to prevent problems before they occur. Advance preparedness is the concrete embodiment of the offensive characteristics of defensive national security strategy and active defense in the field of aerospace security, which emphasizes the forward-looking, foresight, initiative and preventive nature of the guidance and decision-making of the national air and space security strategy. Only when the aerospace security strategy is premised on accurate and effective forecasting and early warning, and takes effective measures in advance to take precautions in advance, can it avoid passivity and blindness, eliminate the lagging effect of strategic decision-making from implementation to effectiveness, and truly prevent problems before they occur. Judging from the situation of rapid development in the world aerospace field and its impact, the risks and threats facing China's aerospace security are increasing day by day, and once crises and conflicts occur, multiple cascading effects will inevitably occur, and improper handling will inevitably have a huge impact on the overall security of the country. This situation puts forward increasingly high demands on the preventive role of China's air and space security strategy. We must accurately grasp the internal law of aerospace security, base ourselves on the most difficult and complicated situations, take necessary measures and effective means in advance, and eliminate possible risks in the invisible and nip them in the bud.

The essence of active defense is offensive defense. This is the general law of military confrontation, which shows that offense has more advantages than defense. For a long time, the United States has often made its opponent invincible through its fierce offensive means in the air and space field, fully demonstrating the tremendous superiority of air and space offensive means. Active defense requires a later strike and attention paid to the preemptive control of the enemy. "If anyone does not offend me, I will not offend anyone, but if anyone sins against me, I will commit a crime." China adheres to the security strategy of peaceful development and will not take the initiative to cause trouble in the air and space field, but it will never show weakness when faced with air and space threats. Once a country's sovereignty and security are or may be violated, China will not hesitate to strike back with justice and effectiveness. Therefore, in building and applying China's air and space security forces, it is necessary to adhere to the strategic guidance of active defense and focusing on attack, focus on developing and using air and space offensive means, plan and move, be proactive and enterprising, take the initiative to attack, resolutely fight back, make full use of all favorable conditions, comprehensively apply all effective means, and form a strategic situation that is beneficial to itself and unfavorable to the enemy. Only in this way can we give full play to the sharp advantages and rigid specialties of air and space forces, better serve the country's military strategy of active defense, and safeguard national security with effective air and space offensive operations.

2. Fully prepared and carefully shaped

At present, a super-diversified threat adversary and high-end and diverse threat targets in the world pose a severe challenge to China's ability to safeguard China's air and space security interests, and we must attach great importance to it, make full preparations, carefully shape it, constantly expand and deepen preparations for the air and space security struggle, and further enhance the ability to resolve air and space crises, resolve air and space conflicts, and contain and win air and space wars in the information age. Full preparation and meticulous shaping are the concrete embodiment of China's strategic air and space security principles in peacetime.

Full preparation is a series of activities carried out in advance in various aspects such as theoretical innovation, equipment development, personnel training, and support environment in view of the development trend of the world aerospace field and the situation facing China's aerospace security, in accordance with the national aerospace security strategic goals. The prerequisite for full preparation is to strengthen the concept of space and establish a strategic awareness of space and space. In recent years, the world's multipolarization, economic globalization, and military informatization have accelerated development, and the security environment facing China has become more severe and complex. With the quiet rise of the air-space arms race, the scope and field of national security have continued to expand, and the comprehensiveness, complexity, and variability are unprecedented. This determines that China must regard aerospace as an important field of national security development, pool wisdom and strength, and actively explore, study, and solve new situations and new problems in the field of aerospace security.

The core of adequate preparedness is to enhance the country's air and space security capabilities, especially air and space military capabilities. Since the beginning of the new century, the new military changes in the world have entered a new stage of qualitative change. The new military reform of informationization, air-space, and integration has brought about revolutionary changes in army building and combat methods; system confrontation is becoming the basic form of battlefield confrontation, and air and space are the strategic commanding heights of system confrontation and the key point of military competition. In the face of the strong impact of the new military changes in the world, China has actively promoted military changes with its own characteristics, has a good foundation for mechanization, made marked progress in informationization, and significantly enhanced the deterrence and actual combat capabilities of informationization conditions. In the field of air and space, military space power and air power complement each other, develop simultaneously, and achieve remarkable results; marked by the official operation of the Beidou system and the successful test flight of new aviation equipment, China's air and space security capability has been greatly improved. However, objectively speaking, there is still a gap between China's air and space security capability and the world's advanced level, and the contradiction between China's air and space security strategic goals is still prominent. It is necessary to take precautions, make full preparations, accelerate the national air and space security capacity building with the passage of space and space as the traction, and use effective air and space security preparations to form an air and space security system capability based on information systems.

Meticulous shaping means getting rid of the shackles of passive response thinking, shaping a favorable national air and space security strategic posture through active preparation and proactive behavior, and winning the strategic initiative. The essence of shaping lies in plotting momentum, creating momentum, and ultimately winning. Externally, to improve the regional and international security environment through dialogue, cooperation and coordination among countries, to obtain support and understanding; As needed, use air and space deterrence, deterrence, and strangulation to deal with various air and space threats and challenges from opponents; Through actively participating in non-war military operations such as international peacekeeping, joint military exercises, counter-terrorism and rescue, and military exchanges, we will normalize the legalization and institutionalization of overseas military training and give play to the strategic influence of major powers. Internally, through positive publicity, momentum and guidance, people will fully understand the importance of the aerospace field to national security, national interests, and national survival and development, actively mobilize the forces of all parties to form a consensus and action on the space and the country, and jointly promote the development of the national aerospace cause. Meticulous shaping is a positive behavior, which must have a broad vision and long-term planning, must have the superb wisdom of seeking survival in dangerous situations, seizing opportunities in the midst of challenges, and seeking development in the struggle, proceed from the strategic height and overall situation of national security development, and take a more proactive attitude to resolve and eliminate potential and actual threats, defend national interests, and safeguard air and space security. Carefully shaping should be centered on ourselves, step by step, pursue advantages and avoid disadvantages, and promote the comprehensive and harmonious development of national air and space security with a responsible, pragmatic and flexible strategic style.

In terms of strength building, we must do something while leaving others undone, develop in an orderly manner, and leapfrog to catch up and surpass; In the use of force, it is necessary to change from focusing on passive response to crises to actively shaping the situation, from mainly operating on a local scale to active overseas participation, from paying attention to actual combat application to paying attention to deterrence, deterrence and actual combat combination, and expanding the scope of application in both horizontal and vertical space, forming an all-directional overview, clear hierarchy, and highly increasing overall layout. In short, we must persistently proceed from the objective reality of national air and space security, focus on the overall needs of safeguarding national security interests, weigh the pros and cons, take steps step by step, and decide on trade-offs. In participating in international air and space security cooperation, we must be proactive in handling sensitive air and space issues, and we must be even more cautious in resolving hot issues in space and space. Through careful shaping, we will achieve the rapid development of the country's aerospace undertakings, form an aerospace situation conducive to the development of national security, maintain world peace and promote common development.

3. Scientific operation and effective control

In the face of the profound changes in the international security situation and the intricate security threats in the aerospace field, scientific operation and effective management and control are particularly important, which is an objective requirement for improving the scientific and rationality of air and space security activities, reducing and eliminating deviations and errors, is the core and key to effectively responding to current and future national air and space security threats, and is also the main content of China's air and space security strategic policy.

Scientific operation research is an overall planning activity for the overall situation of national security strategy with the overall situation of national security and interests in mind and the use of modern science and technology, means and methods. In the field of aerospace security, scientific operation is to build a new pattern and new order of international aerospace and space, break the strategic situation of "one family dominating" as a hegemonic power, and promote the harmonious development and common development of the world's aerospace undertakings. At present, the trend of multipolarization in the world is surging. In planning national air and space security affairs, it is necessary to conform to the world trend, accurately grasp the general trend of the development of the international air and space situation, take the initiative to create a security environment for peaceful development through scientific strategic planning, and safeguard the strategic opportunity period for national security and development. First, it is necessary to accurately judge the strategic situation of air and space security. Based on the reality of the development of national aerospace security, with advanced security thinking and innovative rational thinking, correctly analyze the world's conditions, national conditions and military conditions, scientifically predict the trend of the aerospace security situation, and make forward-looking scientific judgments on the aerospace security situation facing the country. Second, it is necessary to scientifically formulate strategic objectives for aerospace security. With the goal of safeguarding national air and space security and ensuring that the fundamental interests of the country are not harmed, aiming at the needs of national air and space security, we will make long-term plans, invest in personnel for a long time, and make unremitting efforts to achieve maximum security benefits with limited investment personnel.

Third, it is necessary to correctly choose the strategic means of air and space security. Means are roads and bridges to the goal. The selection of national air and space security strategic means should be based on the basic principle of resolving conflicts, defusing crises, and maximizing national interests, combining cooperative means with means of confrontation, combining military means with non-military means, and combining war means with non-war means, so as to base the realization of the strategic goal of national air and space security on the correct selection and comprehensive application of strategic means. Fourth, it is necessary to carefully formulate a strategic plan for air and space security. It pays attention to giving full play to the comprehensive advantages of the national air and space security forces, focuses on maintaining long-term strategic stability, pays close attention to the current complex dynamics, and formulates a strategic plan in line with China's air and space security reality on the basis of fully demonstrating, simulating, deducing and accurately evaluating various plans. Fifth, it is necessary to grasp well the implementation of the strategic plan for air and space security. Without implementation, all planning will fail. It is necessary to mobilize all forces of the national aerospace security forces, focus on the implementation of the strategic plan, strictly grasp the implementation, highlight and solve the overall and basic problems affecting security operations, solve difficulties, highlight key points, break through key points, give full play to the comprehensive advantages of the national aerospace security forces, and firmly grasp the initiative in the air and space security struggle.

Effective control refers to the activities of strictly evaluating and adjusting each stage and link in the process of national aerospace security operations, avoiding or reducing mistakes as much as possible, and achieving national aerospace security goals.

Its purpose is to actively create conditions to deal with new situations and new problems that arise, solve various problems in the process of achieving goals, and effectively safeguard national air and space security and even national security. The implementation of the National Aerospace Security Strategy is a process that begins with goals and ends with goals. Without the process, there will be no result, and without effective control of the process, the achievement of the goal is likely to become empty talk. Realizing the effective control of the national aerospace security process is a very important and extremely arduous task, which must be managed scientifically, and organically combine feed-forward control, target control, process control, feedback control and precise control.

Comprehensive application to avoid the lack of control, weak control, and lagging control that cause air and space security activities to deviate from the direction, or go out of the wrong area, and even threaten the core interests of the country. Effective control requires the flexible use of various means to reduce potential security risks in the aerospace field and avoid concentrated outbreaks of problems. Soft control of national aerospace security activities should strictly follow the objective laws of aerospace security and development, not only to fully understand the complex situation, but also to focus on solving complex problems; Neither rush nor procrastination. When an aerospace crisis occurs, through effective management and control, it is necessary to prevent a single crisis from evolving into a compound crisis, a partial crisis from evolving into a comprehensive crisis, and ensure the favorable situation of national air and space security as a whole and as a whole.

4. Information-led, system wins

Aerospace security activities are essentially a systematic confrontation activity based on information systems, which will be comprehensively spread out in multi-dimensional spaces such as land, sea, air, space, network, and electricity with various forces, and how to aggregate various elements of forces into an organic whole and release the overall effectiveness to the maximum is an issue that the national aerospace security strategy must focus on solving. Information-led and system-winning, as an important law of great power games and military confrontation in the information age, is an important guideline that must be followed in China's air and space security strategic practice.

Information dominance means incorporating informationization construction and information confrontation into the main theme of aerospace security strategic guidance, using information to support the construction of aerospace security forces and leading aerospace security strategic actions. Its essence is to fully understand the important role of information in aerospace security activities, comprehensively use aerospace information forces and means, flexibly take offensive and defensive actions, seize and maintain its own advantages in information acquisition, transmission, processing, and utilization, win the strategic initiative, and maintain aerospace security. The advent of the information age has made information resources the most important strategic resource, information technology has become the core technology that dominates everything, and informationization in the military field has become a distinctive characteristic of the times. Compared with other war resources, the use of information resources is not consumption, but increase, which can not only appear at multiple points at the same time, but also dominate the role of other resources; Information technology has a powerful performance gathering function, is a bridge and link connecting various aerospace security elements, and is also a key factor to achieve the multiplication of aerospace security efficiency, and is leading national defense and military construction out of the "physical domain," into the "information domain," and towards the "cognitive domain". At present, for China, which is generally in the development stage of "mechanization, semi-mechanization and partial informationization," how to quickly get out of the "physical domain," enter the "information domain" at an early date, and rely on the flow of information to drive the precise aggregation and release of material flow and energy flow has become a major strategic task that needs to be completed urgently. Only by conforming to the trend of development of the times, establishing an information-led strategic concept, and adopting a composite development path of informationization driving mechanization and mechanization promoting informationization can we give full play to the due value of information as a strategic resource for aerospace and space, come into the upper place in the field of aerospace security, and win the initiative.

To win the system is to form an integrated air and space security capability based on information systems as the goal, to create a favorable air and space security situation in a planned and step-by-step manner in peacetime, and to contain the air and space crisis, win the air and space war, and maintain air and space security with a superior air and space force system in times of crisis and war.

The basis for the success of the system is the system of air and space security forces. If China wants to achieve rapid and safe development in the field of air and space, it must establish the idea of ensuring security and seeking development with strength, continuously enhance its comprehensive strength, especially enhance its air and space strength, and build a sound air and space security force system with strong air and space strength, so as to provide effective means for coping with air and space threats and resisting air and space risks. Building an air and space security force system is a major strategic project, which requires the strength of the whole country and the whole army to be effective. According to the idea of system integration, the urgent task at present is to build a networked information system that can cover air space, near space, and outer space, a modern air defense and anti-missile system that can cover the entire territory and expand moderately outward and upward, a long-range precision strike system with the cross-domain advantages of air-space network and electricity, and a comprehensive support system that can ensure that aerospace security forces can carry out large-scale, high-intensity and continuous air-space security tasks at any time. An integrated air and space security force system based on the network.

The key to the success of the system is the comprehensive use of air and space security forces to enable them to play a powerful system function. In general, it is necessary to comprehensively use the country's political, economic, military, diplomatic, scientific, technological, cultural and other forces to give full play to the overall effectiveness of the country's comprehensive national strength. In the military field, it is necessary to rely on the aerospace and information network resources of the state and the armed forces to integrate combat forces such as reconnaissance and early warning, air offensive, air defense and anti-missile, and network and electricity attack and defense, so as to form the overall power of systematic operations; In accordance with the idea of multi-domain response and multi-dimensional linkage, it is necessary to strengthen the joint actions of all services, actively safeguard the security of national airspace, effectively monitor quasi-public air space (airspace above the national maritime exclusive economic zone), effectively use public air space (airspace above the high seas, polar regions, etc.), freely enter and use space, and create a favorable air-space situation and a stable air-space security environment; It is necessary to resolutely resist threats and attacks from vertical space, actively respond to security challenges from cyber-electromagnetic space, control conflicts, resolve crises, deter and win wars; It is necessary to focus on the characteristics of air and space security operations that integrate air and space, have both offensive and defensive capabilities, and simultaneously promote deterrence and war, comprehensively use the integrated forces of land, sea, air, space, electricity, and networks, and obtain comprehensive advantages composed of air and space information superiority, firepower superiority, and mobile superiority through coordinated full-spectrum actions such as air-space attack, air defense and anti-missile, and network and electricity offensive and defense, so as to ensure the stability of the national strategic air frontier and security situation.

Section 2 Strategic Principles of China's Aerospace Security

Strategic principles are the laws or standards that guide strategic actions established in accordance with certain strategic ideas. The strategic principles of aerospace security originate from the strategic practice of aerospace security, which is not only a refined summary and theoretical summary of the practical experience of aerospace security, but also a concrete embodiment of the law of aerospace strategic management activities, and it is also the guidance and follow-up for the effective implementation of aerospace security operations. Based on China's national security strategic objectives and corresponding security strategic guidelines, summarizing and carrying forward the practical experience of China's national security strategy, and taking into account the strategic situation and tasks facing China's air and space security, we believe that the principles that China's air and space security strategy should follow can be summarized into the following five points:

1. The principle of integrating air and space and having both attack and defense

Aerospace integration refers to the process and method of carrying out integrated design, building an integrated system, implementing integrated actions, and realizing and maintaining national aerospace security in the construction and application of national aerospace forces, in accordance with the idea of integration; To have both attack and defense means that in the construction of the national air and space security system and air and space security operations, we should pay attention to the coordinated development and comprehensive use of offensive and defensive forces, rationally set the proportion of offensive and defensive structures, scientifically build a security force system, form an air and space security situation that integrates attack and defense, and realize and maintain national air and space security. The integration of air and space and both offensive and defensive capabilities embodies the essential characteristics of air and space forces, conforms to the basic law of the development of air and space forces, is an inevitable requirement for the strategic application of national air and space forces, and is an important principle that must be adhered to in the strategic guidance of China's air and space security.

(1) Aerospace integration

The integration of air and space is an inevitable choice for the construction and application of air and space forces. From a technical point of view, aerospace is an extension and expansion of aviation, and the development of aerospace technology is mature, so that the space system has a strong information support function for aviation forces and air defense forces, and provides the basic conditions for the integrated development and integrated application of aerospace forces.

The comprehensive coverage of aircraft flight speed from low speed to hypersonic speed, as well as the successful application of rocket engines on aircraft, provide the possibility for the development and application of integrated air and space safety equipment; The limitations of aviation equipment in terms of flight speed and distance and the shortcomings of aerospace equipment in terms of rapid entry into space and high operating costs have laid the premise for the integrated development and integrated application of the two. From a functional point of view, the integration of air and space can organically integrate the information superiority of "Tian" with the firepower superiority and mobility superiority of "Air"; under the framework of integrated air-space forces, the value of "air" and "sky" can be amplified at the same time, the strategic functions of aviation and air defense forces at the same time can be enhanced to the maximum, and the capabilities of air offensive operations and air defense and anti-missile warfare will be greatly enhanced. From an operational point of view, the positioning, navigation, guidance and target information provided by space-based systems can enable long-range precision strikes by air power; The strategic early warning information provided by space-based systems can provide strong support for ground-based air defense and air defense. At present, in view of the great advantages of air-space integration, major countries have taken the integration of air and space as the basic choice for the development of aerospace security forces. The advantages of the integrated air and space force model built by the United States with strategic missiles as the backing, space power as the support, and air power as the main body have been successfully verified in the practice of many wars. The integration of air and space has become the trend of the times in the development and application of aerospace forces in major countries in the world.

The premise of aerospace integration is to realize the transformation of aviation thinking to aerospace thinking. Aviation thinking is people's thinking and cognition of air space, aviation equipment and air combat, as a military security thinking mode of mechanized warfare in the industrial era, it is a major leap forward in traditional plane security thinking, it not only guides the plane security awareness to a three-dimensional form, but also makes significant contributions to the expansion of national security concepts.

It has also narrowed the distance between countries in the world and promoted the development of human society. However, if we limit our thinking to the aviation field, focus our attention on aviation space, and lock our vision on aviation equipment and air operations, it is obvious that we are no longer suited to the needs of the times in the development and combat use of aerospace forces in the information age. Aerospace thinking is a kind of abandonment of aviation thinking, a kind of transcendence, the essence of which is to regard the aviation space, adjacent space and outer space above the earth's surface as a unified whole, integrated development and utilization. At present, we are in a critical period of accelerating the transformation from mechanization to informationization and accelerating the development from the military form of aviation to the military form of air and space; only by changing the mode of thinking of aviation with air defense confrontation as the basic thinking and doing a good job of aviation as the only demand, and building an air and space security thinking mode that is compatible with the informationized air and space era, can we make the aerospace security force develop healthily at a higher level through the leading role of advanced thinking.

The core of aerospace integration is the integrated development and integrated application of aviation power and aerospace force. Judging from the development trend, before the middle of this century, the main function of space-based systems will still be information support, and the basic mode of air-space integrated security operations is air confrontation, air-ground confrontation and space-ground confrontation operations supported by space-based systems. Only by integrating aviation forces with aerospace forces, air defense forces and space defense forces, and forming a force system that integrates air and space, can we effectively carry out integrated air and space security operations. To this end, the building of aerospace forces must give full consideration to giving full play to the unique high-position advantages of space, especially the information advantages in space situation cognition, strategic early warning, communication and navigation, weapon guidance, information confrontation, etc., strengthen the construction of space information systems, and provide strong information support for air forces and ground air defense and anti-missile forces. Explore and develop actual combat military space forces, and gradually realize the transformation of space forces from information support to support and actual combat; We should further speed up the pace of research and development of advanced aviation equipment and ground-based air defense and anti-missile equipment, intensify the transformation of air-ground (sea) equipment in active service, realize information links with space systems on the basis of air-air, air-ground, and air-sea integration, so that the backbone of national air and space security, such as air power and ground-based air defense and anti-missile forces, will be deeply integrated with aerospace forces, and a new generation of aerospace equipment will be formed and effectively applied.

(2) Both offensive and defensive

Having both offensive and defensive is the basic requirement for the construction and operation of the country's air and space security forces. Sun Tzu says: "Those who cannot win, defend; those who can win, attack." Mao Zedong pointed out that in any war between ancient and modern China and abroad, "there are only two basic forms of battle: offensive and defensive." Dialectically speaking, "attack" and "defense" have never been diametrically opposed; offensive with defense and defense in offensive are the basic requirements of strategic guidance and are also the common pursuit of the development and application of air and space security forces in major countries in the world. While highlighting the construction and application of strategic offensive forces in air and space, the United States has been committed to the construction of the ballistic missile defense system, and has strived to base the means of safeguarding national interests on the comprehensive advantage of integrating attack and defense. Constrained by the dual pressure of the domestic economic downturn and NATO's step-by-step pressure, Russia is actively seeking and building strategic means that are both offensive and defensive to balance a strong enemy while focusing on building a national air-space defense system to deal with NATO's air-space threats. Judging from China's capabilities and means to maintain air and space security, it is an inevitable choice to have both offensive and defensive measures. Offense and defense are the two basic means of maintaining national air and space security.

Theoretically speaking, as a complete air and space force system, it must be a unified whole composed of two basic elements: air and space offensive force and air and space defense force. Aerospace offensive forces are like sharp swords, which are the main means to achieve and maintain national air and space security, and strengthening the building of air and space offensive forces is essentially to enhance the deterrent effect of national air and space and build a solid foundation for national air and space security. Aerospace defense forces are like shields, which are necessary means to realize and maintain national air and space security, and strengthening the building of air and space defense forces is essentially to build a national air and space security shield and thicken the "top cover" of national security. Therefore, we cannot narrowly equate the system of forces for maintaining national air and space security with the system of air and space defense forces or even the system of air defense forces. In order to effectively safeguard the interests of national air and space security, it is necessary to take into account the coordinated development and comprehensive use of air and space offensive forces and defensive forces.^{1,2}

To have both offensive and defensive forces, we must pay attention to the coordinated development and comprehensive use of offensive and defensive forces in air, while also focusing on strengthening the building and application of offensive forces. Judging from the cycle of military technology and equipment development, we have now entered an era in which "spears" are far better than "shields," and this is particularly evident in the field of air and space security. Relying on the air-space battlefield, which is vast and boundless and has no danger to defend, this highlights the importance of advanced offensive weapons and equipment, and also brings about the basic situation of air-space confrontation with strong offensive and weak defense: air raids have won many times, and air defense operations have rarely succeeded. Especially since the 80s of the 20th century, the widespread use of stealth aircraft, cruise missiles, and tactical ballistic missiles has brought the characteristics and advantages of air and space forces to the extreme. At present, informationization construction is booming, and a new generation of air and space attack system supported by fourth-generation aircraft, global information grids and space-based systems is accelerating the formation, which exerts tremendous pressure on the traditional air defense system based on defending against third-generation air attack weapons. Data show that in terms of strength building, the cost of defense is dozens or even hundreds of times higher than the cost of attack. In combat, the simulated air combat exchange ratio between fourth-generation and third-generation aircraft reached 1:30. In the future, with the successive use of unmanned combat aircraft, stealth vehicles, hypersonic vehicles and space-based strike weapons, air and space defense operations will face a more difficult situation. Therefore, focusing on strengthening the building of some landmark air-space offensive forces is no different from the development of land-based strategic missiles by the country and the development of aircraft carriers and submarine-launched missiles, which are the cornerstone, soul and symbol of the use of air and space forces. Strengthening the building of air and space offensive forces is not only about improving efficiency, assisting defense with attack, and safeguarding national air space

¹ Zhang Honghe: "Strengthening the Building of Aerospace Forces and Safeguarding National Strategic Interests," *Journal of Air Force Engineering University (Military Science Edition)*, 2011, 4, p4.

² Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p278.

The need for space security is also an inevitable way to reflect the characteristics of air and space forces and amplify the advantages of air and space forces.

To combine offensive and defensive forces, we must realize the transformation of territorial air defense into air-space defense while strengthening the building of air-space offensive forces. Without good defensive strength, there will be no lasting combat effectiveness, and air and space defense is an indispensable means of maintaining national air and space security. Therefore, while focusing on strengthening the building of air and space offensive forces, we should simultaneously realize the transformation of national territorial air defense forces into air and space defense forces. First of all, it is necessary to take the integrated construction of air defense forces as a starting point to build a framework for the air and space defense system. After decades of development, China has built a relatively complete territorial air defense system with the air force as the mainstay, but it is obviously insufficient in the face of new air and space threats. To this end, it is necessary to proceed from the overall situation, choose the path of "gradual integration," promote the integration and upgrading of air defense technology, equipment and systems, and build a framework for the system of air and space defense forces. Second, with the building of anti-missile forces as the starting point, we will bring about an overall leap in the air and space defense capability. Anti-missile defense is a major practical problem facing China's air and space defense, and strengthening the building of anti-missile forces is an urgent need to cope with the increasingly serious missile threat. To this end, it is necessary to take the systematic development of multidimensional space early warning and detection, interception and strike, command and control, and other operational elements as the starting point, adopt the development mode of combining construction and application with "development, verification, deployment, and improvement," and form the ability to deal with new threats such as space-based targets, stealth targets, and highly dynamic near-space targets through breakthroughs in anti-missile technology and integration with air defense technology. Finally, accelerate the integration of "cyber" space forces, and expand the composition of the system to achieve multi-dimensional integration. "Cyber" space forces are combat forces covering electromagnetic space, cyberspace, and psychological space, and "cyber" space operations mainly include electronic warfare, network warfare, and psychological warfare; among them, the network and electricity battle is the core of "cyber" space operations, and is currently forming a new major threat to China. To this end, it is necessary to establish the basic idea of "integrated development," focus on the offensive and defensive capacity building of the network and electricity, form the "cyber" space combat capability as soon as possible, and take the integration of the network and electricity as the cornerstone and link to realize the seamless link of the combat capability of the ground, air and space multidimensional forces, and forge the information sword of air and space defense.

2. The principle of combining rigidity and softness and deterring war

Rigidity and flexibility complement each other, that is, in the construction and application of national aerospace security forces, it is necessary to properly grasp the scale of "rigidity" and "softness," and combine rigidity and flexibility to complement each other; Simultaneous deterrence and war are the organic combination and comprehensive application of the two major functions of national air and space security forces of deterrence and actual combat.

Rigidity and softness, deterrence and war, reflect different aspects of the national air and space security strategy, the former focusing on the inherent characteristics of the air and space forces themselves, and the latter focusing on the different ways of using the air and space forces. Combining rigidity and softness and deterring war at the same time is an important guideline for the practice of national air and space security strategy and an important principle guiding the construction and application of China's air and space security forces.

(1) Rigidity and softness

"Rigidity and softness, yin and yang coordination" is the essence of classical Chinese philosophy, the essence of which is to combine principle and flexibility, unify external performance with internal practice, and combine soft and hard and rigid in dealing with threats and handling relations between countries, so as to win the strategic initiative and obtain maximum benefits. Generally speaking, on issues involving the core interests of the country, "rigidity" should be the mainstay, and never give in, which is a necessary means to declare the will of the country, and it is also the bottom line of the principle that reflects the determination of the country; However, on some specific details and non-principled issues, mediation, negotiation and coordination should be carried out through corresponding "soft" measures, showing sincerity and achieving national air and space security goals.

Rigidity and softness are a realistic choice for China's aerospace security strategy. In the field of aerospace and space, China, as a latecomer, has not only made remarkable achievements in construction, but also faces development bottlenecks that need to be broken through urgently. Inheriting the ideological essence of ancient Chinese philosophy and adopting strategic operational means that combine rigidity and softness are conducive to highlighting the advantages of air and space and unblocking development bottlenecks, which is an important principle that China must follow in its development and use of air and space forces to maintain national air and space security. On the one hand, China's aerospace undertaking has made brilliant historical achievements through the hard work of several generations, not only becoming an important pillar of national security and development, but also occupying an important place in the world aerospace field, which has made great achievements in promoting China's trans-human ranks among the world's aerospace powers, and has made great achievements for the expansion of the Chinese nation in vertical space, and has also laid a solid foundation for China to swear national will and determination and adopt rigid means to resolutely safeguard national air and space interests. On the other hand, the great rejuvenation of the Chinese nation has entered a new and important stage of development, competition in the field of air and space in all countries in the world has become increasingly fierce, national interests and aerospace security are closely linked, and the development of China's aerospace undertakings is shouldering new and more severe challenges. This determines that China's pursuit of air and space security cannot only adopt a simple and flamboyant rigid line, but also needs to use a "soft" way to obtain a broader detour space, while expressing the determination and will to resolutely safeguard national air and space security in a "rigid" way, it can obtain extensive understanding and support from the international community through a "soft" way, expand air and space cooperation with the outside world while maintaining autonomy, and seek the realization of national air and space security interests in cooperation.

Rigidity and flexibility are important ways to achieve the strategic goals of national air and space security. In seeking development in the aerospace field, China must not only be good at expressing its firm determination and courage to take responsibility, but also create a strategic environment conducive to development with great wisdom and wisdom. History has repeatedly proved that if the strategic goal is too high, the strategic approach is too direct, and the attitude is too tough, it is often half the effort. Whether it is the historical lying salary and guts, or the traditional Chinese Taoguang Yanghui, it is a manifestation of "restraint" and "flexibility," and it is also the embodiment of a clever strategic art. At present, as a developing aerospace power, we cannot cover our vision with small gains, and we cannot affect our determination due to temporary difficulties, but should choose the most suitable and appropriate path and strategy in major strategic decisions. The soft is soft, and the soft is strong. When the aerospace crisis is in a serious predicament, it is not necessary to adopt rigid means, but it is possible to wait for action, "avoid its sharp energy" and "seek to attack"; When encountering an air and space problem that is difficult to solve directly, you can "take a detour as a straight," wait for the time to move, and take the seemingly long circuitous road as an effective shortcut to achieve the goal. At present, with the acceleration of the pace of the United States' return to the Asia-Pacific region, China's struggle to deal with disputes over peripheral and aerospace interests is more complicated and difficult than in the past, and too rigid will inevitably lead to more misunderstandings and even be exploited. If we are too tolerant, national security interests will inevitably be lost. Only by combining rigidity and softness, combining soft and hard, and responding flexibly can we win the strategic initiative in the field of aerospace security.¹

Applying the principle of rigidity and softness to deal with space security is a complex and delicate strategic art. In order to strive to improve and maintain the stability of the strategic environment for aerospace security, we must pay attention to analyzing the relationship between interests with strategic opponents, study the advantages and disadvantages of all sides, skillfully use our own advantages, and use rigid means to force the other side to make compromises and concessions. At the same time, it is also necessary to understand the trend of public opinion in the country and avoid being incited and used by the enemy to affect domestic security, stability and development. We must not passively evade various emergencies, but actively respond to them and seize the opportunity. In 1999, after the Sino-US plane collision incident in the South China Sea, the United States "sued the wicked first," posing a serious challenge to China's sovereignty and dignity. In the face of the aggressiveness of the United States, the Chinese government has waged a righteous and solemn struggle, not only publicly condemning the violations and practices of the United States, but also winning the understanding and support of the international community.

¹ [UK] Liddell Hart: "The Theory of Strategy" (translated by the Academy of Military Sciences of the Chinese People's Liberation Army), Beijing, Soldier Press, 1981 edition, p4.

At the same time, it has also made representations, negotiations and claims in accordance with relevant international laws, safeguarding national sovereignty, dignity and rights and interests to the greatest extent.

(2) Simultaneous deterrence

Deterrence and actual combat are the two basic forms of strategic use of China's air and space security forces. China has always held high the banner of peace, development, cooperation and win-win results, and is unswervingly committed to safeguarding world peace and promoting common development. However, China's adherence to the path of peaceful development and the pursuit of a defensive national defense policy do not exclude national defense and army building. Only when the armed forces are "able to fight and win wars" and have strong deterrence and actual combat capabilities can they "stop," "win," and "not fight" and ensure national security.

As the basic forms of air and space security operations, deterrence and actual combat complement each other and are indispensable. Simultaneous deterrence and war means that in the action of safeguarding national air and space security, we should integrate deterrence with actual combat, comprehensively use and effectively bring into play their respective advantages, and improve the effectiveness of national air and space security operations. Actual air and space combat has the advantages of mobility, flexibility, rapid strikes, and obvious results; it is a necessary means to maintain national air and space security in the form of war; at the same time, it is faced with problems such as complex organization, huge costs, and greater risks and unpredictability; while air and space deterrence can demonstrate the power of one's own air and space forces and achieve the goal of subjugating the opponent and containing crises and wars by issuing air raid warnings, ultimatums, establishing no-fly zones, holding exercises, and disclosing combat operation concepts. Aerospace deterrence, with its advantages similar to actual air and space combat, covers a wide area, forms a rapid situation, has a large degree of freedom of action, and has strong deterrence, is an effective means of defeating the enemy and safeguarding national air and space security through non-military confrontation, and has thus become an important content and a specific form of the use of air and space forces in the information age. Therefore, in using the national air and space security forces, we should closely combine "victory in battle" with "deterrence and submission," regard "soldiers who surrender without a fight" as the best way to safeguard national air and space security, and take victory in actual combat as a strong backing and last resort for safeguarding national air and space security, so as to ensure national air and space security.

To persist in simultaneously developing war deterrence, we should focus on grasping the following points: First, we must take "war" as the traction and "construction" as the basis, speed up the development of the country's air and space security strength, improve the space security capability with actual combat as the sole standard, and build effective deterrence on the basis of a strong actual air and space combat capability. Second, the function of "deterrence" must be enhanced. Whether it is deterrence or war, the essence is to "stop the war" and "win the war," and the highest realm # is "no war," and "no war" not only requires the support of air and space strength, but also requires the determination and will to dare to "shine the sword," as well as superb strategy and wisdom, through propaganda, momentum, etc., so that the opponent does not dare to fight, does not grasp the battle, or realizes that the price paid by the war is greater than expected and "stops the war".

In the 1979 self-defense counterattack against Vietnam, although China did not use superior air power to effectively support ground operations, the combat aircraft assembled in the Sino-Vietnamese border area forced the Vietnamese Air Force not to take off into the air, creating combat conditions for our army's operations from another side without the threat of air strikes. Third, the use of "deterrence" and "war" must be flexible and not stick to one form. Although the "empty city plan" is popular, it is difficult to implement, and if it is not well thought out and missed in the slightest, it will fall by a thousand miles. Aerospace security is related to national security, and without it, whether it is airspace security, public space security, or space security, national security interests will lose reliable guarantees. Therefore, the application of "deterrence" and "war" should be combined with reality and fiction, with odd and positive, and with deterrence and war; we must not completely pin our security hopes on unrealistic and unreliable "deterrence." We must make good actual combat preparations once deterrence fails, and earnestly ensure national air and space security.

3. The principle of overall planning and civil-military integration

Overall planning means taking charge of the overall situation, taking into account all parties, making overall planning, and comprehensive balance, combining the present with the long-term, and combining comprehensive promotion with key breakthroughs; Military-civilian integration is based on China's national and military conditions, stands at the overall situation and height of national security and development, coordinates economic construction, national defense construction and national aerospace security force building, and promotes the coordinated development of national economic construction, national defense army construction and national aerospace security construction at a higher level and to a deeper extent. Taking into account overall planning and military-civilian integration are important principles that must always be adhered to in China's air and space security strategy.¹

(1) Take into account all aspects

Taking into account all aspects is an important experience formed in China's long-term practice of socialist construction, and it is also an important way to resolve the many contradictions facing China's aerospace security, rationally allocate strategic resources, scientifically mobilize various forces, prevent various risks and threats, and realize and safeguard the interests of national aerospace security.

¹ "Guidance Reader for the Report of the 18th National Congress," Beijing, People's Liberation Army Press, November 2012, p43.

In essence, overall planning and consideration means acting in accordance with the objective law governing the construction and use of air and space security forces, giving full play to people's subjective initiative, taking the overall situation into account, strengthening macroeconomic regulation and control, effectively distributing forces, and making correct policy decisions. In particular, in the context of the continuous expansion of national interests, the intensification of foreign ties, and the increasing importance of air and space security, the national air and space security strategic planning must be more creative, find effective ways and means to rely on multiple forces, resolve multiple contradictions, and achieve multiple goals, so as to better safeguard national air and space security.

The overall consideration in the field of national aerospace security emphasizes the unity of air and space security and space development, the unity of territorial air sovereignty security and public space and space rights and interests, the unity of air and space security and national security, the unity of actual security and future security, the unity of traditional security and non-traditional security, and the unity of hard power development and application with soft power development and application. Based on this, it is necessary to grasp the following points in an overall way: First, the relationship between aerospace security and development. Aerospace security and space development are interrelated, interdependent and mutually reinforcing. Aerospace security is a necessary condition for aerospace development, and without a good aerospace security environment, aerospace development is not a real, stable and sustainable development; Aerospace development is an important guarantee for aerospace security, and without healthy, stable and sustained aerospace development, it will be difficult to ensure aerospace security. Practice has proved that if we only seek development without paying attention to security, or if we only stress security without seeking development, the result will inevitably be the simultaneous loss of aerospace security and development. Aerospace is a very risky field, and the contradiction between security and development in the aerospace field is very prominent, and it is necessary to correctly handle the relationship between the two and harmoniously unify them. We cannot pursue development one-sidedly and neglect security, nor can we passively pursue security and abandon development. The second is the relationship between ensuring the security of airspace and safeguarding the rights and interests of public space and space. Territorial space is the core issue of national air and space security, public air is an important guarantee for safeguarding national maritime rights and interests and the security of strategic sea passages, and space is the strategic commanding height of national air and space security and even national security. Coordinating the development and comprehensive use of airspace, public space and space is to actively develop and use long-range air forces and space forces under the premise of ensuring the security of national airspace, so as to provide reliable security for the expansion of national interests in horizontal space and vertical space. Third, the relationship between air and space security and national security. As an important field of national security in the information age, air and space security has a prominent position and plays a huge role; in a certain sense, national security in the information age is inseparable from air and space security, which has become a high-end barrier for national survival and a reliable guarantee for national development.¹

¹ Li Xuezhong: "Air Force Security Development Theory," Beijing, National Defense Industry Press, 2008 edition, p20.

To coordinate the relationship between air and space security and national security, it is necessary to take air and space security as an important part of the national security system, squarely face the role of air and space security forces in guaranteeing the development of national security, and focus on construction and use. Fourth, the relationship between dealing with real air and space threats and dealing with long-term air and space threats. From a military point of view, on the one hand, we must base ourselves on reality and be fully prepared to deal with real threats such as air stealth targets, ballistic targets and cyber electromagnetic attacks; On the other hand, we must focus on the future, and we must attach great importance to the threats to new types of air and space targets that will appear in the near future, such as space weapons, near-space hypersonic weapons, and other new concepts and new mechanism weapons. Fifth, the relationship between responding to traditional air and space security threats and responding to non-traditional air and space security threats. While actively responding to traditional military threats such as air-space attacks, we should pay more attention to the comprehensiveness and complexity of non-traditional air-space threats such as terrorist hijacking and aviation flight accidents. Threats to the sovereignty of national territorial airspace and problems facing public space and space, threats to the state in the field of air and space and problems faced by the country on land and sea must be scientifically coordinated and comprehensively taken into account. Sixth, the relationship between the construction and application of soft and hard power in space and space. Aerospace hard power and aerospace soft power are the two basic components of a country's air and space security strength. Through centralized control, unified scheduling, effective allocation of human, material, financial, scientific and technological forces and other forces, the combination of software and hardware, to enhance the country's comprehensive strength in maintaining air and space security. Seventh, the relationship between local air and space interests and global air and space interests. Local and overall situation are contradictions and problems that will inevitably be encountered in the construction and application of aerospace security forces. When designing and planning the overall issue of national air and space security, it is necessary to pay attention to the coordination of overall security interests and local security interests, properly solve local security problems on the premise of grasping and ensuring the overall situation of air and space security, and prevent local problems from affecting and affecting the overall situation of national air and space security.

(2) Military-civilian integration

Military-civilian integration is a universal law in the construction and application of aerospace forces in all countries in the world, a historical experience in the development of China's aerospace undertakings and brilliant achievements, and an effective way to enhance the country's air and space security strength.

The core of civil-military integration is integration. Military-civilian integration reflects the essential relationship between the construction of aerospace security forces and the economic and social development system, and reveals the realization process of the organic integration of national defense construction into the economic and social development system. "Through proactive strategic planning, we should organically integrate national defense construction into the economic and social development system, so that economic construction and national defense construction can promote and integrate each other, and strive to form a scientific mechanism for the coordinated development of economic construction and national defense construction."

"Military-civilian integration is neither a simple superposition of each other, nor a mechanical binding of each other, but through a scientific mechanism to reflect its essential relationship and objective requirements, solve the world problem of the trade-off between the investment in aerospace force construction and the country's economic development, and it is difficult to obtain a win-win situation, and achieve a high degree of coordination on the basis of a high division of labor in all fields of society." The basic platform for civil-military integration is the market. The market has become the basic platform for socio-economic development and resource allocation, the market mechanism is the key link to promote military-civilian integration, and China has successfully achieved a great historical turning point from a planned economic system to a socialist market economic system, which is the common basis for the synchronous development of economy and national defense, including the construction of aerospace forces, and is also an objective basis for establishing the market as the basic platform for military-civilian integration development. At present, China's economy and society are developing rapidly, and not only the economy and industry have reached a considerable scale, but also the aerospace science and technology as a key field of national defense has a high level as a whole, which has created conditions for the implementation of military-civilian integration in the field of air and space. The development of China's aerospace forces should give full play to the advantages of all parties in the military and localities, constantly improve the integration mechanism, enrich the forms of integration, expand the scope of integration, and raise the level of integration, strive to form a deep development pattern of all-factor, multi-field, and high-efficiency military-civilian integration that integrates policies and regulations, construction planning, major projects, talent training, and resource sharing, raises the starting point of the construction of aerospace forces, and accelerates the speed of the country's space management.

To adhere to military-civilian integration, we should focus on the following points: First, establish and improve laws and regulations that adapt to military-civilian integration. The process of integration between the science, technology and industry for national defense and private enterprises is completely different in many aspects such as the source of funds, ownership, management and operation system, and the process of integration between the two is a process of mutual game, adaptation and integration, and it is necessary to regulate the legal status of the government, the military and enterprises in this process through legislation, and form a legal system to protect the rights and interests of all parties concerned. The second is to incorporate the construction of air and space security into the national security construction system. Formulate a plan for the construction of air-space security for military-civilian integration, highlight military-civilian integration in construction, and focus on civilian use and military supplementation in peacetime, with emphasis on peacetime and wartime. Third, persist in relying on national construction. Relying on the advantages of the civilian aerospace industry and abundant scientific and technological resources, we will directly transform mature civilian technology into aerospace technology, and do a good job in the optimization, reorganization, and systematic integration of military and local scientific and technological resources. Combine. Fourth, make good preparations for wartime and space mobilization. In order to rapidly transform the air and space resources that are used by the military and the civilian into air and space combat capabilities in wartime, preparations for air and space mobilization should be placed in a prominent position as an important task in preparation for war mobilization. Thorough knowledge of the number, capabilities and distribution of national and social aerospace enterprises, aerospace resources, and aerospace science and technology personnel to ensure rapid mobilization as soon as necessary.

Fifth, fully rely on national education to cultivate aerospace talents. Relying on local institutions of higher learning and scientific research institutes, strengthen the construction of aerospace talent teams, vigorously promote the strategic project of aerospace talent training, and scientifically build a joint training system for aerospace talents; Make full use of the advantages of local educational resources, establish a sound professional system of aerospace disciplines, and lay a solid foundation for the training of aerospace personnel in the military. Sixth, it is necessary to innovate a joint air-space-military-ground support model that meets the needs of modern warfare. Accelerate the integration of air and space support facilities, combine urban infrastructure construction, and focus on strengthening the overall planning of civil air defense projects, command systems, air situation warning systems, and protection projects; In connection with the construction of national transportation infrastructure, we should pay attention to the construction of national defense transportation facilities. In view of the weak long-range air delivery capability, we should speed up the development of large-scale transport forces and make extensive use of civil aviation and other means of mobile transportation to greatly improve the rapid response capability of the national air and space forces. The seventh is to establish and improve a research and development model for air and space equipment with a high degree of military-civilian integration. On the basis of institutional integration, we should deepen the reform of the aerospace military industry system, and establish an open and coordinated military industry management system in accordance with the development requirements of "integrating military and civilian use and integrating military with civilian use".

(3) Combination of military and non-military

The integration of military and non-military is an important part of the principle of overall planning and civil-military integration. Security threats in the air and space field come from traditional military security threats on the one hand and non-traditional non-military security threats on the other. Aerospace military security threats refer to the destructive impact and harm caused to the air and space field by military means, especially means of war, such as air and space reconnaissance, air and space attacks, and air and space disturbance. Non-military air and space security threats refer to the destructive impact and harm caused to the air and space field by reasons other than military means, especially means of war, such as terrorist hijacking incidents, man-made or natural air and space accidents, etc. The combination of military and non-military is an inevitable choice for actively adapting to the diversified trend of air and space threats, and is an inevitable requirement for effectively responding to various military and non-military air and space threats.

In today's era, the multipolarization of the world and economic globalization are deeply developing, cultural diversification and social informatization are constantly advancing, the overall strength of emerging countries and developing countries is increasing, the international balance of forces is developing in a direction conducive to maintaining world peace, and there are more favorable conditions for maintaining the overall stability of the international situation.

However, the imbalance in global development has intensified, hegemonism, power

politics, and neo-interventionism, local crises and turbulence have occurred frequently, threats to national security have tended to diversify, and the center of gravity of national security is expanding from the ground to the air; the "11 September" incident once shook the United States and the world; Iraq, the Federal Republic of Yugoslavia, and Libya once suffered the disastrous bitter fruits brought about by the air and space military forces of the Western powers. Facts have proved that while hegemonism and power politics still exist, we must attach great importance to the building and application of military forces, especially air and space military forces, because military means are still an important means of safeguarding national security, and military strength is still the basis of national political diplomacy. Facts have also proved that the pluralism of threatening opponents and the diversification of threat targets caused by political multipolarization, economic globalization, and the militarization of air and space are no longer suitable for relying on military force alone to cope with and resolve crises; military is no longer the only means of safeguarding national security, and military means cannot solve all the problems facing national security. Therefore, in the field of national air and space security, it is necessary to adhere to the principle of close integration between military and non-military, give overall consideration to the national air and space military capacity building and application and air space non-military capacity building and application, and base the means of maintaining national air and space security on the basis of close integration between military and non-military.¹

The combination of military and non-military means that, from the perspective of ensuring national air and space security, the planning and deployment of air and space military construction should be organically integrated into the overall layout of the country's air and space development, the top-level design of the development and application of air and space forces should be strengthened, and the process of strengthening the military and enriching the country and securing the country should be matched, so that the air and space military and the air and space non-military will be coordinated and unified, developed in a balanced manner, and comprehensively applied. In terms of military capacity building and application, it is necessary to persist in taking into account the three armed services, coordinate the development and comprehensive use of the air and space forces of various services, and form an overall joint force. In terms of non-military capacity building, we should pay attention to the comprehensiveness and complexity of non-traditional threats, accurately identify the non-military threats facing the country's air and space field, scientifically design the target plan for the development of non-military air and space security in accordance with the needs of expanding national interests, do a good job in emergency plans for responding to air and space crises and wars, and properly handle various non-military air and space security issues. In the combination of military and non-military, adhere to the coordinated development of military construction and non-military construction, so that the aerospace development strategy is compatible with the national development strategy; Taking into account the needs of economic and social development, simultaneously improving the military and social benefits of space resources in peacetime; Scientifically plan and implement the use of military and non-military capabilities, actively participate in international air and space security cooperation, carry out various forms of air and space exchanges, enhance understanding and mutual trust with other countries in the air and space field, create a harmonious air and space security environment, and build a favorable air and space security situation.

¹ Compilation of Documents of the 18th National Congress of the Communist Party of China, Beijing, People's Publishing House, November 2012, p42.

4. The principle of independence and win-win cooperation

Independence and self-determination means to pool the wisdom and talents of the domestic people, rely on domestic technical strength and other resources, and pool wisdom to tackle key problems in key technical fields, major construction projects and core security issues, and innovate and develop; Win-win cooperation means maintaining aerospace security and building a harmonious space through extensive exchanges and cooperation with relevant countries and organizations in the field of air and space. Independence and win-win cooperation are the basic ways for the construction and application of national aerospace forces, the former focusing on the development of forces, the latter taking into account the construction and application of forces, they complement each other and are indispensable, which is an important principle that China's aerospace security strategy must always adhere to.

(1) Independence and self-determination

Independence and self-determination is the fundamental right of the Chinese people after a long and arduous struggle, a summary of the experience of being invincible in the tortuous and complicated international struggle after the founding of New China, and a basic foothold of China's national security strategy. Since the founding of New China, although the situation at home and abroad has undergone major changes many times, the principle of independence and self-reliance has not changed. Mao Zedong once pointed out, "What basis should our policy be placed on? Placed on the basis of one's own strength, it is called self-reliance. Deng Xiaoping clearly pointed out at the 1978 National Science Conference: "To improve China's scientific and technological level, of course, we must rely on our own efforts and develop our own creation." At the 1985 enlarged meeting of the Central Military Commission, he also stressed that the renewal of weapons and equipment "can be purchased from foreign countries, and it is even more necessary to base itself on conducting scientific research."¹²³⁴

¹ Yang Yi: "China's National Security Strategic Concept," Beijing, Shishi Publishing House, 2009 edition, p96.

² "Mao Zedong's Military Anthology" No 3 Volume, Beijing, Military Science Press, 1993 edition, p17.

³ Selected Works of Deng Xiaoping, No 2 Volume, Beijing, People's Publishing House, 1994 edition, p91.

⁴ Selected Works of Deng Xiaoping, No 3 Volume, Beijing, People's Publishing House, 1993 edition, p129.

Jiang Zemin pointed out: "Self-reliance and independent innovation are important cornerstones for us to truly occupy a place in the world's high-tech field." Hu Jintao further explained at the 18th National Congress of the Communist Party of China: "We must adhere to the path of independent innovation with Chinese characteristics, plan and promote innovation with a global vision, improve the ability of original innovation, integrated innovation and introduction, digestion, absorption and re-innovation, and pay more attention to collaborative innovation." As a key area of national security in the information age, it is unrealistic and unfeasible for many technologies and resources to rely on foreign aid and import, and only by basing ourselves on self-innovation can we take a good road of development.¹²

Independence is the fundamental principle of China's aerospace security strategy. Since the founding of New China, China has successfully developed nuclear weapons and missiles relying on the spirit of "two bombs and one satellite," and has successfully carried out manned space experiments and the development and operation of the "Beidou" navigation system against the background of the strict embargo imposed by Western countries on China's military products and technology, and relying on its own domestic strength. A series of major achievements made by China over the past 60 years and more fully demonstrate that in order to become an aerospace power and space power with strong influence in the world, it must have an unswerving strategic will to be independent and self-reliant. As the foundation of China's strong development, independence has a more positive significance and deeper strategic connotation in the field of air and space. The space field is a very special one, and the issue of space is a very sensitive issue. Aerospace has important strategic resource value, economic development value and security barrier value, although peacetime technology introduction, international cooperation is an important path to solve the "bottleneck" problem and improve the efficiency of aerospace construction, China's rapid economic growth and steady improvement of comprehensive national strength can also provide relatively rich financial support for the introduction of technology and the development of equipment, but national aerospace security is not something that can be bought with money, and the maintenance of national core interests cannot be completely established with the help of other countries. There are precedents in Argentina, precedents in Kuwait, precedents in Libya, and China has suffered. Practice has proved that the key to the strategy of the rise of a great power lies in laying a solid domestic foundation and enhancing comprehensive national strength. Therefore, we must mainly base ourselves on our own national and military conditions, carry out independent innovation, original innovation, integrated innovation and introduction, digestion, absorption and re-innovation in a down-to-earth manner, and mainly rely on our own wisdom and strength to build a solid edifice of China's aerospace and national defense.

To uphold independence and self-determination, we should focus on the following points: First, persist in taking national interests as the highest criterion. Scientifically handle space security issues, resolutely safeguard the rights and interests of space and space, including ensuring the security of national airspace, safeguarding international public air security, ensuring the right of free access to space and the right to space development, and maintaining the freedom of national space operations.

¹ Jiang Zemin: "On Science and Technology," Beijing, Central Literature Publishing House, 2001 edition, p164.

² Compilation of Documents of the 18th National Congress of the Communist Party of China, Beijing, People's Publishing House, 2012 edition, p20.

Second, adhere to independent innovation. While actively seeking technical cooperation through diplomatic means, we should independently carry out the development of aerospace technology based on domestic aerospace technology innovation, especially in some major technological projects and key fields, and strive to make breakthroughs at an early date. The third is to advocate justice and fairness. Proceeding from the common interests of China and other countries in the world, we should determine our own aerospace stance and policy in a truth-seeking manner, uphold international justice and fairness, and oppose any form of air and space hegemony. Fourth, it advocates equality and mutual benefit. Respect the air and space rights of other countries, and support other countries and peoples in their struggle to safeguard their sovereignty over airspace, public space rights and interests, and space rights. Fifth, persist in reform and opening up. It is necessary to further stimulate the vitality and potential of aerospace development and improve the speed and efficiency of the country's management of space through the construction of the aerospace safety system, laws and regulations and the transformation of the mode of aerospace development.

(2) Win-win cooperation

Win-win cooperation is an inevitable choice for maintaining national air and space security. In the middle and second half of the 20th century, the Cold War mentality prevailed, confrontation and conflict became the basic norms for handling relations, and international relations emphasized "either friend or foe" and "gain or loss," which brought many factors of instability to the entire international community. After the end of the cold war, with the increase of the international community's strength for peace, in order to meet the objective needs of national survival and development, countries began to emphasize inclusiveness and more far-sighted strategic thinking on the basis of mutual respect, and win-win cooperation became the main development trend. Jiang Zemin pointed out: "The interdependence of all countries in security is deepening and the common ground is increasing, and it is difficult for any country to achieve its security goals alone." "All countries should seek security with mutual trust and cooperation with mutual benefit, fundamentally reduce insecurity, and maintain global strategic balance and stability." Xi Jinping stressed that it is necessary to innovate security concepts, actively build a new framework for security cooperation, and strive to create a security road of joint construction, sharing and win-win. Aerospace is the common wealth and homeland of human society, and maintaining aerospace security and building a harmonious space is the good wish of the vast majority of countries in the world. Only cooperation will have a win-win situation; Only through cooperation can good wishes be realized.¹²

Win-win cooperation is a necessary means to defend national interests and build a harmonious space and space.

¹ Jiang Zemin: "Jointly Create a New Century of Peace and Prosperity," People's Daily, 11 April 2002, 1.

² Xi Jinping, 21 April 2014, Remarks at the Fourth Summit of the Conference on Interaction and Confidence in Asia, held in Shanghai, Japan.

Strengthening international aerospace cooperation and relying on collective action and strength can not only effectively respond to the new threats facing China's aerospace security, but also a necessary means to demonstrate national will, demonstrate national strength, defend national interests, accumulate moral resources, and enhance national image. China advocates and adheres to the principle of win-win cooperation, takes mutual respect for each other's space interests as the premise, aims to enhance mutual trust, expand consensus and deepen cooperation in aerospace security, transcends the shackles of social systems and ideologies, transcends cultural and historical entanglements, overcomes the limitations of nation-state interests, understands and examines those common interests in the field of aerospace security that have a bearing on the survival and development of the entire human society with a global perspective and a positive attitude, and strives to seek the intersection of the interests of all parties, a big country that is developing peacefully, a big country that has established the "Chinese dream," and is responsible for the history of building a harmonious space and seeking to build a harmonious world.

Win-win cooperation must have a lofty vision and a broad mind. China is an emerging force in the development of space and the use of space, has the advantage of being a latecomer in the field of air and space, and has no shortage of potential and driving force for development; China needs the world, and the world also needs China; it is a historical necessity to fully integrate with the world in the field of aerospace security, integrate the international system and eventually play a leading role in the international community. It is undeniable that this integration is a difficult, complex process that needs to be actively sought, and whether it can leap from the edge and supporting role of the international aerospace system to the center and play a leading role in the process of integrating into the world depends to a large extent on how China handles its relations with the international community, especially with the extensive existence of aerospace powers. After the end of the Cold War, the United States and Russia have moved from confrontation to cooperation in the aerospace field, and their joint participation in the construction experiment of the Russian space station has provided us with useful references. At present, as an important field of human social development, aerospace has become a new convergence of interests and the focus of contradictions. We advocate and adhere to the principle of win-win cooperation, that is, in the process of administering space and space, we should handle the space issue in accordance with the norms of international law, take the path of space security and development based on equality, mutual benefit and win-win, resolve differences and disputes between countries in the field of space and space in a peaceful manner, promote mutual understanding and trust through dialogue and consultation, and seek national space security through bilateral and multilateral cooperation. Of course, the principle of win-win cooperation cannot be at the expense of one's own air and space security interests, nor can we put one's own air and space security interests above other countries, let alone harm the common air and space security interests of mankind in order to safeguard our own air and space security interests, but should conform to the realistic development of international relations, adhere to the overall national security concept, and strive to build a more harmonious air and space and harmonious world on the basis of ensuring China's air and space security interests.

5. The principle of peaceful development and following the trend

Peaceful development and following the trend means that in the guidance of the national aerospace security strategy, it is necessary to conform to the theme of the times and the general trend of development of peace and development, and scientifically plan, construct and apply the national aerospace security system that is compatible with the development of the times. In order for China to safeguard national air and space security, ensure that national sovereignty and interests are not infringed upon, stand tall among the world's aerospace powers, and make due contributions to the development and progress of human society, China must take advantage of the east wind of world historical development, seek long-term national security and development, and seek China's air and space security and development under the general trend of world peace and development. This is the only way to follow the basic law of human social progress and conform to the general trend of development in the space era, and is an initiative to understand, grasp, use, and act according to the law.

To adhere to the principle of peaceful development and following the trend, we must accurately grasp the basic trend of the international security situation, especially the international air and space security situation. The international security situation is the basic trend of war and peace determined by the mainstream public opinion of the international community, and the national air and space security situation is the embodiment of the international security situation in the air and space field. In today's world, although the general trend of peace and development is still there, factors of world instability and air and space insecurity seriously exist and are growing, and almost all kinds of factors affecting and restricting national security are closely related to the air and space field, and air and space have become the intersection of the security interests of all countries and the strategic commanding heights for safeguarding national security. The prominence of the role of the status of air and space, the shift of the focus of military security, and the evolution of the pattern of war have posed new challenges to the strategic planning of national air and space security, and have also provided new opportunities and opened up new space for the strategic planning of national air and space security. In the face of the world trend of peaceful development and the growing threat to air and space, we must bear in mind the ancient adage that "if you go with the trend, you will prosper, and if you go against the trend, you will perish," comprehensively understand and grasp the impact of international factors on China's security development, and actively respond to the opportunities and challenges brought by the air and space security situation to China's security. In the final analysis, when planning and guiding China's air and space security issues, it is necessary to conform to the general trend of security development in the world and in the air and space field, seek and plan air and space development under this general trend, and base the strategic practice of safeguarding national air and space security on the basis of clearly understanding the situation and conforming to the general trend.

To adhere to the principle of peaceful development and following the trend, we must follow the strategic principle of "actively shaping," be down-to-earth, judge the hour and size up the situation, and take the initiative to act. "The mission of strategy is not and cannot be to design some kind of self-righteous ending for the complex objective world ...

A truly wise strategist does not rely on strong national power to impose his own whimsy and beautiful blueprint on the objective world, but can judge the situation and do what history allows. If you can't do what you can't do by force, you can achieve immediate success by luck, but in the end you will be drowned out by the tide of history. The lesson of the Iraq war, although the United States was able to take militarily lightly, has been unable to "digest" the fruits of its victory for a long time, is worth learning. To plan China's space security issues, we must base ourselves on reality, keep the overall situation in mind, focus on the long term, persist in observing the world with a broad vision, and improve the level of scientific judgment of the international aerospace security situation and strategic thinking. We must break through the shackles of historical experience in seeking plane security in the past and establish a three-dimensional security concept that is compatible with the information age; We must profoundly understand the overall situation of international aerospace security, scientifically grasp the profound changes and characteristics in the world aerospace field, take the initiative to conform to the trend of the times in safeguarding peace in space and promoting space development, correctly respond to the development trend of world multipolarization, economic globalization, military informationization, and aerospace technology, and ensure that we take advantage of the situation, take into account both internal and external considerations, exploit our strengths and avoid our weaknesses, pursue advantages and avoid disadvantages, make full use of favorable factors, actively resolve unfavorable factors, turn challenges into opportunities, take the initiative to act, and develop scientifically. Constantly create air and space security capabilities that are compatible with the development and changes of the international situation.¹

¹ Yang Yi: China's National Security Strategic Concept, Beijing, Shishi Publishing House, 2009 edition, p99.

CHAPTER 5 CHINA'S STRATEGIC CAPABILITIES FOR AEROSPACE SECURITY

Capability is the cornerstone of strategy. The national air and space security strategic capability is a necessary prerequisite for the state to transform and use certain strategic resources to achieve the strategic goals of air and space security. It includes not only the ability to shape a favorable air and space situation in peacetime, but also the ability to respond to and deter air and space crises in times of crisis, and the ability to control the air and space war situation and win air and space war in wartime.

With the omnidirectionalization of the main body of air and space threats, the space of threat objects, the enhancement of threat effectiveness, the diversification of threat patterns, and the diversification of threat types, how to form a national air and space security strategic capability with the help of the country's basic strength, the use of aerospace science and technology strength, and the reliance on air and space military strength, and how to properly transform and apply it to the strategic practice of maintaining national air and space security, has become a problem that the national air and space security strategy must pay close attention to, focus on researching and solving. At present, along with the historical process of the great rejuvenation of the Chinese nation, China has ushered in the historical opportunity to move from an aerospace power to an aerospace power, and at the same time is facing many contradictions and challenges between the strategic capabilities and needs of national aerospace security. Strengthening the strategic capacity building of aerospace security is an inevitable choice to solve contradictions and meet challenges. Capacity building is a systematic project, which should highlight the building of strength, because strength is the basis for the formation of air and space security capabilities; It is also necessary to highlight the construction of the capability transformation mechanism, because the transformation mechanism is the key to the effectiveness of aerospace security capabilities; It is even more necessary to give prominence to the building of air and space military capacity, because of this

Aerospace military capability is the core of maintaining national air and space security and supporting the expansion of national interests.

Section 1 Definition of National Aerospace Security Strategic Capability

The national air and space security strategic capability is a reflection of the national security strategic capability in the air and space field. How to possess a certain degree of air and space security strength and properly apply it to the strategic practice of maintaining national air and space security is precisely the main issue that the national air and space security strategy should pay attention to, study and solve.

1. The meaning of the national air and space security strategic capability

National air and space security strategic capability is an important part of national security strategic capability, which refers to the country's ability to transform and use certain strategic resources to achieve air and space security strategic goals. It includes not only the ability to shape a favorable air-space situation in peacetime, but also the ability to respond to and deter air-space crises in times of crisis, and the ability to control the air-space war situation and win air-space wars in wartime.¹

(1) The basic connotation of the national air and space security strategic capability

As a comprehensive capability to safeguard national aerospace security interests and eliminate air and space security threats, the national air and space security strategic capability is not only dependent on the role of its internal factors, but also subject to the influence of the external environment, and its connotation is mainly reflected in three aspects:

First, the national air and space security strategic capability is aimed at safeguarding national air and space security interests. National air and space security interests are the reflection of national security interests in the air and space field, and together with national land security interests and maritime security interests, they constitute a national security interest system.

¹ Tian Anping, Deng Pan, et al., "On the Strategic Capability of National Air and Space Security," Journal of Air Force Engineering University (Military Science Edition), 2011, 1, p1~4.

From the perspective of expression, national air and space security interests can be divided into direct interests and indirect interests. Direct interests refer to the security interests contained in space itself, such as space security interests such as aerospace, near space, outer space, and platform security interests such as aircraft, aerostats, spacecraft, and space vehicles. Indirect interests refer to security interests that are not possessed by space itself, but are generated or enhanced through the radiation or derivative effects of space platforms, systems and spaces, such as political security interests, economic security interests, military security interests, scientific and technological security interests, etc.¹

Second, the national strategic capability for air and space security is a comprehensive capability to eliminate threats to air and space security. Since the 90s of the 20th century, air and space forces have risen rapidly, the status of air and space battlefields has become prominent, and air and space security threats have replaced traditional security threats as major threats to national security, such as the regular threat of space-based reconnaissance and surveillance, the real threat of precision strikes in the air, the serious threat of ballistic missile attacks, and the potential threat of space-based attack weapons. On the whole, national air and space security threats are mainly manifested in three forms: crisis, conflict and war. A crisis is a problem in the internal and external environment on which the country depends for its survival and development, and further deterioration of the state that may seriously endanger the country's air and space security; Conflicts will be conflicts in the global commons, such as conflicts in the air commons, conflicts in the space commons and conflicts in the "cyber" space commons, etc., and national air and space security interests not only exist in their own territorial land, territorial waters and territorial airspace, but also exist in the vast space and "cyber" space; War is the result of the escalation of crises and armed conflicts, and the highest degree of threat to national air and space security has always been the core issue affecting national air and space security. To develop the country's strategic capability for air and space security and safeguard the country's air and space security interests, we must not only use air and space forces to actively respond to and effectively defuse air and space security threats, but also pay attention to the scientific use of various domestic and international air and space security strategic forces, create a favorable strategic situation for air and space security, actively prevent and control crises and conflicts, and avoid the occurrence of war as much as possible.

Third, the strategic capability of national air and space security depends on air and space strength and its application. Aerospace strength is a prerequisite for generating a national strategic capability for air and space security. National aerospace strength is a reflection of national strength in the air and space field, usually including basic strength, military strength, scientific and technological strength, political strength and diplomatic strength. National air and space power includes both actual and potential strength; This includes both hard and soft power; It includes both domestic and international forces.

¹ Tian Anping: "Pay attention to the interests of air and space and ensure air and space security," Journal of Air Force Engineering University (Military Science Edition), 2010, 1, p16~19.

In the era of economic globalization, international forces are developing in a direction conducive to maintaining world peace, and the development of national aerospace security strength should not only pay attention to the accumulation of domestic forces, but also pay attention to the cultivation and use of international forces. In addition, the formation of a national strategic capability for air and space security also depends on the scientific application of air and space capabilities, and only when it is applied at the right time, in the right place and in the right way, can an effective strategic capability for air and space security be formed. A sound organizational mechanism for strategic mobilization, a scientific strategic mobilization system, and superb strategic planning art are the keys to rapidly and efficiently forming a national strategic capability for air and space security, which mainly depends on the country's legal system and strategic culture, and on the quality of the leading group and the quality of the staff group.

(2) The essential characteristics of the country's strategic air and space security capabilities

As a national security strategic capability in the field of air and space, the national air and space security strategic capability not only has the general characteristics of national security strategic capability, but also presents inherent characteristics that distinguish it from other strategic capabilities. It is mainly manifested in the following four aspects:

The first is the open nature of the ability category. National air and space security strategic capability is a dynamic, developing and open concept, and its constituent elements change with the development of the times. In terms of safe space, from air and ground security in the aviation era to ground, air and space security in the space age, until the current ground, air, space and information space security in the information age; In terms of the ability to deal with security issues, from more emphasis on military strength to emphasis on the comprehensive use of non-military forces such as politics, economy, diplomacy and culture; In terms of security means, from focusing on military means to the integrated use of military and non-military means; In terms of security operations, from giving priority to military operations to unified actions based on military operations and coordinated with various non-military operations. It can be seen from this that with the changes in the objective world and the deepening of subjective understanding, the strategic capability of national aerospace security will continue to enrich its connotation, add new constituent elements, and the status and role of each element are also changing.¹

The second is the differential characteristics of ability appeals. Due to the different national conditions of all countries in the world, the air and space security threats and air space security requirements are also different, and the corresponding air and space security strategic capabilities also have different characteristics. Even the same country, in different historical periods, has certain differences in its strategic capabilities for air and space security.

¹ Wang Xingwang: "A Preliminary Study on National Strategic Capability," "Chinese Military Science," 2009, 2, p138~144.

China actively advocates the concept of "new aerospace security concept" and "harmonious air and space," adheres to the comprehensive and coordinated development of various elements in the capacity building of air and space security strategy, emphasizes the central role of political strength and diplomatic strength, and maintains appropriate air and space military strength, forming a strategic air and space security capability with defensive nature as the basic feature. The United States pursues the national security strategic goal of "global leadership," introduces new theories and concepts such as "global commons," "cross-domain integration" and "cross-domain control," strengthens the comprehensive superiority of the United States in many fields such as land, sea, air, space and cyberspace, highlights the "cornerstone" status of the armed forces in US national security, requires the armed forces to maintain conventional superiority and nuclear deterrence capabilities, and enhances the ability to defeat asymmetric threats.¹

Third, the coordinated characteristics of capacity development. The national aerospace security strategic capability is formed by the interaction of various elements, which has both the multiplier effect of positive feedback and the offset effect of negative feedback, which determines the coordination of the national air and space security strategic capability. Coordinating the relationship between various elements can effectively enhance the national air and space security strategic capability, on the contrary, it will lead to the decline of the national air and space security strategic capability due to mutual containment and mutual cancellation. For example, in order to strengthen the building of aerospace security forces, it is necessary to increase the proportion of funds invested, which will lead to a reduction in development funds in the economic, scientific, technological, and educational fields, and may lead to a weakening of factors such as economic, scientific, technological, and diplomatic strength, thus causing the country's strategic capability of aerospace security to fall instead of rising. Therefore, to develop the national air and space security strategic capability, it is necessary to coordinate the development relationship between different fields, achieve the comprehensive development and coordinated development of various strategic capability elements, and realize the overall improvement of the national air and space security strategic capability.

Fourth, the mandatory characteristics of the use of capacity. Judging from the current situation and trend of air and space competition in the world today, the main threat to national air and space security is still a military threat, and effectively handling the military threats faced by the country in the air and space field objectively requires that the national air and space security strategic capability must be coercive. Whether it is to deal with air security threats, space security threats, or security threats in the information field, air and space military strength has always occupied a special position and played a unique role; when dealing with national air and space security issues, although it is necessary to consider and comprehensively use a variety of capabilities and means, there is no doubt that air and space military capabilities are still the core elements of air and space security strategic capabilities, and are the key bargaining chips in the strategic game of air and space security between major powers, which is of great significance for winning the strategic initiative of air and space security.

¹ Liu Yongtao: "The Unchanging Strategy of Changeable Language," Wen Wei Po, 4 June 2010, 6.

Of course, despite the mandatory nature of the strategic capability of air and space security, we maintain that when dealing with national air and space security issues, we should avoid the use of military force to the greatest extent, make full use of non-military means such as politics and diplomacy, and try to solve problems through dialogue rather than confrontation.

2. The formation and performance of the national strategic capability for air and space security

The national aerospace security strategic capability is a complex giant system, and from the perspective of its formation conditions and role, it mainly includes three aspects: aerospace strength, strength transformation mechanism and strategic application of strength; Judging from its manifestations in different environments, it mainly includes the ability to shape the air and space situation in peacetime, the ability to "turn crisis into opportunity" in times of crisis, and the ability to "control and win" in wartime.¹

(1) The mechanism for forming a national strategic capability for air and space security

Aerospace strength, the transformation of aerospace strength and the use of aerospace strength are the basic elements for the formation and play of the national air and space security strategic capability, among which the aerospace strength is the basis for the formation of the national air and space security strategic capability, the transformation of strength is the key to the formation of the national air and space security strategic capability, and the use of strength determines the development of the national air and space security strategic capability.

First of all, aerospace strength is the basis for the formation of a national strategic capability for air and space security. Aerospace strength is a reflection of national strength in the field of aerospace security, mainly including national basic strength, aerospace science and technology strength, and aerospace military strength. Among them, the basic strength of the country is the basic element of the constituent elements of the national aerospace strength, the foundation of the country's survival and development, and plays a supporting role in the national aerospace security strategic capacity building; Aerospace science and technology strength is a leading factor in the capacity building and application of national aerospace security, as a link, it closely links other elements of national aerospace strength, and it also reflects the future development trend of national aerospace strength.²

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p157~159.

² Decide on national air and space security strategy, In addition to the country's basic strength, scientific and technological strength and military strength, the factors of capability should also include the country's political, diplomatic, spiritual and cultural strength.

Aerospace military strength is a mandatory element in the country's air and space strength to resist aggression externally and maintain social stability internally, and is also the core content of national air and space security strategic capacity building. As the basic element of a national strategic capability of air and space security, national air and space strength can be divided into relative stable strength and relatively unstable strength, actual air and space strength and potential air and space strength, air and space hard power and air space soft power, etc., which are all indispensable basic conditions for the formation of national air and space security capabilities.

Second, the transformation of aerospace strength is the key to the formation of national air and space security strategic capabilities. Strategic strength is not the same as strategic capability, and the amount of strategic aerospace resources does not necessarily determine the level of a country's air and space security capability. In history, there are many lessons learned from the damage to national security due to the lack of corresponding strategic capabilities, and there are also frequent examples of effective safeguarding of national security despite limited strategic strength but strong strategic capabilities. The reason for the disconnect between strength and strategic capability is that strength cannot be directly applied to security strategy, and it is necessary to transform potential strategic strength into actual strategic capability through certain intermediaries in order to turn the national security strategic goal from idea to reality. As an important component of strategic capability, the strength transformation mechanism is a bridge and link to transform static potential aerospace strength into strategic air and space security capabilities, and is an intermediate link to enable aerospace security strategic strength to play a role and achieve the strategic goal of aerospace security. From the perspective of the process of strength transformation and the actual needs of maintaining the national aerospace security strategic goals, the strength transformation mechanism mainly includes early warning mechanism, decision-making mechanism, coordination mechanism and mobilization mechanism, which are the sum of a series of institutions, systems and operational processes for the state to transform its own air and space strength into actual air and space security strategic capabilities, which is of great significance in the process of forming national air and space security strategic capabilities.

Finally, the use of air and space strength determines the development of a country's strategic air and space security capabilities. The formation, accumulation and application of national air and space security strategic capabilities are actually the process by which the state can actively dispatch and use air and space security resources and forces to achieve the strategic goals of national air and space security and realize national air and space security interests and even national security interests. This process is characterized by subjectivity and flexibility, so that

The use of air and space security capabilities has become an indispensable element in the composition of national air and space security strategic capabilities. The role of the application of aerospace security strength in the composition of a national air and space security strategic capability is not only that it guides the practical application of the strategic force of air and space security, but also that it may have a major impact on the emergence of national air and space security strength. As the core of the use of aerospace security strength, the correct strategy is a "multiplier" to make the aerospace security strength play a role, and the successful application of strategy in the national aerospace security strategy can greatly improve the effectiveness of aerospace security strength in maintaining the national aerospace security strategy.

On the contrary, it will make it difficult to integrate and coordinate the elements of aerospace security strength, and affect the transformation of aerospace security strength into aerospace security strategic capability. From the perspective of strength distribution, aerospace security capabilities widely exist on the ground, in the air, in space and in cyber-electromagnetic space, and how to effectively aggregate, fully release, and maximize the effectiveness of these widely distributed air and space security strength elements depends entirely on the comprehensive use of these capabilities by the state.

(2) The manifestation of the country's strategic air and space security capabilities

From the perspective of security, peace, crisis and war are three different states that have alternated in the long history of human social development. Correspondingly, the national air and space security strategic capability is also manifested in three different forms: the ability to "shape the situation" in peacetime, the ability to "turn crisis into opportunity" in crisis time, and the ability to "control and win" in wartime, which embodies the different needs of the national aerospace security strategic goals for strategic capabilities under different security conditions and is the specific manifestation of the national aerospace security strategic capability in different periods.¹

The first is the ability to shape a favorable air and space security posture in peacetime. Peacetime is a relatively safe period for national aerospace security, and the strategic capability of aerospace security is mainly manifested in the ability to shape a favorable air and space security situation. Specifically, it includes four aspects: First, the ability to coordinate the elements of national air and space security to build an air and space security system. The national aerospace security system is the basic means for the country to realize and maintain aerospace security, and whether the national aerospace security architecture is reasonable and whether the combination of various elements is appropriate is directly related to the function and efficiency of the system. Regulating the proportion and interrelationship among the components of the air and space security system and ensuring the smooth operation of the air and space security system is an important manifestation of the country's strategic capability of air and space security in peacetime. Second, demonstrate the country's air and space security strength and ability to curb air and space threats. National air and space security strength exists objectively, and how to "artistically" display this strength in front of the world through equipment tests, joint military exercises and other activities to obtain the effect of "knocking mountains and shaking tigers" is one of the main forms of the country's strategic capability of air and space security in peacetime. Third, the ability to operate an international all-day security network and create a harmonious air and space environment.

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p153~156.

In today's international system, the elimination of threats and the acquisition of security increasingly need to be achieved through bilateral or multilateral institutional arrangements. Advocating, participating in and establishing regional and global air and space security mechanisms and jointly seeking harmonious air and space through various forms of security dialogue is also an important form of the application of national air and space security strategic capabilities in peacetime. Fourth, do a good job in responding to aerospace crisis plans and the ability to prevent air and space security crises. Security in peacetime does not mean absolute security. In fact, absolute security does not exist. For example, the security of a country on land does not mean that it is also safe in the air and space domain; The security of the state in the tangible physical space does not mean that it is also safe in the intangible space such as information, network, and cognition; The security of a country's airspace in the field of space does not mean that it is also safe in space. Practice has proved that in the air and space field, security is always relative, and threats are always present. To this end, it is necessary to take precautions against problems before they occur, and preparations should be made as early as possible to deal with potential threats that can affect national air and space security and real threats that may deteriorate in peacetime.

The second is the ability to "turn crises into opportunities" in times of crisis. The crisis period refers to a period of instability in national aerospace security between security and war, the trend of national air and space security is uncertain, "there are opportunities in danger, and danger is bred in opportunities," if well handled, crises can be resolved and peace can be moved; Otherwise, the situation will deteriorate and lead to war. The national aerospace security strategic capability during this period is mainly manifested as the ability to "turn crisis into opportunity," which specifically includes three aspects: First, the ability to play games with opponents in crisis. Effectively mobilizing, coordinating, allocating and using various element-based aerospace strategic strength to game with opponents in crisis and make them act according to their own will is an important manifestation of national aerospace security strategic capability in crisis times. Secondly, the ability to use international safety networks for dialogue and coordination. When a country is in a time of crisis, the importance of air and space security mechanisms is often apparent. Rather than solving the crises faced by ourselves, we can respond to and resolve crises more effectively through a security network represented by various bilateral and multilateral air and space security mechanisms, especially when resolving large-scale transnational crises. Second, the ability to obtain the recognition and support of the domestic public. Whether it is an international crisis or a domestic crisis, whether it is a social crisis or a crisis caused by natural causes, the government, as the representative of the state authority, needs to be supported and recognized by the people. In times of crisis, the state can communicate with the public in a timely manner through public opinion, the media and other means, so that they can correctly understand the progress of the crisis situation, the government's position in dealing with crisis issues, the possible consequences and impacts of the crisis, etc., so that the people can understand the government's decision-making and response measures, and obtain their support and recognition.

The third is the ability to control the war situation and win the war in wartime. War is a fierce military confrontation between two opposing parties to achieve certain political and economic goals, and the war situation is the battlefield situation formed by the two opposing sides through a series of battles in the course of war. In wartime, the national air and space security strategic capability is concentrated in the ability to control the war situation and win the war, which specifically includes three aspects: First, the ability to compete for and maintain the supremacy of air and space supremacy. Air and space supremacy is the product of the integration of air supremacy and space supremacy, which comes from the formation of the air-space battlefield and the rise of integrated air-space operations. Air supremacy is the extension of land supremacy and sea supremacy to three-dimensional space, and space supremacy is a natural extension of air supremacy and exists in integration with air supremacy. The acquisition and maintenance of air and space supremacy is mainly aimed at correctly using fully mobilized and trained air and space military forces, forcing the enemy to submit to its own will and ensuring its own control over the scale, process, and outcome of the air and space military struggle. Second, the diplomatic ability to obtain international support. Mainly through diplomatic means, we should give play to the role and influence of structural strategic strength, and seek the support of most countries and international organizations in the international system for their own air and space military struggles. If it is difficult to achieve the above objectives for various reasons, at least the majority of countries should maintain a neutral attitude and try their best to avoid an unfavorable situation in which "the enemy is outnumbered". Third, design the aftermath capability of post-war arrangements. The ultimate goal of the air-space military struggle is to safeguard and expand national interests, and special attention needs to be paid to the distribution of war benefits. In general, countries should, in accordance with the progress of the air-space war, conduct timely exchanges and consultations with relevant countries, including hostile countries, on the issue of ending the war and dividing interests. When dealing with the issue of distribution of benefits, the state must learn from the experience of the "rise of force" of some countries, not only to safeguard and expand its own interests, but also to leave appropriate leeway for other countries.

3. The main role of the national air and space security strategic capability

The national air and space security strategic capability is a comprehensive embodiment of air and space security strength, strength transformation mechanism and strength application, and is also the basis and premise for responding to air and space security threats and maintaining national air and space security. With the omnidirectionalization of the main body of air and space threats, the space of threats, the enhancement of threat effectiveness, the diversification of threat patterns and the diversification of threat types, the role of national aerospace security strategic capabilities in maintaining national aerospace security has become more prominent.

(1) An important basis for formulating strategies

Strategies must be based on capacity. Strong strategic capability of air and space security is an important basis for formulating a national air and space security strategy. First of all, capability is an important condition for formulating strategic guidelines for air and space security. As the basic observance of the national air and space security strategic actions, the formulation of the air and space security strategic guidelines must fully consider the factor of capability, otherwise it will lead to adventure and blind action in air and space security operations, resulting in mistakes in the strategic guidance of air and space security. Generally speaking, the stronger the strategic capability of aerospace security, the greater the freedom of strategic directors to make strategic choices, and the more conducive it is to the implementation and timely adjustment of the strategic guidelines for aerospace security. Secondly, capability is an important factor in establishing strategic objectives of aerospace security. The establishment of strategic objectives of security must not only be based on the international aerospace security environment, national strategic interests of aerospace and national security strategic objectives, but also be seriously constrained by the strategic capabilities of aerospace security, and the strategic objectives of aerospace security must be consistent with the strategic capabilities of aerospace security. This would deprive the entire strategy of a reliable material basis and lead to failure. Third, capability is an important support for the implementation of strategic guidance for aerospace security. The operation and guidance of the air and space security strategy is based on the strategic capability of air and space security, and it is necessary to plan and guide the construction and application of air and space security forces around the needs of the national air and space security capability, and it is necessary to plan and plan not only the ability to win wars/but also the ability to contain crises and prevent war.¹

(2) An important foundation for achieving strategic goals

The realization of the goal must be based on the ability to be used. Strong strategic capabilities for air and space security are an important foundation for achieving national air and space security goals. The basic role of the strategic capability of air and space security is mainly reflected in three aspects: First, the basis of the capability to deal with air and space security threats. Since the beginning of the 21st century, the world's major aerospace powers and China's neighboring countries and regions have noticeably accelerated their pace of skirmishing, and whether or not their air and space forces are strong has become an important indicator for measuring the strength of a country's military strength; whether it is to deal with the constant threat of space-based reconnaissance and surveillance, the potential threat of space-based attack weapons, or the realistic threat of precision air strikes and the serious threat of ballistic missile attacks, it is necessary to have a strong strategic capability of air and space security.

¹ Fan Zhenjiang and Ma Baoan: *A Theory of Military Strategy*, Beijing, National Defense University Press, 2007 edition, p118.

The second is the capability basis for maintaining national air and space security. From a military point of view, the strategic center of gravity of the information age has shifted from land to sea and air, and space, as the strategic commanding height supporting informationized warfare, dominates the ability of battlefield situational awareness, decision-making and action. The third is the ability basis for realizing the expansion of national interests. With the development of economic globalization, political multipolarization and military informatization, the expansion of the structure and scope of national interests has shown a trend of diversification and multidimensionalization. The strategic capability of aerospace security must provide a strong air and space security guarantee for safeguarding national interests, and must rely on air and space to balance power and seek strategic stability of major powers. Relying on air and space to control the sea and safeguard national sovereignty and interests; Relying on air and space to defend strategic channels and support the expansion of national interests.

(3) An important guarantee for the fulfillment of strategic tasks

The completion of the task must be guaranteed by the ability to do so. Strong strategic capability of air and space security is an important guarantee for fulfilling the strategic tasks of national air and space security. The role of air and space security strategic capability is mainly reflected in three aspects: First, the guarantee of airspace and aircraft flight safety. Since the beginning of the Gulf War, the United States and other Western powers have relied on their superiority in air power to first launch attacks from the air, paralyzing the opponent's air defense system and destroying the opponent's defense system through high-intensity precision air strikes. The changes in the pattern of war have prompted all countries in the world to compete to increase the intensity of air power building, especially the rapid development of stealth aircraft, precision-guided munitions and high-speed aircraft, which pose a threat to China's airspace to varying degrees. The second is to ensure the safety of orbital and spacecraft operation. The world's major military powers have long regarded space control as an important part of their national strategy, manned space combat platforms, directed energy weapons, kinetic energy weapons, anti-satellite satellites, anti-satellite missiles, etc. are gradually forming actual combat capabilities, China's spacecraft are facing severe threats, in order to achieve the safety of orbit and spacecraft operation, it is necessary to have a strong strategic capability of air and space security to provide guarantee. The third is to ensure the safety of the ground system of the space platform. The ground system of the aerospace platform, as a ground support facility for the take-off, launch, flight (operation) and return of aircraft and spacecraft, directly affects the safety of the use of aircraft and spacecraft; once something happens in the future, it will certainly become an important target for the enemy to carry out air and space strikes; in order to effectively ensure that the ground systems and facilities of the air and space platform are not disturbed, damaged or destroyed, it is necessary to have a strong strategic capability of air and space security as a guarantee so that they can operate continuously, stably and efficiently.

(4) Important support for the implementation of strategic actions

The implementation of the action must be supported by the ability to be supported. In the field of air and space, whether it is strategic deterrence, strategic defense, strategic offensive and other military operations, or the implementation of non-military operations such as the development and utilization of aerospace resources, air control and security, space monitoring and control, and air-space exchanges and international cooperation, we must be supported by strategic capabilities of aerospace security. The supporting role of the strategic capability of air and space security is mainly reflected in three aspects: First, the support for the implementation of air and space strategic deterrence operations. With the complexity of air and space security factors and the diversification of security threats, the world's major countries are paying more and more attention to the role of air and space security strategic threats, through the threat of using air and space military forces to deter and deter opponents, for example, the United States has held a number of space military exercises codenamed "Schriever" since 2001, including the "Schriever-3" exercise in 2005, which is set to be a conflict in many regions of the world in 2020, including the intervention of the US military in which an ally is attacked by a neighboring country. The US military's participation in UN peacekeeping operations and attacks on the US mainland have focused on solving problems such as the ability to quickly restore satellites and speed up the decision-making time for launching an attack. In February 2008, the United States successfully destroyed a space abandoned satellite by launching a missile from an offshore platform to verify the effectiveness of the U.S. ballistic missile defense system. The second is the support for the implementation of strategic air and space defense operations. The mission of the Aerospace Strategic Defense is to respond to threats to air and space security, maintain strategic stability of national security, defend against air and space threats, defend national airspace security and interests, and safeguard air and space security in areas of national maritime rights and interests. Aero-space strategic defense operations carry out integrated air defense, anti-missile, and anti-space operations, mainly including air-space resistance operations, air-space counterattack operations, and air-space defense activities. Obviously, strategic air-space defense operations require the support of strategic capabilities for air-space security. The third is the support for the implementation of strategic offensive operations in the air and space. Aerospace security strategic offensive is an active offensive behavior adopted to realize and safeguard national air and space security interests, and it is also the most confrontational intensity of air and space security strategic means, whether launched on the ground and in the air, in space and in network space, or simultaneously launched in different spaces and fields, must be supported by the corresponding air and space security strategic capabilities.¹

¹ Ning Ling: Space Confrontation, Beijing, Military Translation Press, 2010 edition, p287~289.

Section 2 Assessment of China's Aerospace Security Strategic Capability

Aerospace security strategic capability assessment refers to the evaluation activities of objectively measuring, evaluating and estimating aerospace security strategic capabilities based on clear aerospace security strategic objectives, a large number of objective facts and data, certain norms and procedures, and applicable principles and standards, and using scientific, reliable and feasible methods to objectively measure, evaluate and estimate aerospace security strategic capabilities, and put forward requirements and countermeasures for construction and development.

1. The attributes of the assessment of strategic capabilities for aerospace security

Aerospace security strategic capability assessment is a purposeful, multi-objective, comprehensive assessment, but also a systematic, process-oriented, dynamic assessment, not only involving politics, military, diplomacy and other fields, but also closely related to the economy, science and technology, culture, etc. To carry out scientific assessment of national aerospace security strategic capability, it is necessary to first clarify the attributes of the national aerospace security strategic capability assessment.

(1) Comprehensive assessment of strategic capabilities for aerospace security

Aerospace security strategic capability is a comprehensive capability with military strength as the core and composed of multiple capabilities, and in this sense, the assessment of aerospace security strategic capability is comprehensive. Aerospace security strategic assessment is the application of comprehensive assessment technology in the field of national aerospace security, which refers to the activities of the high-level leadership and management institution of the construction and management of the national aerospace security force to investigate, evaluate and evaluate the design, implementation and effectiveness of major reform measures, construction planning plans and key construction projects being implemented. As a comprehensive assessment, the fundamental purpose of the Aerospace Security Strategic Capacity Assessment is to grasp the basic laws of aerospace security strategic capacity building activities, find out the main crux and causes that restrict and affect the quality and effectiveness of air and space security strategic capacity building, so as to adjust and improve the objectives and methods of space security strategic capacity building, ensure a virtuous cycle of various building activities of air and space security strategic capabilities, and improve the level of air and space security strategic capacity building.

(2) The overall nature of the assessment of strategic capabilities for aerospace security

The strategic nature of the aerospace security strategy determines the overall nature of the assessment of the strategic capability of aerospace security. Strategic assessment is a general assessment of war and military issues, through comparative and systematic analysis and research, to draw general conclusions on the nature, situation and possible changes of the problems faced, and to provide a basis for further research and determination of strategic countermeasures and measures. As a global assessment, the purpose of the Aerospace Security Strategic Capability Assessment is to support the scientific strategic decision-making of the national aerospace security strategic decision-making department and the quantitative strategic analysis of strategic research institutions. The assessment of aerospace security strategic capability is a comprehensive and overall assessment of the country's air and space military capabilities and non-military capabilities to achieve the strategic purpose of air and space security, which is based on the premise of a certain air and space security strategic environment, air and space security strategic objectives and air and space security strategic tasks, and is closely related to the strategic intentions, strategic posture, military forces, and non-military forces of relevant parties, as well as the air and space security threats they face, and its focus is on the effectiveness of the use of air and space military forces to achieve the strategic objectives of air and space security and their development needs. In particular, the level of critical capabilities to deal with major air-space threat targets and major air-space threat targets.

(3) The objectivity of the assessment of strategic capabilities for aerospace security

The objects and elements of the assessment of strategic capabilities of aerospace security determine the objectivity of the assessment of strategic capabilities of aerospace security. As mentioned in the preamble to this section, capacity assessment refers to the evaluation of actual capabilities objectively measured, evaluated and estimated by specialized organizations based on a large number of objective facts and data, in accordance with certain norms and procedures, in accordance with applicable principles and standards, and in the use of scientific, fair and feasible methods, and the evaluation of suggestions and measures for improvement, based on clear strategic capacity needs. As a capability assessment, the aerospace security strategic capability assessment is not only an important measure to promote the capacity building of the aerospace security strategy, but also an important practical activity that provides a scientific basis for the generation, improvement and application of the strategic capability of aerospace security, and is a process evaluation and dynamic evaluation, which must follow the requirements of objectivity, integrity, scientificity and standardization.

2. The purpose of the strategic capability assessment for air and space security

The assessment of aerospace security strategic capability is an important link in the process of aerospace security strategic capacity building, which can establish reference points, identify relevant points, grasp the focus points for aerospace security strategic capacity building, point out the direction and goals of aerospace security strategic capacity building, and ensure the quality and effectiveness of aerospace security strategic capacity building.

(1) Establish benchmarks for strategic capacity-building

The precondition for the assessment of strategic capabilities of aerospace security is the assessment of aerospace security threats, which is the basic basis for establishing the requirements of strategic capabilities of aerospace security and the benchmark for building the capacity of aerospace security strategies. The 21st century is a century of peace and development, and at the same time a century of victory in the air and space. In the future, the aerospace field will present a complex situation of fierce competition between multiple subjects, and aerospace security will face a series of new threats and challenges. For example, the strategic air and space security threats of major powers represented by the United States, the contact air and space security threats in Northeast Asia, the Taiwan Strait, the East China Sea, the South China Sea, South China Sea, South Asia and West Asia, the air and space security threats in areas of interest such as overseas energy production areas and maritime strategic passages, and global non-war air and space security threats such as counter-terrorism, peacekeeping, disaster relief, economic security, network security, energy security, and environmental security. In order to effectively face actual and potential air and space security threats and ensure China's air and space security, it is necessary to evaluate the pattern, size and degree of impact of various types of air and space security threats, and accordingly establish the basic capability requirements to deal with all kinds of air and space security threats, so as to establish the reference point for the scale, proportion and structure of the air and space security forces required to maintain national air and space security.

(2) Find the right entry point for the development of strategic capabilities

The key content of the Aerospace Security Strategic Capability Assessment is the Aerospace Security Capability Assessment, which is an important basis for formulating the Aerospace Security Strategic Capability Development Plan and Plan.

From the perspective of the conditions for the formation and application process of the national air and space security strategic capability, the air and space security strength is the basis for the formation of the air and space security strategic capability, and at the same time, the national air and space security strength is a concrete reflection of the national strength in the field of air and space security, and the military strength in the national strength is the mandatory element of the national air and space security strength to resist aggression externally and maintain social stability internally. Therefore, the core of strategic capacity building for aerospace security is the building of military strength in national strength, especially the overall security capability composed of rapid space entry capability, air and space information support capability, space target monitoring capability, air and space defense capability, air and space offensive capability, and strategic projection capability. In order to effectively respond to national air and space security threats and carry out the national air and space security strategic tasks, it is necessary to carry out an assessment of air and space security strength, especially the military strength assessment in national strength, based on the needs of air and space security capabilities, and find out the existing gaps and deficiencies, deficiencies and shortcomings, so as to determine the relevant points for the development of air and space security strategic capabilities.

(3) Grasp the focus for strategic capability improvement

The basic format of the Aerospace Security Strategic Capability Assessment is a dynamic procedural assessment. Dynamic process assessment is an important means for the adjustment, control and capability improvement of aerospace security strategic capability development planning. Aerospace security strategic capacity building is a complex strategic project with the characteristics of multiple fields, styles, and systems, which not only involves political, economic, cultural, military, scientific, technological, humanistic, and other fields, but also includes multiple forms such as air and space deterrence, air-space defense, and air-space offensive, and also includes multiple systems such as intelligence reconnaissance, navigation and positioning, information and communications, command and control, firepower strikes, and comprehensive support. Through the evaluation of each stage and link of the aerospace security strategic capacity building process, in order to verify the scientificity of the aerospace security strategic capacity building plan, the effectiveness of the implementation path and the feasibility of the stage objectives, so as to timely discover the major problems in the aerospace security strategic capacity building, find the focus of the aerospace security strategic capacity building, so as to better determine and adjust the construction plan, phase construction objectives and implementation paths, and ensure that the aerospace security strategic capability is in the correct direction. Effective ways and scientific planning to build and develop to ensure the steady improvement of the country's strategic capability of air and space security.

3. Principles and methods for assessing strategic capabilities for aerospace security

Aerospace security strategic capability is an important guarantee for the implementation of aerospace security strategic actions and the fulfillment of aerospace security strategic tasks, and only by adopting reasonable assessment methods based on correct evaluation principles can we establish a reference point, find an accurate entry point, and grasp the focus point for the capacity building of aerospace security strategy, otherwise it may lead to wrong decision-making and thus fail to achieve the strategic goal of aerospace security.

(1) Basic principles of assessment

1. The principle of holisticness

The diversity of the components of the strategic capability of aerospace security determines that the assessment of strategic capabilities of aerospace security must follow the principle of holisticness. Aerospace security strategic capability is composed of aerospace strength, transformation mechanism and strength application, among which, aerospace strength is the basis for the formation of aerospace security strategic capability, including national basic strength, aerospace science and technology strength and aerospace military strength, etc., both resource elements and capability elements, as well as static elements and dynamic elements, therefore, it is necessary to comprehensively consider resources and capabilities, static and dynamic elements and their comprehensive roles, in order to fully reflect the current situation of national aerospace security strategic capabilities, and to relatively accurately reflect the status of special capabilities for aerospace security.

2. The principle of dynamism

The phased nature of the process of building the capacity of the aerospace security strategy determines that the assessment of the strategic capability of the aerospace security must follow the principle of dynamics. Aerospace security strategic capacity building is a long-term systematic project, there are short-term goals and long-term goals in the construction goals, strategic projects, basic projects and frontier projects in the construction content, and the construction means are the sequential advancement of "planning-construction-application-evaluation," and it is necessary to conduct real-time aerospace security strategic capability assessment at different stages of the construction process, especially when strategic objectives are adjusted or major problems occur, so as to better grasp the goals and directions of aerospace security strategic capacity building. Scientifically formulate paths and steps for building capacity for aerospace security strategies.

3. Scientific principle

The feedback of the results of the assessment of aerospace security strategic capabilities determines that the assessment of strategic capabilities of aerospace security must follow the scientific principle. The role of the aerospace security strategic capability assessment is to establish the reference point, identify the relevant point and grasp the focus point for the strategic capacity building of the aerospace security strategy, and it is necessary to use scientific methods to conduct the assessment of the strategic capability of aerospace security with a scientific attitude and scientific spirit, ensure the authenticity, objectivity and scientificity of the assessment results, and better serve the strategic capacity building of the aerospace security.

4. Operability principle

The practicality of the means of assessing the strategic capability of aerospace security determines that the assessment of strategic capability of aerospace security must follow the principle of operability. The composition of aerospace security strategic capability is complex, the evaluation content covers a wide range, the evaluation process involves political science, military science, statistics and other disciplines, in the construction of evaluation indicators should pay attention to pertinence and representativeness, in the selection of evaluation methods should highlight the advanced and practical.

When establishing the assessment process, it is necessary to grasp simplicity and operability to ensure that the air and space security strategic capability assessment index system, evaluation methods and evaluation process are more advanced, practical and effective.

(2) The main methods of assessment

Drawing on the application of assessment theories and methods in the fields of national strategic assessment, comprehensive national strength assessment and combat capability assessment, combined with the characteristics and requirements of the assessment of air and space security strategic capability, the following methods can be adopted:

Overall evaluation method. The overall evaluation method refers to a method of conducting a holistic and general evaluation of the elements that constitute the strategic capability of aerospace security from a macro perspective. Aerospace security strategic capability is the convergence of aerospace strength, strength transformation mechanism and strength utilization, which not only depends on the size of aerospace strength, but also is closely related to the quality of the strength transformation mechanism, the advantages and disadvantages of the strength application strategy, and the degree of coordination and consistency between the three. Among them, the evaluation of the strength transformation mechanism and the strength application strategy is a qualitative and subjective evaluation, and can only be an overall evaluation. In addition, as the basis for the formation of aerospace security strategic capabilities, aerospace strength involves many elements and covers a wide area, and the aggregation between each element is difficult to describe by a definite functional relationship. Therefore, this book uses the overall evaluation method, focusing on the evaluation of the country's basic strength, aerospace science and technology strength, and space military strength in air and **space** strength.

Comparative evaluation method. The comparative evaluation method refers to the method of comparative analysis of the past and present, demand and reality, domestic and foreign, according to the idea of analysis, comparison, induction and summary.

The purpose of the Aerospace Security Strategic Capability Assessment is to establish the baseline, entry point and focus of aerospace security strategic capacity building. Through the comparative analysis of past and present, it is helpful to summarize the lessons of success and failure; Through the comparative analysis of demand and reality, it is helpful to establish construction goals and construction priorities; Through the comparative analysis of domestic and foreign countries, it is helpful to grasp the direction of construction and the way to achieve it. Therefore, the comparative evaluation method is also an important method for assessing the strategic capability of aerospace security.

Expert scoring methodology. The expert scoring method refers to a method in which experts make direct judgments on the advantages and disadvantages of aerospace security strategic capabilities based on their own knowledge, experience and feelings. Aerospace security strategic capabilities not only involve political, military, diplomatic and other fields, but are also closely related to the economy, science and technology, culture, etc., many of which are difficult to measure with quantitative indicators, which requires experts to use knowledge, experience and thinking, on the basis of mastering certain objective situations and actual data, to make judgments, evaluations and predictions on the corresponding capability elements. When using this method to conduct the assessment of aerospace security strategic capability, it is necessary to establish scientific implementation steps and scoring standards, select authoritative and representative experts, and pay attention to the anonymity, feedback and concentration and statistics of evaluation results in the evaluation process.

Analytic hierarchy. Analytic hierarchy method is a combination of qualitative and quantitative, systematic and hierarchical analysis method, the principle of which is to divide the various components of aerospace security strategic capabilities into several ordered levels by dividing the relationship between them, and form a hierarchical hierarchy model. Therefore, the strategic capability of aerospace security can first be decomposed into aerospace strength, transformation mechanism and strength application, and then decomposed into corresponding evaluation indicators or evaluation contents, and then the scores of each evaluation index or evaluation content are weighted and synthesized, and finally the comprehensive evaluation results of aerospace security strategic capabilities are obtained.¹

4. Overall evaluation of China's strategic capabilities in air and space security

Aerospace security is actual security, and physical security is security supported by strength. Strength is not only an important foundation for the formulation and implementation of a national air and space security strategy, but also a basic condition for forming a national air and space security capability and achieving strategic goals.

¹ Li Zufa: *Military Soft Power Strategy*, Beijing, People's Liberation Army Press, 2012 edition, p127.

Only by objectively assessing the main contents of a country's air and space security strength and making correct judgments can we grasp reality as a whole, focus on the future, and use the country's realistic and developed air and space forces to achieve the strategic goal of air and space security. We mainly from the national basic strength,

The three aspects of aerospace science and technology strength and aerospace military strength are the basis for the formation of China's air and space security strategic capability - strength (mainly hard power) - objective analysis and overall evaluation.¹

(1) The basic strength of the country

Basic strength is the basic element in the composition of national aerospace security strength, mainly including geopolitical environment, natural resources, human resources, economic strength, etc. The basic strength of the country is the basic basis for establishing the strategic capability requirements of national aerospace security and formulating the goal of national aerospace security strategic capacity building, which not only directly affects the state of national aerospace security, but also restricts the expansion of national air and space security interests.

1. Geographical environment

The geopolitical environment affects the state of national air and space security and strategic choices. Geography refers to the interrelationships between people or countries constituted by geographical location, distance and spatial regional influences. China's geopolitical environment has the following characteristics: First, it has many neighboring countries and faces a complex air and space security environment. China is a land-sea complex country, with 9.6 million square kilometers of land and more than 3 million square kilometers of ocean area, more than 22,000 kilometers of land border with North Korea, Russia, Mongolia, India and other 15 countries, about 18,000 kilometers of coastline and North Korea, South Korea, Japan, the Philippines and other 8 countries, their political conditions, foreign policy, economic development level, culture and religion and other factors are very different, some countries have or actively seek to develop air and space strike forces. It has complex implications for China's national air and space security.²³

¹ Regarding national strength, there are many different understandings in the theoretical community, and the more common view is that national power is divided into two aspects: hard power and soft power; In his book "Three Sides of Chinese Power," American scholar David Lampton divides Chinese power into three aspects: compulsory military strength, utilitarian financial strength and standard intelligence; Kang Shaobang, Gong Li and others in the book "New Theory of International Strategy" divide national strength into seven kinds of forces, such as economic power, scientific and technological strength, political power, national defense power, diplomatic power, resource power and educational power, which are also representative to a certain extent. This book mainly follows the principle of "overall analysis" to objectively analyze and evaluate the strength of the foundation of China's air and space security strategic capability, including the country's basic strength, aerospace science and technology strength, and air and space military strength.

² Pu Ning: *Geostrategy and the Shaping of China's Security Environment*, Beijing, Shishi Publishing House, 2009 edition, p282.

³ Ma Rongsheng: *Geostrategy and National Security*, Beijing, Military Science Press, 2009 edition, p1.

Second, the terrain and landforms are complex, forming an effective security barrier. To the north is the vast Mongolian plateau, and to the north of the plateau is the primeval Siberian forest in the cold zone; The northwest is composed of a series of lofty mountains and insurmountable deserts and Gobi; To the northeast, the Xing'an Ridge is separated from the Mongolian steppe, to the east by the vast Sea of Okhotsk and the Sea of Japan, and to the north by the Outer Xing'an Ridge that runs east and west to separate northeast China from thousands of miles of frozen Eastern Siberia; The southwest consists of the world's highest mountain ranges, the Himalayas, Tangula Mountains, Gandis Mountains and the Hengduan Mountains with deep valleys and rapid waters have become an insurmountable natural barrier; To the southeast is a long coastline, and the Pacific Ocean is endless. Third, the land frontier is vast and has a large space for safe living. China is a big country with land power characteristics, with a vast territory, complex terrain, rich human and material resources, and a land territory surrounded by plateaus, mountains and deserts, which makes China have huge security living space, development potential and strategic room for maneuver.

However, it must be noted that China's geopolitical environment also has shortcomings: First, it is difficult to form an air-space security buffer zone. Due to the closed and semi-closed nature of China's land territory, it directly faces such a land and space power as Russia in the north, and the relative economic and cultural backwardness caused by geographical conditions in the west and southwest, making it more difficult for China to rely on land to develop outward, its external influence is weak, and it is difficult to form a buffer zone on air and space security, and hostile countries can easily pose a direct air and space security threat to China. Second, it is difficult to effectively ensure the security of strategic maritime passages. China's marine environment is complex, the coast is long, from north to south, spanning temperate, subtropical and tropical, but it does not directly face the ocean, and there is an island chain composed of peninsulas and islands outside the sea area, which forms a blockade trend for China. Third, it is difficult to choose the strategic orientation of national aerospace security. China is located in the center of Asia, backed by the Eurasian continent, facing the Pacific Ocean, the regional environment is complex, between the two major forces of the world's land and sea, and there are many difficult neighbors to get along with, the strategic orientation of national air and space security is the key to the growth and decline of land or sea forces, because of the strategic pressure and strategic attraction of both land and sea directions, improper decision-making will lead to the dispersion of the allocation and use of air and space security strategic forces.

2. Natural resources

Natural resources constrain the scale and level of national aerospace security strategic capacity-building. China is a country with a relatively complete range of natural resources, with 171 kinds of mineral resources discovered, 158 kinds of identified resource reserves, the total amount is relatively rich, and the actual utilization of major natural resources ranks second in the world, which provides necessary material support for the national air and space security strategic capacity building.¹

¹ Yang Yi: "China's National Security Strategic Concept," Beijing, Shishi Publishing House, 2009 edition, p117.

However, it must also be noted that China's natural resources still have the following problems: First, mineral resources are in short supply, which cannot meet the development needs of aerospace equipment. Mineral resources are an important material basis for the national aerospace security strategic capacity building, and almost all the materials and energy required for aerospace equipment come from mineral resources. Jim Rogers, one of the founders of the Quantum Foundation and manager of the Special Fund for Raw Materials, once said, "The best way to play with China is to buy what China is going to buy." What you should buy will not be cars or televisions, but raw materials, because China needs them very much. "It is expected that by 2020, only 9 of the 45 major minerals can be guaranteed, 10 can be basically guaranteed, 21 such as iron, manganese and copper cannot be guaranteed, and 5 types such as potash and diamond will be in shortage." Second, the low energy self-sufficiency rate and the need for strategic actions for aerospace security are prominent. Energy is not only an indispensable resource for the development and production of aerospace weapons and equipment, but also a guarantee resource for the implementation of strategic actions for aerospace security, and is also an important support for social, economic, cultural, scientific and technological development. China's energy structure is unreasonable, developed countries generally coal accounts for 26%, oil and gas account for more than 60%, China coal accounts for 71%, oil and gas only 22%; China's comprehensive energy utilization rate is 32%, 10% lower than that of foreign countries, and the energy utilization efficiency is 30%~ lower than that of developed countries¹

40%; It is estimated that by 2020, China needs 2.09 billion tons of coal, 610 million tons of oil, and 165.4 billion cubic meters of natural gas, of which 50%~70% need to be imported.²

3. Human resources

Human resources affect the quality and effectiveness of capacity-building in national aerospace security strategies. According to the data of the sixth national census released by the National Bureau of Statistics on April 28, 2011, the total population of the country was 1.340 billion at the time of the sixth population census in 2010, and the per capita education level of citizens over the age of 15 has increased from 45 years in the early 80s of the 20th century to about 8.5 years at present; the number of graduates with college or above has jumped from 6.1 million in 1982 to about 90 million at present.³

¹ Bai Chunli, ed., *Science and China: A Collection of Environmental and Resource Science and Technology*, Beijing, Peking University Press, 2012 edition, p27~30.

² Bai Chunli: *Science and China: A Collection of Environmental and Resource Science and Technology*, Beijing, Peking University Press, 2012 edition, p31~32.

³ Chen Youhua: "Chinese and Development," Beijing, China Social Sciences Press, 2012 edition, p134~136.

This shows that at present, China is not only the world's most populous country, but also the world's largest country in terms of total human capital, which provides strong manpower support for the national aerospace security strategic capacity building.¹

However, it must also be noted that there are still problems in China's human resources that need to be paid great attention to: First, the cultural quality of the population is low, which affects the speed of national air and space security strategic capacity building. So far, China's illiteracy rate is still as high as 8%, which is obviously higher than that of developed countries, which will lead to low public awareness of national aerospace security, and it is difficult to establish the concept of aerospace security, which will affect the speed of national aerospace security strategic capacity building. Second, the rapid aging of the population affects the benefits of national aerospace security strategic capacity building. The peak number of elderly people in China is expected to occur around 2050, when the number of people aged 65 and above will reach 328 million. At present, some experts call on policymakers to be vigilant: the Lewis turning point from labor surplus to labor shortage has arrived, and China's "demographic dividend" may be transformed into "population debt" in the future, which will not only affect the formulation of the strategic capacity building plan for aerospace security, but also restrict the effectiveness of strategic capacity building for aerospace security. Third, the quality of high-level talents is low, which restricts the quality of air and space security strategic capacity building. The total number of high-quality talents in China is insufficient and unevenly distributed, and there is a large gap between the talent structure and the actual demand, which not only affects the determination of the strategic capacity building goal of aerospace security, but also restricts the quality of strategic capacity building of aerospace security.²

4. Economic strength

Economic strength is a supporting factor in the composition of national aerospace security strength, which is not only the material basis of national aerospace security strategic capability, but also a constraint for establishing the needs of national aerospace security strategic capability and formulating the development goal of national aerospace security strategic capability. Since the reform and opening up, China's economic strength has grown steadily and its status in the international economic system has improved rapidly.

First, the sustained and steady growth of GDP has laid an economic foundation for the national aerospace security strategic capacity building. Aerospace security strategic capacity building consumes a lot of human, financial and material resources, and without strong economic strength as a backing, aerospace security strategic capacity building will become a source of water and a tree without roots, only military needs and technology promotion, and it is difficult to provide the driving force required for aerospace security strategic capacity building. In 2011, the GDP increased from 12.03 trillion yuan in 2002 to 47.3 trillion yuan, deducting price factors, an increase of 1.5 times, an average annual growth rate of 10.7%, far higher than the world average growth rate of 3.9% in the same period, the total economic volume rose from sixth to second in the world, and its share in the world economy increased from 4.4% to 10%. The contribution rate to world economic growth averages more than 20% per year.³

¹ Kang Shaobang, Gong Li, et al.: *A New Theory of International Strategy*, Beijing, People's Liberation Army Press, 2010 edition, p350.

² Chen Huayou: "Chinese and Development," Beijing, China Social Sciences Press, 2011 edition, p142.

³ "Guidance Reader for the Report of the 18th National Congress," Beijing, People's Publishing House, 2012 edition, p17.

In the first half of 2013, China's GDP growth rate reached 7.6%, which not only exceeded expectations, but also led the world's major economies, and it is estimated that China will likely become the world's largest economic entity by 2020.¹²

Second, the adjustment of the economic and industrial structure has continued to advance, providing a reliable guarantee for the national aerospace security strategic capacity building. The strategic capacity building of aerospace security needs to rely on strong industrial production capacity such as energy, materials, and manufacturing, without which it will be difficult to transform national economic strength into aerospace security capabilities. Over the past 30 years, China's economic and industrial structure has been increasingly perfected, and its industrial production capacity has been comprehensively improved.

From 2003 to 2011, the primary industry grew at an average annual rate of 4.6%, the secondary industry by 11.9%, and the tertiary industry by 11.1%, maintaining a rapid development trend. The output of more than 220 kinds of industrial products such as steel, cement and automobiles ranks first in the world; In 2010, China's manufacturing output accounted for 19.8% of the world's total, surpassing the United States to become the world's largest manufacturing country; Emerging industries such as new energy, new materials, and new medicine are also booming.³

Third, the rapid development of infrastructure and basic industries has provided important support for the national aerospace security strategic capacity building. The strategic capacity building of aerospace security should be subordinated to the overall situation of national economic construction, and its construction scale and development speed should consider not only economic affordability, but also the constraints of energy, transportation, communications and other infrastructure. From 2003 to 2011, the cumulative investment in infrastructure was 25.7 trillion yuan, with an average annual growth of more than 20%. A number of major projects related to the national economy and people's livelihood have been completed and put into operation, forming excellent assets conducive to the people and long-term development. Energy production and supply capacity has steadily increased. Total energy production in 2011 increased by 1.1 times over 2002. Transportation capacity has continued to increase, high-speed railways have developed rapidly, and the main trunk national highway of "five vertical and seven horizontal" and eight trunk highways for the development of the western region have been completed. In 2011, the railway operating mileage was 93,000 kilometers, an increase of 29.6% over 2002. Road mileage 410,600 kilometers, an increase of 1.3 times, including 8 expressways 50,000 km, an increase of 2.4 times; The mileage of civil aviation routes is 349,100 km, an increase of 1.1 times;

¹ People's Daily, 31 July 2013, 1.

² Kang Shaobang, Gong Li, et al.: A New Theory of International Strategy, Beijing, People's Liberation Army Press, 2010 edition, p349.

³ "Guidance Reader for the Report of the 18th National Congress," Beijing, People's Publishing House, 2012 edition, p17.

The cargo throughput of major ports above coastal size increased by 2.7 times. The post and telecommunications industry is booming, with an average annual growth rate of 23.2 percent in the total volume of postal and telecommunications business nationwide. As of 2011, there were 986.25 million mobile phone subscribers, an increase of 3.8 times over 2002. The number of Internet users is 510 million, ranking first in the world.¹

Fourth, the rapid growth of foreign exchange reserves and world trade has provided a strong impetus for the national air and space security strategic capacity building. The strategic capacity building of aerospace security, especially the development of high and new technologies and the development of aerospace equipment, not only requires enhancing the ability of independent innovation, but also requires the introduction and use of internationally advanced technologies and products. China's financial system reform has made important progress, the international income is good, and foreign exchange reserves have increased from US\$286.4 billion in 2002 to US\$3,181.1 billion in 2011. Gold reserves increased from 19.29 million ounces in 2002 to 33.89 million ounces in 2011. With the rapid development of an open economy, China's total import and export of goods in 2011 was US\$3,642.1 billion, an increase of 4.9 times over 2002; it has become the world's largest exporter and second importer of goods for three consecutive years. From 2003 to 2011, the average annual growth rate of export trade in goods was 21.6%, and the average annual growth rate of import trade was 21.8%. The structure of import and export commodities has been gradually optimized, and in 2011, industrial manufactured products accounted for 94% of the total exports 7%, mechanical and electrical products accounted for 57.2%, high-tech products accounted for 28.9%.²

However, it must also be noted that there is still a certain gap between China's economic strength and developed countries, and the contradiction between it and the national air and space security strategic capacity building needs is still very prominent. First, problems such as irrational economic structure, extensive growth mode, and imperfect institutional mechanisms have not been fundamentally resolved; Second, economic development is unbalanced, with significant urban-rural disparities and regional differences; Third, the foundation of the energy industry is not stable enough, and there are many unstable and uncoordinated factors; Fourth, the financial system is fragile and the contradictions between resources and environment are becoming increasingly acute. These problems not only restrict the sustainable development of the country's economic strength itself, but also affect the strategic capacity building of aerospace security and its coordinated development with the country's economic strength.

(2) Aerospace science and technology strength

Scientific and technological strength is the leading element among the constituent elements of national aerospace security strength, mainly including the quantity and quality of scientific and technological teams, scientific and technological input, scientific and technological system, scientific and technological development level, and contribution to scientific and technological progress.

¹ "Guidance Reader for the Report of the 18th National Congress," Beijing, People's Publishing House, 2012 edition, p18.

² "Guidance Reader for the Report of the 18th National Congress," Beijing, People's Publishing House, 2012 edition, p23~24.

First, the investment in aerospace science and technology has continued to increase, providing a financial guarantee for the national aerospace security strategic capacity building. For example, in 2011, the national research and experimental development (R&D) expenditure was 861 billion yuan, an increase of 5.7 times over 2002, and the proportion of GDP increased from 1.07% to 1.83%, of which the national aerospace science and technology investment also increased in corresponding proportions, effectively ensuring the funding needs of the national aerospace security force construction.¹

The second is to establish the development goals of aerospace science and technology, which provides technical guidance for the national aerospace security strategic capacity building. In the "Outline of the National Medium and Long-term Science and Technology Development Plan (2006~2020)," the overall goal of national science and technology development is clarified, and the core electronic devices, high-end general chips and basic software, extremely large-scale integrated circuit manufacturing technology and complete sets of processes, a new generation of broadband wireless mobile communications, high-end CNC machine tools and basic manufacturing technology, large advanced pressurized water reactors and high-temperature gas-cooled reactor nuclear power plants and other major special projects are established, as well as large aircraft, Manned spaceflight and lunar exploration projects and other major aerospace projects.

Third, major aerospace scientific and technological achievements have been achieved, which have provided an important guarantee for enhancing the country's strategic capability of aerospace security. The successful development of the billion-time supercomputer system "Tianhe-2" marks that China is at the forefront of the world in the field of supercomputers; The successful landing of "Chang'e-3" on the moon, the successful docking of "Shenzhou-9" and "Shenzhou-10" manned spacecraft and "Tiangong-1," have become a new milestone in the history of China's space development; The Beidou regional satellite navigation system completed the network launch, and the "Beidou-2" satellite navigation system was officially opened, covering the Asia-Pacific region and ranking among the world's navigation powers; The Gaofen-1 satellite has been put into use, and China has entered a new stage in the application of remote sensing satellites. The "Long March 6" carrier rocket successfully launched 20 satellites into the sky, setting a new record for China's launch of multiple satellites with one arrow, indicating that China's ability to enter space has been greatly improved; China's self-developed multi-role fighter-bomber, fourth-generation stealth fighter and large air transport platform and other advanced aviation equipment have made significant progress, the first aircraft carrier was delivered and the J-15 carrier-based aircraft completed the takeoff and landing on board. In addition, in recent years, China has successfully carried out a series of demonstration and verification tests of key technologies for air-space defense, such as land-based mid-course anti-missile, space rendezvous and docking, orbital transfer flight and ground-based strong laser, which have attracted extensive attention from the international community.²³

¹ "Guidance Reader for the Report of the 18th National Congress," Beijing, People's Publishing House, 2012 edition, p19.

² Xinhua Times News, 20 September 2015.

³ Dong Zifeng: "Missile Defense System and Nuclear Deterrence Failure," Air Force Military Academic Press, 2002, 6, p42~45.

However, it must also be noted that there is still a big gap between the national aerospace science and technology strength and that of developed countries, and it cannot fully meet the needs of national aerospace security strategic capacity building. It is mainly manifested in the low investment in aerospace science and technology, especially basic research, the ability and level of independent innovation are still low, the shortage of high-level aerospace science and technology talents, and the limited role of aerospace science and technology in promoting it. These gaps and deficiencies not only seriously restrict the quality and scale of national aerospace security strategic capacity building, but also directly affect the realization of the national aerospace security strategic capacity building goals.

(3) Aerospace military strength

Military strength is a mandatory element in a country's air and space security strength to resist aggression externally and maintain social stability internally, mainly including the quantity and quality of the armed forces, national defense expenditure, establishment system, training level, national defense science and technology, defense industry, and war mobilization capability. In recent years, in accordance with the requirements of fulfilling its missions and tasks and the development of informationization, the People's Liberation Army has actively promoted the building of new-type combat forces, adjusted and optimized the scale structure of various services, reformed the mode of troop organization, and promoted the development of combat forces in the direction of lean, combined, multi-capable, and highly efficient. On the whole, China's air and space military strength has steadily increased.

First, the investment in national defense has continued to increase, providing support for the development of air and space military affairs. In recent years, with the steady improvement of China's economic strength, the state has continuously increased its investment in national defense and army building. In 2014, China's defense budget was about 808.2 billion yuan, an increase of about 12% over 2013. The plan for 2015 is about 10% higher than in 2014. The steadily increasing investment in national defense has laid the foundation for the country to manage the space and improve its air and space military capability, injected vitality, and won the initiative.

Second, the military force system has been continuously optimized, and the efficiency of the air and space force structure has been significantly enhanced. China's armed forces are composed of the People's Liberation Army, the People's Armed Police Force and the militia. In the structure of military forces, the air force, ground air defense units, and airborne troops have been markedly strengthened; strategic early warning, air strikes, air defense and anti-missile, information confrontation, airborne operations, strategic projection, and comprehensive support capabilities have been continuously enhanced; at present, the air force has always maintained a sensitive and efficient state of combat readiness in accordance with the principles of integrating peacetime and wartime operations, all-domain response, and all-Xinjiang arrival.¹

¹ Information Office of the State Council of the People's Republic of China: "China's Military Strategy" National Defense White Paper, May 2015.

In addition, military space forces, naval aviation, rocket forces, and army aviation have also developed considerably.

Third, aviation air defense forces have developed steadily, and the combat effectiveness of air and space equipment has been markedly improved. It has a variety of medium- and long-range strike platforms such as third- and second-generation manned combat aircraft and unmanned aerial vehicles, which can be equipped with a variety of precision-guided munitions and can carry out small- and medium-scale precision strikes against the enemy. Equipped with advanced ground-based air defense weapon systems, which can effectively defend against the enemy's conventional air and space weapons, the new ground-to-air missile weapon system will soon become a sharp weapon for effectively dealing with air and space threats; An early warning and detection system with land-based radar as the main body, air- and sea-based early warning means as supplements, and special detection means as the auxiliary means has been initially established, which can provide effective early warning for air defense and anti-missile operations.

Fourth, the space defense force system has begun to take shape, and space support and combat capabilities have been steadily improved. In terms of space-based information support, it has initially acquired battlefield information perception, strategic/tactical communication, active navigation and positioning, battlefield weather prediction and other capabilities; In terms of space offensive and defensive equipment, research on aerospace combat vehicles, space-based jammers, and space combat robots has accelerated, and ground-based lasers, kinetic energy weapons, and microwave weapons are being developed. In terms of aerospace infrastructure, a "four-ship, nine-point, and three-center" tracking and control communication network has been formed, three modern launch sites in Xichang, Taiyuan, and Jiuquan and spacecraft landing sites have been built, and the Hainan cosmodrome is under construction. In addition, in terms of ground-based anti-missile, so far China has successfully conducted three land-based mid-course anti-missile tests, marking a new step in the construction of our military's air-space defense equipment, and an anti-missile and space-defensive combat capability that is both offensive and defensive is taking shape.

However, it must also be noted that with the diversification and diversification of air and space security threats faced by the country, compared with the requirements of implementing air and space security strategic operations, there is still a limited total amount of defense funds (China's military expenditure accounts for 11.40% of the world's total, only 1/3~1/4 of the United States, and the expenditure structure is unreasonable, 60%~70%) For capitulation expenses, it is more than three times that of the United States), the degree of equipment informatization is low, the structure of combat forces is irrational, there is a shortage of high-quality military personnel, and in the field of air and space security, such problems as emphasizing "two ends" (aerospace, aviation) and light "middle" (seamless connection between air and space) have become "bottlenecks" restricting the capacity building and formation of national air and space security, and not only affect the development level and scale of air and space weapons and equipment. It also affects the organization and conduct of air-space security combat operations.

¹ Kang Shaobang, Gong Li, et al., *New Theory of International Strategy*, Beijing, People's Liberation Army Press, 2010 edition, p351.

Section 3 Capacity Building of China's Aerospace Security Strategy

Building a consolidated national defense and a strong army commensurate with China's international status and national security and development interests is a strategic task for China's modernization drive and a strong guarantee for China's peaceful development. Strengthening the capacity building of the national aerospace security strategy is an important way to safeguard the interests of national aerospace security and achieve the strategic goal of "harmonious air and space".¹

The capacity building of the national aerospace security strategy should be guided by the needs of national aerospace security interests, based on the strategic objectives of national aerospace security, and take peaceful development and cooperation as the main means to ensure that the country enters and uses space peacefully, so as to achieve the simultaneous growth of space interests and the status of a major country; Ensure that national sovereignty over territorial airspace, legitimate rights and interests in space and space assets are not violated, and national interests are not undermined and attacked from or through vertical space; Ensure that the development of aerospace forces approaches or reaches the world's advanced level, and forms and maintains strategic checks and balances on the air and space of major strategic adversaries; Ensure that countries acquire and continuously enhance their voice in international aerospace affairs and grasp the initiative of international aerospace cooperation.

1. The general idea of strategic capacity building for aerospace security

The capacity building of the national air and space security strategy is an important part of the national security strategy capacity building, which should be carried out under the guidance of the national security strategy and the national air and space security strategy, should be compatible with the national air and space security strategic objectives, and should highlight the building of national strength and air and space security strength.

¹ Information Office of the State Council of the People's Republic of China: National Defense White Paper on the Diversified Use of China's Armed Forces, April 2013.

According to the attributes, objectives, tasks, and guidelines and principles of national aerospace security, the national aerospace security strategic capacity building should establish the idea of "basing itself on space and advancing systematically," make scientific plans, and strive to build a complete and powerful aerospace security force to support national security and development.

"Based on air and space" means focusing on the interests and needs of national air and space security and the overall situation of the development strategy of air and space security, persisting in taking air and space security as the core and air and space security needs as the traction, strengthening the strategic capacity building of air and space security, so as to achieve the strategic purpose of air and space security development, provide support for air and space security through the development of air and space security, and further promote the enhancement of the status of a major country and comprehensive national strength. Basing ourselves on the air and space is not only the basic practice of all countries in the world to develop air and space strength, but also the successful experience of China's air and space power building. It is necessary to use aerospace security to dominate the overall situation of air and space security strategic capacity building, establish the dominant position of national defense and the armed forces in air and space security strategic capacity building, clarify the key areas and directions of air and space security strategic capacity building, scientifically build an air and space security force system, and ensure the realization of the goal of shaping a favorable air and space situation in peacetime, controlling various air and space crises, and winning air and space wars in wartime.

"System advancement" is to meet China's strategic needs for aerospace security and development, adhere to centralized and unified leadership, strengthen scientific overall planning, comprehensively enhance the overall strategic capability of aerospace security, and ensure a high degree of unity between national aerospace security interests and aerospace development interests in accordance with the objective law of the integrated development of aerospace forces. It is necessary to persist in scientific overall planning, focus on coordinating the relationship between the aviation field and the aerospace field, civil technology and military technology, strength building and capability utilization, prevent the development imbalance between strength and the emergence of gaps between links, and form an organic and systematic construction and development layout; It is necessary to persist in combining with each other, realize benign interaction and complementary advantages between various fields, systems and directions, and promote the systematic promotion of strategic capacity building for aerospace security.

Aerospace security strategic capacity building is a complex, systematic and systematic project, and it is necessary to establish the construction concept of "symbiosis, openness and long-term effect," innovate construction methods and approaches, and ensure the scientific and efficient capacity building of aerospace security strategy capacity building through the "four persistences".

First, adhere to the high degree of consistency between exploration and application. Aerospace technology, aerospace technology and space-space integration technology are typical representatives of contemporary cutting-edge high technology, representing the future of science and technology, the future of the country and the future of mankind, and it is particularly necessary to make unremitting exploration. As a major developing country, China must relay and forge ahead in its exploration in the field of air and space, and occupy an important place in the international aerospace pattern through various technological breakthroughs and technological explorations in a planned manner.

At the same time, it is necessary to strengthen the high degree of unity between exploration and application, transform technology into social productive forces and military combat effectiveness, and promote the rapid growth of military strength and economic strength. As an aviation and aerospace industry, we should pay attention to innovating industrial development models, establish a good market operation system, and promote the prosperity and development of aviation and aerospace technology application industries and service industries. In the field of aviation and aerospace military, we should base ourselves on the needs of national air and space security and winning air and space wars, focus on effective control and utilization of air and space, promote the construction of air and space combat systems, and effectively safeguard national air and space security.

The second is to adhere to the organic combination of introduction and self-research. Science and technology are the origin and life of strategic capabilities for aerospace security, and it is difficult to obtain strategic advantages in aerospace security without scientific and technological superiority. The introduction, digestion, absorption and re-innovation of science and technology is a successful experience in the development of science and technology in the more than 30 years of China's reform and opening up, and this experience still needs to be adhered to and developed in the field of aviation and aerospace. The experience of the development of world aviation and space technology tells us that it is difficult to achieve world-class achievements with the strength of one country alone, and it is necessary to carry out technical cooperation and exchanges between countries and draw on foreign scientific and technological advantages to develop China's aerospace strength. However, at the same time, it must also be noted that the technological blockade of China's aerospace by big countries and powerful countries is becoming increasingly tight, and the development model of relying on "introducing production, testing and imitation improvement" in the past is difficult to sustain, and it is necessary to break through the technical bottleneck that restricts the development of China's aviation and aerospace equipment, put independent development in a more prominent strategic position, strengthen the construction of innovation systems, continue to increase investment, concentrate on carrying out research on a number of strategic, basic and cutting-edge projects with major driving effects, and solve the problems of high-performance aircraft engines. Major technical "bottlenecks" such as advanced materials and manufacturing processes and key electronic components promote the rapid development of technological innovation and fundamentally solve the problem of being subject to people.

Third, adhere to the harmonious integration of national defense and society. Aerospace security is an important field closely related to national security interests, and the ultimate goal of aerospace security strategic capacity building to realize national security and development interests must unite the will of the whole nation and the strength of the whole society, not only relying on the main role of the state, the military and the industry, but also mobilizing the enthusiasm of local and social organizations. The enthusiasm of the armed forces is mainly to persist in taking air and space as the strategic commanding height and the main battlefield of future wars, give priority to the development of air and space forces, and lead the development of the country's air and space undertakings. The enthusiasm of society is mainly to fully understand the huge social, economic and national defense benefits in the field of aerospace and to participate in and support the development of the national aerospace undertaking through various ways such as policies and markets. Society is the foundation and source of strength for the development of the aerospace cause, and its enthusiasm is mainly manifested in the high awareness of the whole society of space and space, paying attention to the space, loving the

space, supporting the aerospace cause, and dedicating a large number of outstanding sons and daughters to the aerospace cause.

Fourth, adhere to the coordinated development of basic and high-end.

Aviation and aerospace, as a key construction field of aerospace security strength, have the dual characteristics of high technology and high risk, which are both high-quality and high-quality, which not only requires improving the quality of technology and talent, but also needs to strengthen the basic quality construction of the whole society.

With the rapid development of aerospace technology and the wide application of aerospace equipment, air and space are becoming increasingly crowded, which puts forward higher requirements for the order and safety of aviation and aerospace activities. As a high-tech field, aviation and aerospace should strengthen the shaping of high-end quality and create high-end products and elite teams for national aerospace safety; At the same time, we should pay attention to strengthening the cultivation of aviation and aerospace personnel, especially the cultivation of ability and quality, and strive to improve the quality of aviation and aerospace personnel, optimize their behavior and customs, form a cultural atmosphere of stressing order, emphasizing safety and benefiting others, and create a good basic conditions and environment for the strategic capacity building of aerospace security through strengthening the construction of laws and regulations and self-discipline culture and education.

2. Key elements of strategic capacity building for aerospace security

Strength is the foundation for the formation of air and space security capabilities, the strength transformation mechanism is the key to the effectiveness of air and space security capabilities, and air and space military capabilities are the core means to maintain national air and space security and support the expansion of national interests. China's air and space security strategic capacity building must focus on the three contents of strength, strength transformation mechanism and air and space military capability, and promote synchronous and coordinated development.

(1) Highlight the building of air and space security strength

Among the constituent elements of national aerospace security strength, national basic strength is a relatively stable factor, and national economic strength, aerospace science and technology strength and aerospace military strength are relatively unstable factors. Relative stability factors are the basis on which a country's air and space security strength is formed, and it also restricts the scale and capability of national air and space security strength; At the same time, the relative stability factor is constrained by the relative unstable factor. Therefore, in the construction, we must grasp the relationship between the two, coordinate development, maintain adaptability in quality, and keep pace with the accumulation of any kind of strength with the development of other strengths; Maintaining a certain equilibrium in quantity and overemphasizing one strength will inevitably lead to an imbalance in the system. At present and for some time to come, the building of national aerospace security strength should focus on the following aspects:

First, seize the period of major strategic opportunities. National aerospace security strength has dynamic characteristics, and there will be differences in national aerospace security

strength at different times, such as increase or loss of resources, capital flow or outflow, increase or weakening of technological strength, improvement or decline of labor quality, etc., therefore, the construction of national aerospace security strength must seize the fleeting period of strategic opportunities. According to relevant scholars, since the 16th century, there have been four periods of major strategic opportunities in China's history, but they have not been well grasped, or they have missed it because they closed their eyes and listened to it. Either because of the emphasis on the military over the economy, it is excessive. At present, we are in the fifth major strategic opportunity period, we must plan as a whole, balance development, highlight key points, in order to gradually narrow the gap with developed countries, achieve China's "three-step" grand strategic goal, and further consolidate the strength foundation for safeguarding national air and space security interests.

The second is to rapidly promote scientific and technological progress. The world's science and technology development is advancing by leaps and bounds, scientific and technological innovation and creation are changing with each passing day, the world's science and technology is giving birth to new major breakthroughs, the role of knowledge in economic and social development is becoming increasingly prominent, and the status of scientific and technological competition in the competition of comprehensive national strength has been greatly improved, which has become the main driving force for supporting and leading economic development and the progress of human civilization. In today's world, whoever masters advanced science and technology will grasp the initiative in social and economic development. We must insist that science and technology are the primary productive forces, that human resources are the primary resources, that we must persist in improving our ability to make independent innovations, and that we must persist in giving play to the socialist system's ability to concentrate our efforts. The political advantages of major events have promoted the continuous development of China's science and technology and provided scientific and technological support for the national aerospace security strategic capacity building.

Third, accelerate the transformation of military strategy. The role and status of military strength in maintaining national air and space security is irreplaceable; it is the key guarantee for the lasting maintenance of national air and space security, and the core means to safeguard national air and space security interests and achieve the strategic goal of national air and space security. At present, China's national defense and army building should focus on the requirements of the world's new military changes, adhere to combat effectiveness as the core, accelerate the transformation of the mode of generating combat strength, accelerate the reform and transformation of the armed forces, and at the same time actively explore new national defense development models, so that the national defense science, technology and industry system and national defense mobilization system can keep up with the pace of change in the information society and the aerospace age, and exert greater effectiveness in realizing China's security strategic goals, including the strategic goals of air and space security.

The fourth is to strengthen the strategic material reserve. The national strategic material reserve is the basic guarantee for the comprehensive, coordinated and sustainable development of the national economy, an objective requirement for safeguarding national security, including national air and space security, and an important backing for coping with various crises, emergencies and natural disasters. At present, China has established a reserve system for important strategic materials such as cotton, grain and oil, and the development momentum is good and the achievements are remarkable. In the future, on the basis of continuing to improve its existing grain, cotton and oil reserves, China will incorporate rare earth metals such as

indium, tungsten, molybdenum, tin, antimony, germanium and other rare earth metals and coal into the reserve system, and establish a supporting legal and regulatory system to strengthen the national strategic material reserve and accumulate reserve strength for the development of the country's air and space security capabilities.

Fifth, speed up the reform of the political system. Political system reform is an important part of China's reform and a necessary link for China to further accumulate political resources and enhance its strategic capabilities. We should steadily deepen political reform by improving the party's ruling ability and strengthening its ruling position, take the promotion of inner-party democracy as the breakthrough point, strengthen the construction of the legal system as the way, and reduce the cost of ruling and improve public recognition as the symbol, so as to provide a strong institutional guarantee for the sustainable development of the country and the maintenance of national security. In addition, we should start from the four points of actively expanding employment, improving the social security system, straightening out distribution relations, and developing social undertakings, vigorously coordinate the interests of all strata, comprehensively promote the construction of a harmonious society, and create a good internal environment for the growth of the country's air and space security capabilities.

(2) Strengthen the establishment of mechanisms for transforming strength

There is no "seamless connection" between aerospace security capabilities and national aerospace security strategic capabilities, and there is a medium between the two - a transformation mechanism. At present, China is in the early warning mechanism, decision-making mechanism,

There are certain deficiencies and gaps in various aspects such as the coordination mechanism and the mobilization mechanism, and in order to effectively maintain national aerospace security, it is necessary to strengthen the construction of the strength transformation mechanism while strengthening the construction of air and space security strength.

The first is to establish a national early warning mechanism for air and space security. The early warning mechanism is the primary link of the national aerospace security strategic capability transformation mechanism, which can help people quickly locate the source of risk and crisis when various actual or potential risks have not yet formed or have just begun to emerge, take targeted preventive measures, exclude or prevent the arrival of risks and the occurrence of crises, resolve risks and crises, and minimize the threat factor as much as possible. At present, China must strengthen the overall collection and processing of intelligence information, and strengthen intelligence support for national air and space decision-making. In view of the problem that intelligence systems in the political, economic, military, scientific and technological, cultural and other fields are closed and independent of each other, China's air and space security early warning mechanism may appropriately refer to the current practice of the intelligence systems of some developed countries, set up an agency responsible for national air and space security intelligence, integrate intelligence collection and processing capabilities across departments, explore and utilize existing intelligence resources to the greatest extent, share relevant intelligence information, and ensure that intelligence sources are wide and channel, complementing and confirming each other. Meet the needs of air and space security decision-making from different angles and enhance the national air and space security early warning capability.

The second is to improve the national air and space security decision-making mechanism. The decision-making mechanism is a key link in the national aerospace security strategic capability transformation mechanism, which can help people make scientific decisions on risks and dangers in the political, economic, military, scientific, technological, cultural and other fields, and take corresponding preventive measures and necessary actions. At present, China should further strengthen the construction of think tanks, clarify the functions and obligations of various strategic research institutions, strengthen exchanges and cooperation among various strategic research institutions, and enhance their cohesion in strategic decision-making on aerospace security. At the same time, it is necessary to establish and improve the relevant guarantee system for aerospace security decision-making, so that the work of various strategic research institutions can be effectively carried out and better provide decision-making support for the national aerospace security decision-making body.

The third is to optimize the national air and space security coordination mechanism. The coordination mechanism occupies an "intermediary" position in the national aerospace security strategic capability transformation mechanism, which plays a role in connecting the upper and lower levels, and directly affects the smooth implementation and implementation of national air and space security decisions. At present, China has formed a set of emergency management models for various public emergencies under the leadership of the State Council and by category and department. When encountering major emergencies, a temporary command organ is often set up, with the State Council leader in charge as the chief commander, with the participation of relevant departments, and the daily office is set up in the corresponding competent department to uniformly command and coordinate the emergency response work of various departments and regions. This model has strong rapid response ability when dealing with traditional crisis events, general crisis events and individual crisis events, but the rapid response ability is significantly reduced when dealing with new crisis events, special crisis events and complex crisis events. As a new type and special security field, national aerospace security needs to build a corresponding national-level overall coordination mechanism that integrates military and government, military-civilian integration, and cross-departmental and cross-field to realize the integrated allocation of strategic resources for aerospace security and give full play to the overall synergy of strategic resources for aerospace security.

The fourth is to improve the national air and space security mobilization mechanism. The mobilization mechanism is the key link in transforming the country's air and space security strength into strategic capabilities, which mainly includes the establishment of a strong mobilization leadership organization, the formulation and implementation of mobilization regulations, and the formulation of mobilization plans. According to relevant military statistics, the pre-war strategic resource reserve could only guarantee 10 percent of the war needs, and 90 percent were generated through war mobilization. In this sense, the mobilization mechanism can, to some extent, directly determine the strategic capability of national air and space security. At present, China has established a national defense mobilization organizational system composed of the highest leadership decision-making body, the organization and coordination agency and the executive body, but its main military function is limited to peacetime and war, and it cannot meet the objective needs of responding to diversified threats, including air and space threats.

(3) Focusing on the development of air and space military capabilities

Aerospace military capability is a key factor in seizing and maintaining a favorable air-space security posture. Focusing on the development of national air and space military capabilities, with rapid space entry capabilities, air and space information support capabilities, space target monitoring capabilities, air and space defense capabilities, air and space offensive capabilities, and strategic projection capabilities as the main contents, is the need to maintain national air and space security and support the expansion of national interests.

The first is to develop the ability to enter space quickly. Rapid space access capability refers to the ability of spacecraft to enter space quickly, reliably and economically and return as needed, or to effectively perform orbital maneuvers to achieve on-orbit services and orbital resource reallocation. Develop the ability to enter space quickly, which can quickly send all kinds of government, commercial, scientific and technological spacecraft into orbit in peacetime, timely communication, reconnaissance, survey and other activities, greatly improving economic profits; In wartime, it can quickly deploy and operate air and space forces, and win an air and space war with rapid reaction capabilities. Rapid access to space capability is the need for space forces to flexibly use and implement confrontation in wartime, effectively achieve the purpose of using space and controlling space, the US military has identified "ensuring access" as the key goal of its space power development, in its "long-term plan - 2020 vision" pointed out that ensuring access is "on-demand use" of space traffic routes, to achieve unhindered operation in space and through space. The United States and other aerospace military powers already have a variety of capabilities and means to enter space, especially those with the ability and means to enter space quickly. In order to meet the needs of future space confrontation, China must regard the establishment of an emergency space mechanism and the improvement of its ability to rapidly enter and use space as one of the priorities of its space system construction and development. To this end, we should vigorously strengthen the construction of systems and equipment such as charging stations and delivery vehicles, satellites, etc., and form and improve the ability to quickly enter and use space. The launch vehicle should focus on improving the batch reserve capacity, meet the requirements of modularization and serialization, and be able to complete different payload and orbit launch tasks; The launch platform should focus on the development of mobile launch platforms, especially the development of space-based launch of micro-small satellites, to meet the needs of emergency launch of low- and medium-orbit satellites under confrontation conditions;¹

¹ Yang Xuejun and Zhang Wangxin, "Superiority Comes from Space: On Space Battlefield and Space Combat," Beijing, National Defense Industry Press, 2005 edition, p27.

The satellite-rocket interface should focus on solving the problem of versatility, and can complete the conversion of satellites and launch vehicles in a short period of time and launch quickly; Establish reasonably distributed and movable tracking and control stations and simple measurement and control systems, and adopt scientific, simple and ingenious measurement and control methods to ensure that the setting of positioning, flight landing points, flight trajectories and other data is quickly completed.

The second is to develop aerospace information support capabilities. The demand of the state and the armed forces for air and space information support is huge and urgent, and without air and space information support, the development of national construction and the combat capability of the armed forces will be greatly limited. The development of air and space information support capabilities mainly includes the following specific contents: First, it is necessary to develop air and space reconnaissance and surveillance means and improve air and space intelligence support capabilities. Be able to obtain relevant intelligence information on important targets, national key areas and strategic interest areas of neighboring countries and major strategic opponents, provide a basis for the country's accurate judgment of the surrounding security environment and strategic direction situation, and provide support for disaster relief, stability maintenance, engineering construction survey and international peacekeeping activities; It can obtain reconnaissance intelligence within the scope of strategic activities, provide information such as battlefield environment, situation, target and strike effect assessment, and meet the information needs of military combat command, force operations and strike weapon platforms. Second, it is necessary to develop means of air and space navigation and positioning and improve navigation and positioning capabilities. It can provide all-weather, large-capacity, real-time positioning information for various high-speed motion platforms, provide services for transportation, engineering construction, scientific exploration, surveying and mapping, etc., and meet the needs of the military in navigation and precision-guided munitions in complex electromagnetic environments. Third, it is necessary to develop air-space communication relay means and improve air-space communication capabilities. The establishment of multi-user, anti-jamming and highly confidential satellite communication links can ensure the use of all kinds of military and civilian user terminals. Fourth, it is necessary to develop means of space surveying and mapping and aerospace timing, and improve the ability of surveying and mapping timing. It can obtain geographic information covering the national strategic activities, provide surveying and mapping support for production activities and military operations, and provide stable, reliable and high-precision timing services for various information systems. Fifth, it is necessary to develop meteorological satellites and improve meteorological support capabilities. It can use meteorological satellites to provide all kinds of global atmospheric environment information in real time, systematically master detailed meteorological data in key areas in China, surrounding areas and distant seas, and provide meteorological information support for the country and the military.

The third is to develop the ability to monitor space targets. Space target monitoring capability refers to the ability to detect, track, identify, and control cooperative targets by relying on various ground-based and space-based surveillance systems, as well as the ability to continuously monitor the space environment and complete the measurement, classification, cataloging, forecasting, and damage assessment of space targets. The space target surveillance system and the space tracking and control system are the main means of space target monitoring, and the advanced space target monitoring and space tracking and control system has perfect space area situation perception capabilities, can understand the distribution of space threat targets

in near real time, can provide timely missile early warning, real-time accurate navigation, remote sensing images, weather data and reliable communications, and ensure the aerospace forces to carry out air and space security operations by providing space-based information support.

With the maturity of "satellite-to-satellite" communication, on-board data processing and information fusion technology, the development of space system networking and systematization has become a trend, and the space system will gradually form a space force system with perfect functions and both attack and defense, which puts forward higher requirements for space monitoring and control capabilities. At the same time, with the maturity of space-based space target monitoring means, the space-based target monitoring system represented by space-based optoelectronic telescopes and space-based radio reconnaissance receiving equipment will provide more diverse and efficient means for wide-area space surveillance and local space surveillance, thereby enhancing the ability to assess the entire space situation in near real time.

The fourth is to develop air and space strategic defense capabilities. With the development of various new stealth, long-range, high-speed, and high-mobility air-space strike weapons, which have posed major threats to important national strategic targets, it is necessary to vigorously develop early warning and interception means in near space and outer space while continuing to develop and improve ground-based and space-based early warning and interception systems, so as to form a multi-layered and three-dimensional early warning and interception system. Through the development of an air, space, ground and sea integrated early warning and detection system, the global all-weather seamless coverage is realized, integrated early warning is implemented, and the ability of early warning, tracking and identification of air and space targets is formed and improved; Build a joint air-space defense command system to form cross-regional and cross-service joint command and control capabilities; Construct a multi-layered multi-stage firepower system that combines air, space, earth and sea to form a comprehensive interception capability that can resist saturation attacks at different heights and distances; Develop aircraft and spacecraft protection capabilities, such as the development of warning protection, spacecraft reinforcement, stealth or carrying weapons to counterattack and other means to ensure the safety of aerospace vehicles.

Fifth, it is necessary to develop strategic offensive capabilities in air and space. In order to meet the needs of future air-space confrontation, realize all-dimensional confrontation with strategic opponents from space to the deep sea, and effectively enhance national strategic deterrence and actual combat capabilities, it is necessary to develop air-space offensive weapons that can carry out long-range and hypersonic strikes against the enemy through adjacent space or outer space, and break through the enemy's increasingly perfect air-space defense system. Develop a new fourth-generation combat aircraft with the characteristics of stealth, short take-off and landing, high maneuverability and supersonic cruise, which can conduct all-weather and full-time operations, penetrate the enemy's defense system, and strike at the enemy's strategic targets; To develop new bombers and cruise missiles, the new bombers should have the characteristics of large load, long range, high speed, total stealth, attack outside the defense zone and nuclear weapons at the same time, and cruise missiles should have the characteristics of stealth and high-speed penetration; Develop new ballistic missiles, further improve and improve ballistic missile penetration capabilities and strike accuracy, and develop new combat platforms and hypersonic sliding warheads that combine "bomb-slip" and "bomb-one-orbit"; Development of near-space strike weapon systems to achieve near-space hypersonic strike capabilities; Development of space target countermeasure weapon systems, with combat capabilities against satellites, orbiters, etc.; develop space-to-ground strike weapon systems to achieve orbital deployment and

maneuver orbit change capabilities against air, ground, and sea targets.

Sixth, it is necessary to develop the capability of strategic air and space projection. Aerospace strategic projection capability refers to the ability to use the air and space transportation platform to quickly deliver national strategic materials and forces to designated areas and complete strategic support tasks. Powerful strategic air and space projection means can improve the country's overall emergency response capability, complete the tasks of disaster response and rescue, strategic resource transmission, overseas Chinese evacuation, foreign trade, foreign economic and technical assistance, etc., and play an important role in national construction and development. As far as the armed forces are concerned, the strategic projection capability of air and space is an important part of the military's combat capability, of great significance to improving the effectiveness of the military's long-range operations and joint operations, and is also an important guarantee for the armed forces to carry out non-war military operations such as maintaining stability and dealing with emergencies, emergency rescue and disaster relief, and international peacekeeping. At present, the focus of strategic projection capacity building is to develop new large transport aircraft and air refueling aircraft, so that they have the characteristics of large load, long range, generalization and high reliability, which can be used as civil air transport platforms and improve national civil aviation transportation capabilities; It can also be used as a military aviation platform to improve military airlift capabilities. The military platform of large transport aircraft can be used as airborne force vehicles, as air platforms for airborne early warning aircraft, electronic warfare aircraft and anti-submarine patrol aircraft, and even as the basic platform for future air-based anti-missile and air-based strategic strikes; Air tankers mainly provide extended range support for long-range delivery and air attack. It is necessary to strengthen the construction of supporting facilities for air bases and civilian airports in important strategic directions, so that they can have the ability to support large transport aircraft and the corresponding capabilities of material handling, storage, and distribution, so as to improve their effectiveness in supporting various tasks in important strategic directions.

3. Several kinds of relationships should be grasped well in the course of construction

Aerospace security strategic capacity building is a complex system engineering, and we must adhere to the basic principle of overall planning and coordinated development, grasp well the various relationships in the specific construction process, and ensure that the strategic capacity building of aerospace security develops well and rapidly.

First, it is necessary to grasp the relationship between "emptiness" and "heaven". Aerospace strategic capacity building involves aviation and space in two major fields, aviation is the foundation of spaceflight, aerospace is the expansion of aviation and plays a role in promoting aviation, and the two are a relationship of mutual influence, mutual dependence and mutual promotion. Therefore, it is necessary to adhere to the guidance of aerospace and aviation as the support in accordance with the inherent requirements of balanced development of space and space, strengthen the integration of space and space, and achieve a high degree of unity and coordinated development of aviation and space. As a strategic commanding height supporting national security and informationized warfare, outer space is rapidly becoming the main space

that dominates battlefield situational awareness, decision-making and action capabilities. Aviation space is the main space for strategic actions in aerospace security and the basic support of space space, whether it is the competition between major powers in the air and space game or future war, it must have air superiority. The latest air-space tests conducted by the US military show that the air-space force system is forming a five-element force pattern of aircraft, ballistic missiles, nearby space vehicles, spacecraft and transatmospheric vehicles, the geographical separation between inner space and outer space will be completely opened, and the air-space integration linked by information networks is leaping to a higher level. The scope of this integration, the high difficulty and the complexity of the coordination relationship are unmatched in any previous period, which requires that we must further coordinate the construction of aviation and aerospace forces, vigorously promote the development model of integration and innovation, and form a good pattern of synchronous and integrated development of aviation and space.

Second, it is necessary to properly grasp the relationship between the "military" and the "people." Aerospace security strategic capacity building not only involves the military field, but also includes political, economic, scientific, technological, cultural and other fields, especially the strength of aerospace science and technology has typical dual-use characteristics, the characteristics of military-civilian integration development are particularly prominent in the field of aviation and aerospace, it is necessary to adhere to the construction ideology of military-civilian integration, military-civilian and military-civilian compatibility, scientifically integrate relevant resources of the military and localities, integrate military aerospace personnel into the overall system of national economic construction, and promote aerospace security capacity building with the help of the development plan of national construction. It is necessary to attach great importance to the development of general military and civilian technology and equipment, make full use of advanced civilian technology, speed up the pace of building air and space military equipment, and improve the efficiency of air and space military equipment construction. At the same time, it is necessary to give prominence to the civilian transformation of military technology, promote the development of civilian technology driven by cutting-edge technology, and form a benign interaction pattern between the military and the people.

Third, it is necessary to grasp well the relationship between "management" and "use." The ultimate purpose of aerospace security strategy capacity building is to provide capability support for the application of aerospace security strategy, so while building air and space security strategy capacity building, it is also necessary to strengthen research on management and application. At present, there is a lack of unified management of the strategic capacity building of aerospace security, a strategic system based on maintaining national air and space security has not yet been formed, and the development and application of forces are limited to the scope of "departmental support," and it is difficult to guarantee the joint military operations of the three services, including the integrated air and space joint security operations. In addition, the combat use mechanism of air and space security strategic capabilities is not smooth, many space-based information stays at the strategic level to serve decision-making, and there is no necessary operational mechanism for information sharing and support for air and ground security operations, and it is difficult for limited space resources to achieve due national defense and military benefits. In the aerospace industry, there are also problems that cannot be ignored, such as the continuous breakthrough and surpassing of cutting-edge aerospace technology, and the aerospace technology application industry and aerospace service industry have great potential, but the development is relatively lagging behind.

We should take the battlefield and the market as the drive, solve the application problem as the breakthrough point, and strengthen unified management as the starting point, further rationalize the construction and management system and mechanism, and form a good pattern of maximizing benefits.

Fourth, it is necessary to grasp well the relationship between "points" and "surfaces." Therefore, in the process of building the strategic capacity of aerospace security, it is necessary to apply the viewpoint of system theory to correctly handle the relationship between the construction of key contents and the comprehensive construction of the system, and not only highlight the construction of key contents, but also pay attention to the comprehensive construction of the system. The system is a whole composed of elements, each element and its combination have an impact on the function of the system, and the lack of any element will seriously affect the overall effectiveness of the aerospace security system. Therefore, the strategic capacity building of aerospace security must highlight the construction of key contents, scientifically distinguish between priority tasks and projects, give priority to the construction of key elements, and give full play to the traction effect, breakthrough effect and complement effect of key projects. For example, early warning and command aircraft and high-definition and high-sensitivity satellites are the eyes, ears and antennae of the air and space security system, and are important equipment for obtaining and transmitting all kinds of information. For another example, the information interconnection required by the C4ISR system is the lifeline of the aerospace security system and a key issue restricting the construction and use of the informationized aerospace security system. The aerospace security system is huge, and its completion is by no means a one-day effort, and it is necessary to carry out overall design, step-by-step implementation and gradual advancement from the perspective of the system, so as to promote the comprehensive construction of the aerospace security system with key construction, and promote the comprehensive development of the national aerospace security system with breakthroughs in key construction projects. For example, near space plays a unique role in the national air and space security system, and it can ascend to the sky and dominate the air at the bottom, and accelerate the development and utilization of adjacent space, which is of special significance for bridging the air-space battlefield and improving the effectiveness of air-space security operations.

Fifth, it is necessary to grasp well the relationship between "near" and "far." Aerospace security strategic capacity building is a long-term dynamic and systematic project, therefore, in the process of aerospace security strategic capacity building, it is necessary to establish the concept of long-term peace and stability and sustainable security, emphasizing both short-term benefits and long-term goals. The short-term benefits are an inevitable response to the real threat of air and space security, and are the embodiment of the ideological line of seeking truth from facts and materialism; The long-term goal is to plan in advance for potential threats to air and space security, which is the embodiment of a dialectic that emphasizes the change and development of the movement. Emphasis on short-term benefits to solve the current or a period of time of space security, focusing on long-term goals to solve the future sustainable air and space security issues. The former is a point or finite line segment, and the latter is a long line that connects points or line segments to form a continuous stretch. The strategic capacity building of aerospace security must combine the emphasis on immediate benefits with the pursuit of long-term peace and stability, and actively and consciously do a good job in projects with long-term value in the current construction.

In addition, the strategic capacity building of aerospace security must also be short-term and long-term, and seek long-term peace and stability in the air and space with the current infrastructure. At present and for some time to come, we are facing many and more difficult air and space security issues, and the construction tasks that need to be completed are quite arduous. The so-called more are that the transformation of the national aerospace security infrastructure from mechanization to informationization and from the aviation era to the aerospace era are all systematic projects, whether it is the ideological concept of construction, organizational mechanism, scientific and technological strength, talent training, etc., there is a lot of meticulous and meticulous work to be completed. The so-called more difficult, that is, many tasks, projects need to start from scratch, from scratch, whether it is ideological innovation, research and development demonstration, or technological breakthroughs, use and maintenance, etc., all require to overcome difficulties. Therefore, regardless of the difficulty of the task itself, the institutions and individuals undertaking the task must concentrate, be meticulous and rigorous, strive to mature and reap a piece, so that the strategic capacity building of aerospace security can achieve initial results in the short term, and at the same time lay a solid foundation for achieving the long-term goal of strategic capacity building of aerospace security.

CHAPTER 6 CHINA'S STRATEGIC MEANS OF AEROSPACE SECURITY

Means are the way strategies behave. The strategic means of national air and space security are the ways and methods for the state to exercise its air and space forces in general. Strategic means of maintaining national air and space security usually include international cooperation, competition of strength and military confrontation, which are closely related and interact. From the theme of the times, peaceful development and win-win cooperation should be the primary choice; From the perspective of practical laws, developing strength and consolidating internal strength should be the basic choice; From the perspective of using the bottom line, we must adhere to the bottom-line thinking and be fully prepared to use military confrontation means to safeguard national interests.

International cooperation is the norm. International cooperation is not only a basic principle of international law, but also an important means to safeguard China's air and space security. International cooperation should be regarded as a measure, method and way to achieve and maintain national air and space security, and win-win benefits and security sharing should be achieved through bilateral or multilateral cooperation in the field of air and space.

Competition in strength is fundamental. Although competition and cooperation in the era of globalization have replaced zero-sum relations as the theme of the times, the drumbeat of competition and the willingness to cooperate exist at the same time. Personal strength in peacetime, display strength in times of crisis, and use strength in wartime. Competition of strength aimed at winning superiority in the air and space is the main means of safeguarding national air and space security.

Military confrontation is the bottom line. There is no permanent peace, and there is no permanent war. Stopping war with war and maintaining peace with war are important functions of war. When peace encounters a crisis or comes to an end, and security is too fragile to be guaranteed, it is necessary to use the means of war to win the war and maintain peace. Military confrontation with war as the core content is the means of guaranteeing national air and space security.

Section 1 International Cooperation

Cooperation refers to the action of different stakeholders working together to do something or complete a task. International cooperation is a coordinated action taken by countries to achieve specific purposes from the intersection of interests, in cooperation with each other. "Achieving international cooperation" is one of the purposes of the Charter of the United Nations, and the Declaration of Principles of International Law declares that cooperation among States in accordance with the Charter of the United Nations is an obligation that must be "strictly observed," and that States shall cooperate with other States in taking joint and separate actions to cooperate with the United Nations in the maintenance of international peace and security and the promotion of international economic, social, cultural, educational, scientific and technological progress. International cooperation is not only a "basic principle of international law," but also an important strategic means to maintain China's air and space security.

1. Definition of Aerospace Cooperation

Aerospace cooperation is a reflection of international cooperation in the field of aerospace security, and refers to a series of coordinated actions and measures taken by countries to realize and safeguard the interests of aerospace security from the intersection of the interests of the two sides (multi-party) in space security. The types of international air and space security cooperation are diverse: according to the scope of cooperation, it can be divided into bilateral, multilateral, regional or global cooperation; According to the cooperation space, it can be divided into ground cooperation and aerospace cooperation around air and space security affairs; According to the nature of cooperation, air and space security cooperation is generally divided into military cooperation and non-military cooperation. Aerospace military cooperation refers to cooperation between countries on military security issues in the field of air and space, such as the United States military satellites providing intelligence information to its allies, the United States and many countries jointly developing F-35 fighters, Russia and India cooperating in the development of T-50 fighters, and joint military exercises and joint counter-terrorism in the field of aerospace security. Non-military cooperation means refer to cooperation between countries in the field of air and space on non-military security issues, such as multinational manufacturing of civil aviation aircraft, repatriation of civil aviation hijackers, civil satellite leasing, and launching commercial satellites for other countries. International air and space security cooperation, regardless of its form, is cooperation based on mutual trust and mutual benefit, and is cooperation with cooperation as a means and security as an end.

The means of international air and space security cooperation is to take international cooperation as a measure, method and way to achieve and maintain national air and space security, and to achieve win-win benefits and security sharing through bilateral or multilateral cooperation in the field of air and space. At present, although countries have different geographical locations, different political systems and different levels of economic development, they all face a vast space with unlimited interests, and all need to carry out international cooperation in the field of aerospace security in accordance with the law. Only when members of the international community cooperate in good faith and establish and improve the legal system for international air and space security cooperation can mankind share the same space and space harmony and tranquility, live in peace and develop together on the same earth. As an ideal means, international aerospace cooperation is conducive to avoiding or reducing conflicts between countries in the air and space field and achieving win-win results. Therefore, the essence of international air and space security cooperation means is to actively carry out international exchanges and cooperation in the field of air and space, promote the construction of an air and space order that respects each other's sovereignty over territorial airspace, equally owns public space rights and shares public resources through participation in the formulation of air and space rules, and strives to build a safe and harmonious space environment.

The international air and space security cooperation mechanism refers to international actors following the corresponding principles, norms, rules and decision-making procedures in bilateral and multilateral relations and activities, and ensuring the smooth progress of cooperation projects and activities under the operation of the organization and pursuing the maximization of benefits and benefits. There are many types of cooperation mechanisms in the international community today, and although there are certain differences in the way in which they operate and the roles they play, they play their due role in solidifying cooperation organizations. As an important part of the international cooperation mechanism, the international air-space cooperation mechanism has the following characteristics: First, it has developed rapidly under the impact of the tide of new military changes in the world. Technological progress and the strengthening of mutual cooperation have given rise to and developed a number of new international air and space security cooperation mechanisms, promoted the rapid development of international air and space security cooperation, and created and developed a series of principles, norms and rules in the practice of international air and space security cooperation, which have become an important basis for maintaining international air and space order and security. Second, the role of a major country is obvious. After the end of the Cold War, the international political system has developed in the direction of multipolarization, and the increasing international public opinion and practice of international political democratization have played a powerful role in promoting the development of multipolarization in the world. Nevertheless, in the current international air and space security system, the characteristics of the dominance of major powers in the air and space order are still very obvious. History has proved that whether in the past or at present, whether in military cooperation in the air and space field or cooperation in other fields, the great powers have always played a leading and dominant role. Third, its own limitations are still prominent. At present, the international air and space security cooperation mechanism is not perfect, and even seriously lags behind or even lacks in some aspects, and it is still weak and weak to jointly contain the space crisis, resolve conflicts of interest, and balance the gap between the development process of different countries in the aerospace field.

As a unique form of diplomacy, international air and space security cooperation has its own unique operational laws. The first is the law of environmental adaptation. The international air and space security environment is the foundation of international air and space security cooperation, and whatever international air and space security environment there is, there will be corresponding international air and space security cooperation organizations and forms. Second, the law of demand traction generally speaking, international cooperation develops under the dual role of national interests and threats, so the driving force for the development of cooperation mainly comes from two aspects: interests and threats. From the perspective of interests, cooperation can only be formed when there are common interests among the parties involved; From the perspective of threats, cooperation can only be formed when the parties to cooperation face a common threat, which is difficult to eliminate on their own, and must join forces to eliminate or respond to this threat. Third, the law of political decision. A country's participation in international cooperation must operate under the guidance of the country's overall foreign policy, and there is generally no form of international air and space security cooperation that goes beyond the country's overall foreign policy. Fourth, the law of dominance of major powers. International cooperation on air and space security is a complex of many contradictions. Practice has proved that superpowers and aerospace powers play a leading role in the complex of contradictions and are the main aspects of contradictions. Their comprehensive national strength and dominant position in the field of aerospace security determine their influence and dominance in the international arena and in the field of air and space.

2. Aerospace-military cooperation

Aerospace military cooperation refers to cooperation between countries in the air-space military field to safeguard national air-space security and interests. Aerospace military cooperation is a special phenomenon of human social interaction activities, including cooperation between international military forces, military cooperation between military forces and non-military forces, and military cooperation between non-military forces, and it is a special means to maintain national air and space security.

Aerospace military cooperation is a form of military diplomacy commonly adopted by the international community, which is of great practical significance for promoting world peace, safeguarding national air and space security strategic interests, promoting the building of national air and space security forces, and implementing national air and space security strategic guidelines. First, international air-space military cooperation is an important means of maintaining world peace and stability. The strategic pattern of the international community is different at different stages of historical development, and the manifestations of the air and space threats it faces are also different. In order to maintain world peace and stability, countries or groups of countries often seek military cooperation to maintain a relative balance of world air and space forces and eliminate potential security dangers caused by air and space threats. Second, international air-space military cooperation is the basic way to safeguard the strategic interests of national air-space security. International air-space military cooperation is, in the final analysis,

a kind of social interaction between countries or groups of countries for their own or common air and space interests. The main body of international air-space military cooperation represents the core interests of the country, and why and with whom to cooperate, in what form of cooperation, and what state of cooperation is achieved depends entirely on the national air and space interests. Countries move according to their interests, and international air-space military cooperation is the basic way to safeguard national strategic interests in air-space security. Third, international air-space military cooperation is an important means to promote the building of national air and space security forces. As a special social collective, if the air and space military forces do not carry out communication activities with the outside world, they are bound to decline and eventually lose their combat effectiveness. In a relatively peaceful historical period, extensive military exchanges and cooperation with other countries play an irreplaceable role in enhancing the ability to respond to air and space crises and even war. Fourth, international air-space-military cooperation is a realistic measure to implement the strategic guidelines for air-space security. Marxism believes that the factors that affect the development of things are composed of internal and external causes. The building of air and space security forces must also include these two aspects. As an important external factor restricting the building of air and space security forces, international air-space military cooperation has a major impact on the formation and development of national air-space security strategic guidelines.

Aerospace-military cooperation mainly includes the following aspects:

The first is counter-terrorism cooperation. Anti-terrorist cooperation refers to economic, military, judicial and intelligence exchanges and cooperation between the international community on a global or regional scale in order to prevent and combat terrorism. The spread of terrorism around the world and its increasingly cross-border and trans-regional characteristics have posed unprecedented challenges to national security, including air and space security. In today's world, the anti-terrorist alliance led by the United States is the main force in international anti-terrorist actions, but because the United States has always pursued hegemonic tactics and taken the needs of hegemonic strategic interests as the premise, while combating international terrorism, it has also become an important source of the spread of international terrorism. National and international experts distinguish between them according to their causes. From the end of the Cold War to the events of 11 September, an international anti-terrorist cooperation mechanism based on the United Nations with the broad participation of all countries has taken shape. At present, international anti-terrorism cooperation mainly includes three basic types: anti-terrorist cooperation led by the United Nations, anti-terrorist cooperation led by regional organizations and anti-terrorist cooperation between countries.

The second is joint military exercises. Joint military exercises refer to military exercises jointly conducted by two or more countries or groups of countries. Its purpose is to enhance the ability of the armed forces of participating countries to provide military support to the treaty countries or to jointly carry out military operations under specific circumstances, to fulfill their obligations and responsibilities undertaken in bilateral or multilateral military agreements in international relations, and to jointly accomplish specific military tasks. Since the end of the Cold War, with the deepening of global economic integration and the multipolarization of the international pattern, the international security situation has undergone tremendous changes, and international security issues such as local wars, terrorist attacks, natural disasters and transnational crimes have taken on the characteristics of normalization, complexity and diversification, which have promoted cooperation between countries in the military field and promoted more frequent international military exercises.

According to the services participating in the exercise, it can be organized and carried out by the same service and divided into multinational air joint exercises, maritime joint exercises or land joint exercises; Joint three-dimensional combat exercises can also be jointly organized and implemented by multiple services of different countries, such as three-dimensional offensive and defensive operations, joint operations, etc.; According to the content of the exercise, it can be divided into single-content joint military exercises and comprehensive joint military exercises; According to the purpose and nature of the exercise, it can be divided into joint anti-terrorism exercises, joint peacekeeping operations, and so on. The most representative and basic type is bilateral and multilateral joint military exercises.

Third, cooperation in military education. Cooperation in military education is an educational activity carried out by the armed forces of various countries to study and draw on other countries' advanced air and space military theories, military technology, military training, and military management in the field of military education for the sake of building military personnel. With the progress of human civilization and the development of science and technology, the army's weapons and equipment technology has been improved, which has promoted the innovation of military theory and operational theory, and urgently needs a large number of military personnel with advanced military theories and mastery of advanced weapons and equipment technology, thus giving birth to the development of military education and giving birth to international cooperation in military education. After many years of practice, international military education cooperation has formed three basic types: unilateral training, bilateral exchanges, and multi-party joint educational cooperation. Unilateral training-type education cooperation means that the two sides of the cooperation have different functions, one undertakes the function of organizing training, and the other party selects military personnel to receive training; Exchange-type educational cooperation between the two sides refers to the mutual dispatch of military personnel to engage in military education or receive training between the two parties in accordance with the cooperation agreement; Multi-party joint military education cooperation is a product of meeting the needs of multinational military alliances, which is jointly built by the member countries of the military alliance, with teachers from member states and military personnel trained from the militaries of member countries.

Fourth, military intelligence cooperation. Military intelligence cooperation refers to the mutually beneficial relationship between countries to exchange military information, is an important channel for international military struggle to achieve knowledge of the other side and oneself, and is also an important content of international air-space military cooperation. Targeted international air-space military intelligence cooperation is conducive to better serving national strategy. In essence, international military intelligence cooperation is an exchange of interests, and for their own or common strategic interests, the cooperation subjects are usually carried out on the principle of mutual benefit and cooperation. There are two main types of international military intelligence cooperation: formal information exchange and informal information exchange. Formal information exchange refers to the exchange of military information and conditional exchange and sharing of military information between two or more countries on the principle of equality and reciprocity and on the basis of signing cooperation exchange agreements. Informal exchange of information refers to the exchange of military information through secret agreements, undertakings or other forms of conditional exchange and sharing without formal government or military agreements and based on the common interests of intelligence personnel.

Fifth, military equipment and technical cooperation. Military equipment and technical cooperation refers to trade, assistance and joint research and development of finished products and technologies between countries or groups of countries in the field of aerospace weapons and equipment.

As a means of international military cooperation, international military equipment and technical cooperation has unique functions in adjusting multilateral relations, improving the strategic situation, balancing strategic forces, and promoting the high-tech of weapons and equipment. At the same time, it is also an important way for relevant countries to obtain greater economic benefits and ensure the survival and development of their own military industries. Carrying out international air and space military equipment and technical cooperation can not only safeguard the strategic interests of national air and space security, but also enhance mutual political trust and touch and promote cooperation in more fields. The basic types of international air and space military equipment and technical cooperation mainly include joint research and development of air and space equipment, air and space equipment and technical assistance, and aerospace equipment and technology trade. Among them, the joint development of aerospace equipment refers to bilateral or multilateral technical cooperation carried out by two or more countries in the development of new equipment and improvement of existing equipment in the technical field of the military aerospace industry; Aerospace equipment and technical assistance, including equipment assistance and technical assistance, is an important part of the country's diplomatic strategy, aimed at promoting friendly relations with foreign countries and promoting bilateral or multilateral political mutual trust; Aerospace equipment and technology trade is an important part of international trade, which refers to the transaction and circulation of aerospace equipment, special production equipment and equipment technology and related services.

3. Non-military air-space cooperation

Non-military air-space cooperation refers to non-military security cooperation between countries in the field of air and space, with the aim of promoting the realization of mutual non-military security interests. It mainly includes economic cooperation in the field of aerospace around national economic interests, as well as cooperation in aerospace technology and equipment, cooperation in aerospace culture and education, and cooperation in aerospace security and intelligence. As one of the main means of air-space cooperation, non-military air-space cooperation plays an important role in enhancing national air and space strength and safeguarding national air and space security.

First, international economic cooperation. International economic cooperation refers to the long-term economic cooperation activities carried out by different sovereign governments, international economic organizations and natural and legal persons that transcend national boundaries in the field of production with the movement and reallocation of production factors as the main content for the common good. According to the degree of economic development and economic system, it can be divided into North-North cooperation, South-South cooperation, North-South cooperation, regional economic integration, etc.; According to the number of participants in international economic cooperation, it can be divided into bilateral economic cooperation and multilateral economic cooperation. In the traditional pattern of international division of labor before World War II, the most important form of international economic

exchanges was commodity trade; after World War II, international economic ties have greatly exceeded the past in both breadth and depth, and there are profound social and historical reasons for international economic cooperation in the field of air and space. First, the continuous development of aerospace science and technology is the driving force for international economic cooperation in the field of space and space. Second, the new development of the international division of labor after the war is the basis for international economic cooperation in the field of aerospace and space; Third, the internationalization of economic life and the deepening of the economic dependence of various countries are important factors in promoting economic cooperation in the international aerospace field. Fourth, the rapid development of transnational corporations is a direct impetus for international economic cooperation in the field of aerospace and space; Fifth, various international economic organizations have played an important role in carrying out economic cooperation in the field of aerospace and space.

Second, non-military cooperation in air-space technology and equipment. International cooperation in aerospace technology and equipment in the non-military field refers to trade, assistance and joint research and development of non-military finished products and technologies carried out between countries or groups of countries in the field of air and space. There are also three basic types of international cooperation in non-military aerospace technology and equipment: joint research and development of aerospace equipment, assistance in aerospace technology and equipment, and trade in aerospace technology and equipment. Among them, the joint development of non-military aerospace equipment refers to bilateral or multilateral technical cooperation carried out by two or more countries in the field of non-military aerospace technology to develop new equipment and improve existing equipment; Non-military air and space technology and equipment assistance, including technical assistance and equipment assistance, is an important part of the country's diplomatic strategy, aimed at promoting friendly relations with foreign countries and promoting bilateral or multilateral political mutual trust; Trade in non-military aerospace technology and equipment is an important part of international trade, which refers to the trade and circulation of aerospace equipment, special production equipment and equipment technology and related services. As a means of international aerospace cooperation, non-military cooperation in aerospace technology and equipment plays a unique role in adjusting bilateral or multilateral relations, promoting the development of aerospace science and technology, and serving human society.

Third, cooperation in aerospace culture and education. Aerospace cultural and educational cooperation in the non-military field refers to international cultural and educational cooperation between countries in the field of aerospace culture and education without the purpose of military interests. Aerospace culture and education cooperation in the non-military field has been practiced for many years, and has formed bilateral or multilateral cultural exchanges and cooperation, unilateral training-type educational cooperation, and bilateral exchange-type educational cooperation. Bilateral or multilateral cultural exchanges and cooperation refer to bilateral or multilateral exchanges and cooperation with aerospace material culture, aerospace spiritual culture, aerospace system culture and aerospace behavior culture as the main content, with aerospace culture as the main purpose; Unilateral training education cooperation means that the two parties have different functions, one party undertakes the function of organizing training, and the other party selects non-military personnel to receive training; Exchange-based educational cooperation between the two sides refers to the mutual dispatch of non-military personnel for education or training between the two parties in accordance with the cooperation agreement.

As an important means of international aerospace cooperation, aerospace culture and education cooperation is conducive to the formation of international consensus in the field of aerospace security, the cultivation and improvement of the ability and quality of aerospace talents of partners, the development of national aerospace undertakings, and the construction of a mutually beneficial and win-win situation and a harmonious space environment.

Fourth, non-military air-space intelligence and information cooperation. Non-military air-space intelligence information cooperation refers to air-space intelligence information cooperation between subjects (governments, non-military groups, organizations and enterprises, etc.) that is not for the purpose of military interests, and it is manifested as a mutually beneficial relationship between subjects to exchange aerospace intelligence information on the basis of the principle of equality and reciprocity. Non-military intelligence information cooperation mainly includes two types: formal intelligence exchange and informal information exchange. Formal information exchange refers to the exchange of intelligence information and the conditional exchange and sharing of information between two or more cooperative entities on the basis of signing a cooperation exchange agreement; Informal information exchange refers to the exchange of intelligence information through secret agreements, commitments or other forms of conditional exchange and sharing in the absence of formal government agreements and based on the common interests of intelligence personnel. Extensive cooperation in air and space intelligence and information in the non-military field is a common need of the international community to effectively respond to non-military security threats such as natural disasters, maintain social security and stability, and promote the survival and development of classified classes.

Section 2 Strength Competition

Strength is the cornerstone of national air and space security. In the final analysis, the competition between countries in the world in the air and space field is, in the final analysis, a competition of comprehensive national strength. Although competition and cooperation in the era of globalization have replaced zero-sum relations as the theme of the times, the drumbeat of competition and the willingness to cooperate exist at the same time. Strength competition in peacetime, display strength in times of crisis, and use strength in wartime with the aim of winning air and space superiority has become the main strategic means to maintain national air and space security.

1. Definition of competition in air and space strength

Strength, that is, real power.

The strength possessed by a country, also known as comprehensive national strength, refers to the sum of the strategic resources that the country can mobilize to achieve its security strategic goals, and it is the unity of material strategic resources and spiritual strategic resources. National strength mainly includes basic strength, economic strength, military strength, scientific and technological strength, political strength, diplomatic strength, and spiritual strength. According to different criteria for division, there are different types of national strength. According to the degree of stability, it can be divided into stable strength and unstable strength, according to the time of action, it can be divided into actual strength and potential strength, and according to the mode of action, it can be divided into hard power and soft power. Among them, the most representative are hard power and soft power.¹

Hard power refers to dominant power, mainly including basic strength (such as land area, population, natural resources, etc.), military strength, economic strength and scientific and technological strength; Soft power refers to attraction power, which mainly includes national cohesion, the degree to which the culture is universally recognized, and the degree of participation in international institutions. In the information age, the influence of hard power has not diminished, and the influence of soft power has increased sharply. Hard power and soft power, as two forms of national strength, are mutually conditioned and mutually influencing, and there are also obvious differences. From the perspective of manifestations and means of action, hard power is manifested as a kind of "hard power," which is to coerce others to do things they do not want to do through methods such as military strikes and deterrence or economic blockades and sanctions; Soft power is expressed as a kind of "soft power," which is to influence, induce and persuade others to believe or agree to certain codes of conduct, values and institutional arrangements through the intangible power resources of culture, ideology and social system, so as to produce the process and results desired by the party with soft power. So, relative to hard power, soft power manifests itself mildly. From the point of view of the way it functions, the use of hard power is direct and has obvious coercion; The use of soft power is indirect and has a relatively distinct inducement.

Competition of strength in the strategic field of aerospace security refers to a non-violent and non-confrontational competition between different entities in order to obtain a superior position in the field of aerospace security. Its purpose is to create a favorable air and space security environment and posture and win the strategic initiative. The outcome of competition is often very uncertain, and it may lead to cooperation or confrontation, which is a "gray area between confrontation and cooperation," which tends to seek to work together with diplomatic, political, economic and other means to achieve strategic goals with the support of military means and military strength. Therefore, the competition of a country's strength in the field of air and space is, in the final analysis, a competition of comprehensive national strength. During the Cold War period, in order to compete with the United States for world hegemony, the Soviet Union mainly developed military strength and blindly pursued military superiority, resulting in a serious imbalance in the elements of national strength, and as a result, it was completely defeated in all-round competition and confrontation with the United States.

¹ Yang Yi: "National Security Strategy Theory," Beijing, Shishi Publishing House, 2008 edition, p35.

Aerospace strength is also comprehensive strength, economic, military, science and technology, culture, politics, diplomacy, spirituality, etc., soft and hard coexist, multi-dimensional integration, each has its own merits, indispensable, only the coordinated development of various strengths, can produce comprehensive competitiveness, win strategic advantages and initiative.

2. Competition in air and space hard power

Hard power is the dominant power in the national power system, which refers to a country's economic, military and scientific and technological strength. In layman's terms, hard power is a tangible carrier, a material force that can be seen, touched, and described by quantitative means. From the perspective of national aerospace security strategy, hard power refers to economic strength, military strength, scientific and technological strength closely related to national aerospace security, as well as economic support capabilities, military behavior capabilities and scientific and technological support capabilities transformed and formed therefrom. The essence of the competition in air and space hard power is the competition in the economic, military, and scientific and technological fields for the purpose of gaining air and space superiority.

Economic strength is the foundation of a country's survival and development, and is the most important element in the country's comprehensive strength system. A country's economic strength mainly includes: gross national product and per capita value, economic system, industrial and agricultural production capacity, fiscal revenue, financial strength and foreign trade relations. As the basic strength of air and space hard power, economic strength plays a decisive role in the generation and play of other air and space hard power, such as air and space military strength and scientific and technological strength. Aerospace belongs to the high-end field, and the skies belong to high-end undertakings, and without the backing of strong economic strength, it is impossible to produce strong military strength and scientific and technological strength. At the same time, economic strength is also an important guarantee for influencing the world and improving the country's international competitiveness. In the era of globalization, a country's economic strength not only determines its role in the international community, but also builds a new international order conducive to its own security and development through the influence of strong economic power on the international community. Therefore, maintaining sustained, healthy and steady growth of the national economy is not only an inherent requirement for today's sovereign countries to participate in world competition, but also a fundamental need for improving national aerospace competitiveness and maintaining aerospace security. On the basis of sustained economic growth, continuously raising and improving the level of national aerospace security and satisfying as much as possible the reasonable needs arising from the development of the aerospace industry with economic growth is of great significance to ensuring that the country is invincible in the international aerospace security competition.

Military strength is the core element of air and space hard power, and the hardest, final and most reliable strategic means to maintain national air and space security. The air and space military strength of a country mainly includes: aviation military force, aerospace military force, information power running through aerospace military force, and ground force closely related to

air and space military force. As a kind of hard power competition, the competition of air and space military strength is usually manifested in the competition of air and space weapons and equipment, combat strength and combat capability, with the aim of gaining military confrontation superiority in the air and space field and occupying the initiative, leading power and winning power in safeguarding national air and space security and interests. At present, although the end of the Cold War has made the priority of military competition, including air and space military competition, a thing of the past, and the concept of cooperative security has become more and more deeply rooted in the hearts of the people, the essence of anarchy and power politics has not changed, the important role of military strength in comprehensive national strength has not changed, the common interests of mankind have not been greater than or surpassed the sovereign interests of nation-states, and the strength of military strength still determines the international status and role of countries to a considerable extent. The role of air and space military strength in national air and space security and even the overall security of the country is more direct and effective than economy and science and technology. Because of this, the military development and utilization of major countries in the field of aerospace has accelerated significantly: military space forces have accelerated from the traditional combat support type to the integration of combat support and rapid strike, and space-based strike weapons have taken shape; The transition of air combat forces from the third generation to the fourth generation is accelerating, and a new generation of air precision strike system based on information systems is accelerating. The offensive and defensive systems around ballistic missiles are maturing day by day, and air-space cross-domain combat platforms and weapons are about to emerge. All this shows an indisputable fact: military competition in air and space is constantly intensifying, and the situation of air and space security is becoming increasingly grim. Developing air and space military forces, enhancing air and space military competitiveness, and enhancing national air and space security capabilities are strategic missions that are forced by the situation and brook no delay.

Scientific and technological strength is an important factor in the hard power of air and space, and the scientific and technological strength of a country that plays a supporting role in the country's economic management of space and space, economic development, and improvement of military capability mainly includes: the quantity and quality of scientific and technological teams, scientific and technological investment, scientific and technological facilities and contributions to scientific and technological progress. At present, the world's scientific and technological development is advancing by leaps and bounds, innovation and creation are changing with each passing day, the field of science and technology is giving birth to new major breakthroughs, the status of scientific and technological competition in the competition of comprehensive national strength has been rapidly improved, and scientific and technological innovation has become the main driving force for supporting and leading economic development and the progress of human civilization. The aerospace field is a high-tech field, and aviation technology, aerospace technology and information technology represent the highest level of scientific and technological development in the contemporary world. The value of innovating aerospace science and technology, enhancing the strength of aerospace science and technology, and enhancing the country's scientific and technological competitiveness in the field of space far exceeds that of space science and technology itself, which can not only directly provide scientific and technological support for national aerospace security affairs, but also produce a strong radiation effect and penetration effect, affecting the overall leap of the national science and technology level and even comprehensive national strength.

The United States, Russia, the European Union and other contemporary countries and regions with developed science and technology regard aerospace as the strategic commanding height of national security and development, and have long regarded aerospace as the main field of scientific and technological innovation and development, and the strategic advantages of aerospace formed by the transformation of aerospace science and technology are very obvious. In recent years, China has developed the aerospace undertaking in accordance with the strategic thinking of a scientific and technological power, and its scientific and technological competitiveness in the field of aerospace has been continuously enhanced, which has not only effectively supported the development of China's aerospace forces, but also effectively promoted the enhancement of the country's comprehensive national strength.

3. Competition in soft power in space and space

Aerospace soft power is a spiritual factor that distinguishes it from economic, military, scientific and technological and other tangible forces, is an invisible force hidden behind hard power, difficult to be quantified and calculated, and has permeability, and is a special strategic capability based on hard power and composed of many non-material factors such as political, cultural, spiritual and mechanical factors. Its essence is the ability to use non-coercive means to enhance oneself, influence other sides, and achieve the strategic goals of air and space security in the field of aerospace security, which includes cohesion, boost, and effectiveness for one's own side, appeal, attraction, and influence on friendly sides, and deterrence, deterrence, and disintegration against the enemy. For example, "military soft power" mainly includes the fighting spirit and military style of military personnel, the strategic ability of military leaders and organs at all levels, the organizational structure of the military establishment system that reflects the organic combination of personnel and equipment, the military cultural power that embodies the peaceful and civilized division of the military and the cultural cultivation of military personnel, the military diplomatic power of carrying out friendly exchanges with the armed forces of all countries in the world to display an international image, and the deterrent power of rationally using military force to contain the opponent through manifestation and momentum.

As an "invisible force" in the aerospace power system, aerospace soft power has its inherent essential characteristics: First, it is distinctly political. As a concentrated embodiment of ideals, beliefs, values, aerospace culture and spirit, aerospace soft power more clearly and directly reflects the nature and political essence of the national aerospace undertaking. Politics is the soul of space soft power, and soft power without the political goals of the main body is meaningless and non-existent. The political nature of aerospace soft power is mainly reflected in its realities as national interests in a certain historical period. Although "airspace" is still a new field that has not been developed and utilized for a short time, the soft power of space and space is deeply rooted in the soil of national culture, the presentation and sublimation of the national spirit in the field of air and space, and the accumulation and promotion of national traditional culture. The second is typical non-coercion. Aerospace soft power is the ability to influence and shape other countries by using non-coercive means, mainly refers to gaining the respect, recognition and closeness of the object through attraction, infection, influence, assimilation, deterrence and other means to make the object obey its own will.

Generally speaking, the non-coercive use of hard resources can produce soft power, and the compulsory use of soft resources not only fails to produce soft power, but also causes great damage to soft power. If air and space hard power is mainly embodied in the ability to directly resort to force, air and space soft power is more embodied in the ability to use military force peacefully and flexibly. The third is long-lasting permeability. The improvement of aerospace soft power is a long-term accumulation process, which is usually difficult to achieve the expected goal in the short term, but once formed, it has long-lasting permeability, usually in the form of subtle, gradual penetration to exert its effectiveness, it is pervasive, highly permeable, and lasts for a long time. Fourth, strong inheritance. The deep source of soft power has been formed over a long period of historical evolution. In today's era, the soft power of any country in the field of air and space is developed on the basis of traditional soft power, and it inevitably bears the imprint of tradition. For example, the great peace-loving national spirit of the Chinese nation is not only the spiritual support and powerful driving force for the continuous development and growth of the Chinese nation, but also the profound accumulation of China's strengthening of aerospace soft power construction. The new security concept of peace, development and cooperation and the security concept of harmony and space advocated by China are the full embodiment of the Chinese nation's idea of peace.

The purpose of the competition in aerospace soft power is to enhance cohesion internally and enhance influence externally. The first is to enhance cohesion internally and cultivate the national spirit with national cohesion as the core. Without a great national spirit, there can be no great country. The rise or fall of a nation and a country depends to a large extent on the stretching or shrinking of the national will and the spirit of the state. Integrating culture, strengthening faith, and uniting the national spirit are the natural prerequisites for national rejuvenation and national rejuvenation. For thousands of years, the reason why the Chinese nation has endured disasters and made unremitting efforts to improve itself has relied on the national sentiment with reunification as the core concept and the national character of broadness, tolerance and perseverance. To a large extent, the role of national spirit, patriotism and Juche culture is crucial to the development of aerospace strength. Chinese aviation pioneer Feng Ru has influenced and inspired generations of aviation people with his great feat of serving the country through aviation, and China's aerospace spirit is a typical symbol of contemporary China's national spirit, and has become a powerful spiritual driving force to stimulate the development of China's aerospace industry. The second is to enhance external influence and promote the value recognition of the core concept of the country in the international community. In the international system, the fundamental purpose of developing strength through space and space is not simply the expansion of material power, but the growth of spiritual power at a higher level, if a country that can provide the world with historic innovations in values and international norms of behavior, its prospects for development in the field of space and space will be even greater. For example, as a traditional aerospace power, the United States has long held the leading power in the construction of the world aerospace order by virtue of its advantages in aerospace science and technology, equipment and force use that it has formed and continuously strengthened in the international community.

For China, a rapidly developing aerospace power, it is absolutely necessary and possible to use its own development advantages and cultural advantages to build an aerospace soft power system with Chinese characteristics, shape a good international image with continuous self-improvement, and promote the healthy development of the international aerospace order with the active influence of both rigidity and softness.

Section 3 Military Confrontation

War and peace are the two basic states of human society. There is no permanent peace, and there is no permanent war; Peace is not equal to security, nor is war equal to insecurity. Ending wars with war, maintaining peace with war, and seeking security through war are important functions of war. When peace encounters a crisis or comes to an end, and security is too fragile to be guaranteed, it is necessary to use the means of war to win the war and maintain peace. Military confrontation with war as the core content is the means of guaranteeing national air and space security.

1. Definition of air-space military confrontation

Confrontation is a form of contradiction and struggle, a state in which two things are opposed to each other and cannot stand each other. Space-space military confrontation is a direct confrontation and confrontation between the two opposing sides in the air-space field based on military strength around certain air-space interests. First of all, the root cause of the occurrence of air-space military confrontation is the contradiction of air-space interests between the two sides of the confrontation; Second, this conflict of interests has developed to an unavoidable level and must be resolved by military action; Finally, confrontation is direct, but the forms are diverse, and according to the intensity can be divided into non-war forms and war forms, and according to the social state, it can be divided into air-space deterrence operations in peacetime and air-space combat operations in wartime.

As a strategic means of safeguarding national air and space security, air-space military confrontation has distinct characteristics that distinguish it from military confrontation in other fields and has outstanding strategic effects. The air-space battlefield has an outstanding high-position advantage and has become a new strategic commanding height in informationized warfare, and the rapid development of air and space forces and the rapid improvement of the effectiveness of weapons and equipment have greatly strengthened the strategic function of air-space military confrontation.

The U.S. military believes that "attacking the U.S. space system means attacking the U.S. homeland." The Russian army believes that "giving priority to the development of space-based information systems and ensuring effective support for the actions of troops is necessary for Russia's national security interests and the maintenance of world strategic stability." "The second is fierce command confrontation. In the air-space military confrontation, due to the extensive application of various high and new technologies, weapons and equipment have become faster, more precise, and more long-range, and the battlefield environment has also become highly transparent, which has provided conditions and possibilities for directly attacking the opponent's command system, and the "center" and "joint" of the command system have also become important targets for first strikes in the course of operations. The realization of this form of direct confrontation enables command confrontation to unfold simultaneously in tangible and intangible spaces, and the confrontation situation is extremely fierce. The third is a full-dimensional battlefield space. "More expansive than land is the ocean, and wider than the ocean is the sky." Space-to-space military confrontation operations are simultaneously launched in multidimensional spaces and fields such as land, sea, air, space, network, and electricity. Each space influences, cooperates, depends on each other, and is indispensable. In such a multi-dimensional, three-dimensional vast battlefield space, "the side with the superiority of technical strength can carry out its combat operations within the scope of its capabilities." Fourth, lethal combat operations. Aerospace military forces integrate mature industrial technology with emerging information technology, network technology, and space technology, and not only have high-speed mobility, super damage capabilities, and long-range projection capabilities, but also have precision strike capabilities. This enables it to carry out precision strikes and destroy key and high-value targets in the combat system directly in confrontational operations, paralyzing the entire combat system, and then achieving the operational objectives and winning the war.¹

2. Peacetime military confrontation between air and space

Peace is a relatively safe period for national security. Peacetime air-space military confrontation can be understood as military struggle preparation (combat readiness) in a certain sense, which refers to confrontation and countervailing activities carried out in the vertical space above the relevant area in peacetime to defend national interests, as well as preparation and preparedness activities in response to possible war or military emergencies in the air and space field. The posture of air-space military confrontation in peacetime has a major impact on the posture and outcome of air-space military confrontation in wartime, and is also an important means to enhance the country's strategic position in the international community, curb possible wars in the air and space field, maintain national air and space security and support the expansion of national interests.

Peacetime air-space military confrontation exists in two forms: "explicit" confrontation (direct confrontation) and "implicit" confrontation (indirect confrontation). Overt confrontation

¹ Cai Fengzhen and Tian Anping: "Aerospace Integrated Combat Science," Beijing, People's Liberation Army Press, 2006 edition, p104.

refers to confrontation and countervailing actions carried out by two sides with conflicting interests mainly using air and space military forces in vertical spaces above the area of interest, such as the air confrontation between China and the United States over the Yellow Sea in October 1994, and the air confrontation between China and Japan over the waters of Diaoyu Dao in recent years. This kind of confrontation usually takes place in disputed areas and during crisis periods, and the confrontation is tense, posing a severe test of the strategic wisdom, decision-making level, response strategy, and combat capability of both sides. Implicit confrontation is a series of military struggle preparation activities carried out by the two sides of the conflict of interest to win the future air and space superiority over the opponent, this confrontation is an indirect confrontation, which can be understood in a certain sense as the accumulation of strength or capacity building, usually expressed in the form of innovating air and space theory, developing air and space equipment, and demonstrating air and space strength.

The first is to form the country's operational theoretical superiority over its opponents in future air-space military confrontations by innovating air-space combat theories. As a powerful soft power, advanced air-space combat theory has the special effect of amplifying advantages or making up for disadvantages in hard power such as air-space weapons and equipment, and can correctly guide the building of air-space forces and guide the practice of air-space operations. Therefore, military powers have taken the theory of "forward-looking" and "deterrence" air-space operations as an important means to obtain superiority in future air-space military confrontation, and through theoretical innovation and breakthroughs, they have influenced the development of air-space military forces internally and enhanced their theoretical leading superiority with their opponents in air-space military confrontation externally. The US military's concepts and theories such as "Star Wars," "Five Rings Theory," "Air-Sea Integration," and "Global Commons," and Russia's and China's "Air-Space Defense" are all based on strategic thinking and understanding of counterbalancing opponents and gaining superiority in air-space military confrontation. At present, the military changes in the world are deepening

Air combat forces are maturing day by day, aerospace military systems are developing rapidly, and new means of air and space combat are constantly emerging. All countries in the world are paying close attention to the development trend in the air-space military field and strengthening theoretical research on air-space operations in order to constantly adapt to the development trend of air-space military struggle. It can be predicted that the winner in the future air and space military confrontation will inevitably be the superior side of the current air and space combat theory.

The second is to accumulate the country's material superiority over the opponent in future air and space military confrontation through the development of air and space weapons and equipment. Weapons and equipment are an important factor in military capability and the material basis for air-space military confrontation. At present, driven by the "twin launches" of military science and technology and combat needs, all countries in the world are constantly strengthening the development of high-end weapons and equipment in the air and space, and the strategic information equipment integrating ground, air and space, the new generation of stealth equipment, the cross-domain equipment of the air and space, the unmanned equipment of the air and space, the network and electric countermeasure equipment, the ballistic missile weapon system, the hypersonic cruise trajectory, the space-based strike weapon, the new type of air and space defense system and other air and space combat equipment have shown a trend of rapid development and cross-generational leap, and the combat capability of the air and space system based on information systems is taking shape at an accelerated pace.

Aerospace weapons and equipment are material means to deal with air and space threats and safeguard national security, and the purpose of military powers to accelerate the development of air and space weapons and equipment is to accumulate the country's material advantage over opponents in future air and space military confrontations. Practice has proved that the development of air and space weapons and equipment, as a hidden means of air and space military confrontation in peacetime, is of great strategic significance to strengthening the strategic position of major powers, safeguarding and expanding national interests in peacetime, winning strategic initiative in wartime, winning air-space wars, and safeguarding national security.

The third is to improve the country's strategic deterrence in air and space military confrontation by demonstrating the level of air and space strength. Deterrence is an important form of military confrontation in air and space. National air and space security strength exists objectively, and displaying this strength "artistically" in front of the world through experiments, exercises, and other activities is one of the main forms of air-space military confrontation in peacetime to achieve the effect of "knocking mountains and shaking tigers," curbing air and space threats, and safeguarding air and space security. Deterrence generally includes offensive deterrence and defensive deterrence. Offensive deterrence is a deterrent method aimed at safeguarding and expanding national interests, and deterring and deterring opponents through the threat of using offensive air and space strategic forces, including strategic information forces, strategic strike forces, and strategic projection forces. For example, the "space war" exercises conducted by the US Air Force many times, the US-ROK military exercises involving US B-2 and B-52 strategic bombers in the Korean Peninsula crisis, and the DPRK's declaration of a state of war and claim to carry out strategic "nuclear strikes" against the United States and South Korea are all offensive deterrents. Defensive deterrence is a deterrent method aimed at safeguarding national security and interests, and by threatening to use defensive air and space strategic forces, including strategic early warning forces, air defense and anti-missile forces, and information confrontation forces, to deter and deter the opponent's attack. For example, the "National Missile Defense (NMD)" and "Theater Missile Defense (TMD)" built by the United States, as well as the "National Air-Space Defense System" established by the Soviet Union/Russia, all have defensive deterrent significance. In fact, the practical application of air-space deterrence measures usually adopts a comprehensive deterrence that integrates attack and defense. Whether it is offensive deterrence, defensive deterrence, or comprehensive deterrence, air and space deterrence is a more flexible and effective way of using military force. Proper use of such deterrence means based on air and space military strength can better achieve national strategic goals, ensure national air and space security, and safeguard the overall interests of the country.¹

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p161.

3. Aerospace military confrontation in times of war

War is a relatively insecure period for national security. Aerospace military confrontation in wartime can be understood as air-space combat in a certain sense, which is an offensive and defensive confrontation marked by war in the air-space battlefield with aerospace forces, air defense and space defense forces and information combat forces as the main body. From the operational point of view, it mainly includes military confrontation (strategic defense) in which the enemy attacks and defends ourselves, military confrontation in which we attack and defend the enemy (strategic offensive), and information confrontation aimed at gaining information superiority. The situation, process, and outcome of air-space military confrontation in wartime play a major role in safeguarding and expanding national strategic interests, gaining the initiative in a multipolar strategic pattern, and ensuring national air and space security.

First, the military confrontation between the enemy attacking and defending ourselves. Military confrontation between the enemy attacking and defending ourselves can be understood as air-space defense operations, which refers to air-space defense operations carried out in air-space battlefields with air and space defense forces as the main body, with the main purpose of thwarting the enemy's air-space attacks and protecting the country's political, economic, military, and other important targets and the security of space systems, mainly using air-space defense weapon systems, and carrying out air-space defense operations on the air-space battlefield with air defense, anti-missile, and space defense as the main content and resistance, counterattack, and protection as the main forms. Air-space defense operations are an indispensable form of confrontation in air-space military confrontation, and are also an important means to deal with air-space threats, balance strong enemies, and safeguard national security and interests. In peacetime, air-space defense is a strategic means to deal with enemy airspace reconnaissance and harassment, defend national airspace, and safeguard national sovereignty and dignity. In wartime, air-space defense is a necessary means to resist and counter enemy air-space attacks, protect the safety of important national targets, and ensure the freedom of movement of the armed forces.

The second is our military confrontation in attacking and defending the enemy. The military confrontation between our attack and defense of the enemy can be understood as air-space offensive operations, which refers to the strategic surprise attacks carried out by our side against the enemy's space, air, and ground targets in the air-space battlefield with the air-space offensive forces as the main body, with the main purpose of gaining strategic superiority and safeguarding and expanding national interests. Aerospace strategic surprise attack is the most representative form of confrontation in air and space military confrontation, and it is also the most effective means to safeguard national air and space security and expand national interests. Aerospace-space surprise attack is a combat operation with strong initiative, and it is also a combat operation mode that can give full play to the advantages of high-precision, high-speed, and long-range projection of air and space forces, which plays an overall role in achieving victory in war and occupies a leading position in air-space military confrontation operations. At the present stage, air-space offensive operations are mainly manifested in offensive operations of air forces supported by space systems and long-range missile strikes; with the development of air and space technology and weaponry, new air-space offensive operations such as air-to-space, space-to-air, space-to-earth, and space-to-air will emerge in the future.

The third is a military confrontation centered on the acquisition of air and space information superiority.

Air-space information confrontation refers to the air-space military confrontation in which the two opposing sides comprehensively use aviation, space, and information combat forces for the direct purpose of competing for strategic information superiority. According to the field of confrontation, it can be divided into intelligence warfare, electronic warfare, psychological warfare, computer network warfare, etc.; According to the nature of confrontation, it can be divided into information attack and information defense; According to the means of confrontation, it can be divided into electronic warfare, computer network warfare and physical warfare. Air-space information confrontation is not only an integral part of air-space offensive and air-space defense, but also a relatively independent combat operation. Space-space information confrontation usually precedes other countermeasures and runs through the entire process of air-space countermeasures. Generally speaking, air-space information confrontation emphasizes the combination of attack and defense, and pays more attention to the role of information defense. Emphasize the combination of professional and non-professional forces, and pay more attention to the role of non-professional forces; Emphasize the combination of "soft killing" and "hard destruction," and pay more attention to the role of "soft killing"; Emphasis is placed on the combination of independent implementation and joint implementation with other combat operations, and more attention is paid to the role of joint implementation with other combat operations.

Section 4 The Selection and Application of China's Strategic Means of Aerospace Security

The selection and application of China's strategic means of air and space security is a very important and extremely arduous system engineering and strategic task. From the perspective of the theme of the times, peaceful development and win-win cooperation should be the primary choice; From the perspective of practical laws, developing strength and consolidating internal strength should be the basic choice; From the perspective of the bottom line, we must be fully prepared to use military confrontation to safeguard national interests. To this end, we must base ourselves on the strategic theme of harmonious space and space, follow the strategic principle of peaceful development, and follow the basic ideas of putting cooperation first, strength first, and confrontation first, and plan echeloned, build it as a whole, and make comprehensive use of it. This is an analytical consideration based on system theory, and it is also a scientific choice for China's air and space security strategic means.

1. Put cooperation first and adhere to the path of peaceful development

Historically, the law of the jungle and survival of the fittest once hung high in the sky of the world, and war was often the passport to the rise of great powers. However, the "rise of war" cannot represent the whole of history, and war is by no means the only means of the rise of a great power. In the final analysis, rise is the natural result of a country's long-term efforts to govern the country and strive to make it strong. History and reality have repeatedly proved that force cannot create peace and might cannot ensure security. Breaking the mono-model of "rising war," adhering to the path of peaceful development, and strengthening international air and space security cooperation are the following moves under the theme of today's era of world peace and development, and are also the primary choice of China's air and space security strategic means.

(1) Actively carry out international cooperation on air and space security

In a certain sense, international aerospace security cooperation is to expand strategic rights and interests in vertical space in a cooperative development, mutually beneficial and win-win manner. The traditional expansion of strategic rights and interests is often a zero-sum game, and the acquisition of strategic rights and interests of one party means the loss of strategic rights and interests of the other party. With the development of economic globalization, traditional and non-traditional security factors are intertwined, the interests of all countries in the aerospace field are interpenetrating, and common air and space security threats and common strategic needs are increasing. The rights and interests of countries in certain strategic spaces (such as space) can be realized through cooperation, and the contradictions in rights and interests in certain strategic spaces (such as public space: high seas and air space above the polar regions) can also be resolved through cooperation. The joint use and maintenance of vertical space will become an important way for the development and utilization of international strategic space. Therefore, in the process of safeguarding and expanding its strategic rights and interests in vertical space, China should grasp the relevance of national interests, handle well the relationship between safeguarding its own air and space interests and taking into account the reasonable air and space interests of other countries, and should not only base itself on its own interests, but also take into account the common interests of all mankind.

International air and space security cooperation is a special embodiment of international cooperation in the field of air and space security, and is also an important way to "maintain air and space security and build a harmonious air and space". With the further elevation of the status of aerospace in the security strategies of various countries and the continuous enhancement of China's aerospace security strength, it is necessary to actively carry out international cooperation in air and space security and make achievements and breakthroughs in the overall strategic situation of managing air and space. First, actively advocate the new concept of air and space security.

We should abandon the "cold war" mentality, oppose air and space hegemony, establish a new security concept of "comprehensive, common, cooperative and sustainable security," take the road of "joint construction, sharing and win-win" of air and space security, establish a fair and effective collective air and space security mechanism, jointly prevent conflicts and wars, and make air and space better serve human civilization. Second, actively participate in and promote the process of foreign air control. China¹ should adhere to its stance of preventing an arms race in outer space, work with relevant countries to contain the development of foreign space weapons and capabilities by military powers, properly handle relations with the United States, Russia and other countries in the field of outer space security, take China as the main use of us, and strive to maximize space interests. The third is to take the initiative to carry out air and space public diplomacy. Positively publicize China's policy proposition on the peaceful use of outer space, regularly issue white papers objectively introducing China's air and space military activities, take the initiative to guide international public opinion, counter and eliminate the "China threat theory," and strive to create a good atmosphere for the development of China's aerospace undertakings. Fourth, actively participate in the establishment of air and space norms and order. In accordance with the purposes of the Charter of the United Nations and the basic principles of international law, and in accordance with the new development of space security, seek consensus on issues such as airspace security, public space security, space security and cyber and air security, and further improve the international laws and regulations related to air and space security. Fifth, actively carry out the mission of peace. Focusing on combating terrorism, separatism and extremist forces and responding to major natural disasters, we will further strengthen joint exercises in the air and space fields, explore the establishment of mechanisms for early warning, information sharing and mission coordination in the fields of counter-terrorism, peacekeeping, disaster relief and search and rescue, and continuously improve the response and handling capabilities of joint operations. Sixth, actively organize and participate in various forums, aerospace exhibitions and other activities in the international aerospace field, and further enrich and improve the level, form and content of exchanges in the aerospace field; We should speed up the training of a large number of high-quality aerospace personnel who understand both aerospace security and military affairs and foreign exchanges and cooperation, so that they will become the vanguard and main force that can promote international aerospace security cooperation.

(2) Take the road of peaceful development of air and space security

What kind of development path China will take in the 21 st century has a bearing on China's future and the destiny of the Chinese nation, as well as on the development trend of the region and even the world. In his speech at the opening ceremony of the 2013 Boao Forum for Asia, Chinese President Xi Jinping noted:

¹ Xi Jinping, 21 May 2014, Remarks at the Fourth Summit of the Conference on Interaction and Confidence-Building Measures in Asia, held in Shanghai.

"The international community should advocate a new concept of comprehensive, common and cooperative security, so that our global village will become a big stage for common development, not an arena for competing with each other, let alone chaos a region or even the world for its own selfishness." China must break the historical fate of the rise and fall of great powers, realize a historic innovation in its development model, and embark on a pioneering path of peaceful development of world significance in the field of aerospace security.

Peaceful development has been a consistent strategic ideology since the founding of New China. China is the only big country in the world whose civilization has survived for 5,000 years. This lasting vitality comes from the cultural tradition with "benevolence" and "harmony" as the core and the strategic orientation of "virtue" rather than "force," and the strategy of winning peace with strength and achieving security with peace is the crystallization of the survival wisdom of the Chinese nation in history. Since the founding of New China, due to the influence and restrictions of various factors at home and abroad, China's development has taken detours and even suffered major setbacks, but it has never stopped thinking and exploring the issue of peaceful development. In 1978, China implemented the policy of reform and opening up and began to shift the focus of its work to economic construction, entering a golden period of peaceful development and opening up a new era of peaceful development. After more than 30 years of practice, adhering to the path of peaceful development has become the will of the state and an established national policy. Throughout history and looking around the world, peaceful development is a road that is in keeping with the characteristics of the times and China's national conditions, a road closely linked to economic globalization but independent development, and a road of striving for development while adhering to peace.¹ The core connotation of peaceful development is to seek harmonious development internally and promote peace and cooperation externally, that is, to take advantage of the favorable opportunity of world peace to achieve self-development, and at the same time to better maintain and promote world peace with self-development; It is to actively participate in the process of economic globalization, operate large resources and large markets in the world, cultivate a strong momentum for its own development, and at the same time provide new impetus, space and opportunities for world development, and strive to achieve mutual benefit and win-win with other countries; That is, while adhering to opening wider to the outside world, the basic point of development is to rely on its own strength, through independent innovation, technological progress, scientific management, etc., to clear the bottlenecks that restrict development, and to achieve China's sustained and scientific development in the economic, military, scientific and technological fields.

Peaceful development is a major strategic choice to grasp the trend of the times and base itself on the actual national conditions. First of all, the theme of the times of peace and development is the condition of the times for China to choose the path of peaceful development. Peaceful development is the theme of the times, the major forces rely on each other, contain each other, compete and coexist, there is cooperation in competition, coordination in contradictions, compromise in struggle, the possibility of all-out war between major powers is reduced, and peace and development have become the strategic orientation of more and more countries.

¹ Ge Dongsheng: "National Security Strategy Theory," Beijing, Military Science Press, 2006 edition, p41.

At the same time, the accelerated development of economic globalization has deepened the interdependence of the interests of all countries to an unprecedented extent, and the relationship between countries with you and me with you, and the relationship between countries that have lost everything and prospered has become a distinctive characteristic of the times. Globalization has made it possible for a latecomer country like China to obtain the capital, technology and resources needed for development through peaceful means, injected more non-zero-sum factors into security relations between countries, and opened up great prospects for peace, development and cooperation. In a certain sense, China's choice to transcend the path of military expansion with the path of peaceful development and the model of conflict of interests with a mutually beneficial and win-win model to achieve great rejuvenation is based on objective possibility and subjective initiative. Second, the basic national conditions of large developing countries are the foothold for China to choose the path of peaceful development. As a large developing country, China's central task is to concentrate on construction, wholeheartedly seek development, and always base its development on basing itself on its own reality. At present, China has initially completed its transformation from a large agricultural country to a major industrial country, and the pace of building a moderately prosperous society in an all-round way is accelerating, and it has a solid foundation for peaceful development and has become an important link in the world economic chain in the process of economic globalization. The vitality and attractiveness of China's economy determine that China's ability to freely carry out market development and resource allocation on a global scale is getting stronger and stronger, and there is no need to safeguard and expand national interests through expansion wars. Third, stable politics and strong national defense are the basic guarantees for China to choose the path of peaceful development. From a political point of view, the founding of the People's Republic of China in 1949 ended the century-old history of bullying, war and turmoil in modern times, and laid a solid foundation for China to embark on the path of peaceful development. The profound lessons of the "Cultural Revolution" in the past 10 years and the valuable experience of reform and opening up over the past 30 years have brought China's political ecology into a mature, stable and pragmatic period. From the perspective of national defense, after more than 60 years of construction, China's defensive national defense system has become increasingly complete, and the level of modernization of national defense and the armed forces has been continuously improved. At present, the Chinese armed forces are accelerating the transformation from mechanization to informationization, the navy has begun to move from the near sea to the deep blue, the air force has gradually changed from territorial air defense to both offensive and defensive and air-space integration, and the rocket force initially has the dual strategic functions of nuclear deterrence, nuclear counterattack and conventional medium- and long-range precision strike. The continuous improvement of the combat capability of the Chinese military has provided strength support for containing crises and winning wars, and has also provided a guarantee for China's peaceful development.

Empty space is a reflection of the ground, a profile of national interests. Peaceful development is the basic aspiration of China's security strategy and the primary choice of China's aerospace security strategy. The theme of the times of peaceful development, the cultural tradition of valuing peace, the consistent concept of peace, the basic national conditions of major developing countries, stable politics, and strong national defense determine the basic orientation of China's security strategy and the strategic path of China's peaceful development in the air and space field.

2. Strength-based, plan the advantages and accumulate strategies

Strength is the "last word". Peaceful development increases strength, military confrontation uses strength, and air and space security depends on strength. Strength is the foundation of the strategic game, the premise of social development, and the reliance of national security. China opposes a policy of strength in international affairs, but China itself must have strength, and strength competition is the basic means to gain superiority, develop superiority, and win the strategic initiative in air and space.

(1) Develop air and space hard power

Hard power is a tangible force and a "last word". Hard power is used as a strategic means of national air and space security because hard power is the basic reliance for maintaining national air and space security. To develop air and space security strength, we must first develop air and space hard power.

Develop the country's economic strength. Aerospace security is a high-investment field, and the size of economic strength determines the scale, quality and speed of the construction of national aerospace security forces. As the basic force for safeguarding national air and space security, the modernization and development of aerospace forces must be backed by strong economic strength. With the continuous increase in the price of technology and materials, the cost of developing and purchasing aerospace equipment is getting higher and higher, and without a large amount of financial investment, the construction of aerospace forces and leapfrog development are empty words. For example, the development cost of the US Air Force's F-35 in the engineering and manufacturing development stage is planned to be \$24 billion, and some estimate that the total cost of the entire project will reach \$225 billion. The US military's new generation of fighter F-22 has greatly reduced the number of original plans due to huge costs. The development of aviation power is still like this, and the cost of development, utilization and maintenance in the aerospace field does not need to be exhausted. Because of this, the Western powers that have invested in the field of air and space have entered the fast lane of the development of aerospace forces and have always been in the leading position; However, the development of aerospace forces in developing countries has always hovered at a low level due to economic constraints. China is currently the largest developing country in the world. Although major achievements have been made in economic construction since the beginning of reform and opening up, and the comprehensive national strength has been continuously enhanced, there is still a big gap between us and the goal of building a moderately prosperous society in an all-round way and realizing the "Chinese dream," and there is still a big gap compared with developed countries, especially the air and space powers. We must further develop the country's economic strength, and while continuously improving the people's living standards, lay a more solid material foundation and provide more powerful financial support for the country's management of space and space security.

Develop aerospace science and technology strength. Science and technology are important combat and national security capabilities. In a certain sense, the history of military development is the history of scientific and technological progress, and the evolution from cold weapons, hot weapons, and thermonuclear weapons to today's informationized weapons all stems from the strong and continuous promotion of scientific and technological progress, and then brings about fundamental changes in the form of war, the mode of operation, and the establishment of the system. For example, the emergence of the air force is an inevitable product of the development of aviation technology and the historical embedding of human life, while the emergence of space power is the continuation of human social competition in space. The impact of science and technology on national aerospace security is profound, and it is not subject to the will of a certain country, no matter which country # develops aerospace technology first, all other countries will inevitably be brought into a new era of aerospace security; At the same time, the strength of aerospace science and technology belongs to high-end strength, and national aerospace security needs to master the complex laws of the movement of space things, and only countries with strong overall strength and strong foundation in science and technology can show full freedom of creation and obtain reliable aerospace security capabilities. As a latecomer aerospace power, China has entered the world's advanced ranks in the field of space, but the reason why China is not yet an aerospace power is that the overall lag of aerospace science and technology is the overall lag. To revitalize China's aerospace undertakings, it is necessary to develop and accumulate aerospace science and technology strength, and only by materializing the strength of aerospace science and technology into a powerful aerospace security capability can we build a solid edifice of China's aerospace security with a strong aerospace security capability.

Develop air and space military strength. Economic development and scientific and technological progress do not mean that national defense is naturally strong or that air and space are naturally secure, but we must also have military strength that can directly act on the field of air and space security. As the materialized form and inevitable result of the development of air and space military strength, air and space military strength is the core force element of the country in shaping a favorable situation in peacetime, managing and responding to crises in times of crisis, controlling the war situation in wartime, and winning wars, and plays a key role in the struggle to maintain national air and space security and even national security. At present, the Chinese armed forces are accelerating their transformation to informationization in accordance with the requirements of "being able to fight and win wars," and their combat capabilities based on information systems have been steadily improved. We must take the strategic needs of national air and space security as the traction and information technology as the core and link to actively build a military force system that is compatible with the national air and space security strategy. In accordance with the basic requirements for the development of the national air and space security system, and in accordance with the general idea of accelerating the development of military space forces, optimizing air combat forces as a whole, and actively building an air and space defense system, we should concentrate on building air and space information perception forces, air and space command and control forces, air and space offensive and defensive combat forces, air and space information confrontation forces, and air and space comprehensive support forces, so as to continuously improve air and space combat capabilities, actively seek air and space security advantages, and at the same time protect aerospace vehicles from military threats, Maintain the existence and expansion of core national interests in vertical space and on a global scale.

Pay attention to the coordinated development of military strength and economic and scientific and technological strength. The competition of air and space strength is not only a competition of military strength, but also a competition of non-military strength, and a competition of comprehensive strength with the competition of military strength as the core. On the one hand, military means have always been the most direct and effective means to realize and safeguard national security interests, so military strength is also the most basic and important factor in realizing and safeguarding national air and space security interests. The winners of the competition generally obtain the greatest national benefits; The loser of the competition is likely to lose the benefits they should have in the subsequent confrontation. On the other hand, hard power competition is not limited to the competition of military power. In the final analysis, military strength is only the embodiment of air and space hard power in the military field, and without strong economic and scientific and technological strength, it is impossible to have strong military strength. For example, economic strength is the material basis of military strength, and if the country's economic strength is not strong, the country's military strength will inevitably be weak; Scientific and technological strength is an important support for military strength, and the supporting role of scientific and technological strength in the field of national aerospace security is particularly prominent; without strong aerospace scientific and technological strength, it is impossible to become a big and powerful air and space country, and it is impossible to occupy the initiative in the competition in the field of air and space security. Therefore, to develop the hard power of national air and space security, it is necessary to pay attention to the accumulation of air and space military strength to enhance the competitiveness of air and space forces; It is more necessary to pay attention to the development of economic, scientific and technological strength, and provide support for the accumulation and enhancement of national air and space security strength.

(2) Strengthen air and space soft power

Soft power is an invisible force and a "last word". In order to turn the historical trend of peaceful development in the field of aerospace security into a historical inevitability, China must not only be satisfied with the strength of material air and space hard power, but must attach great importance to the construction of soft power while continuously accumulating economic, military, scientific and technological and other hard air and space power. The use of soft power as a strategic means of national air and space security is because the role of soft power in national air and space security has become increasingly prominent. Therefore, we must continuously strengthen the construction of aerospace soft power, enhance ourselves through strong aerospace soft power, influence the world, and promote peace.

At present, with the development of political multipolarization and economic globalization, soft power is playing an increasingly high role in national strength, playing an increasingly important role in national security, and the competition around soft power in the air and space field is becoming more and more intense. Practice has proved that soft power is not soft, it is the embodiment of hard power; The increase in soft power will also promote the growth of hard power. As an ancient civilization in the world, China has always attached importance to the accumulation and application of soft power with "strategy" as the core. Since the founding of New China, it has always placed spiritual civilization in the same important position as material civilization.

With the advent of the information age, the scope of soft power has been continuously expanded, and the connotation has become richer, and aerospace soft power, as an important component of national soft power, has become a powerful "left hook fist" in air and space power and even national strength. Under the realistic conditions of China's expanding national interests and increasing demand for aerospace security, we must actively plan and build an aerospace soft power system dominated by the concept of space and space, with the spirit of space as the core, the support of space culture and the guarantee of space system from a strategic perspective. Among them, special attention should be paid to cultivating aerospace culture, improving the aerospace system, and striving to enhance national cohesion and international influence. The first is to cultivate aerospace culture. Inherit the excellent cultural traditions of the Chinese nation, focus on the new demands of the national aerospace culture in the new era, widely publicize the national concept of aerospace security and interests internally, and form a good atmosphere for the whole society to pay attention to air and space safety; Externally, we actively advocate the concept of harmonious aerospace security, jointly promote air-space exchanges and mutual trust, jointly establish aerospace norms and order, jointly fulfill peace missions in the field of aerospace and jointly enjoy the security and benefits brought by aerospace culture. The second is to improve the air and space system. Establish a command system, force structure and legal system conducive to safeguarding national air and space security, actively promote the integrated development and integrated application of aviation forces and aerospace forces in accordance with the management and operation mode of "air and space integration," use the advantages of "space" to enhance the efficiency of "air," and use the advantages of "air" to amplify the value of "sky". The third is to enhance national cohesion. Adhere to the road of economic and space with Chinese characteristics, give play to the special role of aerospace forces in serving national economic construction, improving people's living standards, carrying out disaster relief, and promoting social stability, guide the Chinese people to pay attention to space and support the development of space and space undertakings, and enhance national cohesion. The fourth is to enhance international influence. With a positive attitude and initiative, we will extensively participate in international aerospace security affairs, further establish the image of a peaceful, constructive and responsible aerospace power, and constantly enhance China's voice and influence in the international community.

(3) "Grasp with both hands, both hands are hard"

Hard power and soft power are the "right and left hands" for maintaining national air and space security, and must be planned in an overall way, coordinated development, and comprehensive application.

Aerospace hard power is the material basis of aerospace soft power, and without strong, authentic and credible aerospace hard power, aerospace soft power will lose its support; Aerospace soft power is the glue and multiplier of aerospace hard power, the "field effect" of hard power, the display, amplification and extension of hard power, without strong soft power, hard power will lose its soul and radiance. Matter determines consciousness, and it is always an unbreakable truth;

It is also a kind of sorrow to be powerful but not to understand the wisdom of the Tao. China's development of aerospace soft power must be promoted simultaneously with the improvement of air and space hard power, and the construction of air and space soft power must be placed on the basis of the continuous enhancement of air and space hard power. However, the most fundamental thing is to persist in taking economic construction, including national defense economic construction, as the center, and enhance China's air and space security capability on the basis of enhancing the country's economic competitiveness and realizing national defense modernization.

Realizing the coordinated development and comprehensive application of hard power and soft power is an inevitable choice to enhance the comprehensive strength of aerospace and improve its application efficiency. The country's air and space power is not the sum of air and space hard power and air space soft power, but the product, and the product is the largest only when the two are in equilibrium. The growth of a country's hard power such as economy, military, science and technology does not necessarily lead to the simultaneous enhancement of soft power such as culture, spirituality and system. To develop and apply aerospace strength, we must establish a strategic thinking on the coordinated development and comprehensive application of strength elements. Historically, a typical mistake made by some countries in developing power is to overemphasize the importance of a single element. Practice has proved that any development model that absolutely turns a single element into a single factor will inevitably lead to the perversion and deformity of national strength, or make the country unable to rise due to the constraints of the short board effect, or lead the country to the edge of danger. The real successful rise of major powers in modern history are all countries with synchronous development of soft and hard power and relatively balanced comprehensive national strength. This is true for the development of national strength and national security, as well as for the development of national air and space strength and national air and space security.

3. Confrontation is important, and preparations should be made to contain and win wars

Peaceful development is inseparable from a peaceful environment. How to maintain peace is the key to strategic choices. Although the world is safe, it is dangerous to forget the war. Ideals can be based on good intentions, and strategies must be based on dealing with the most difficult and complex situations. To maintain peace is to contain war, and when war cannot be contained, we must win war. Military confrontation that can fight and win wars, with containing and winning wars as the core, is still the most important means to defuse crises, safeguard peace, turn crises into safety, and safeguard national air and space security. This is the dialectic of war and peace, as well as the dialectic of China's air and space security strategy.

(1) Eliminate air and space threats through "containment."

Since the beginning of the new century, the world has been in the midst of profound changes.

Overall peace, local war, overall relaxation, local tension, overall stability, and local turmoil will be the basic trend of the development of the international situation at present and for some time to come, and the opportunities and challenges we are facing will coexist. Maintaining the period of strategic opportunity is undoubtedly the focus of China's security strategy, including its air and space security strategy, at this stage. The period of strategic opportunity is not equal to the period of strategic security, and threats to national security, especially national air and space security, are serious. The bitter lessons of the strategic game between weak countries against strong countries and small countries against big countries in many local wars in recent years warn us that the transformation of a peaceful situation in the air and space field into an air and space war is a process of instant outbreak and short-term confrontation. To properly safeguard the period of China's strategic opportunity, we must be highly vigilant, control and eliminate the air and space threat factors that are nurtured in peace at all times, and curb the proliferation and fermentation of the space crisis and even the war gene in the body of peace with effective military struggle.

Containment means reducing or eliminating security threats in the air and space field through active control of the key factors that trigger air and space crises and wars, preventing general air and space crises from evolving into military crises, and preventing military crises from escalating into air and space conflicts and even wars. "Containment," as one of the main forms of air and space military struggle, is more difficult and demanding than "winning." First, containment must have the strength to win the war. Only with a strong comprehensive national strength as the backing and a strong air and space military strength as the main axis can a strong balance and sufficient deterrence be formed in the air and space field, forcing the opponent to be afraid and retreat in spite of difficulties. Second, containment must be comprehensive. It is necessary to highly coordinate political, military, diplomatic, economic, legal, public opinion and other forces at the national strategic level, and form mutual cooperation and synchronization between air and space military means and non-military means, so that checks and balances can be achieved and containment can be effective. Third, containment must be scientifically planned. We must have a superb level of strategy and greater strategic skill; we must be good at grasping proportion, applying both soft and hard measures, and making vertical and horizontal moves in the strategic game between opposing sides or even multiple parties in the air and space field; we must not only stick to the strategic bottom line, but also prevent developments from crossing the border of war. Fourthly, containment must focus on deterrence. Deterrence is the basic means of curbing air-space wars, and heavy deterrence and cautious warfare are the basic principles for curbing air-space wars. Containing and delaying air-space wars through air-space deterrence and striving to "not fight and surrender" at the minimum cost is indeed a strategic move and a wise policy for China to eliminate air-space threats and maintain air-space security.

(2) Maintaining air and space security by "winning the game."

Taking history as a guide, we know the opportunity for war and peace, and the way to victory or defeat. In many cases, sum, and sum, are not available; Only by using war to contain war can we stop it. In today's era, war is constrained by more factors, and rational countries will never talk about war lightly.

China insists on safeguarding air and space peace with the greatest sincerity and doing its utmost to build a harmonious space and space, but when war is inevitable, it must dare to face war and win a war that must be won. On some key issues involving national air sovereignty and security interests, at the crucial moment when contradictions are intensified and irreconcilable by peaceful means, we must make resolute policy decisions, strike out with a heavy fist, and resolutely win the war in order to win the war and safeguard the country's security in the air and space field and ensure the country's overall security with air and space security.

Winning a war is where the functional requirements of the armed forces lie, is the direct embodiment of "being able to fight and win wars" in the air and space battlefields, and is the ultimate means to achieve and maintain national air and space security by means of military struggle at the crucial moment when containment fails and war approaches. Beginning with the air and deciding from the air is an important law of modern warfare. Winning an informationized air-space war is equally demanding and more difficult than winning a mechanized war in the traditional sense. First, it must be subordinate to politics. Air-space operations based on the air-space battlefield environment, even a military confrontation operation of an extremely limited scale, must be fought as a highly sensitive political and military battle. In accordance with the strategic requirements of the country and the actual air and space military capabilities, the political objectives of war and reasonable and feasible military objectives shall be determined. Second, we must fight the initial battle well. The main forms of air-space operations between major powers in the future will be air-space stealth warfare, man-machine coordinated warfare, network-electricity confrontation warfare, missile offensive and defensive warfare, and air-space cross-domain warfare with a nuclear deterrent background under the guidance of information. In air-space combat in the air-space battlefield environment, the initial battle can not only quickly determine the direction of the war situation, but also directly related to the outcome of the war. Once you are determined to engage in an air-space duel with your opponent, you must strike decisively, concentrate your forces, and slam suddenly, striving for a decisive victory in the first battle. Third, we must control the war situation. War is a complex confrontation full of contingencies and uncertainties, and this is especially true in air-space operations. We must adjust our strategic guidance, troop deployment, combat objectives, combat methods, and combat intensity accordingly in light of changes in the situation on the air and space battlefields, take the initiative to control the rhythm and course of war, and guide the development of the war situation in a direction favorable to our own and unfavorable to the enemy. At the same time, it is necessary to base ourselves on the most difficult and complicated situations, strive for the best possibilities, reserve a strong backhand, maintain sustained combat strength, curb intervention, and prevent the expansion and escalation of war. Fourth, we must properly end the war. The purpose of winning a war is to win peace. We must take national interests as the criterion, comprehensively consider various factors, focus on the strategic needs of the post-war period and the actual course of the war, choose the appropriate mode and timing of the final war, and closely cooperate with politics with the military and diplomacy to stabilize the post-war situation and restore a state of peace.

(3) Give play to the strategic role of the Air Force in safeguarding national air and space security

We have entered the era of space, which is an era in which aerospace forces shoulder the heavy responsibility of history and play a key role. The Air Force is a strategic service and the backbone of the national air and space forces, and its basic function is to carry out various strategic tasks through aviation, space, and information and cyberspace, safeguard national air and space security, and support the expansion of national interests. We must take the Central Military Commission's military strategic principles for the new period and the Air Force strategy as our guide, constantly strengthen mission responsibility, strengthen actual combat preparations, strengthen reform and innovation, strengthen political guarantees, actively shape the Air Force's high-position, long-range, fast, accurate, and cross-domain advantages, and build the Air Force into a modern strategic service with both offensive and defensive capabilities in air and space at an early date, escort the development of national security, and provide strong force support for the realization of the Chinese dream of strengthening the army.

To bring into play the strategic role of the Air Force, we must untie the shackles of traditional military concepts, strengthen the status and strategic functions of the Air Force of the times, and give play to the leading role of the Air Force in safeguarding national air and space security. The first is to strengthen the status of the Air Force as the "main force" and give play to the core role of the Air Force in the national air and space security joint operations. Military confrontation is the most important means of safeguarding national air and space security, and air and space military confrontation is a highly three-dimensional integrated joint confrontation, and the Air Force, with its unique military characteristics, is of decisive significance for seizing the initiative and even the right to win the joint air and space military confrontation action. The second is to strengthen the status of the Air Force as a "protective umbrella" and give play to the backbone role of the Air Force in national air and space defense operations. In the information age, the military threat facing national security mainly comes from the air and space, and the air space is precisely the field of activity of the air force, the combat space of the air force, and the main battlefield of the air force. To win air and space supremacy and safeguard air and space security, the Air Force has an unshirkable responsibility. The third is to strengthen the Air Force's status as an "all-rounder" and give play to its special role in accomplishing diversified military tasks. The Air Force is a high-tech military service, a strategic mobile force based on air and space that can quickly carry out diversified military tasks across vast geographical spaces, a strategic defensive force capable of safeguarding the security of the country's core interests, a strategic strike force capable of carrying out vertical strikes to eliminate threats instantaneously, and a strategic deterrent force capable of strongly deterring enemy threatening attempts. The strategic nature of the Air Force determines the strategic function of the Air Force that distinguishes it from other branches of the military. We must speed up the pace of modernization of the air force with a sense of urgency to seize the day, a spirit of unshirkable responsibility, and a lofty aspiration to fight against the sky, give full play to the advantages and strategic role of the air force's services, and shoulder the historical responsibility of fulfilling the diversified military tasks entrusted by the state.¹

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p341~342.

To give play to the strategic role of the Air Force, we must adhere to the strategic guidance of system victory and enhance the overall effectiveness of national air and space security through joint operations with other air and space security forces. On the one hand, air and space security activities are a state act, and the basis of the forces to maintain national air and space security is the military strength and various non-military forces of a country. In addition to the air force, air and space military forces also include the military space forces, strategic missile forces, and aviation and air defense forces of the navy and army of other services; In addition to civil air defense forces, non-military forces also include political, economic, scientific, technological, diplomatic, cultural and other forces related to national air and space security.

Although all kinds of military forces and non-military forces have different status and different roles in the practice of national air and space security, they are indispensable factors in the national air and space security force system.

On the other hand, the air and space security activities of State action dictate that air and space security operations must be a joint operation. Aerospace is a big stage, although the Air Force can play the leading role, shoulder heavy responsibilities, and pick the main beam in the action of maintaining national air and space security, but air and space security operations are not a one-man show of the Air Force, for example, the US Air Force has most of the US military's military space force and manages all US air-based and land-based strategic nuclear forces, but it has not fought alone in previous military operations, even in an air-space war like the all-out air and space forces over Kosovo. Therefore, only by placing the Air Force on the big system and stage of national air and space security, giving full play to the comprehensive role of the air and space forces of other services, such as the information support role of space-based systems, the strategic deterrent and strike role of strategic missile forces and maritime security forces, and jointly building a solid Great Wall of Aerospace can we ensure the country's long-term peace and stability in the air and space field.

CHAPTER 7 CHINA'S STRATEGIC MODEL OF AEROSPACE SECURITY

Patterns are the expression of strategy. As a typical strategic pattern formed in long-term aerospace security practice, the strategic model of aerospace security is a comprehensive embodiment of the national aerospace security strategic culture, strategic objectives and strategic behaviors in a specific historical period.

In today's world, due to the different strategic cultures, different value orientations and different strategic resources of various countries, the national air and space security strategic model has shown diversified characteristics. The US air and space security strategy and its actions are global and outward, focusing on "collective" security, forming a typical "global offensive" model; Russia is regionally focused, relatively restrained, focusing on limited response and independent security, forming a distinct "regional conservatism" model; The EU takes following strong countries as the main melody and taking independent security and collective security as its goals, forming a "limited following" model; On the basis of consolidating its existing capabilities, Japan has adopted the "active dependence" model by strengthening the Japan-US alliance; India takes seeking the superiority of a major country as its ideal goal, offensive deterrence as a realistic drive, and technology introduction to promote independent growth as the basic path, forming a strong "self-inflate" pattern.

As a major developing country, China should start by strengthening its awareness of air and space security, outlining the correct path of air and space security, optimizing the operational mechanism of air and space security, and tempering comprehensive means of air and space security, taking into account the advantages of rigidity and softness, the advantages of both attack and defense, and taking into account the security of both inside and outside, and actively build an "active" air and space security strategic model with "both rigidity and flexibility, internal and external integration, and both attack and defense" as the main content.

Section 1 Implications of the National Aerospace Security Strategic Model

If strategy is a summary of history, a grasp of the present and a choice for the future, then the strategic model is the sail that harnesses the "wind of history" on the strategic boat. It is a visual reflection of the strategic concept of the decision-making subject, a subjective response to the changing development of the current operation research object, an exploration and planning of the future strategic road, and the key to the success of the strategy.

1. The concept of a strategic model for national air and space security

Pattern, also translated as "paradigm," generally refers to a style that can be used as a model, model, or variation, or "the standard form of something or the standard form that allows people to follow it". These definitions provide a cognitive basis for us to distinguish and understand the definition of patterns, and also highlight the exemplary value of models, which is a good interpretation of the general meaning of patterns from a static perspective.¹²

In academic terminology, the meaning of patterns varies from discipline to discipline. Based on the relevant research of psychology and behavior, it is believed that the model is a model that solidifies the strategic concept through a series of specific and feasible programs, systems, etc., so as to give full play to the maximum advantages of its own resources, so as to achieve the goal of the behavior for reference; It is the theoretical schema and interpretation scheme of the subject to study natural phenomena or social phenomena, and it is also the subject's ideological system and way of thinking; The formation of the model is based on the subject's analysis and interpretation of the environmental situation, through induction and summary of the theoretical cognition with certain logical clues, relatively stable and distinctive; Pattern is the theoretical logical framework of the research object, an operable knowledge system between experience and theory, and a theoretical simplified structure that reproduces reality. These definitions are formed on the basis of a large number of analyses of human behavior phenomena, reflecting the inherent universality of behavior patterns as subjective and objective interactive behaviors, which are both subjective and objective, with distinct subject-object interaction.

¹ Ci Hai Editorial Committee: Ci Hai, Shanghai, Shanghai Lexicon Publishing House, 1989 edition, p3457.

² Dictionary Editing Office, Institute of Linguistics, Chinese Academy of Social Sciences: Modern Chinese Dictionary, Beijing, Commercial Press, 2005 edition, p961.

The representative view of economics and management scholars is that the model is "a high degree of summary and summary of practical activities, and solidified through processes, systems and forms, etc., to become the norm of the daily operation of enterprises". It is considered to be an organic derivative of "corporate culture," including the general theoretical premise of practical activities, the core ideas unique to a certain model, and the operating methods and tools of the model itself; "The (strategic) model, that is, the systematic way in which strategic resources are allocated and strategies are implemented, which includes strategic types or strategic lines, strategic structures, strategic priorities, strategic layout, strategic processes and strategic stages." The main object of these scholars is a large human organization with a clear purpose - enterprises, and the environment-oriented business competition is fierce and dynamic, and the basic purpose is to help enterprises gain advantages through the optimization of internal and external resources. It can be said that this kind of definition pays more attention to the instrumentality of the model (or strategic model), attaches importance to the supporting role of the model on the strategy itself, and attaches importance to the shaping role of the existing model on long-term goals. It is believed that the model first has a certain theoretical core, including the system and form derived on this basis, and also includes the specific working methods and methods formed on this basis, reflecting the unity of theory and practice in the construction of the model. Therefore, the model can be defined as: the subject is solidified in order to solve a class of problems based on historical experience, current internal and external environmental conditions and future goals.¹²

A specific style that is relatively stable, typical and referenced. The mode of observation and analysis must be integrated from both subjective and objective aspects, namely cognitive and behavioral levels. At present, the purpose of defining the national air and space security model is to conform to the trend of the times of the air and space security strategy, optimize China's air and space security strategic resources, implement China's air and space security strategic goals, support China's air and space security strategic guidelines, and shape China's air and space security strategic capabilities.

Based on this, the national air and space security strategic model can be regarded as a typical pattern formed by a country in the process of using national resources, shaping national air and space security capabilities, and achieving national air and space security goals on the basis of personalized interpretation of its comprehensive air and space security situation. It is the concretization and operationalization of the national aerospace security strategy, and it takes the rational understanding of the strategic situation of aerospace security as the core, including a series of relatively stable rules and programs formed accordingly, and the way of acting accordingly. This includes both the internal cognitive thinking mode of selecting or constructing an aerospace security strategy, and a certain external concretization behavior of the aerospace security strategy.

¹ Guo Jie and Chen Lifan: "Enterprise Flexible Strategic Model," Beijing, Tsinghua University Press, 2005 edition, p1~15.

² Liang Guiquan: "Development Strategy," Fuzhou, Fujian People's Publishing House, 1989 edition, p164.

2. The attributes of the national air and space security strategic model

Attributes are the inherent properties of things themselves, including the inherent, basic and inseparable properties of matter, as well as the manifestations of all aspects of the quality of things. As a model in a general sense, the national aerospace security strategic model has a theoretical hierarchy and is guided by different levels of theory. It has the function of practice and is used to guide social practice; It has relative stability and has a certain form in a certain historical period; has a clear directivity, specially designed to solve problems in the field of air and space; Wait a minute. The following attributes are more prominent or of great significance.

Typicality and variability. This is the basis on which the strategic model of national air and space security can be studied. Its root cause is the unity of the universality and particularity of the law. First of all, they come from the peculiarities of the environment and conditions in which they are conceived. The national air and space security strategic model is the independent choice of each country within a certain period of time, from its own position and with its own ability level. The selected and constructed air and space security strategic behavior mode is a distinct and intuitive embodiment of the historical accumulation, cultural inheritance and strategic intention of the strategic operation subject, and each has a different special style in the same time and space environment. The typicality of the model comes from the representativeness of the universal laws of such things, and different countries often have similarities beyond time and space in similar strategic models or the same countries in different strategic models, reflecting the striking similarity of universal laws. It is the dialectical unity of difference and typicality that converges on the same thing that makes "mode" called "mode". In-depth study of the typicality and differences of the national aerospace security strategic model can help us recognize its inherent essential attributes and universal laws. It also tells us that we should not be rigid when learning from the experience of other countries in the world, which shows the objective reality of exploring the strategic model of national aerospace security with Chinese characteristics.

Global and macroscopic. This is the most prominent attribute of the national air and space security strategic model. The strategic position of air and space security is far-reaching and has a far-reaching impact. First of all, it is endowed by the strategic nature of the country. The national aerospace security strategy model is the concretization of the national aerospace security strategy and a special manifestation of the national strategy in the field of aerospace security. As an indispensable and important part of the national strategy, it is an overall interpretation and summary of the national air and space security situation, and is part of the country's great game of economic, scientific and technological and military forces.

Second, it is determined by the operational object of air and space security. The air and space environment is far-reaching and vast, the situation is short, moving up for nine days and covering nine places below, and the air and space behavior runs through multi-dimensional spaces such as land, sea, air, space, network, and electricity, and affects the whole body. The national aerospace security strategy should give top-level design and macroscopic guidance to the practice of national aerospace security, and have the overall characteristics of overall planning from the high degree of national strategy and aerospace security. In addition, with the deepening dependence of informatization on space and the continuous appreciation of space assets themselves, space has risen to become the core survival interest of the country and has become the "Achilles heel" that affects the national power system and even the world strategic pattern.

Inheritance and prescriptiveness. This is the unification of the national air and space security strategy model in two dimensions: historical and realistic. Patterns contain the subject's cognition of objective things. As a model at the national strategic level, the national aerospace security strategic model is an extension and concrete application of each country on the basis of its own historical experience in handling international and domestic affairs. From this point of view, different countries have different understandings and interpretations of the same things due to their different historical, cultural and traditional experiences. For example, the national air and space security strategic model in the United States has a distinct Christian-Protestant salvation tradition, while Russia's national space security strategic model has a certain Slavic national color, and China's national air and space security strategic model is a profound embodiment of the harmonious thinking of Chinese history and tradition. Prescriptiveness mainly refers to the relative certainty of the overall national strategy on the national aerospace security strategy and its model requirements. The national air and space security strategy model is subordinate to the national air and space security strategy, which is an integral part of the overall national strategy in the air and space field. This attribute clarifies the pertinence of the national air-space security strategy model in terms of timing, objects and goals.

Referenceability and constructability. This highlights the practical significance of studying the strategic model of national air and space security.

The reason why patterns are also called paradigms and paradigms is because of their transfer value. When chosen correctly, the pattern of a successful person can lead to similar achievements for later learners. Mahan's "sea power theory" was formed on the basis of a summary and analysis of the historical practice of European powers in different periods of history, believing that the world trading powers have interpreted a "maritime model" of achieving national strength by seizing and controlling sea power. After being adopted by US political and military circles, this thesis was widely used to guide US political and military practice, and the United States, which sits on two oceans, has rapidly risen to become a veritable maritime power. Patterns can not only be "learned" and "taken," but also have constructability from scratch. For various reasons, in order to achieve their air and space security goals, various countries have shown a variety of models in the choice of models.

The national air and space security strategic model not only involves a high level of strategy, a wide range of objects, and generalization, but also presents further uncertainties with the development of the international air and space security situation, which makes simple repetition and reference replaced by carefully planned "tailor-made".

Section 2 Typical national air-space security strategic model

The National Aerospace Security Strategy Model is a very comprehensive concept, and from different research angles and different priorities, the National Aerospace Security Strategy Model can be separated into many different types. For example, according to different value orientations, it can be divided into external tension mode and introverted mode; In terms of means focus, it can be divided into offensive mode and defensive mode; From the selection of development path, it can be divided into equilibrium mode and asymmetric mode; From the security strategy, it can be divided into collective mode and autonomous mode; According to the size of the scope of capabilities, it can be divided into global models and regional models; From the overall strategy, it can be divided into threat based mode, limited response mode, etc. The analysis of typical national air and space security strategic models is helpful for the selection and construction of China's air and space security strategic models.

1. The US National Aerospace Security Strategic Model

The US National Aerospace Security Strategic Model is a typical cognitive and behavioral mode formed by the United States based on its strategic needs and understanding of the air and space security strategy it faces.

(1) U.S. National Awareness of Aerospace Security

The United States' understanding of national air and space security is multi-level and comprehensive, and here it mainly discusses the parts of the United States that are official and have an impact on the national decision-making of the United States. Its main forms of existence are: First, the national strategy and policy officially issued and promulgated by the US government. For example, the "National Security Strategy," "Quadrennial Defense Assessment Report," "National Intelligence Strategy," "National Security Space Strategy," "National Space Policy" and other strategic documents issued by the US government on a regular basis, which are the most important documents for understanding US air and space policy, predicting its air and space behavior, and analyzing its air and space security model.

The second is a law and regulation approved or concluded by the US government. Domestic laws such as the National Aeronautics and Space Act, the Commercial Satellite Law, the Commercial Space Launch Act, the Ground Remote Sensing Policy Act, and international conventions such as the Outer Space Treaty ratified are the direct embodiment of the US concept of aerospace governance and space security. Third, various rules and regulations related to air and space security formulated by the US Joint Chiefs of Staff and the US Air Force are formulated. For example, the "Space Combat Doctrine," the first document on space combat operations in military history, the "Joint Space Doctrine" promulgated by the US Joint Chiefs of Staff, and the "Space Confrontation Operations Doctrine" promulgated by the US Air Force have systematically clarified and explained the relevant principles, responsibilities, command and control, and target plans of specific US air and space security behaviors. Fourth, various academic materials written and published by experts and scholars in related fields in the United States and various research institutions are research opinions on aerospace security from different disciplines, angles and levels. In addition, including the relevant remarks on aerospace security made by US politicians, they represent the specific understanding of aerospace security by mainstream US political forces and are an important supplement for us to judge the strategic model of US aerospace security.

The US awareness of aerospace security prominently reflects the following characteristics: First, the country and the nation have distinct personalities. The U.S. National Space Security Policy is a reflection of U.S. national ideology and national strategy, with a distinct Anglo-Saxon white cultural tradition and Christian-Protestant salvationism, claiming to be the rule-maker and defender of air and space security behavior, claiming to fight for the "common good of all nations," but adopting a double standard of national interest supremacy in actual implementation. Second, conservatism is strong. In general, the Republican Party tends to be realistic in security strategy, while the Democratic Party is more liberal, but in the latest version of the National Space Policy, for example, although the wording has been greatly relaxed, the elaboration of national space security has been greatly reduced, the emphasis on international cooperation has been increased, and the "pre-emptive" strategy has been revised, it has still clearly stated that it will regard "interference with space systems and their infrastructure" as "infringement of national rights" and declare that various measures will be taken to "ensure." "The ability to use space to thwart attacks when deterrence is ineffective demonstrates its ability to threaten and deter." In addition, the United States has also worked hard to promote the militarized application of its air and space systems and constantly strengthen its ability to support and seize air and space superiority. Third, it is very systematic. Since the formulation of the first law in the field of air and space, the National Air and Space Law, in 1958, the United States has continuously promoted relevant international and domestic legislation in the field of air and space, with the goal of comprehensively covering all kinds of air and space behaviors. Similarly, the U.S. military was the first to develop a doctrine and organizational system for air and space operations, especially the U.S. Air Force, which has formulated a detailed doctrine system for the various space missions it may undertake and gradually perfected it.

Fourth, continuity is prominent. Since entering the space age, the United States has experienced more than half a century, more than 10 presidents, and many changes in political parties, but its core views of viewing space as a "lifeline," ensuring "free access to and use of space," and using technological advantages to maintain aerospace superiority have never fundamentally changed, and the core concept of aerospace security has been deeply rooted in the US government and the public.

(2) U.S. National Aerospace Security Acts

The behavior of the US national air and space security strategic model mainly includes: First, practical application. In fact, many wars since the 90s of the 20th century, such as the Gulf War, the Kosovo War, the Afghan War and the Libyan War, which on the surface seem to be mainly wars based on air strikes, have all involved security in the air and space fields to varying degrees. Its behavior of monitoring space flying objects and destroying its decommissioned runaway satellites is a more typical air and space safety behavior. The second is the deduction exercise. The United States is the country with the largest number and frequency of exercises in the world, and it also has the most exercises involving the air and space field, of which the "Schriever" series of exercises is the most representative. Since 2001, the US Air Force has successively conducted seven "Schriever" exercises, each of which has a different theme and focus, ranging from "highlighting the importance of space deterrence," "testing space assets," "improving joint combat capability," "improving wartime capability," "paying attention to the boundary between space and 'cyber' space," and "highlighting the importance of integrating space and 'cyber' operations," which systematically reflects the deepening of the United States' understanding of air and space security issues. The third is scientific research experiments. The United States is one of the first countries in the world to carry out aerospace scientific research, and in addition to daily aviation tests and satellite launches, deep space exploration, and manned spaceflight, US aerospace military scientific research, including anti-missile system tests and space aircraft verification flights, is of outstanding significance. Since the Clinton era, the United States has restarted and integrated its anti-missile tests, made substantial progress and entered the phase of actual combat deployment, and has made significant contributions to the X-37 B, X-47, X New aerospace platforms such as the -51 have been intensively verified. It can be said that the two wings of US air and space security defense and offensive in the future have been slowly unfolded. Fourth, the organizational structure. The United States mainly relies on the aerospace integration force with the US Air Force as the main body. In 1982, the U.S. Air Force took the lead in establishing the Space Command; In 1985, the Space Command with joint command capabilities was established; In 1993, the space combat command center under the leadership of the Air Force Space Command was established; In 1999, the Space Command, Control, Communications, Intelligence, Surveillance and Reconnaissance Center was established; In 2002, the U.S. Air Force established the Joint Office of National Security and Space;

In 2003, the U.S. Air Force established the 614th Space Squadron to protect its satellites and ground systems. In 2003, the US military merged the two aerospace and strategic commands, and gradually established and improved the "Aerospace Expeditionary Force"; In 2007, the Air Force Intelligence Surveillance and Reconnaissance Bureau was established to further integrate air and space reconnaissance and intelligence forces, forming a relatively complete organizational system.

The US air and space security behavior has the following characteristics: First, it has a strong combat character. The admiration for pragmatism is a major characteristic of the American nation, which is manifested in the security strategy, which emphasizes the actual combat use of security means. Americans believe that deterrence without combat is meaningless deterrence. It is based on this thinking that the United States continues to promote the miniaturization of nuclear weapons, and it is based on this thinking that Obama announced that the United States will be committed to promoting the "denuclearization" of the world, so that the focus of the US national security strategic forces will be fully shifted to a new type of air and space forces. The United States has spared no effort to strengthen its actual combat and militarized use in the air and space field, and its air and space deterrence has never been satisfied with staying on paper and in words. Second, it has a strong offensive nature. After the end of the Cold War, the United States became the only remaining superpower, unmatched in its national strength and international status, and pursued unilateralism of taking the initiative to attack in many fields, and its strategy was generally manifested as an offensive strategy. In the field of air and space security, during the Cold War, the starting point of the US security strategy was confrontational, and the strategic means were "large-scale nuclear strikes" and "ensuring mutual destruction"; the basic method was to ensure the effectiveness of the second offensive through quantitative and qualitative superiority. In the post-Cold War era, when the effectiveness of nuclear weapons tends to be saturated, the threshold for use continues to rise, and security threats continue to generalize, the United States has abruptly tore up the "ABM Treaty" and offset the enemy's offensive means by upgrading its air-space offensive and defensive capabilities to ensure its offensive capability. Although the liberal Obama administration has embellished Bush's "neo-offensive" space security policy to a certain extent, it has not changed the essence of the strategic offensive of the United States to ensure its "leadership" in the world. Third, it is very forward-looking. As the creator and maintainer of many "firsts" in the field of air and space, the US aerospace security strategy highlights forward-looking on the basis of focusing on practicality. From the perspective of aerospace equipment technology, the United States adopts the spiral scientific research path of equipment generation, improvement generation and pre-research generation, and is on average 20~30 years ahead of other aerospace powers; From the perspective of the air and space situation, the United States often aims in advance at the changes in the air and space situation in the next 10~20 years through simulation, exercises and other methods; Judging from the development of air and space forces, other countries in the world are either still in the stage of demonstration or in the early stage of repeated adjustments, while the organizational system of the US aerospace security forces has matured.

(3) The U.S. National Air-Space Security Strategic Model and Its Characteristics

To sum up, the US national aerospace security strategic model is a typical "global offensive" model, which is mainly reflected in different aspects such as active outreach, emphasis on offense, balanced and comprehensive, collective security, global focus and capability-based.

The value-oriented active outreach model refers to the fact that in the decision-making and implementation of the national air and space security strategy, the United States mainly focuses its strategic vision and strategic focus on the external part of the country, and seeks a national air and space security strategy to maintain its own security by expanding its interests beyond its territory (territorial land, territorial waters, and airspace). With the continuous development of American capitalism, especially after the war, the United States has jumped from a "second-rate" country to a superpower that dominates the world, and its strong desire and impulse to expand outward and seek benefits are restless all the time. As for the air and space field, in the 80s of the 20th century, the "high frontier theory" was thrown out, and the "Star Wars" program was concocted, which clearly advocated that space security should be included in the scope of human national security, pointing out that it is necessary to seize the new virgin land of space without losing time and fighting for and defending the right to dominate space. Its outward mode of air and space security value orientation is a concrete embodiment of the national character of the United States and a true portrayal of the hegemonic mentality.¹

The offensive mode of focusing on means refers to the fact that the United States has prominently demonstrated its importance to and reliance on offensive means in terms of national air and space security behavior and air and space security capacity building. Foreign expansion runs through the entire process of the formation and development of the United States and its nation, and offensive strategy is a habitual behavior of the United States. At the beginning of the aerospace era, when aviation power was dominant, the United States sought and maintained a large-scale offensive force dominated by long-range large aviation platforms, and established the world's largest strategic bomber fleet; In the period when space power was emerging, the United States actively sought to obtain the ability to view the world from a high and distant space, and the integrated air-space long-range precision strike force was booming; Today, when it already has absolute superiority in space, the United States is still struggling to find a new generation of ultra-mobile, ultra-long-range, and high-performance air and space offensive technology. Its enthusiasm for "means of denial" and the reduction of nuclear weapons is nothing more than to break the nuclear balance among major powers in the near future and re-imprison the world under the sharp pawns of its air and space offensive; its essence is to support strategic offensive with technological defense, and its purpose is to break through the status quo that the strategic offensive of major powers tends to be saturated, and to achieve "zero" of the enemy's strategic offensive capability through "offsetting" the enemy's strategic attack means.

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p169.

The balanced model of development path refers to the more comprehensive and sustained development route adopted by the United States in different historical periods and different development directions relying on its strong national comprehensive strength, especially the far leading science and technology in the aerospace field. After the end of World War II, from strategic missiles to artificial satellites,

From "Apollo" to "Star Wars," the United States has never been left behind. In particular, during the bipolar confrontation between the United States and the Soviet Union, the United States was even more in confrontation with the Soviet Union in the field of air and space, striving to have no enemy and me, the enemy to have superiority, and the enemy to be superior to our new, and never spared manpower and material resources for the basic sciences, core fields, and key technologies involved, thus eventually dragging down the Soviet Union. After the end of the Cold War, the United States spared no expense in the field of aerospace research, relying on its economic and technological foundation to do its best to support the pre-research, verification and equipment of various directions, technologies and platforms.

The collective model of security strategy refers to the fact that the United States has outstanding alliance strategy and collective security characteristics in seeking security strategy in the air and space field, and seeks to jointly resist air and space security threats through multilateral or bilateral cooperation at the international level. Based on multilateral common interests, it is the common practice of the United States in the field of security to seek cooperative defense and risk sharing through the construction of a collective security mechanism. This approach is of great benefit to U.S. air and space security. First, isolating opponents and adopting a collective model helps to win the political initiative. Secondly, the aerospace field costs a lot of money, such as the International Space Station, advanced fighters, etc., in the case of conservative core technologies, they often share risks evenly through international cooperation and strengthen financial and technological advantages. Finally, the air-space domain is of special significance, the air-space struggle is changing rapidly, and having a wide range of allies is of great significance to the United States to expand the depth of its security strategy.

The global model in the scope of capabilities means that the United States has always taken global capabilities as a strategic background in the process of seeking air and space security, and has always taken global capabilities as an indicator in the goal of building air and space security capabilities, and has initially acquired this capability. In fact, the thirst for global power has always been a stubborn disease that hegemonic powers cannot get rid of. In the 16th ~ 19th centuries, Spain, the Netherlands, Britain and other countries respected the power of the sea; In the middle and late 20th century, the obsession of the United States and the Soviet Union with strategic bombers and intercontinental ballistic missiles is a portrayal of history. Today, the US Air Force, as the main body of its air and space forces, has more than 10 aerospace expeditionary forces, nearly 200 strategic bombers, more than 600 tankers and more than 1,000 transport aircraft; as the "first global, full-dimensional mobile force," the US Air Force has initially realized the strategy of "global vigilance, global arrival, and global strength," and will safeguard national security by "dominating and using aviation, space, and cyberspace." Global capabilities are both a direct embodiment of the value of U.S. aerospace security and a realistic support.

Capability-based model on strategic base points. After the collapse of the Soviet Union, because the United States cannot accurately predict with whom, where, and what kind of war it will fight with, this situation will run through the decades of adjustment of the international strategic pattern from now. In response to this dilemma, the United States has adjusted its strategy to focus on development and building an overwhelming superior capability that can defeat any challenger, the so-called "capability-based." Its main way is to establish absolute superiority, the main body of its superiority is military means, and the core of its means is air and space forces. In particular, in the face of the challenge of a potential power that is neither friend nor foe, the United States will pay attention to relying on new technologies and "resolutely countering" by seeking to develop "comprehensive capabilities" of air and space offensive and defensive capabilities. In fact, during the Bush Jr. period, the United States made it clear that it would no longer rely on a strategic balanced framework for ensuring mutual destruction and large-scale retaliation, and would resolutely terminate the "Anti-Ballistic Missile Treaty" and speed up the deployment of the missile defense system. Obama's announcement in Prague Square that the United States will reduce and eventually achieve "denuclearization" while non-stop stepping up the construction of a new type of air and space offensive force is essentially a further negation of the existing air-space balance framework. Marked by the initial completion of the missile defense system and the successful test flights of new air and space platforms such as the X-37 B, the United States has successfully integrated its air-space defensive deterrence capability and air-space offensive forces, and its air-space superiority over other major powers has taken shape.

2. Russia's strategic model of national air and space security

Russia's national aerospace security strategic model is a typical cognitive and behavioral mode formed by Russia based on its strategic needs and understanding of the aerospace security strategy it faces.

(1) Russia's national awareness of air and space security

We also discuss Russia's perception of national air and space security from three aspects. First, the Russian government officially promulgated national strategies and policies. The main ones are "Concept of National Security of the Russian Federation," "Military Doctrine of the Russian Federation," "Concept of Foreign Policy of the Russian Federation," "National Security Strategy of the Russian Federation," "National Security Address of the President" and so on. The second is the laws and regulations promulgated and concluded by the Russian government. Different from the US sub-law integrated legislative model, Russia's legislation on aerospace activities mainly adopts a parent law-led model. At present, the parent law for space activities, represented by the Law on Space Activities, has been initially formed.

Russia has more than 200 departmental rules and regulations on space activities, covering all specific links and contents of national space activities, and is a relatively complete normative system, including the management, licensing, registration, protection, responsibility, promotion and other aspects of aerospace-related activities. International conventions concluded include the Outer Space Treaty, the Rescue Agreement and the Liability Convention. After the "9/11" incident, Russia's national security policy also made rapid adjustments and paid timely attention to air security. In view of the fact that civil aircraft do not apply for take-off, do not comply with requirements when flying, and do not notify and contact light aircraft when flying, 12 types of aviation laws have been formulated and relevant departments are required to strictly implement them. A number of measures have also been taken to further strengthen cooperation with the neighboring CIS countries in the area of air safety. The third is various rules and regulations related to air and space security formulated by the Russian state and military. Although Russia is still in the exploratory stage of reform of its aerospace forces, there are many uncertainties, but its relevant rules and regulations have preliminarily defined and standardized the behavior of the Russian armed forces under relevant security conditions, and its basic path and means are to achieve comprehensive air-space security by building an integrated air-space defense system of air defense, anti-space and anti-missile defense in the capital and surrounding areas. The fourth is the views and views expressed by well-known Russian scholars and think tanks on national aerospace security-related institutions.¹

Russia's awareness of aerospace security has the following characteristics: First, it is closely related to the situation of the Russian state. There was no concept of a "national security strategy" in the Soviet theory of national security. Russia's "national security strategy" was gradually formed after constantly adjusting and improving its security policy in accordance with the new security environment and the needs of national interests. With the dissolution of the Warsaw Pact and the parting of the Soviet republics, Russia's geopolitical environment has seriously deteriorated, losing about 2,000 kilometers of strategic depth and facing destructive challenges from the international and domestic security structures. However, due to the active implementation of a pro-Western "one-sided" policy at the beginning of Russia's founding, national security, including air and space security, fell victim to overtures to the West, and the rich air and space "legacy" was sharply reduced. The proper place of air and space security in national security has almost been "forgotten," and air and space assets have even become to a large extent Russia's "chicken ribs" for "tasteless food and discarded pity". The GLONASS system was not replenished in time, the Mir orbital space station was finally allowed to crash due to disrepair, and a large number of strategic aerospace resources in the Soviet era were destroyed, abandoned or idle. Due to the fundamental conflict between this security policy and Russia's national interests, Russia soon put forward the "Concept of National Security of the Russian Federation" and officially embarked on the road of seeking rejuvenation.

¹ Jia Qiulan and Wu Guili: "'9.11"Russia's Initiatives to Strengthen Air Security after the Incident," Foreign Air Force Training, 2004, 2, p21~23.

By the late Yeltsin era, the main goals of Russia's national security were to ensure the stability of the domestic economy, consolidate the political system, and gradually restore military power, and did not pay much attention to the air and space field. In the Putin era, Russia has begun to show signs of rejuvenation, the concept of national security has begun to adjust, and the national security strategy has taken shape, clearly pointing out in terms of reducing strategic weapons: "Some major powers have increasing superiority in weapons and equipment, and the new generation of weapons and military technology and equipment developed by them may lead to a new stage in the arms race and fundamentally affect the form and mode of military operations." It marks the revival of Russia's awareness of aerospace security. In the Medvedev era, Russia has "overcome the consequences of the systemic crisis in the political and socio-economic fields caused by the collapse of the original Soviet Union" and classified the development of other major powers, including high-tech weapons, non-nuclear strategic weapons, unilateral establishment of a global anti-missile defense system, militarization of near-Earth space, and the destruction of the stability of state management and military command systems, missile early warning systems, and space supervision systems, as traditional security issues that threaten the territorial integrity and military security of the country, ranking first. It reflects Russia's extreme concern for air and space security.¹²

Second, the characteristics of the slave attribute are obvious. Throughout the formation and development of Russia's national security strategy, domestic economic and political security has always been the focus of its attention, and other security strategies are in a secondary or subordinate position. In particular, air and space security issues have not been explicitly listed as the core element of national security, and have not even formed an independent concept of air and space security similar to the United States, but in essence they are only regarded as the next level of strategy in the game of great powers. On the one hand, this is closely related to the actual environment in which Russia finds itself at home and abroad, on the other hand, it is also inseparable from Russia's international positioning, and of course, there are also some technical factors that enable Russia to respond to the superpower's air and space provocations in the "most cost-effective way". Third, contradictions are prominent. There are multiple contradictions in Russia's national perception of air and space security. At this stage, Russia does not want to engage in a comprehensive air-space security confrontation with the United States, but it has to strengthen the construction of the air and space system. Russian military doctrine has clearly regarded the militarization of space and the expansion of the use of space weapons by the United States as one of the main threats facing Russia, and proposed to establish and improve the Russian Federation's air and space defense system, but in actual actions it has constantly strengthened its offensive forces with nuclear as the mainstay; the root cause of this contradiction is the gap between Russia's national air and space security goals and its actual air and space security capabilities. On the specific building of air and space security forces, there are also many different views and views within Russia and the Russian military.

¹ Xue Xingguo: "Russian National Security Theory and Practice," Beijing, Shishi Publishing House, 2011 edition, p145.

² <http://www.Cetin.net.cn/Cetin2/servlet/Cetin/action/HtmlDocumentAction?baseid=1&docno=385648>.

(2) Russia's national air and space security behavior

The behavior of the Russian national air and space security strategic model mainly includes three aspects. First, practical application. In recent years, Russia's activity in the air and space field has been declining, and its use of air and space forces to maintain national security accounts for the overwhelming majority, and its actions directly for the purpose of air and space security are relatively small. For example, the use of space-based reconnaissance and surveillance systems and air-based weapon platforms to combat domestic terrorist organizations and support small-scale military operations belong to the former. It is worth noting that in the face of NATO's air-space encirclement, Russia has carried out frequent launch activities in a targeted manner and deployed the "Iskander" campaign tactical missile system. At the same time, Russia is also vigorously developing new-type strategic nuclear forces. In 2010, Russia successfully tested two sea-based Bulava missiles. But in 2011, Russia suffered a total of 5 space launch failures and lost 7 spacecraft, making it the most failed year in recent years. At the same time, Russia has continuously optimized and adjusted its air and space defense forces, and has begun to establish a "national air and space defense system" that "integrates air defense, anti-missile and space defense," striving to change the original situation of dispersion and inefficiency of air and space defense forces. However, the decline in the overall strength of the country and the lack of new air and space means still have a huge impact on Russia, and many signs indicate that Russia's behavior and policy in the field of air and space will not change significantly in recent years. The second is exercise testing. Since the collapse of the Soviet Union, Russia's civil space and space research has been greatly reduced, and even space military research has shown signs of decline. The related tests mainly focused on the testing of new long-range delivery vehicles. In particular, under the pressure of NATO's eastward expansion and the United States' stepping up the development of new air-space offensive weapons and the deployment of anti-missile systems, Russia's continuous verification and testing of new strategic missile penetration technology in recent years has become its most important exercise test. In addition, after experiencing the failure of Mig-1.44, S-47 and other models of exploration, Russia is still actively conducting tests of a new generation of advanced aviation combat platforms, although the technical and tactical level of the T-50 is still unknown, but Russia is still a representative force in the field of aerospace security that cannot be ignored. The third is the organizational structure. The organizational structure of the Russian Aerospace Security Forces has been in the process of dynamic adjustment. In 2011, the Russian army formed an air and space defense force, and the newly formed air and space defense force was composed of all the former aerospace forces and the weapons and forces under the air force air and space defense campaign strategic command. The Aerospace Defense Command is the Strategic Command, which has jurisdiction over the Space Command, the Air Defense and Missile Command, and the Plesetsk State Cosmodrome. In August 2015, the Russian army merged the air force and the air and space defense forces to form a new service, the Aerospace Force. The new Aerospace Forces appear in the sequence of the Russian military as a branch of the military, will directly participate in air-space operations, and will be the main force in future air-space security operations.

Russia's air and space security behavior has the following characteristics: First, it highlights deterrence. Thanks to breakthroughs in anti-missile technology and new means of air and space offensive, the original strategic balance between the United States and Russia has been broken and substantially changed. With the gradual recovery of Russia, Russia has never stopped the construction of its air and space forces while constantly showing its tough attitude, and has strived to maintain the balance of the air and space strategic posture by asymmetric means through the establishment of air and space defense forces. In addition, Russia has also strengthened its air and space deterrence effect by lowering the threshold for the use of nuclear weapons, constantly declaring its determination to use nuclear weapons, and actively testing new types of penetration technology. It can be said that Russia's national security, including aerospace security, is built on the cornerstone of traditional, nuclear-based and limited deterrence. The second is to focus on defense. Compared with the US strategic model of air and space security, which is mainly offensive, Russia's air and space security strategic model reflects more defensiveness. The limited strategic purpose is mainly to support the inherent rights and interests of the country through air and space security, and the expansion is less; The defensive nature of strategic means, with air and space defense as the main and limited offensive as the supplement, is the essence of Russia's air and space security means at the current stage. Third, pay attention to practical results. Although Russia is also aware of the great significance of air and space competition, limited by various factors at home and abroad, Russia is temporarily unable to support the huge consumption of an air and space arms race, and the experience of "Star Wars" has also forced Russia to highlight economy and effectiveness in various aspects such as the selection of scientific research projects, the choice of strategic means, and the construction of strategic forces.

(3) The strategic model of Russia's national air and space security and its characteristics

Different from the US national aerospace security strategic model, the Russian national air and space security strategic model is a "regional observance" model compared to the United States and the Soviet era, which is mainly reflected in different aspects such as restraint, heavy defense, asymmetry, autonomous security, and focusing on regions and limited response.

A restrained model of value orientation. The so-called "restrained" strategic model refers to the fact that in the decision-making and implementation of the national aerospace security strategy, the strategic vision and strategic focus are mainly focused on the internal part of the country, subjectively lacking the desire and impulse to expand interests in the air and overseas for various reasons, and there is basically no strategy and action that can expand above and beyond the traditional territory in national security practice. In fact, the Soviet air-space strategy was, to a large extent, hegemonic outward in opposition to the United States.¹

¹ Li Xuezhong and Tian Anping: *The Theory of National Aerospace Security*, Beijing, People's Liberation Army Press, 2010 edition, p171.

After the collapse of the Soviet Union, revitalizing the status of a world power and reconstructing the world's pivotal pole has always been the overall goal of the national security of the Russian Federation. In recent years, especially since Putin took charge of Russia, Russia has gradually overcome the impact of the comprehensive regression of economic, military and political strength brought about by the collapse of the Soviet Union, and has shown a relatively strong momentum of recovery. However, paying attention to domestic political stability is still the focus of its national security strategy at present and in the future, forming a national security concept including individuals, society, and countries, and its focus on air and space security is also based on the derivation of this national security concept. These strategic characteristics are also reflected in the choice of Russia's national air and space strategic model, making its current national air and space security strategic model have passive and restrained characteristics.

The means focus on the defensive model. Unlike a series of offensive security strategies with a strong smell of gunpowder, such as the United States announcing its unilateral withdrawal from the "ABM Treaty" and deploying missile defense systems in NATO countries close to Russia's borders, Russia's national air and space security strategy has generally shown a relatively obvious defensive nature. In view of the real threat of the United States speeding up the development of missile defense systems and space-based weapon systems, Russia has focused on strengthening its air-space defense construction, actively developing and perfecting the theoretical system of air-space defense, including air defense, anti-missile defense, and space defense, and deploying its independently developed national air-space defense system in stages in practice. However, in the face of the aggressive US air-space offensive, Russia's air-space security policy tends to be conservative, and on the basis of abandoning its "no first use of nuclear weapons" commitment, it further strengthens the status and role of nuclear weapons in national security and actively seeks more advanced long-range strategic strike technology. These technical and tactical offensive actions are only Russia's helpless moves to take offense as defense and have no choice, and have not changed the overall situation of the United States being strong and Russia weak and the United States attacking and defending Russia in the air-space game, nor has it changed the defensive nature of Russia's air and space security strategy.

Autonomous mode on security policies. For various reasons, the collective security system of the USSR has collapsed. Not only the original Warsaw Pact members joined NATO, but even many former Soviet Union members have already stood in the NATO camp. Although Russia still maintains a certain collective security mechanism, it mainly adopts a self-oriented model in the field of air and space security. The collective model of the United States and the autonomous model of Russia have their own advantages and disadvantages. Although the autonomous model cannot enjoy the "shareholding system" dividend brought by the collective model, it does not need to bear too many responsibilities and obligations, and has certain advantages for countries with a certain technical foundation and strategic depth: in peacetime, it is convenient to coordinate and effectively use domestic resources, achieve breakthroughs as soon as possible in a certain period and in a certain direction, and form a national chess game; In a crisis situation, it helps to prevent multiple orders and delays, which is of practical significance for improving the decision-making and operational efficiency of air and space safety.

Asymmetric patterns on the development path. During the Cold War, the Soviet Union often adopted a strategy of all-round confrontation in its confrontation with the United States, trying to maintain a basic balance in quality and quantity with potential enemies and engaging in head-on confrontation and confrontation that was evenly matched. Although today's Russia has gradually emerged from the haze of the collapse of the Soviet Union, the status of superpower on an equal footing with the United States no longer exists. Represented by its strength building, it will take balanced development as the guideline and highlight the key points of development; Take independent and moderate development as the goal, and do not "symmetrical competition" with powerful countries; Taking step-by-step and planned development as the keynote and promoting development with reform can be summed up as taking the road of "asymmetric response".¹

Regional patterns on the scope of capabilities. In fact, Russia is still the world's air and space power second only to the United States, and its air and space security capabilities can fully achieve global coverage. However, due to the decline in its national positioning and the shrinking of national interests, Russia's subordinate national aerospace security strategy has also been adjusted accordingly, mainly focusing on providing support for domestic security and security in the CIS region. At present, the United States and NATO are constantly encroaching on Russia's strategic space, stepping up the deployment of missile defense systems in Eastern Europe, prompting Russia to strengthen the collective security of the Russian-Belarusian alliance and the CIS to jointly deal with the air and space security threats facing the CIS region. However, from its overall defensive and relatively regional nature, it can be considered that Russia's national air and space security model is still mainly a regional model.

Limited response model in overall strategy. Limited response refers to Russia's mainly passive, defensive and relatively limited means and measures to maintain its air and space security in the face of air and space threats and challenges. The United States believes that space is the commanding height of human space, and in order to ensure its freedom of movement while restricting the freedom of movement of the enemy, the United States should control the air and space. Therefore, the United States advocates making all-out efforts to develop air and space forces, seek absolute air and space superiority, and consolidate global air and space hegemony. Russia, as the second largest space power after the United States, "rightfully" becomes a competitor of the United States in the field of air and space. In the face of the step-by-step pressure of the United States, Russia will naturally not sit still. Russia responded by the frequent development of air and space weapons by the United States, especially the high-profile announcement of the formation of an air and space defense force shortly after the test flight of the X-37 B. The tree wants to be quiet, but the wind does not stop, the mermaid is unwilling, and the all-round confrontation is beyond its strength, which has become a true portrayal of Russia's air and space security strategy. As Medvedev once publicly stated: "Russia will adopt the most cost-effective way to deal with the US anti-missile system and global strike system, etc., and will not participate in a new arms race," limited response has become the overall strategy of Russia's air and space security.

¹ Xue Xingguo: "Russian National Security Theory and Practice," Beijing, Shishi Publishing House, 2011 edition, p296.

3. The strategic model of air and space security of the EU and other countries

As the two major powers in the world in the air and space field today, the characteristics of the strategic model of air and space security are relatively clear. With the development of the world economic and political pattern and the spread of aerospace technology, many countries, especially many developing countries, have also joined the competition in the aerospace field, and the national aerospace security strategic model they choose and form according to their own conditions also has their own different characteristics.

(1) The EU model

The EU is a regional integration organization formed by 27 European countries, including France, Germany, Britain and Italy, which integrates political and economic entities. With the development and evolution of the international political and economic landscape, Europe is increasingly inclined to appear on the international stage as a "common voice". The establishment of ESA in 1975 marked a substantial step towards the formation of unified space projects, programs and policies in Europe. In January 2003, the EU launched the Green Paper "European Space Policy," and in November it produced the white paper "Space: a new European frontier for an enlarged alliance". After 9/11, the European Summit and the Council of Ministers asked the European Commission to push for legislation to establish uniform aviation security standards across Europe. In 2011, EU regulations and the European Parliament submitted their first draft regulations. In 2002, EU Regulation 2302/2002 was promulgated to establish uniform aviation security standards, followed by a number of regulations to form a complete system of aviation security regulations and standards. In 2004, the European Space Council was formally established to define the principles and guidelines of European space policy. In 2005, the EU began drafting a European Space Policy and adopted the European Space Policy in May 2007. But because the space powers that determine Europe's space industry have major differences in space research and applications: France wants to seek more autonomous industrial and military capabilities for Europe; And Britain prefers to proceed with the United States to consolidate the special relationship between the United States and Britain; Other EU countries have made commitments to NATO to develop military applications in space, increasing NATO's military capabilities and thus increasing European security. This would make it difficult to achieve a unified and coherent European space policy.¹²

¹ Diao Weimin: Aviation Security, Beijing, Civil Aviation Press of China, 2008 edition, p144.

² He Qisong: "A Brief Analysis of European Space Policy," European Studies, 2009, 3, p119~126.

In addition, due to the special nature of the EU itself, there are differences in the level and priority areas of aerospace technology among its member states, the management methods of aerospace scientific research projects and development plans are different, and the sources and structure of funds are relatively diverse. These realities have led to the EU's obvious lack of confidence in space policy, and its aerospace security strategy has two characteristics: First, it pays attention to promoting collective security. As a supranational organization, the EU's air and space security requires the participation of every member state. It is precisely because of the confusion of the concept of air and space security in the EU, the lack of air and space security institutions and the shortage of air and space security capabilities that the EU has continuously increased its efforts to promote the formation of a unified European air and space security strategy and policy, through the issuance of the European Aerospace Policy and the "Unified Aviation Security Standards" and a series of specific EU regulations specifically aimed at air and space security, organizing the European Civil Aviation Congress and other international institutions with the participation of European countries. Vigorously develop different forms such as landmark space projects to promote the formation of a European aerospace collective security mechanism. In addition, European scholars not only believe that it is necessary to establish a European collective air and space security mechanism, but also believe that the formation of international collective security in the field of air and space can be promoted by strengthening cooperation with China, Russia, India, Israel and other countries. The second is dependence on and following the United States. For many reasons such as history, politics, culture and reality, European countries have a very close and special relationship with the United States. Especially in the field of international security, which has a huge impact, European countries mostly follow the basic line to follow the United States. Represented by the Libyan war, several recent local conflicts have once again demonstrated the huge gap between Europe and the United States in terms of air and space military capabilities and its heavy dependence on it. As far as space security is concerned, because Europe has limited military capabilities in space and has no bargaining capital, the United States refuses to discuss the use of space and space security with Europe in depth within NATO. In addition, the special political relationship between European countries and the United States makes the EU's air and space security strategy more or less bear the traces of following the United States. However, an independent Europe will inevitably need its own air and space security strategy, and Europe is actively developing aviation combat platforms and space technology forces with completely independent intellectual property rights, constantly increasing independent scientific research efforts or jointly developing aerospace capabilities with countries other than the United States, and this trend will become more and more obvious with time. This is also an advantage that other countries seeking to establish a new space security landscape can take advantage of.¹

¹ Rebecca E. Johnson, Weaponisation of Space and Threats to European Assets Supporting ES-DP, Committee on Foreign Affairs Subcommittee on Security and Defence Public Hearing on the Contribution of Space to ESDP. 2 May 2007, ASP, European Parliament. P.5, http://www.europarl.europa.eu/hearings/20070502/sede/Johnson_en.pdf, Quoted from Cheng Group "European security policy: perceptions, actions and obstacles," German Studies, 2010, 1, p3541.

Generally speaking, the EU's strategic model of aerospace security is a "limited follower" model with follow-up as the main theme and autonomous security and collective security as the ultimate goal.

(2) The Japanese model

As a defeated country in World War II, Japan's "Peace Constitution" stipulates that its military strength can only be maintained at the level necessary for self-defense, making Japan's national security strategy dependent on the United States for a long time, and making the Japan-US military alliance the cornerstone of Japan's security. During the Cold War, the United States relied on the Japan-US alliance to politically prevent Japan from falling into the socialist camp, militarily using Japan as the eastern bridgehead of the Cold War, and incorporating Japan into its own security system. With the end of the Cold War, the Japan-US alliance has been strengthened rather than weakened. In 1990, Japan and the United States issued the "Japan-U.S. Joint Declaration on Security and Security," which held that the Japan-U.S. security system is indispensable to Japan's security and the stability of Japan's surrounding areas, and that the Japan-U.S. security treaty is the core of the Japan-U.S. alliance, the cornerstone of Japan-U.S. interdependence, and the basis for Japan-U.S. cooperation on global issues. In 1997, the Guidelines for Defense Cooperation were revised to put forward three major cooperation mechanisms between Japan and the United States: cooperation in peacetime, cooperation in times of events in Japan, and cooperation in the event of peripheral events, and detailed the timing and means of jointly coping with Japan's peripheral events. With the end of the war on terror and the eastward shift of the U.S. strategic center of gravity, the goals of the Japan-U.S. alliance have undergone further subtle changes. For Japan, it is first necessary to rely on the U.S.-Japan alliance to ensure Japan's security; The second is to use the Japan-US alliance to contain regional crises; Finally, relying on the Japan-US alliance to reshape the international order. Out of its global security strategy and the need to contain emerging regional powers, the United States has made full use of its psychology of seeking security and restoring its status as a political power, and hit it off with Japan and firmly tied it to the US strategy in Asia. Therefore, although Japan has become a world economic and political power after decades of development, accumulating strong scientific and technological strength, and even possessing Asia's first-class military strength, Japan has always pursued a security strategy dependent on the United States, and the field of air and space security has also deeply laid this imprint. Represented by air and space military security, first, the core forces used by Japan to maintain air and space security have the "direct" blood of the United States.¹²

¹ Qu Xiangli and Sheng Xin: "The Strategic Evolution and Prospect of the Role of the Japan-US Alliance after the War," Military Academia, 2012, 2, p17.

² Qu Xiangli and Sheng Xin: "The Strategic Evolution and Prospect of the Role of the Japan-US Alliance after the War," Military Academia, 2012, 2, p17.

Whether it is its land-based "Patriot" missile or the sea-based "King Kong"-class "Aegis" system, it has been imported from the United States. Although Japan has some construction capacity, the core technology is still in the hands of the United States. Not to mention the F-16 and F-15, which are the backbone of Japan's air security forces, and as for the future F-35, Japan even actively provides "financial support". Second, Japan's air and space security operational mechanism is deeply constrained by the United States. According to Japan's "Peace Constitution" and the U.S.-Japan Security Treaty, Japan can only maintain a limited number of air self-defense forces, and for a long time the US military stationed in Japan was the "first responsible person" for Japan's national security, including air and space security. In 1998, North Korea's "Taepodong" ballistic missile tested skies over Japan, and Japan can only rely on data provided by US spy satellites to track North Korean missiles. Of course, Japan has become a country with both optical and radar imaging satellites after the United States and Russia by virtue of its technological superiority, and its air-space reconnaissance and surveillance means are unique in Asia. In recent years, Japan's Air Self-Defense Force has even preliminarily built a "defense on the ocean" system, which integrates territorial air defense, ocean-going air defense, land air defense, maritime air defense, and missile defense, and is composed of five parts: reconnaissance, early warning, command and control system, peripheral air defense interception system, regional air defense interception system, point air defense system, and air strike system. But Japan did not mean to get rid of the United States. It is worth noting that in addition to continuously improving the US-Japan air security mechanism, Japan also pays special attention to space security. In February 2013, the United States and Japan agreed at their summit that "space is an important area of cooperation between the two countries related to security and economy" and that space cooperation is part of measures to strengthen the Japan-U.S. alliance. In March 2013, the two sides signed a space situational awareness cooperation framework, exchanged information on their respective space policies, and held extensive discussions on further cooperation in positioning, navigation and timing services for GPS and Quasi-Zenith, as well as cooperation in Earth observation, data exchange, space science, space situational awareness and space security. On March 7, the two sides also signed a tentative agreement on the legal framework for U.S. provisions for providing space situational awareness services and information to Japan, reaffirmed interest in the use of space for maritime domain awareness, and pursued a "transparency and confidence-building mechanism" in space activities, including the proposed International Code of Conduct on Outer Space Activities. At the same time, Japan and the United States have further strengthened bilateral surveillance and reconnaissance cooperation in the use of unmanned and manned reconnaissance aircraft against air and ground (sea) targets.

To sum up, although in recent years there has been no obvious intention to expand and offensive actions have frequently appeared, on the whole, its air and space security strategic model is still a model characterized by "active attachment."

It is foreseeable that in the future, Japan will continue to consolidate the Japan-US alliance on the basis of further strengthening its own air and space security capabilities, and its "active dependence" model for air and space security will continue.

(3) The Indian model

India is a large developing country with a strong nationalist color, a tradition of expansion, and an active pursuit of world power status. Successive governments since India's independence have regarded enhancing its international influence and seeking world power status as the main goals of their national strategy, and the aerospace domain is considered an indispensable part of India's becoming a "world-class power". The Indian Air Force has more than 120,000 troops and more than 1,300 combat aircraft, known as the world's "fourth largest air force". With the rapid rise of economic strength in recent years, India's space strategy has become more and more "ambitious," which is based on supporting a strong country and a strong military, and has the characteristics of huge investment, clear goals, attention to foreign aid, and strong military color. In order to realize its dream of a great power, New Delhi has long shown great interest in the space domain. After the 1962 border conflict between China and India, the Indian government decided to expand the air force to 45 flying squadrons, and later to 39 fighter squadrons, which it has maintained to this day, with the main idea of seizing air superiority in another contest with China. In the same year, India drew up a space development plan, established a rocket launch station in Samba, and launched its first rocket the following year with the assistance of the United States; In 1965, India established a space research center and satellite communication station; In 1975, the first artificial satellite was successfully launched with the assistance of the Soviet Union; In 1980, India successfully launched its first Sputnik on a domestically built rocket. In 2007, India successfully launched and reclaimed a capsule for the first time. Indian Air Force Chief of Staff Naik once stressed that the Indian Air Force should prepare for a "multi-dimensional space, multi-directional, multi-front war," "our scope of responsibility covers the fields from the Strait of Hormuz to the Strait of Malacca and beyond," and "we must build the Indian Air Force into a powerful strategic space force in the next 5~7 years".

India's national security strategy derived from "India-centrism" is the core of India's strategic culture, "domination of South Asia" is its preferred goal, and "domination of the Indian Ocean" is its long-term intention. However, the reality of developing countries has seriously restricted India's "dream of a big country," coupled with its special geographical position, India has repeatedly played the pawn of the strategic balance of world powers, left and right, and profited from it. In the field of air and space, India actively uses the help of the United States and Russia to seek to become an air and space power.

At present, India has become a world aerospace power after the United States, Russia, Europe, China and Japan, with two spacecraft launch sites, a total of more than 15,000 research organizations, with the ability to systematically develop, manufacture, launch, control and recover spacecraft, has a relatively complete space organization, and has established a relatively complete set of aerospace system. The second is duality under the slogan of peace. The Indian government has repeatedly vowed that its space undertakings are exclusively peaceful. But the Indian military has not shied away from its strategic ambitions, declaring that India needs military capabilities in space, especially anti-satellite weapons capabilities, and explicitly proposing the deployment of anti-satellite weapons "aimed at the electronic and physical destruction of Earth-orbit and geostationary satellites." The Indian Air Force has begun to outline an ambitious blueprint for its Space Command. Space Command will coordinate India's resources in the field of air and space, build early warning capabilities, and ensure national air and space security; the ability to use aerospace assets to support forces in carrying out other security operations; Command and conduct space warfare and conduct pre-emptive attacks or counterattacks against local air, space and ground targets that may threaten India's national security. Third, the goal is clear. India's "dream of a great power" and its persistent pursuit of becoming a space power are particularly reflected in the impatience to catch up with and surpass China, and comparing with China has become India's "obsessive-compulsive disorder," and it regards faster development than China as the "ultimate goal". To this end, India has actively accumulated various technologies, continuously promoted the development of various new weapons, and jointly developed new air-space combat platforms with other countries in the world while independently developing them. For arms dealers around the world, the Indian Air Force is a "good customer" with endless shopping desire, and its equipment production areas include Britain, the United States, Russia, France, Israel, Sweden, Poland and other countries. Marked by a \$12 billion new fighter purchase program, India's ambitious "Air Force Modernization Program" has quietly launched. In space, too, Sarawat, head of India's Defense Research and Development Organisation, said the anti-missile and anti-satellite domains "are an area where we can get ahead of China." Du has introduced and deployed more than two types of anti-missile systems from various channels, actively improved the quality of its air-space security deterrence means, and openly declared that its strategic missile range has effectively covered China's core cities and most of the country's territory, and its "reliable deterrence strategy" has become more and more explicit to China.¹²

¹ "India to gear up for 'star wars'," Times of India, 25 May 2010, http://articles.timesofindia.indiatimes.com/2010-05-25/india/28300195_1_ballistic-missile-defence-capabilities-satellite. Quoted from He Qisong, "The Motivation of U.S.-India Space Cooperation and Its Progress," *Modern International Relations*, 2011, 1, p2429.

² He Qisong, "The Motivation of U.S.-India Space Cooperation and Its Progress," *Modern International Relations*, 2011, 11, p2429.

It can be said that India's air and space security strategic model is a "self-inflate" model with seeking the superiority of a major country as the fundamental core, targeted offensive deterrence as the reality driven, and technology introduction to promote independent growth as the basic path.

Section 3 Selection and Construction of China's Aerospace Security Strategic Model

To a large extent, the choice of national aerospace security strategy is the choice of the national aerospace security strategic model, and the success or failure of the national aerospace security strategy is essentially the success or failure of the construction and application of the national aerospace security strategic model.

1. The choice of China's strategic model for air and space security

Above we have briefly discussed a number of different national air and space security strategic models. However, in a sense, the model itself is not superior or inferior, it must be placed in the specific environment and practice to measure it, it is neither clear nor either/or, it can be judged and tailored.

(1) Key concerns of China's strategic model of air and space security

The key concerns are the subjective and objective factors that China must focus on and pay attention to when choosing the national air and space security strategic model, mainly including the following aspects:

First, it must adapt to the strategic situation of world air and space security. With the development of aerospace technology, aerospace has become an important field of human practical activities, and international cooperation in the field of aerospace has been deepening. However, as long as war and hegemonism exist, the beautiful vision of the complete peaceful use of space will always have the shadow of militarization, and the "submarine" militarization and "quasi-militarization" of air and space have become an indisputable fact. Only by actively developing the national air and space security capability with Chinese characteristics can we win a place in the international arena in the future.

In the context of informationization, in the special field of air and space, the possibility of exchanging space for time and seeking victory with defense has been greatly reduced. Therefore, in the choice of China's strategic model of air and space security, the significance and value of active defense, both offensive and defensive, and attaching importance to offensive are very obvious.

Second, it must be subordinate to China's national strategy and military strategy. China's national strategy is peaceful development, and its military strategy is active defense. As part of the national strategic framework, China's national air and space security strategic model must actively serve and strongly support this overall strategic guideline and policy. The development of corresponding equipment and the search for sufficient capabilities in the practice of the struggle to maintain national air and space security are determined by the objective laws of the air and space military struggle, conform to China's specific national conditions, and are consistent with China's national strategy. China's peaceful development and active defense are aimed at maintaining air-space harmony and promoting world peace, and serve the country's own air and space interests. At present, the focus of the active defense strategy we pursue is "active," and we must strengthen the "limited offensive" within the framework of active defense, which is fundamentally different from the hegemonic and interventionist "offensive" of a powerful country. It is reflected in the construction of the national air and space security strategic model, that is, it is necessary to attach importance to the development of a number of key technologies, attach importance to the construction of flexible soft power, and better obey China's national strategy and military strategy.

Third, it must serve China's strategic interests in air and space. As one of the greatest and most brilliant scientific achievements of the 20th century, aerospace has profoundly changed the political, economic and military landscape of mankind. In particular, the informationization construction in the middle and late 20th century made the aerospace a new commanding height for economic construction, social development, and military reform. The security of a country's airspace is increasingly closely linked to space security, without which there can be no airspace security, nor can there be national economic, social and military security. The strategic interests of air and space and the strategic interests of the state are increasingly overlapping, deepening in degree and accelerating. Therefore, the establishment of China's strategic model of aerospace security must not only be able to defend China's current national interests, but also have the ability to support the further expansion of national interests to the air and overseas areas. This determines that China's strategic model of aerospace security should be inclusive, pioneering and innovative, flexible and open on the basis of reality.

Fourth, it must be based on China's air and space security strength. National air and space security is strategically short-sighted if it focuses only on reality without looking to the future; If we talk about development without the basis of reality, it is ideological shallowness. After long-term accumulation, China's strategic capability of air and space security is initially possessed; although there is still a certain gap from the world's advanced level, and there are still specific problems and bottlenecks of various kinds, it is at a high level in the world as a whole, which is the basis on which we can rely on and make a difference.

The construction of China's aerospace security strategic model is also a process of in-depth research and comprehensive review of China's aerospace capabilities and exploring the special laws of China's aerospace security. Based on the foundation of China's aerospace security strength and the reality of capabilities, to achieve the sustainable development of China's aerospace security capabilities, we must not only have the courage to face the current problems, but also be good at solving the contradictions hidden therein, scientifically coordinate within the framework of the national aerospace security strategy, plan deeply, do a good job in top-level design, and achieve overall development.

Fifth, we must focus on the development of China's aerospace forces. The national aerospace security strategic model is a summary of past experience, a guide for current practice, and a plan for future behavior. It originates in the past, acts on the present, and points to the future. Strategic capabilities can achieve strategic goals, and the development of national air and space forces is the basic task throughout the national air and space security strategic model. As far as China is concerned, the international air and space security situation and the expansion of national interests overseas and in the air and space objectively require China to have a stronger and more comprehensive national air and space security capability in the future. This requires that in the selection and construction of the national aerospace security strategic model, we must be brave, good at innovation, and conducive to innovation, and form a constantly developing and open active strategic model.

(2) The overall outline of China's air and space security strategic model

In the 21st century, with the continuous deepening of reform and opening up, China has developed rapidly in the political, economic, military, scientific and technological fields, and has made remarkable achievements that have attracted attention. The voices of "China's rise" are constantly heard, including those who rejoice, those who are worried, those who are panicking, and those who are jealous. As stated in Chapter 2 of this book, at this stage, "as a great power, we already have the basic conditions for national rejuvenation; As an emerging power, we are bound to encounter resistance from a resurgence; As an emerging developing country, there is still a huge gap between us and the world's advanced level." This is the starting point for us to outline China's national air and space security strategic model.

Different from other countries, China's national aerospace security strategic model, in terms of value, should not only criticize the external model, but also abandon the introverted model, so as to achieve both internal and external considerations, rigidity and flexibility. In the choice of means, we should not only strengthen international cooperation, but also take the initiative to achieve self-centeredness and harmonious coexistence; In terms of offensive and defensive strategies, it is necessary to actively defend and moderately attack, so as to achieve both offensive and defensive and solid defense; On the development path, it is necessary to consolidate the foundation, make up for the shortcomings, and also focus on breakthroughs, and do something and leave others undone; In terms of the scope of capabilities, we must not only base ourselves on the local area, but also have a strategic view of the surrounding areas, and also look at the world.

It boils down to one point, that is, we should strive to build a comprehensive air and space security strategic model that takes into account the advantages of rigidity and softness, the advantages of both attack and defense, and the security of both inside and outside, which we can call the "active" model.

To build an "active" air and space security strategic model with "both rigidity and flexibility, both offensive and defensive, and internal and external integration" as the main content, the first is to strengthen awareness. Strategic awareness is the internal cognitive thinking of choosing or constructing an aerospace security strategy, the core of the aerospace security strategy model, the concrete interpretation of the aerospace security strategy, and the targeted interpretation of the national strategy. It is at the top of China's national air and space security strategic model, and it can be said that it is the soul of the national air and space security strategic model. The second is to outline the path. In a certain sense, the national air and space security strategy model is a timeline outline of the national air and space security strategy, and is the roadmap of China's national air and space security strategy. The basic point of China's national air and space security strategic model path is based on reality, the focus is on shaping the future, the means are independent and autonomous, and the goal is to make a difference. It can be said that it is the main line of China's national air and space security strategic model. The third is to optimize the mechanism. Mechanism is the regulation and solidification of behavior. A perfect strategic model of aerospace security must be supported by several mature behavioral mechanisms for aerospace security. The construction of the aerospace security strategic model focuses on forming a set of interrelated, mutually promoting and organically combined air and space security behavior mechanisms. It can be said that it is the basis of the national air and space security strategic model. Fourth, it is necessary to temper the means. To temper means is to temper offensive and defensive means in the field of air and space security. Single emphasis on attack, low comprehensive cost, but prone to rigid confrontation, is also not in line with China's national strategy; Purely focused on prevention, high technical risks, and easy to be passively controlled, which is not compatible with China's national goals; Coordinating attack and defense, focusing on each other, and dialectical unity is the essence.

China's aerospace security strategic model is a grasp of the current air and space security situation, an integration of its own air and space security needs, and an explanation of air and space security behavior. Determining and forming a national air and space security strategic model with Chinese characteristics is of great significance, and is the starting point and symbol of the final formation of China's air and space security strategy. First, the determination and formation of China's strategic model for aerospace security is the implementation of China's strategy and aerospace security strategy. Second, the determination and formation of China's strategic model for air and space security is an elaboration of China's security perception. Third, the determination and formation of China's aerospace security strategic model is to shape China's aerospace security behavior. Fourth, the determination and formation of China's air and space security strategic model is to form the ability to maintain China's air and space security and achieve China's strategic goals of air and space security. The first two are the cognitive level of the pattern, and the latter two are the behavioral level of the pattern. At present, cognition is the first and behavior is second, and promoting the formation of behavior and the realization of goals with the establishment of cognition is the internal mechanism of China's aerospace security strategic model. In the long run, demonstrating cognition with behavior and promoting cognition with behavior is the basic mechanism of the external role of China's aerospace security strategic model.

In the field of China's aerospace security, it is the value and goal of China's aerospace security strategic model to achieve the realization of knowledge to promote action, to consolidate knowledge with action, and to integrate knowledge with action.

2. The construction of China's strategic model for air and space security

China's aerospace security strategy model is a profound interpretation of China's aerospace security strategy, and its formation is a process of interaction, dynamic development and spiral between theory and practice, and its establishment is a constructive behavior that starts from selection and application.

(1) Strengthen the security concept of supporting China's dream with harmonious space and space

On November 29, 2012, Xi Jinping, the newly elected general secretary of the CPC Central Committee, pointed out in a speech that realizing the great rejuvenation of the Chinese nation is the greatest "Chinese dream" of the Chinese nation in modern times. The "Chinese Dream" not only carries the value crystallization of the Chinese nation over the past hundred years of struggle, but also indicates that the grand prospect of the great rejuvenation of the Chinese nation has misled the country, and the Chinese dream of working hard to prosper the country "needs the great power of the country and the nation to promote and guarantee." At present, China's strategic opportunity period is in a critical stage of possible "abnormal changes," especially the breakthrough development of US aerospace capabilities, which has re-imprisoned the world in the haze of the unipolar world. Aerospace has become an important lever for China to consolidate and continue the period of strategic opportunity, and the concept of "harmonious space and space" is opportune. The concept of harmony is a new concept of international order put forward by the Chinese Communists in the new stage of the new century from the high plane of human progress, prosperity and development, and is a concentrated embodiment of China's understanding and propositions on the international and domestic situation, international politics, and international relations. It is expressed internally as a harmonious society, externally as a harmonious world, and reflected in the field of space as harmonious air. The proposal of harmony and air is far-reaching. The first is a critique of the current hegemony and the law of the jungle in the air and space field. As the proportion of the aerospace domain in national interests continues to rise,

The battle over space resources is also becoming increasingly fierce. However, the reality of one-super-hegemony in the post-Cold War era is still cruel, and the air-space competition is still a jungle game under the United States, which runs counter to the trend of peace, development and cooperation. The second is the interpretation of China's own air and space security strategy. China is a large developing country,

It is also a responsible big country. A truly responsible major country should make more constructive contributions to the international community instead of imposing hegemonism on the international community that centers on national interests.

Harmonious space is China's solemn commitment to the international community, and it is also a self-restraint of its own space behavior. The third is an initiative for a new world aerospace order. With the deepening of human society's dependence on the space domain, maintaining the current aerospace ecology will surely bury bitter fruits for human beings themselves. Every member of the international community, especially the aerospace powers, must promote the formation of a new aerospace order with the peaceful use of space as the core concept. Harmonious space and space epitomize China's beautiful vision for the international community to share the "dividend" of human space and space. China's national air and space security strategic model will also closely revolve around the realization of these meanings, and be highly unified with the specific goals of the national air and space security strategy.

(2) Outline a security path of independence and military-civilian integration

Independence and military-civilian integration are the basic principles of China's air and space security strategy. To build China's aerospace security strategic model in accordance with the principle of independence and self-determination, the first means that in the national aerospace security strategy, we must adhere to the autonomous model as the center, and prevent pure follow-up mode and dependency mode. At present, aerospace security has changed from China's peripheral development interests to core survival interests, and it is closely related to other core interests and has a long influence. In the space era, the loss of space autonomy is tantamount to being a fish in one's own right. Second, it means that we must persist in independently mastering the core technologies of national air and space security. There are tens of millions of high-tech technologies involved in the aerospace field, but there are only a few core key technologies. The autonomy of the aerospace domain cannot be guaranteed based on technology, especially core technology. The construction of China's air and space security strategic model in accordance with the principle of military-civilian integration is to achieve a high degree of unity between a rich country and a strong military in promoting the benign and sustainable development of the air and space field. Science and technology in the field of aerospace are cutting-edge and costly, and it is often a comprehensive game carried out by the state with the strength of the national economy and science and technology, and it is beneficial to adopt military-civilian integration. First, in the high-end scientific and technological field dominated by the military, highlight the country's goal of strengthening the military, focus on using the military to lead the people, and integrate the state's high-tech forces with the help of major aerospace projects. Second, in the field of mainstay industries for dual military and civilian use, we should give prominence to social and economic benefits, focus on achieving mutual assistance between the military and the people, extensively attract competition mechanisms, break the monopoly situation, and encourage the healthy growth of capable civilian enterprises. In recent years, the development of the "Shenzhou" spacecraft series and new aircraft, from the production of raw materials, components and technical services, has many private enterprises. Third, in the field of personnel building and basic support, we should give prominence to personnel training and quality assurance, focus on ensuring that the source of talent for the military and the army is promoted by the people, and the road to the exchange of aerospace personnel is through the way, and the situation in which aerospace talent emerges in an endless stream, adhere to the direction of socialized support, expand the scope of socialized support, promote the expansion of socialized support from peacetime to wartime, and rely on the people to consolidate and expand the foundation of China's aerospace undertakings.

(3) Optimize internal and external coordination and special supporting security mechanisms

National air and space security is a state that has a present tense and a future tense. As an effective national air and space security strategic model, it must be based on reality and look to the future. China's national air and space security strategic model should improve and establish a variety of mechanisms. Internal and external coordination means that China's national air and space security should not only actively establish internal mechanisms within the military and at home, but also actively participate in the construction and improvement of relevant mechanisms at the international and global levels, and the two types of mechanisms should be coordinated with each other and highly unified with China's air and space security goals. Special support refers to the special importance of air and space security and the rapid and dangerous and changeable characteristics of action, and it is necessary to form a complete set of mechanism system from horizontal to edge, vertical to end, organic combination, and scientific support. At present, it is necessary to focus on the following systems to promote the continuous optimization of China's air and space security strategic model and system. The first is an international dialogue and cooperation mechanism for national aerospace security. Strengthening exchanges and dialogue with the international community is the proper meaning of harmony and space, and is the only way for China to show the world harmony and space and promote the world to move towards harmony and space. The second is the domestic response mechanism for national aerospace security. A multi-layered and unified national aerospace security mechanism with clear powers and responsibilities, reasonable layout, appropriate organization and rapid response is the key to the implementation of the national aerospace security strategy and is also a symbol of the true establishment of the national aerospace security strategy. The United States has this mechanism, Russia has it, the European Union, Japan, India also has it, and a China that wants to write its own chapter in the field of air and space should not only have it, but should also be excellent. The third is the national air and space security capability development mechanism. At present, China has basically formed a pattern of state-led, military-civilian integration, mutual cooperation, and common progress in the development of air and space capabilities, but there are still shortcomings of repeated investment, unclear powers and responsibilities, and inactive situations to varying degrees, especially the core of the national air and space security force is still not clear, and it must be made overall planning and determined as soon as possible.

(4) Tempering security means that simultaneously carry out deterrence and warfare and have both offensive and defensive measures

Simultaneous deterrence and both offensive and defensive measures are also important principles of China's air and space security strategy. In fact, the military means used to support air and space security have always been both deterrent and offensive and defensive; the United States is marked by missile defense systems and strategic bombers, and Russia is marked by air and space defense forces and new-type strategic missiles.

Simultaneous deterrence and both offensive and defensive means means that China should achieve an organic combination of deterrence and actual combat, attack and defense in the construction and application of air and space security means, so as to effectively cope with various security situations. In essence, actual combat capability itself is a deterrent, and deterrence without real combat capability can only remain in words. Therefore, to temper the means of simultaneously developing deterrence, we must grasp the fundamentals of war and broaden the scope of deterrence in construction; In terms of application, it is necessary to enrich the forms of deterrence and strictly guard the bottom line of war. In addition, with the development of the international political pattern and the proliferation of aerospace technology, on the one hand, the core interests of the country have expanded to the aerospace field, and aerospace security has become an indispensable part of national security. On the other hand, the number of States and non-State actors seeking to possess space capabilities is increasing, and the uncertain threats to aerospace security are also growing dramatically. Aerospace security, on the other hand, has the characteristics of a low threshold for air and space attacks, a hundred dense air and space defenses, and easy to attack and difficult to defend. From this point of view, the overall non-dominant country grasping the offensive in the air and space security model should be a reflection of the truth. In 1956, in the face of nuclear blackmail and the nuclear threat of the superpower, Comrade Mao Zedong stated: "We... There must also be an atomic bomb. In today's world, if we want to not be bullied by others, we cannot do without this thing. These words are still worthy of our in-depth consideration today when the air and space security situation has undergone profound changes, and at the present time when we persist in simultaneously advocating deterrence and war, and attacking and defending."¹

¹ Mao Zedong, 25 April 1956, Speech at an enlarged meeting of the Politburo of the Central Committee on Sunday.

CHAPTER 8 CHINA'S AEROSPACE SECURITY STRATEGIC SYSTEM

The system is the support of strategy. The development of air and space forces, the formation of air and space battlefields, and the emergence of integrated air and space operations have made the position of air and space security in the national security strategic system prominent and the role has increased dramatically. It has become an urgent and arduous task to build a national aerospace security strategic system consisting of a leadership management system responsible for air and space security decision-making and operation, an aerospace force system that implements air and space security operations, and an air and space support system that supports the smooth implementation of air and space security operations.

For China, it is necessary to form a lean and efficient aerospace security leadership and management system that combines peacetime and wartime through the establishment of substantive aerospace security decision-making bodies, the establishment of standardized aerospace security decision-making and consulting bodies, and the normalization of aerospace security crisis management mechanisms. It is necessary to strengthen the construction of air and space perception forces, air and space offensive forces, air and space defense forces, network and electricity countermeasures forces, and strategic projection forces, and form an air and space security force system that simultaneously deters war, both offensive and defensive, and integrates military and civilian; It is necessary to improve the air and space safety laws and regulations, improve the allocation of aerospace strategic resources, build space information services and space safety supervision systems, and form an air and space security guarantee system with complete elements, complete systems and functions.

Section 1 Aerospace Safety Leadership Management System

The national aerospace security leadership management system refers to the organizational leadership system that completes the national aerospace security strategic decision-making and commands, monitors and evaluates the decision-making implementation process. The practice of the national aerospace security strategy, involving aviation, aerospace, information and many other spaces and fields, is a complex system engineering, which must be planned as a whole, unified leadership, and centralized management.

1. The functions and roles of the leadership management system for aerospace safety

The national aerospace security leadership and management system undertakes the task of implementing unified planning, construction, management and use of aerospace security forces, and is an important guarantee for improving construction efficiency, enhancing security capabilities and maintaining national aerospace security.

The functions of the national aerospace safety leadership management system are mainly reflected in two levels: the first level is the state. The basic functions of the national aerospace security leadership management system are: responsible for the macro design of the national aerospace security strategy, clarifying the goal orientation of aerospace security and development, unifying the development and utilization of the aerospace field, managing the design of the national aerospace security policy, integrating air and space strategic resources, and establishing the overall deployment of the air and space strategy. The second level is the military, government departments and aerospace conglomerates. The basic functions of the aerospace safety leadership management system at this level are: to lead and manage military aerospace forces, civil aerospace forces and aerospace technology development, and to organize, implement and guide aerospace activities and aerospace technology research and development.

The national aerospace security leadership and management system occupies a dominant position in the national aerospace security strategic system, and plays a role in organizational leadership, coordination, management, supervision and evaluation of the national aerospace security strategy capacity building.

The first is the role of strategic decision-making. National aerospace security strategic decision-making refers to the decision-making behavior of the country's top decision-makers in a specific national security environment to focus on the air and space security threats faced by the country, rely on a reasonable decision-making system, and use scientific procedures and methods to appropriately allocate strategic elements.

According to the urgency of the threats to national aerospace security, it can be divided into two modes: "daily decision-making" and "crisis decision-making".

Daily decision-making refers to the resolution of routine problems faced by national aerospace security by national aerospace security agencies in accordance with the distribution of legal authority, work functions and standard procedures under the condition of accepting ordinary pressure from the decision-making environment; Crisis decision-making refers to the situation that decision-makers face unexpected and sudden major security threats.

Extraordinary emergency security decisions in accordance with statutory duties, powers and work procedures to solve the urgent problems facing national air and space security.

The second is the role of command and control. The command of the implementation of the air and space security strategic decision-making plan refers to the unified leadership and coordination of the national aerospace security strategy implementation body, under the unified leadership and coordination of the highest decision-making body, in accordance with the division of different tasks, to quickly carry out actions in relevant areas for which it is responsible, to implement the instructions of the highest decision-making body, and to mobilize all forces and resources to complete the decisions and orders of the highest national air and space security decision-making body in the shortest possible time. In order to effectively implement the strategic decision-making of aerospace security, the national aerospace security strategic decision-making body is responsible for directing relevant government departments to implement the decision-making. Guidance, organization, coordination, control and other work are the main responsibilities of the highest decision-making body of the state, and through uninterrupted command and control, the strategic decisions on aerospace security can be effectively implemented and implemented, so as to achieve the strategic goals of aerospace security.

The third is the role of evaluation and revision. National air and space security strategic decision-making is a complex and dynamic process, and due to various uncertainties, it is almost impossible to formulate a perfect decision-making plan. Even if the top decision-maker chooses a reasonable action plan, with the change of the objective situation in the implementation process, there will still be many unexpected situations, there is a possibility of not achieving the expected goal, or due to changes in the specific situation, new situations will appear, which requires the highest decision-making body to establish a decision-making feedback, evaluation and adjustment mechanism in the implementation of the aerospace security strategic decision-making plan, closely follow the development of the air and space security situation, and evaluate the effect of the aerospace security strategic decision-making. Necessary corrections and adjustments will be made at any time according to changes in the situation and needs in a timely manner to ensure the smooth completion of strategic decisions on aerospace security. Sensitive, accurate and powerful feedback is an important part of scientific decision-making, and it is also the embodiment of seeking truth from facts and respecting science in decision-making. When the national aerospace security strategic leading institution makes a decision, the entire decision-making activity is not completed, and it is also necessary to track the effect of the strategic decision on air and space security, extensively collect social evaluations of the strategic decision on air and space security, and revise and improve it in a timely manner according to the problems reflected in the implementation of the strategic decision on air and space security, so that the strategic decision on aerospace security can adapt to the changing situation of air and space security.

2. The composition of the leadership management system for aerospace safety

The national aerospace security leadership and management system is mainly composed of aerospace security decision-making bodies, aerospace security legislative bodies, aerospace security military command institutions and non-governmental research and consulting institutions. The basic tasks are to implement the national aerospace security strategic decision, guide the construction of the national aerospace security forces, and safeguard the strategic interests of the national aerospace security.¹

(1) Aerospace security decision-making bodies

Due to the different national conditions of various countries in the world, there are also differences in the setting and level of their national air and space security decision-making bodies. Generally speaking, the national aerospace security decision-making body mainly includes three levels: the highest decision-making body, the relevant functional departments of the central government and the functional departments of local governments.

The first is the highest decision-making body. The highest decision-making body for national air and space security is generally located in the National Security Council, which is directly headed by the supreme leader of the State. In order to facilitate the performance of its functions, the National Aerospace Security Committee may be established under the National Security Committee, and corresponding organizational structures may be established in the relevant competent bodies under the government and the air- and space-related administrative departments. The supreme decision-making body of national aerospace security enjoys the supreme power and authority in the formulation and implementation of national aerospace security strategies and policies. At present, all major countries in the world have set up their air and space security decision-making bodies in national security decision-making bodies, and they are responsible for national air and space security. For example, the United States passed the National Security Act in 1947, pursuant to which the National Security Council was established, which is chaired by the President and the Vice President, the Secretary of State and the Secretary of Defense are statutory full members, whose main duties are to make recommendations to the President on the unification and coordination of all relevant national security policies and to assist the President in formulating, reviewing and coordinating domestic, foreign and military policies related to national security. The Chairman of the Joint Chiefs of Staff and the Director of the Central Intelligence Agency shall attend the meeting as military advisers and intelligence advisers respectively, and the President may designate relevant personnel to attend the meeting as necessary.

¹ Li Xuezhong, Tian Anping: "National Aerospace Security Theory," Beijing, People's Liberation Army Press, 2010 edition, p178-183.

In 1992, the National Security Council was established, with the participation of the President, the Vice-President, the Chairman of the Council of Ministers and other leaders of the Government, and the Secretary of the National Security Council, which in 1993 was elevated to a constitutional body responsible for preparing the resolution of the President of the Russian Federation on the implementation of a unified State policy in ensuring security against internal and external threats to the vital interests of individuals, society and the State. At present, major issues related to Russia's national security, including maritime security issues and air and space security issues, must be discussed and resolved by the National Security Council.

The second is the relevant functional departments of the central government. National aerospace security affairs mainly include aviation space security affairs and space space security affairs. Aviation space security matters include sovereign interests in airspace, civil aviation management and civil air defense. Space security affairs mainly include space safety management, space resource development and utilization, and international space cooperation. In order to better manage national air and space security affairs and make related decisions, the state should generally set up government administrative agencies and functional departments. Due to the differences in the national conditions of various countries in the world, the administrative agencies governing air and space security affairs in different countries are also different. Most of them have administrative departments for the management of aviation safety affairs, while only a few major space-faring countries have administrative departments for the management of aerospace (space) security affairs. Despite these differences, one thing is common, that is, ensuring national air and space security involves the relevant military departments of the country and the military departments such as the air force to which they belong. Judging from the relevant information currently available, the agencies and departments of the US government involved in air and space security management include the State Department, the Department of Defense, the Joint Chiefs of Staff, the Central Intelligence Agency, the Federal Bureau of Investigation, the Defense Intelligence Agency, the White House Policy Development Office, the White House Military Office, the Department of Homeland Security, and the National Aeronautics and Space Administration. The British government agencies involved in air and space security are the Ministry of Foreign Affairs, the Ministry of Defence, and the Ministry of the Interior. The Defence and Overseas Policy Committee is the highest military and foreign policy-making body in the UK, and the Cabinet Secretariat is its subsidiary body, whose functions include intelligence support, crisis management, policy development, policy implementation, policy advice, and action implementation. The "British Defence Council" deals with major defense policy issues, and the Army, Navy and Air Force Committees under the leadership of the National Defence Council manage the day-to-day affairs of the three services.

The third is the relevant functional departments of local governments. Relevant functional departments of local governments generally rely on the government system to establish corresponding institutions. In key areas, especially coastal areas, the central government shall set up dispatch agencies. The establishment of dispatching agencies by the central government is generally determined by the development of maritime undertakings in the region and the air threats it faces. With the development of maritime undertakings and the severe threats to maritime sovereign airspace and the airspace of the exclusive economic zone, the central government often adopts the model of dispatching agencies, whose function is to use local forces to monitor the air situation in the region and organize air-to-space protection.

The model of local governments relying on government agencies to set up corresponding institutions is generally applicable to general areas, and its main tasks are to strengthen civil aviation management, ensure civil aviation safety, strengthen the construction of civil air defense projects, and do a good job in civil air defense.

According to the requirements of the Constitution of the People's Republic of China, China's air and space security decision-making bodies are mainly composed of central and local administrative departments. It includes three levels: First, the National Security Commission and its subordinate military and civilian departments, whose main function is to be responsible for the formulation and implementation of national security strategies and policies (including aerospace security strategies and policies). The second level, the relevant departments of the central government under the direct leadership of the State Council, mainly involve the Ministry of Aerospace, the Ministry of Transport, the Ministry of Public Security, the State Civil Aviation Administration, the State Oceanic Administration, etc. The third level is the relevant departments under the leadership of local governments. In view of the special nature of national air and space security, decision-making organs at all levels should highlight the status and role of the armed forces, especially the air force, which is closely related to air and space security, in decision-making organs.

(2) Aerospace security legislatures

The Aerospace Security Legislative Body is the main component of the national aerospace security leadership and management system, and its function is to carry out legislation to maintain national aerospace security, determine the rights and obligations of the state in the field of air and space through legislation, and protect national air safety and space security. The legislative power of national aerospace laws is concentrated in the highest legislative bodies such as a country's parliament and the National People's Congress and their permanent bodies. The legislative power of the national aerospace, aviation, air defense and other administrative regulations is concentrated in the government administrative organs and their relevant functional management departments. The legislation of local regulations is usually carried out by local permanent legislatures such as provinces or states.

China's legislative system mainly includes the National People's Congress and its Standing Committee, the National Security Commission and its functional departments, the State Council and its relevant government departments, local people's congresses and their standing committees, the Central Military Commission and its military leading organs.

In terms of legislative procedures, it is usually divided into four steps: proposing, drafting, deliberating and passing, promulgating and implementing legislative plans. International legislation can generally be proposed only within the framework of the United Nations and when consensus has been reached in a number of countries, and its procedures are basically the same as domestic legislative procedures, but the legislative body should be the relevant State party to the relevant United Nations body organization.

(3) Aerospace security military command institutions

Military command organs refer to the collective name of military leadership organizations at all levels established according to the needs of war, are the organizational structure form of the main body of military command, and are the basis for the operation of military command activities. Maintaining national air and space security requires not only peacetime management, decision-making and long-term construction of government departments at all levels of the state, but also the military command organs of the state to exercise command over the military forces that ensure national air and space security in the event of a security crisis. Due to the highly professional nature of national air and space security strategic operations, it is usually necessary to implement a dedicated military command, and in line with the principle of "joint integration, lean and efficient, and clear division of responsibilities," three levels of national strategic command organs, regional joint command institutions and tactical operation command institutions should be established.¹

The first is a state-level strategic command organ. The state-level strategic command organ, composed of personnel from relevant departments of the Ministry of National Defense and the Central Military Commission, is mainly responsible for directing and coordinating national air and space security strategic operations, and is directly under the command of the high command or the national air and space security joint operations command. The main functions are to implement the orders and instructions of the Supreme High Command, collect and provide air and space intelligence, establish the objectives, seasons and forces to be used in the strategic operation of air and space security, draw up and organize the implementation of the strategic campaign action plan and mobilization plan for air and space security, coordinate and supervise the air and space security operations in major theaters or directions, and command and coordinate the joint operations of various services and theaters and various armed organizations.

The second is a joint command structure at the regional level. Regional-level joint command organs, composed of relevant departments of the Central Military Commission and relevant personnel of theater headquarters, are mainly responsible for the command and decision-making of air and space offensive operations, air and space defense operations, air and space information operations, and protection operations in theaters or large regions, and are directly under the command and coordination of strategic command organs. The main functions are to complete the analysis of the regional air and space battlefield situation, the determination of defense targets, the adjustment of offensive and defensive force deployment, the optimization of force mobility, the differentiation of operational tasks, and the coordination of tasks of various services. According to their functions, regional joint command institutions usually include information support and confrontation command organizations, defensive operation command institutions, offensive operation command organizations, and protective operation command organizations.

The third is a tactical-level operational command organization. Taxis-level operational command institutions are mainly composed of relevant personnel of division, brigade and regiment-level headquarters, which are mainly responsible for commanding defensive weapons, offensive weapons, information combat weapons and protective combat operations, and are usually directly under the command of regional joint command organs, and can also be directly controlled by strategic command organs for offensive and defensive weapons of strategic significance.

¹ Wang Fengshan et al.: *Modern Air Defense*, Beijing, Aviation Industry Press, 2007 edition, p119.

The institution has system functions such as air and space information processing, attack target selection, fire strike calculation, task differentiation and auxiliary decision-making. According to the spatial position of the command, it can be divided into land tactical command institutions, air tactical command institutions and maritime tactical command institutions.

(4) Non-governmental research and consulting institutions for aerospace security

Non-governmental research and consulting institutions refer to institutions outside the government function system that specialize in research and consultation in the fields of world politics, economy, military, science and technology, and culture. Non-governmental research and consulting institutions study political, economic, military, scientific, technological, cultural and other aspects, and provide decision-making advice on domestic policies and foreign policies. Therefore, non-governmental research and advisory bodies often provide important advice on a country's air and space security decision-making and its implementation, and adopt them by the government. In particular, some internationally renowned research institutions, such as the RAND Corporation of the United States, the International Institute for Strategic Studies in London, the American Society for Strategic Studies, and the Stockholm International Peace Research Institute, have played a role that cannot be underestimated in national security decision-making. Because of the authoritative nature of the research results of these research institutions, government agencies in some countries are often willing to consult with these institutions. For example, as the most famous research institution in the United States, the RAND Corporation has always played a very important role in the development of US military science and technology, the formation and evolution of military strategic thinking and defense policy, and the formulation of foreign policy, etc., and it has a very close relationship with the US military and government, conducting extensive analysis and research for the military and government, and has provided important research reports and consultations on US global strategy, space strategy, military strategy and policy.

3. Construction of a leadership management system for aerospace safety

In order to meet the needs of the development of the national aerospace security situation in the new stage of the new century and to improve the work efficiency of the national aerospace security leadership and management system, it is necessary to further optimize the organizational structure, improve the functions of the institutions, and improve the laws and regulations, so that the highest decision-making organ will develop in the direction of being lean, efficient, and flexible, and the functions of the institutions should change from paying attention to military and political security to attaching equal importance to military, political, economic, and social, and further promote the construction of relevant national air and space security legislation and regulations.

(1) The basic ideas for leading the construction of the management system

In order to better respond to air and space security threats, maintain national air and space security, and give play to the role of the leadership management system, when building an aerospace security leadership management system, it is necessary to ensure the efficient operation of the aerospace security leadership system in line with the idea of "lean and efficient, functional aggregation, combination of peacetime and wartime, and legal system guarantee".

The first is to aim at lean and efficient. The effectiveness of the aerospace safety leadership management system is not determined by the number of its constituent elements, but by the quality of each component itself and the smoothness of the relationship between them. Therefore, when building the aerospace safety leadership management system, we should fully learn from the lessons learned from the construction of the national leadership management system, and pay attention to the streamlining, specialization and functionalization of leading institutions at all levels. Specifically, in accordance with the characteristics and requirements of national air and space security, agencies with similar or similar functions are merged and redundant personnel are reduced; Cutting obsolete institutions and adding new demand institutions; abolishing single-function institutions and strengthening integrated institutions; Reduce the level of leadership and command and strengthen horizontal coordination; Streamline service support institutions and strengthen functional institutions such as information, consultation and supervision to enhance the overall effectiveness of the national aerospace safety leadership and management system.

The second is to focus on functional aggregation. The overall function of the national aerospace safety leadership management system is not a simple addition of the functions of each subsystem, but greater than the sum of each local function. Therefore, when building the national aerospace safety leadership management system, it is necessary to enhance the overall function of the national aerospace safety leadership management system as the basic purpose, strengthen macro control and theoretical guidance, and strive to have a reasonable structure, systematic optimization, appropriate levels, clear functions and powers, perfect mechanisms, smooth relations, and coordination and balance, so as to truly enable the leadership management system to maximize its overall functions from the organizational form and system mechanism.

The third is to take the combination of peacetime and wartime as the path. The national air and space security leadership and management system is not only a wartime leadership decision-making and command body, but also an important command platform for responding to peacetime emergencies, which has the inherent need to combine peacetime and wartime. Therefore, when building the national aerospace safety leadership management system, it is necessary to strengthen the "emergency" function, lay a solid foundation for "responding to the war," and realize the organic combination of the "emergency" and "response" functions. It is necessary to proceed from the overall situation of the national air and space security development strategy, establish the idea of "being able to fight and win wars," organically combine the needs of "responding to war" and "emergency response," and form a national aerospace security leadership and management system that is centralized and unified, integrates peacetime and wartime, responds quickly, and operates smoothly.

The fourth is to guarantee the laws and regulations.

The basis for the operation of the national aerospace safety leadership and management system is the restraint and guarantee of law, and the improvement of the organizational legal system and procedural rules can effectively ensure that institutions at all levels exercise their powers and perform their duties in accordance with legal authority and procedures. Therefore, when building the national aerospace safety leadership management system, it is necessary to pay attention to institutionalization, standardization and procedure, set up institutions and distribute powers according to law, so as to ensure that the delegation of powers is based on evidence, the exercise is regular, and supervision is effective. It is necessary to provide basic models for the handling of national air and space security incidents through the statutory monitoring and early warning system, emergency plan system, crisis confirmation and declaration system, crisis handling system, etc.

(2) Lead the main content of the construction of the management system

The construction of the national aerospace safety leadership management system is urgent and the task is arduous, which requires the overall situation, overall planning, learning from experience, highlighting characteristics, active and prudent, and striving to form a national aerospace safety leadership and management system with sound institutions, complete functions, sensitive response and efficient operation.

1. Establish a substantive national air and space security decision-making body

The national aerospace security decision-making body occupies a central position in the national aerospace security leadership management system and plays a leading role, which can embody the strategic decision-making efficiency and crisis response ability of the highest decision-making level of the country. At present, China does not have a formal national air and space security decision-making body with a defined organizational entity.

According to China's current leadership and management system, national air and space security decisions are mainly made by the National Security Commission, which is mainly composed of the General Secretary of the Party, the President of the People's Republic of China, the Chairman of the Standing Committee of the National People's Congress, the Chairman of the National Committee of the Chinese People's Political Consultative Conference, the Director of the Central Propaganda Department, the Director of the Central Policy Research Office, the Premier of the State Council, the Chairman and Vice Chairman of the Central Military Commission, the Secretary of the Central Commission of Political Science and Law, the Minister of National Defense, the Minister of Foreign Affairs, the Minister of Public Security, the Chief of the Joint Staff of the Central Military Commission, the Minister of State Security, and other relevant personnel. The general secretary of the party is also the president of the state and the chairman of the Central Military Commission, and has overall responsibility for national security decision-making bodies. The main responsibilities of the agency are: to develop and implement a national security strategy; Promote the establishment of the rule of law in national security; Formulate guidelines and policies for national security work; Study and solve major problems in national security work. This agency is not only the formulator of the national security strategy, but also the core decision-maker and commander of the activities to maintain national security.¹

With the increasing threat of air and space security, national air and space security has become an important factor affecting national security, so it is necessary to build a substantive national air and space security decision-making body.

¹ Meng Xiangqing: "It is time for China to set up a national security committee," PLA Daily, 22 November 2013, 7.

First of all, according to China's current national defense and military system, consideration may be given to establishing an interdepartmental Aerospace Security Committee under the National Security Committee, whose main responsibilities are to prepare suggestions and consultations on national air and space security policies and guidelines for the National Aerospace Security Decision-making Conference, coordinate the executive agencies to complete the tasks of the Aerospace Security Conference, study major events and hot issues affecting national Aerospace Security, and put forward suggestions on the impact on China's national Aerospace Security and countermeasures. The second is to establish an aerospace security decision-making advisory body under the Ministry of National Defense, whose main responsibilities are to conduct systematic scientific research and elaboration on national aerospace security issues, conduct post-mortem assessment and summary of the current national aerospace security policy or crisis handling, and make evaluation opinions and suggestions on the decision-making proposals on national aerospace security put forward by the interdepartmental Aerospace Security Committee; Finally, the Air Force takes the lead in establishing a national air and space security crisis handling team, whose main responsibility is to collect, summarize and analyze the latest information and background information on national air and space security crisis incidents, and to formulate various plans and implementation plans for national air and space security crisis handling for discussion by national security decision-making organs, so as to quickly make national air and space security action decisions.

2. Build a standardized national aerospace security decision-making advisory body

The content of national aerospace security is complex and highly specialized, and the main role of decision makers should be shifted from the traditional kind of personally formulating detailed policy plans to selecting the best of the various programs formulated by experts from a strategic perspective. Strictly speaking, China has not yet formed a large-scale, high-level, full-time national aerospace security decision-making advisory body.

The functions of the existing national air and space security decision-making system are scattered or dependent on the policy research institutions of the party, government and military at all levels, the research institutions of the party, government and military functional departments at all levels, academic research institutions and non-governmental consulting institutions, each of which has different characteristics and plays different functions, but there are also drawbacks such as fragmentation, functional misalignment, and lack of institutionalization and independence. Therefore, it is necessary to build a standardized national aerospace security decision-making advisory body according to the content and requirements of national aerospace security decision-making.

The first is to establish a professional air and space security decision-making advisory committee. Its main responsibilities are to study the national air and space security theory, draft laws and regulations on national air and space security, and provide consultation and suggestions for the Party and government to deal with major national air and space security issues; Starting from the overall situation of national aerospace security, conduct a feasibility assessment of the plans proposed by each unit and department, explain them clearly in simple language, data and charts, and provide analysis opinions to the national aerospace security decision-making body; Conduct special research on strategic, comprehensive and long-term issues, and submit research reports to the national aerospace security decision-making body.

The second is to enhance the overall synergy of the existing four types of decision-making and consulting bodies.

The existing four types of decision-making consulting institutions should be built into core institutions that can not only carry out cross-departmental and cross-field research relatively independently, but also effectively organize and coordinate joint actions of other countries' aerospace security research institutions, and can flexibly and flexibly organize research forces with subject research as a link, forming a decision-making and consultation network that runs up and down, connects left and right, and connects quickly and conveniently, so as to jointly serve the decision-making of national aerospace security institutions. Policy research institutions of party, government and military departments at all levels are mainly responsible for research on various urgent topics involving party and state secrets, and are responsible for coordinating and organizing other research institutions to carry out joint research on major projects; The research institutions of each functional department are mainly responsible for the research of professional decision-making issues related to aerospace security related to the functional institutions; Academic decision-making and consulting institutions, mainly responsible for the basic theoretical research of national aerospace security and the research of major topics with strategic, overall and long-term impact on national aerospace security, making suggestions on the national aerospace security strategy, and training, reserve and sending talents for the national aerospace security decision-making and consulting institutions; Civilian advisory bodies, mainly according to actual conditions, participate in and share some research projects related to national air and space security.

The third is to create a good environment for decision-making and consultation on aerospace safety. China established the National Security Committee in November 2013 as the highest decision-making body for responding to and managing major emergencies and crises related to national security, which can effectively achieve centralized and unified leadership over national security work and play a decisive role in China's long-term peace and stability in the future. However, we must also pay attention to straightening out the relationship between them and the existing national defense and foreign affairs departments; we must not weaken the existing institutions and affect the work enthusiasm and initiative of the existing institutions; we must establish an efficient operation mode and an effective coordination mechanism so as to better safeguard the country's external sovereignty, security and development interests, as well as internal political security and social stability. As an important field of national security, national aerospace security needs to strengthen the construction of the legal system in terms of aerospace security decision-making and consultation, ensure the authority, independence and flexibility of advisory decision-making bodies in terms of system, standardize the scope, procedures, channels and responsibilities of consultative and decision-making, standardize the establishment, rights, obligations, responsibilities and operation of decision-making and consulting bodies, establish special qualification examination bodies, supervisory bodies and assessment bodies for decision-making and consulting personnel, implement qualification certificates and distinguish qualification levels, and realize the professionalization of consulting team management. Normalization and holistic.

3. Establish a regular national air and space security crisis management mechanism

The suddenness, abruptness of the process, severity of the threat, uncertainty of the future, cascading of consequences and urgency of decision-making have made the aerospace security crisis a major issue related to national security, and the management of aerospace security crisis has become an overall, whole-process and regular task. Aerospace security crisis management is an organized, planned and continuous dynamic management process, which requires a series of

control actions at different stages of crisis development for potential or current crises in order to effectively prevent, deal with and eliminate crises.¹

At present, in the long-term practice of crisis management, China has gradually formed a crisis management mechanism under the unified leadership of the State Council, in which each crisis management department is responsible for the prevention and handling of one or more related types of crisis events, and other relevant departments assist and cooperate, but the full-time permanent crisis management coordination institution at the national level is not perfect, the timeliness and ability of emergency linkage between government departments are not strong, the overall crisis response ability and self-recovery ability of society are poor, and the relevant laws and regulations on aerospace safety are not sound and not in place. In order to effectively improve the ability to respond to aerospace security crises, it is urgent to establish a regular national aerospace security crisis management mechanism.

The first is to establish a comprehensive leadership and coordination organization for aerospace security crises. Establish a permanent comprehensive coordination department composed of relevant military and civilian leaders, authoritative, with independent status, and above various functional departments. Its main responsibilities are: formulating strategies, policies and plans for aerospace security crisis management, establishing an annual consultation system for major aerospace security crises, and proposing corresponding countermeasures and recommendations to the National Security Committee; Conduct intelligence collection, analysis and management of aerospace security crisis information; Conduct an assessment of the risk of air and space security threats; In non-crisis periods, be responsible for the prevention and early warning of aerospace security crises, and regularly convene relevant experts to conduct early warning analysis on air and space security crisis incidents that may occur in a certain field in the current year or longer; Responsible for leadership and coordination during crises, and authoritatively allocate resources for air and space security emergencies and emergencies that have occurred; Responsible for the supervision and management of aerospace security crisis management; After the crisis is over, assess the damage caused by the aerospace security crisis and judge the risk of future aerospace security crises.

The second is to build a holistic aerospace security crisis response management network. In order to make the management of aerospace security crises orderly, standardized, efficient, and operable, it is necessary to establish and improve an aerospace security crisis response management network with vertical and vertical coordination and management, horizontal mutual communication, information and social resource sharing, efficient command and coordination, and complete organizational structure within the government and the military on the basis of the current government and military administrative organization system. It is necessary to establish and improve mechanisms for international resource cooperation, assistance and support, including governments and international organizations, at a higher level.

The third is to establish a legalized emergency response plan system for aerospace security crises.

¹ ZHANG Tuosheng, [US] Shi Wen, ed., "Confrontation, Game, Cooperation: A Case Study of Sino-US Security Crisis Management," Beijing, World Knowledge Publishing House, 2007 edition, p4.

An efficient national aerospace security agency is not only manifested in its short-term surprise response capability under the threat state of aerospace security, but also needs to formulate corresponding response plans and contingency plans in advance to enhance the scientific and advanced response to various air and space security threat factors. Aerospace security crisis response plans must be targeted, operable and scientific, and their contents generally include: aerospace security crisis prediction and early warning mechanisms; the competence, tasks and coordination of the modalities and work program of the command body in dealing with air and space security crises; design, information integration and notification system of aerospace security crisis response information network; Handling aerospace security emergency agencies, rescue functions and call plans; The activation of emergency communication systems, the comprehensive coordination of central, local and military communication equipment and capabilities, etc.

Section 2 Aerospace Security Force System

The air and space security force system is an organic whole composed of various force elements to ensure national air and space security. In terms of nature, it mainly includes military air and space forces and non-military air and space forces, of which military force is the main force to ensure national air and space security. Therefore, this section mainly studies and discusses the system of national air and space security forces from a military perspective.

1. The functions of the air and space security force system

The air and space security force system is the main body of the national air and space security strategic system, the basis and guarantee for the implementation of the air and space security strategic actions, the core of the construction of the air and space security strategic system, and plays an irreplaceable role in safeguarding the interests of national air and space security.

(1) Guarantee for achieving the strategic objectives of national air and space security

The achievement of the goal must be guaranteed by a corresponding force. As the main means to achieve the strategic goal of national air and space security, it can ensure that the country's territorial airspace is protected from invasion, the country's aerospace assets are not encroached upon, the country's important ground targets are protected from attack, and it can create a good airspace security environment for the country's survival and development.

With the development of air and space technology, the air and space battlefield has become the main battlefield of national strategic competition, and the air and space forces have developed from auxiliary forces in military struggle to main forces, and their strategic role in safeguarding national air and space security operations is very prominent. The aggressive development of military powers in the air and space field is not only a strategic need for safeguarding global interests, but also a major challenge to China's safeguarding and expanding national interests. In the face of the strategic, battlefield and technological threats to China's air and space security by military powers, we must proceed from the practical needs of safeguarding China's air and space security interests, plan the building of air and space security forces, coordinate the development of air and space security forces with national development and national defense construction, continuously improve the strategic ability of air and space forces to fulfill their missions and tasks, and ensure the realization of the national strategic goal of air and space security.

(2) Reliance on the implementation of the national air and space security strategy

Deterrence operations and actual combat operations are the two basic forms of military force exercise. In the national air and space security strategic operations, the air and space security forces have a strong deterrent and actual combat function, and are an important force that the country must rely on at all times. From the perspective of deterrence, under normal circumstances, in order for air and space deterrence to be effective and successful, three conditions must be met: First, absolute superiority in strength; the second is to convince the other side of its purpose and determination to use force; Third, if deterrence fails, it can be immediately transferred to actual combat. In the information age, with the raising of the threshold for the use of nuclear weapons, the dominant position of nuclear deterrence is gradually giving way to information-based conventional deterrence, and air and space forces, as high-end means of military power in the information age, have deterrence incomparable with other forces, especially the powerful air and space offensive forces, which can achieve the deterrent effect of "surrendering without a fight". From the perspective of actual combat, with the great improvement of the performance of aerospace weapons and equipment, almost all kinds of targets on land, sea and air in any region of the world are within the attack range of air and space forces, and with sufficiently powerful air and space forces, coupled with the strong cooperation of other forces, they can defeat the enemy's various forces on land, sea and air, and can effectively defend national interests.¹

¹ Ji Rongren: "To meet the needs of future wars to strengthen the construction of integrated air and space forces," *Journal of Air Force Engineering University (Military Science Edition)*, 2009, 3, p8-11.

(3) Support for the expansion of national air and space security interests

In the information age, the space for human exploration, development and utilization is no longer just in the traditional fields known in the past, but expands to a higher and farther updated space, seeking more, deeper and more strategic interests in the boundless vast world. As an important defender of the expansion of national interests, the air and space forces will surely produce new impetus and provide effective support with the expansion of national interests. In vertical space, aerospace powers are taking the lead in developing "astronauts" who can carry out various tasks in the vast space space, and some countries that have achieved a superior position in the field of space military are promoting the expansion of the theory of "air supremacy" to the theory of "space supremacy," striving to realize the organic integration of the two powers in the air and space military struggle, and providing support for the development and utilization of space by the country; In horizontal space, the air forces of powerful countries have established the strategy of "global vigilance, global arrival, and global strength," and constantly strengthen the construction and application of long-range air power to safeguard their national interests overseas and globally; In the field of information, major countries regard information resources as the core content of national resources and aerospace information resources as the key elements of national information resources, and enhance the state's ability to effectively utilize information resources by strengthening the construction of aerospace information systems. As a large developing country, China's national interests have a strong need to expand into horizontal space, vertical space and information fields, and developing national air and space security forces is an inevitable choice to support the continuous expansion of China's security interests.

2. The composition of the air and space security force system

The air and space security force system is based on the generation of national air and space security strategic capabilities, with the goal of performing air and space security strategic functions and completing air and space security strategic tasks, and is composed of the organic combination of air and space perception forces, air and space offensive forces, air and space defense forces, network and electricity confrontation forces, strategic projection forces and comprehensive support forces under the unified command and control of the air and space security leadership management institutions and the air and space security strategic action command institutions.¹

¹ Liu Hongkun and Xia Yongjie: "Research on National Aerospace Security Needs," Journal of Air Force Engineering University (Military Science Edition), 2008, 1, p33-36.

(1) Space-space perception power

Aerospace perception force is a collective term for various forces that carry out air and space information perception tasks, and is the prerequisite for making air and space security decisions and implementing air and space security command and actions. From the perspective of spatial distribution, air-space perception power can be divided into ground-based perception force, space-based perception force and space-based perception force.

Ground-based perception force refers to the relevant equipment, equipment and personnel deployed on land and sea for information perception of air and space targets. It mainly undertakes the tasks of reconnaissance, surveillance, identification, tracking, and measurement of navigation elements of aviation and aerospace targets, provides timely, accurate and comprehensive target information for air and space safety operations, and can also conduct reconnaissance and surveillance of land or sea targets, and is mainly composed of ground early warning and detection forces, radio technology reconnaissance forces, and air observation and early warning forces. Ground early warning and detection forces, mainly including phased array radar, skywave over-the-horizon radar and ground-wave over-the-horizon radar, are mainly used for reconnaissance, early warning and tracking of air-space targets and provide reliable target information guarantee for air-space security operations. Radio technical reconnaissance forces, which mainly include radio interception, radio reconnaissance, and radio direction finding, are used to intercept the enemy's radio calls, reconnoiter the enemy's radio telegraphs, telex, television, and fax image signals, and locate the enemy's radio transmitters, so as to directly provide support for air and space security operations. As an important part of ground-based perception forces, air observation and early warning forces, mainly ground-to-air observation posts, still play a significant role in air and space reconnaissance and early warning.

Space-based perception capability refers to the relevant equipment, equipment and personnel deployed on air platforms for information perception of air and space targets. Its main tasks are to conduct aerial reconnaissance, grasp the air security situation, provide early warning, and evaluate the effectiveness of security operations, usually including reconnaissance aircraft, early warning aircraft, reconnaissance balloons, and reconnaissance airships. Reconnaissance aircraft are an indispensable and important part of the air-space reconnaissance and early warning force, and mainly use photographic reconnaissance and electronic reconnaissance to carry out peacetime and wartime target reconnaissance and battlefield surveillance tasks. Unmanned reconnaissance aircraft is an important equipment for obtaining battlefield intelligence, has the advantages of strong penetration capability, no cost of life, and so on; relies on visible light cameras, movie cameras, standard or low-light television cameras, infrared scanners, and radar equipment on board to conduct real-time on-the-spot reconnaissance of enemy forces deployment and important targets, and to complete various reconnaissance and surveillance tasks. The AWACS aircraft is an important force in carrying out air-space target vigilance; it can discover, identify, and track targets at an early stage at a long distance and over a large area by using high-performance radar, photographic, communications, and optoelectronic reconnaissance equipment on board, and provide corresponding early warning time for its own interception and strike at threatening targets.

Reconnaissance balloons, which are an important part of the air defense intelligence network, have the characteristics of large coverage area, good low-altitude detection performance, long continuous working time, long service life, and strong confidentiality, and are more suitable for the requirements of air and space target perception in specific areas such as deserts, islands, fortresses, distant sea areas, and military key places. Compared with aircraft and other aircraft, reconnaissance airships are a new means of sensing air and space targets; compared with aircraft and other aircraft, they have the characteristics of strong survivability, long working hours, and wide coverage, and can carry out various tasks such as early warning detection, reconnaissance and surveillance, communication relay, and electronic countermeasures.

Space-based perception force refers to an intelligence system composed of various reconnaissance and early warning satellites (including reconnaissance space stations, spacecraft, etc.), data tracking and relay platforms (including space-based platforms such as space stations) as the main equipment, supplemented by relevant information transmission and data processing equipment. Its main tasks are to conduct space reconnaissance and space target surveillance, discover, identify, monitor and track various space vehicles and ground targets, and provide accurate situational information for air and space security operations. It usually includes missile early warning satellites, electronic reconnaissance satellites, military imaging satellites and space-based space target surveillance systems. Missile early warning satellites have the characteristics of large monitoring range, long warning time, sensitive response, and strong environmental adaptability, and are mainly used in wartime to monitor and discover the launch and operation of ballistic missiles, timely discover the signs of strategic surprise attacks of the other side, and guide the anti-missile system to make interception responses; In normal times, it is mainly used to monitor missile launch tests and space launch activities in various countries around the world, understand the development trend of strategic weapons, and facilitate the adoption of corresponding countermeasures in real time. Electronic reconnaissance satellites, also known as electronic intelligence satellites, are known as the "ears" in space, and have the characteristics of wide reconnaissance range, fast speed, few restrictions, and long life, and are mainly used to intercept radar, communications, telemetry and other signals, so as to find out the test and equipment of new weapons, as well as the nature, location, and activities of military electronic systems, and grasp the battlefield situation through tracking and judging military electronic systems in wartime. Imaging reconnaissance satellites, known as "space clairvoyance," are one of the important means of seizing space and information control; they have the characteristics of a wide range of reconnaissance, fast acquisition speed, accurate and reliable intelligence, and are not restricted by national borders and geographical conditions, and are indispensable members of space-based perception forces. The space-based space target monitoring system has the characteristics of long observation distance, large observation field of view, fast data update, and strong survivability; it can conduct all-weather observation of targets in low-orbit, high-orbit, and geosynchronous orbits, precisely determine the orbits of various satellites, monitor and track mid-flight ballistic missiles, detect and track new-type space-to-space shuttle vehicles and hypersonic vehicles in nearby space, and provide strategic early warning of possible enemy attacks.

(2) Offensive forces in the air and space

Offense is the best defense and the most effective and fundamental means of maintaining national air and space security. Aero-space offensive forces refer to air-space combat forces that mainly carry out offensive combat missions in an air-space battlefield environment. With the development of aerospace forces, especially space forces, from support to equal emphasis on support and confrontation, their combat effectiveness will continue to increase. Aerospace-space offensive forces are generally divided into air offensive forces, space offensive forces, and ballistic missiles.¹

Air offensive force refers to the combat force in the air-space battlefield that undertakes the task of carrying out air attacks on enemy ground, air and space targets in airspace. It mainly includes multi-function fighters, bombers, fighter-bombers, helicopter gunships, unmanned attack aircraft and various airborne weapons (such as air-to-air missiles, air-to-ground guided bombs, air-to-ground cruise/ballistic missiles, etc.). Fighter jets, with the characteristics of fast speed, good mobility, strong firepower, flexibility and mobility, and the ability to carry out a variety of combat tasks, the main tasks they undertake in air offensive operations are: to engage in air combat with enemy fighters and seize air supremacy; intercepting and attacking enemy air bombers, attack aircraft and missiles; Cover bombers and other support aircraft conducting offensive air operations; When necessary, it can carry a certain number of ground attack weapons to strike at ground (sea) surface targets. Bombers, with the characteristics of strong assault power, long range, and large bomb load, are the main force and offensive means for aviation to carry out air assaults. Among them, strategic bombers are mainly used to attack targets of strategic value in the depth of the enemy, and at the same time, they are also an important part of the strategic nuclear forces of military powers and one of the main delivery vehicles of large-yield nuclear weapons. Fighter-bombers, which have the characteristics of large bomb load, long range, fast flight speed, high maneuverability and strong attack capability, are mainly used to attack land and sea targets and air operations in the tactical depth of the enemy's campaign. Helicopter gunships have the characteristics of maneuverability, rapid response, suitable for low altitude, and can fire in motion and hovering conditions, and can undertake tasks such as attacking land and sea targets, competing for ultra-low altitude air supremacy, and performing anti-submarine warfare. Unmanned attack aircraft is a new type of air offensive combat force, which has the characteristics of high combat efficiency and cost ratio, strong mobility, good stealth, and can perform a variety of tasks, and can undertake the tasks of attacking enemy ground targets, anti-ballistic missiles, and seizing air superiority.²

¹ Cai Fengzhen and Tian Anping, "Aerospace Battlefield and Chinese Air Force," Beijing, People's Liberation Army Press, June 2004, 92.

² Yuan Juntang and Zhang Xiangyan, eds., Introduction to Weapons and Equipment, Beijing, National Defense Industry Press, 2011 edition, p141.

Space offensive force refers to the combat force that undertakes the task of attacking enemy ground, air and space targets in outer space in the air-space battlefield. It mainly includes space stations, space planes, attack satellites, etc. The space station, with the advantages of large volume, manned people, long life and comprehensive utilization, is usually a platform for space science experiments and space support, and can also be used as a space reconnaissance, surveillance, communication platform and combat command center, and can also be equipped with missiles, high-energy laser weapons, particle beam weapons, kinetic energy weapons and other space combat weapons, forming a space combat system, used to intercept and destroy space missiles, satellites and spacecraft and other military targets, and has the ability to strike at land, sea, air and other military targets. Aerospace aircraft is a new type of air and space offensive force under development, which has the characteristics of fast flight speed, wide combat use, high reuse rate, and good economic efficiency and cost ratio, and can undertake combat tasks such as air and space information support, air and space weapon launch, and ground attack. Attack satellites, also known as interceptor satellites, are an important force in space operations, mainly responsible for destroying, damaging or disabling enemy spacecraft that threaten China's space security.

Ballistic missiles are combat forces that undertake ground offensive tasks in air-space operations, and mainly refer to ballistic missile systems launched from the ground or underwater and carrying out strategic and tactical strikes against important targets on the enemy's ground through space. It has the characteristics of short preparation time, fast flight speed, strong penetration capability, and great destructive power, and has various functions such as carrying out nuclear and conventional tasks, deterrence and actual combat, and strategic and tactical tasks, and is an indispensable air and space offensive force. According to the space position of the launch platform, it can be divided into land-based ballistic missiles and sea-based (ship/submarine-launched) ballistic missiles. According to the function and nature of missiles, they can be divided into strategic ballistic missiles and tactical ballistic missiles. Strategic ballistic missiles, usually with nuclear warheads, are nuclear deterrence, nuclear strikes, and reliable nuclear retaliatory forces; Tactical ballistic missiles are usually equipped with conventional warheads, but can also be equipped with low-yield nuclear warheads, which have the advantages of long range, high hitting accuracy and strong lethality ability, and are mainly used to support battlefield operations, suppress and destroy targets in depth of enemy campaign tactics.

In addition, at present, major countries attach great importance to the military development and utilization of near space, and the research and development of near-space weapons represented by HTV-2 has attracted great attention and will surely become an important force in future air-space offensive operations.

(3) Aerospace defense forces

Aerospace defense is a necessary means of maintaining national air and space security.

Aerospace defense forces refer to air-space combat forces that mainly carry out defensive combat missions on the air-space battlefield. With the integration and development of air and space technology and forces, air and space defense has shown obvious characteristics of the integration of air defense, space defense and anti-missile. From the perspective of spatial distribution, air and space defense forces mainly include ground defense forces, air defense forces and space defense forces.

Ground defense forces refer to the forces that undertake ground-based air defense, anti-space, and anti-missile combat missions in the air-space battlefield, and mainly include surface-to-air missile weapon systems, anti-aircraft artillery systems, and projectile-artillery combined systems. Surface-to-air missile weapon systems, including ground-to-air missile weapon systems and ship-to-air missile weapon systems, have the characteristics of long range, high launch height, strong maneuverability, wide coverage, short reaction time, and high single-shot hit rate. The anti-aircraft artillery system has the characteristics of long gun body, large muzzle velocity, large firing range, fast rate of fire, high shooting accuracy, automatic tracking and aiming at targets, and is mainly used to hit air targets such as aircraft, helicopters, cruise missiles and other aircraft, and can also be used to shoot at ground targets. The projectile-artillery combined system combines the advantages of high shooting accuracy and single shot: high killing probability, long range and rapid maneuverability, continuous firing, strong anti-jamming ability and low cost of anti-aircraft missiles, and is an effective weapon for resisting low-altitude and ultra-low-altitude targets.

Air defense forces refer to forces that undertake air defense tasks in the air-space battlefield, mainly including combat platforms such as fighters, fighter-bombers, and air combat helicopters, as well as air-to-air missiles, airborne laser weapons, airborne anti-missile missiles, airborne anti-missile missiles, airborne anti-space missiles, and other air-based weapons. Air-to-air missiles have the characteristics of fast response, good maneuverability, small size, light weight, flexible and convenient use, and the fourth-generation air-to-air missiles that adopt infrared imaging detection, post-launch interception, and thrust vector control technologies have good tracking performance, high anti-jamming ability, high maneuverability, dexterous launch mode, and a larger attack area, and have the ability to deal with fourth-generation combat aircraft. Airborne laser weapons have the characteristics of fast reaction speed, fast aiming and killing, high attack accuracy, strong anti-jamming ability, wide range of use, and high ratio of combat use efficiency and cost, and at present, the world's military powers such as the United States, Russia, India, etc. are carrying out the development of airborne laser weapons. Airborne anti-missile missiles have the characteristics of fast interception speed, good maneuverability, high degree of intelligence of guidance system, strong compatibility of launch platforms, wide system deployment area, large interception height, and high efficiency-cost ratio, and can be used to attack short/medium-range ballistic missiles in the boost, ascent or end-of-flight stages, and will surely become an important weapon for air defense in the future. Airborne anti-space missiles refer to air-space missiles launched from the air by carrier aircraft to counter enemy spacecraft, and high-performance combat aircraft carrying anti-space missiles will have the ability to strike at any low-Earth orbit spacecraft.

Space defense force refers to the force that undertakes space defense tasks in the air and space battlefield, mainly active defensive space weapon systems deployed in outer space to destroy or disable enemy spacecraft, including all kinds of space-based platforms and space-based laser weapons, space-based particle beam weapons and space-based kinetic energy weapons mounted on them.

Space-based laser weapons have the advantages of rapid response, no need to calculate the advance amount of the target, no recoil when the laser beam is launched, continuous firing, and the ability to shift the direction of the launch in a short time, and can be used to attack various targets on the earth's surface or atmosphere, and can also condescendingly destroy missiles launched by the enemy, or strike at enemy satellites and facilities. Space-based particle beam weapons, with the characteristics of high concentration of energy, strong penetration, high pulse emissivity, and rapid change of launch direction, are a new type of space weapon being developed by the military powers of the United States and Russia, which can be deployed on space-based platforms such as space stations for offensive and defensive operations against space targets. Space-based microwave weapons have the characteristics of good concealment, great power, fast speed, long range, all-weather combat, and can deal with multiple targets at the same time, such as the space-based high-power microwave weapon being developed by the United States, which is a weapon that kills and injures ground, air and space targets, which is composed of satellite constellations in low orbit, which can direct ultra-broadband microwave energy to the target and generate an electric field within tens to hundreds of meters in the target area, thereby destroying or damaging various electronic components of space targets. Space-based kinetic energy weapon is a weapon that uses the huge kinetic energy generated by the high-speed flight of the warhead to penetrate and destroy the target, and the space-based kinetic energy weapons under development mainly include ultra-high-speed cluster rod penetrators, space electromagnetic railguns and space-based kinetic energy interceptors, etc., which are mainly used to intercept ballistic missiles and fight against spacecraft operations, which is not only a super accurate and light intelligent interception weapon, but also an effective space-based security and defense equipment.

(4) Network and electricity countermeasures forces

Network power countermeasure force is a collective term for equipment, systems and personnel that carry out electronic jamming, electronic protection, network attack and network protection, and is mainly composed of network power offensive force and network power protection force, so as to carry out the task of seizing and maintaining the superiority of network power space.

Network power offensive force refers to the combat force that mainly fulfills the network power attack mission in air and space security operations. Based on air-based long-distance support jamming, accompanying jamming, UAV approach jamming, self-defense jamming, ground-based electronic jamming equipment, network attack systems, wireless network attack systems, anti-radiation missiles and unmanned aerial vehicles, electromagnetic pulses and high-energy microwave weapons, etc., the integrated network and electricity offensive force is used to effectively suppress, jam and deceive the enemy's radar detection system, wireless communication system and data link system, invade and attack the enemy's command information system and battlefield wireless network, destroy or destroy the enemy's ground radar system, AWACS and jammers and other targets.

Among them, typical network power attack systems include the US "Schutte" system, "network electric aircraft" and "5D network power space warfare system". The "Schutte" system is an airborne network electrical attack system used by the US military to attack the enemy's network power system, which can carry out network human intrusion, network deception, and even take over the enemy's integrated air defense electronic system in the battlefield network and power environment, can detect and identify a variety of radiation sources, can find loopholes in the enemy's air defense system and make use of them, send false target information to deceive and mislead, and even shut down the enemy's air defense system. The network power aircraft is a platform that can fly freely in the network space, which can independently collect reliable network power situation intelligence data in the network space according to the operator's strategy and the use of various loads carried, and implement corresponding network power attack actions according to different network power environments. The 5D network power space warfare system is an intelligent network power combat platform with both soft and hard killing capabilities, integrating combat capabilities at all stages of the network and electricity space, with complete functions, both offensive and defensive, and multi-dimensional integration, and has the 5D ability to deceive, refuse, disintegrate, degrade and destroy the enemy's network power system.¹²

Network power defense force refers to the combat force that mainly fulfills the network and electricity defense tasks in air and space security operations. It mainly includes network protection forces, comprehensive protection forces in key places, and confidential secrecy forces. The network and electricity protection force built on the basis of computer network protection system, comprehensive protective equipment for key places and security and security and security system is mainly used to protect the security of information network systems, electronic information equipment and positions in key places. For example, the United States has successively developed the "cryptography modernization" plan, the "network power wolf" distributed network power attack intelligent sniffing system, the "network power deception" software system, the "intrusion shield" software system, the "elastic cloud" project, the "Prometheus" system, the "host-based firewall system" and the "host-based anti-intrusion system," etc., and its strategic goal is to establish a reliable information and network power infrastructure to prevent the enemy from entering, staying and operating in the network power system.

(5) Strategic projection of forces

Strategic projection refers to the long-distance, large-scale, and long-term delivery of military personnel, weapons and equipment, and various materials over long distances, in large quantities, and over a long period of time in order to ensure the smooth implementation of one's own air and space security operations.³

¹ Ma Linli, ed.: "Space Warfare at Foreign Military Networks — Current Status and Development," Beijing, National Defense Industry Press, 2012 edition, p123~128.

² Ma Linli, ed., "Space Warfare at Foreign Military Networks — Current Situation and Development," Beijing, National Defense Industry Press, 2012 edition, p133~136.

³ Shi Xinsheng, Zeng Youchun, Dong Zhiqiang, et al., "Research on the Basic Issues of Strategic Projection," Beijing, Military Science Press, 2010 edition, p1~9.

It has the advantages of strong mobility, fast speed, long distance, large scale, and can surpass natural and artificial obstacles, and is an important means to complete strategic deployment, strategic actions and support tasks. Modern warfare is "the glory of the arrivals," there is no long-range maneuver without adequate means of strategic delivery. As the main means of carrying out the strategic projection of air and space security, the strategic projection of air and space forces has a major impact on or even a decisive role in the success or failure of the national air and space security strategic actions, mainly including air projection forces, space projection forces and other projection forces.

Air delivery force refers to the force that undertakes the strategic projection task of air space in air and space security operations. It mainly includes military transport aircraft, transport helicopters, air tankers, etc. Strategic transport aircraft have the characteristics of fast conveying speed, long conveying distance, strong mobility, and large conveying capacity, and can undertake the transportation tasks of long-distance, large numbers of personnel and large air and space equipment, and the implementation of global rapid mobility. Tactical transport aircraft has the characteristics of small carrying capacity, taking off and landing at small and medium-sized airfields on the front line, and better short-distance take-off and landing capabilities, and can be used to engage in close military mobilization, logistics supply, airborne paratroopers, airdrop military supplies, and transport wounded in front-line theaters. Transport helicopters are an important supplementary force for strategic air delivery, and have the characteristics of not being restricted by ground conditions, accurate delivery locations, rapid battlefield mobility, and concealed modes of transportation, and can perform tasks such as troop mobility, airborne (airborne) operations, and transportation of weapons, equipment, and materials. Air tankers are mainly used to refuel transport aircraft and transport helicopters, thereby extending the range and empty time of the tanker to shorten the strategic delivery time and increase the strategic delivery distance.

Space projection power refers to the force that undertakes space strategic projection tasks in aerospace security operations. It mainly includes launch vehicles, spacecraft, space shuttles, space planes and nearby space vehicles. With the expansion of air and space security operations into space and adjacent space, space strategic projection forces, as an indispensable and important means to safeguard national air and space security interests, have become more and more important in ensuring space defense and offensive combat operations.

Other projection forces, including land projection forces and sea projection forces, as an important supplement to the strategic air-space projection forces, can provide land and sea projection support for strategic air-space projection. Land projection forces mainly include railway transmission, road transmission and pipeline transmission; Sea delivery is an important means to ensure the security of the littoral sea and islands and the security of the far sea and distant oceans, and is an indispensable force for safeguarding maritime rights and interests and expanding national interests, mainly including pre-positioned ships, maritime transport ships, fleet auxiliary ships and special task ships, etc., and is an important force for realizing pre-positioned transportation, rapid maritime transportation and continuous maritime transportation.

(6) Comprehensive support forces

Comprehensive support force refers to the force that provides comprehensive support for air and space perception, air and space attack, air and space defense, network and electricity confrontation, and strategic projection in air and space security operations. According to the task, it can be divided into equipment support forces, logistics support forces, aviation search and rescue forces, etc.

Equipment support force refers to the force that fulfills the task of equipment support in air and space security operations. It is necessary to take into account the rapid changes in the air and space security situation, the support needs of air and space security operations, and the flexible and changeable center of support, and in accordance with the socialized support road of military-civilian integration, uniformly allocate resources to ensure the high integrity rate, high sortie rate, and sustainable mission ability of air and space equipment. The high-tech, informationized, and systematic development of air and space equipment, air and space forces, and air and space operations has become increasingly dependent on equipment support, and without precise, efficient, and agile equipment support, it will be difficult for the "wings" of air and space security forces to spread.

Logistics support force refers to the force that fulfills logistics support tasks in air and space security operations. The full-space and large-system characteristics of air and space security operations have further increased the task space and heavier support work, not only the content of support has increased, the support process is complicated, but also the support activities are diverse and the support risks are increased, which puts forward new requirements for logistics support. In order to effectively meet the logistical support needs of air and space security operations, developed countries have paid special attention to improving the mobility, rapid, and three-dimensional support capabilities of logistics support forces, and have simultaneously built logistics support forces with air and space combat forces, and developed logistics support equipment and air and space combat equipment simultaneously, so that logistics support forces can have "multi-functional," "all-weather," and "all-dimensional" support capabilities.

Aviation search and rescue force refers to the force that undertakes air search tasks in air and space security operations. With the multi-dimensionalization of the air-space safety operation space, it is inevitable that airborne personnel and airborne personnel will be in distress in wartime, and the task of aviation search and rescue will be extremely important and arduous. Aviation search and rescue forces undertake tasks such as daily training, tactical drills, and corresponding national search and rescue in peacetime, and coordinate with local search and rescue forces in wartime to undertake search and rescue tasks for pilots in distress and airborne troops.

For example, the US Air Force's active search and rescue forces include six search and rescue squadrons stationed at bases such as Moody, Georgia, Davis Munson, Arizona, and Nellis, Nevada, and three search groups and squadrons stationed in Kadena, Okinawa, Japan, Osan in South Korea, and Keflavik in Iceland, equipped with 130 search and rescue helicopters such as HC-130 and HH-60, and at the same time use MH-53 "Paving Depression" helicopters and MC-130 special operations aircraft to carry out search and rescue missions.

In addition to the above-mentioned basic forces, the national air and space security force system also includes other forces. For example, the relevant national aviation law enforcement forces (paramilitary forces) mainly maintain the national air transport security order in accordance with national laws and local regulations, and their mission scope is the national airspace area and domestic civil airports. Since air and space security has a strong policy and international cooperation, foreign-related national air and space security affairs also need to deal with security crises through diplomatic means and in accordance with relevant international and domestic laws and policies, and the diplomatic team is also one of the important forces for maintaining national air and space security.¹

3. The construction of an air and space security force system

The national air and space security force system is the core of the national air and space security system and the basis for the implementation of national air and space security operations. The construction of the national air and space security force system must focus on improving the comprehensive ability to maintain national air and space security, reflect the high degree of integration of national air and space forces, highlight the emergency needs of national air and space security, and provide strength support for the realization of the country's long-term peace and stability in the air and space field.

(1) Basic requirements for the construction of the air and space security force system

The building of air and space security forces should closely focus on the realization of the national strategic goal of air and space security, and strive to build a national air and space security force system that is compatible with the status of a major country, has complete elements of various forces, has a reasonable structure, and has the air force as the backbone.

First, it is compatible with the status of a great power. At present, China has become a world political, economic, military, demographic and geographical power, and a major developing country with international influence and responsibility.

¹ Li Xuezhong and Tian Anping, "The Theory of National Aerospace Security," Beijing, People's Liberation Army Press, 2010 edition, p107.

Along with the pace of China's rapid development, the building of national air and space security forces must have big thinking, use big strokes, complete great leaps, achieve great development, and form a large system of national air and space security forces that is compatible with the status of a major country.

Second, the elements are complete and the structure is reasonable. Factor constraint system, structure determines function. To build a national air and space security force system, we must focus on the overall situation and develop in an all-round way. From a spatial point of view, it is necessary to build a force system composed of air security forces, space security forces, information network security forces, and ground-related forces; From the nature point of view, it is necessary to build a force system with aerospace military security forces as the main body and combining with political, economic, scientific, technological, cultural and other aerospace non-military security forces; From the perspective of the degree of function, it is necessary to build a force system that combines direct and realistic air and space security forces with indirect potential air and space security forces.

The third is to take the Air Force as the backbone. The Air Force is an important part of the national armed forces, with obvious advantages and special roles in the national air and space security force system, not only has the basic advantages of system integration, the advantages of technological development of air and space integration, the advantages of mobile and efficient combat platforms and the advantages of constantly expanding combat means, but also the air force activity space is consistent with the national air and space security mission space. Therefore, to build a national air and space security force system, it is necessary to establish the leading support position of the air force, give play to the backbone and leading role of the air force, and improve the efficiency of the construction of the national air and space security force system.

(2) Key contents of the construction of the air and space security force system

In the course of construction, we should adhere to the basic idea of air space as the main body, network as the support, and space and earth support, make overall plans, highlight key points, and promote the stable, coordinated, healthy and rapid development of the construction of air and space security forces.

The first is to accelerate the pace of space force construction and focus on improving the information support capability of space-based systems. Space force is a key factor in maintaining national aerospace security, and the speed and quality of its construction are related to the overall benefits of the construction of national aerospace security forces. In recent years, the pace of China's space force construction has accelerated significantly, and several important technical fields have ranked among the world's advanced ones, and the ability to enter human space has been enhanced by continuously improving the launch vehicle type spectrum.¹

¹ Tian Anping, Yang Fan, Chen Gang: "Thinking on the Construction of the National Aerospace Security System," Journal of Air Force Engineering University (Military Science Edition), 2008, 1, p26~29.

It has built a space infrastructure composed of satellites such as earth observation, communication and broadcasting, navigation and positioning, and improved its space application capabilities; Continuously improve the satellite application service system, expand the scale of satellite application, and meet the needs of national economic and social development. However, from the perspective of national defense and national aerospace security strategy, there are still a series of problems that need to be solved urgently in the construction and development of military aerospace forces, and the contradiction between construction and application needs is very prominent. To this end, the future military space force should focus on strengthening the construction of five aspects: First, develop space-based early warning systems such as early warning satellites, form a complete national strategic early warning system, provide sensitive and efficient early warning information for air defense, space defense, and anti-missile operations, and create conditions for far-reaching interception and multi-level interception; Second, strengthen the construction of space reconnaissance means, realize the information link between space-based platforms and air and ground combat platforms, create conditions for the integration of reconnaissance and strike and near-real-time precision strikes, and improve our military's ability to use air and space offensive forces to safeguard national security interests; Third, accelerate the development of space vehicles, especially space aircraft, truly realize the integrated air-space combat capability, make up for the unfavorable situation of China's nuclear deterrence effect being reduced and limited, and form a strategic means that both conventional air and space deterrence and strike are emphasized; Fourth, attach importance to the development of micro-small satellites to meet the needs of responding to space emergencies and local wars; Fifth, strengthen the networking of space-based systems and improve the ability to obtain, transmit and implement information support. In addition, when speeding up the building of space forces, special attention should be paid to the safety protection of various spacecraft themselves and the safety capability of space systems should be improved.

The second is to optimize the structure of air power, focusing on strengthening air long-range operations and the building of land/sea-based air defense and anti-missile forces. Air power is the main force for maintaining national air and space security, including military aviation and non-military aviation forces. Military aviation force is an air force system with the air force as the main body and composed of the aviation units of all services and ground-related air forces, which mainly performs strategic early warning, air offensive, air transportation, airborne operations, network and electricity confrontation, and plays a basic role in the struggle to maintain national air and space security. As the backbone of the national air and space security forces and the main force for the implementation of national air and space security operations, the Air Force shoulders the strategic mission of effectively controlling air space and expanding to limited control of space and effective use of aerospace space. To vigorously enhance the strategic deterrence and actual combat capability of the Air Force, it is necessary to strengthen the building of long-range offensive forces, focusing on the development of long-range strategic bombers, unmanned combat aircraft integrating air supremacy and strike, long-range high-speed air-to-ground (sea) cruise missiles, hypersonic combat aircraft in near space, and long-range combat support aircraft, so as to expand the scope of the Air Force's ability to perform strategic missions.

Second, it is necessary to strengthen the construction of long-range air delivery forces, including long-range heavy transport aircraft, large tankers, and near-space delivery platforms, so as to expand the strategic boundaries of the Air Force to safeguard national security interests; Third, it is necessary to strengthen the building of air-based anti-missile forces, including air-based anti-missile missiles, laser weapons, and kinetic energy weapons, and enrich the air force's air defense and anti-missile strategic means; Fourth, it is necessary to strengthen the building of land-based/sea-based air defense and anti-missile forces, focusing on the development of land-based mid-section and terminal high-level anti-missile means, anti-stealth targets, nearby space targets, and advanced target capabilities. Through construction, the Air Force will change from focusing on passive response to crises to actively shaping the situation, from mainly operating within the scope of the country to supporting and participating overseas, from paying attention to actual combat application to focusing on deterrence, deterrence and the combination of actual combat, expanding from mainly in air space to sea and outer space, and from separating air and space to participating in sky building, using the sky as the main body, appropriately managing the sky, and leading the development of sky defense. While focusing on strengthening the building of air force, it is also necessary to simultaneously develop the aviation and civil aviation forces of other services, improve the navy's far-sea air defense capabilities through the development of naval carrier-based aviation, and expand the scope of national air and space defense. Through the development of army aviation, improve the army's ability to respond to and deal with low-altitude and ultra-low-altitude crisis incidents, and give play to the army's role in maintaining national air and space security; Through the development of civil aviation forces, the localization and reliability level of civil aviation will be improved, and the ability of civil aviation to respond quickly, rescue and rescue, deal with emergencies and maintain stability at major critical moments, and support air and space military operations in wartime will be enhanced.

The third is to develop and integrate air and space information forces and form a "three-in-one" information network force system. Aerospace information force is the core factor in maintaining national aerospace security, and the integrated development and overall application of aerospace information force is an effective way to enhance the function of the aerospace security force system and improve its application efficiency, which can interconnect the information elements widely distributed in space-based, air-based, land-based and sea-based into an organic whole, and maximize the utilization efficiency of aerospace information resources. Whether from the perspective of technology or military application needs, solving the interconnection of space-based, air-based and ground-based information and forming an information network force system integrating aviation, space and network and air has become an urgent task in the construction of national air and space security forces. To this end, it is necessary to carry out technological transformation of existing aerospace equipment and systems, rapidly improve the level of informatization of aerospace security equipment and forces, and integrate them into the large system of aerospace security forces. It is necessary to develop key aerospace informationization security equipment and forces ahead of schedule, and directly develop and build them in advance in accordance with informationization standards, especially to focus on the development of equipment and forces for air and space information perception, transmission, processing, and application; It is necessary to develop urgently needed air and space security equipment and forces through "introduction" and other paths, and strengthen the construction and development of information support and network and electricity offensive and defensive air and space equipment and forces;

It is necessary to adjust, integrate, and optimize the air and space information application system, develop the space-based information application equipment and units of all branches of the armed services and civil aviation, especially the air force, and realize the seamless connection of space-based information with air, ground, and maritime information systems and forces.

Section 3 Aerospace Security System

The national aerospace security system refers to the collective name of various basic supporting conditions and elements that must be met to ensure the normal operation of the national aerospace security leadership management system and the national aerospace security force system in order to achieve the strategic goals of national aerospace security. It mainly includes aerospace security mechanisms, aerospace safety regulations, and aerospace support resources.

1. The role of the air and space security system

The effective implementation of the national aerospace security strategy and the efficient operation of the national aerospace security system not only need to give full play to the functions of the national aerospace security leadership system, but also need the strong support of the national aerospace security system. In a sense, the national air and space security system determines the quality, management efficiency and application of air and space security forces, and is an important factor in the success or failure of national air and space security strategic actions.

(1) The normative role of the air and space security system

Whether it is the implementation of the aerospace security strategic decision-making process or the formulation of the aerospace security force system construction plan, it is necessary to use corresponding theories and methods in accordance with the corresponding processes and norms according to the determined goals and requirements, so as to ensure the scientific decision-making and the rationality of the planning. The normative role of the national air and space security system is mainly reflected in the following three aspects:

The first is to standardize the procedures for strategic decision-making on air and space security. The essence of decision-making is choice, that is, the choice of strategy, policy, tactics, methods, etc.; The key to decision-making is science, and in order to achieve scientific decision-making, there must be a certain decision-making mechanism.

National aerospace security decision-making is the highest decision-making at the national level, and its essence is the choice of national aerospace security strategy and policy, including the determination of aerospace security strategic decision-making objectives, the generation of decision-making plans, the evaluation of decision-making plans and the formation of decision-making schemes, etc., and corresponding decision-making mechanisms must be established to standardize the procedures, methods and modes of decision-making to ensure the scientific nature of strategic decision-making on aerospace security.

The second is to standardize the formulation of plans for the construction of the air and space security force system. The construction of the aerospace security force system is a long-term systematic project, including the formulation of construction goals, the selection of construction priorities, the generation of construction plans and the selection of construction paths, etc., and at the same time, it is necessary to coordinate and handle well the relationship between internal and external systems, domestic and international, reality and the future, and must be implemented in accordance with relevant regulations, systems and standards to ensure the rationality of the construction plan of the aerospace security force system.

The third is to standardize the establishment of a plan for the use of the air and space security force system. In peacetime, it is necessary to formulate air and space security action plans for different modes of operation, and in times of crisis, it is necessary to formulate air and space security action plans for different air and space threats, and the formulation of plans and plans must be carried out in accordance with the corresponding norms and procedures to ensure the rationality and effectiveness of the plans and plans.

(2) The guarantee role of the air and space security system

Whether it is the function of the national aerospace security leadership management system or the realization of the function of the national aerospace security force system, the national aerospace security system needs to provide legal and institutional guarantees. The guarantee role of the national air and space security system is mainly reflected in the following three aspects:

The first is the legal guarantee for the design of the national aerospace security strategy. The macro design of the national aerospace security strategy is an important function of the national aerospace security leadership management system, which not only involves the goal-oriented orientation of national aerospace security and development, but also includes the development, utilization, management and defense of the air and space field, in view of the sovereignty of the airspace, the exclusivity of the sea and air and the public ownership of public space and space, it is necessary to integrate the national security strategy of airspace, public space and space in accordance with the relevant national security laws and international space laws and other laws, and establish the overall deployment of the national space security strategy.

The second is the legal guarantee of the national air and space security strategic action. Aerospace security strategic operations, especially non-military strategic operations such as the development and utilization of air and space, air control and security, space monitoring and control, and air and space exchanges and international cooperation, are all carried out in aerospace and outer space.

The third is the legal guarantee for the construction of the national air and space security forces. The building of national air and space security forces is not only closely related to national air and space security and development interests, but also inseparable from the international security strategic situation. At the same time, the construction of national aerospace security forces involves many aspects such as aviation forces, space forces and network power space forces, especially the construction of space forces, which must be guaranteed by international space law to ensure that the construction of national space forces meets the needs of national aerospace security strategies and national development interests.

(3) The supporting role of the air and space security system

The role of the national aerospace security leadership system in strategic decision-making, command and control, as well as the implementation of strategic actions for aerospace security, all require aerospace support resources to support. The supporting role of the air and space security system is mainly reflected in the following three aspects:

The first is to provide support for strategic decisions on air and space security. Whether it is the decision-making of the highest decision-making body of the state, or the decision-making of the functional departments of the central government or the functional departments of local governments, it is necessary to support the selection and design of aerospace security strategies and strategies based on national strategic resources and aerospace information resources, and formulate and implement strategic objectives of aerospace security.

The second is to provide support for the construction of air and space security forces. The core of the building of air and space security forces involves many aspects such as air and space perception forces, air and space offensive forces, air and space defense forces, network and electricity countermeasure forces, strategic projection forces, and comprehensive support forces; the core of which is the construction of air and space security equipment; the development, production, and use of air and space security equipment all require the consumption of the state's strategic resources in materials and energy, and the shortage of raw materials and energy will directly restrict the scale and efficiency of the construction of air and space security forces.

The third is to provide support for the use of air and space security forces. Whether in peacetime or wartime, whether military or non-military operations, the use of air and space security forces needs to have sufficient strategic resources such as materials, energy and related materials as support, otherwise it will lead to the inability of air platforms and space platforms to take off and enter space, resulting in "not standing high" in altitude, "not seeing far" in distance, and "not keeping up" in speed, directly restricting the completion of air and space perception, long-range attack, strategic projection, and comprehensive support tasks.

2. The composition of the air and space security system

The national aerospace security system aims to ensure national aerospace security, meets the needs of national aerospace security activities, and is mainly composed of aerospace security mechanisms, aerospace safety regulations and aerospace support resources.

(1) Aerospace security mechanisms

The national air and space security mechanism refers to the systematic organization and operation mode built to prevent and respond to various security crises faced by the country and ensure national air and space security. A sound national aerospace security mechanism can ensure the completeness of the organizational structure, clear responsibilities, sensitive response, efficient operation, correct decision-making and smooth command information in formulating the national aerospace security strategy, and plays an extremely important role in coping with the occurrence of various aerospace security crises and emergencies and better safeguarding and safeguarding the interests of national aerospace security. The national air and space security mechanism includes an air and space security decision-making mechanism and an air and space security enforcement mechanism.¹²

The national air and space security decision-making mechanism refers to the basic model of effective decision-making on national air and space security issues constructed by the state within the framework of national security system and policy in order to achieve the strategic goals of air and space security. The national air and space security decision-making mechanism is usually composed of basic elements such as decision-making system, intelligence system, think tank system and institutional system. The decision-making system is the core element of the national aerospace security decision-making mechanism, which is mainly composed of the decision-making center and decision-making body. The decision-making center refers to the highest decision-making unit composed of national leaders or leadership collectives with the ultimate decision-making power on national aerospace security issues, which can be either one person or a group, with both great power and great responsibility; Decision-making bodies refer to those national functional departments or organizations related to national aerospace security decision-making, are the main participants in national aerospace security decision-making, are the planners, formulators and implementers of decision-making programs, are the main auxiliary systems of decision-making centers, and are also the supplement and extension of the will of decision-making centers.³

¹ Huang Xin and Zhang Shanming, eds., *The Way to Safety and Danger: National Security and Security System Construction*, Beijing, People's Liberation Army Press, 2011 edition, p165.

² Wang Fan and Lu Jing, eds., *Introduction to International Security*, Beijing, World Knowledge Publishing House, 2010 edition, p88.

³ Liu Jingbo, editor-in-chief: *21China's National Security Strategy at the Beginning of the Century*, Beijing, Shishi Publishing House, 2006 edition, p295.

The intelligence system is a key element of the national air and space security decision-making mechanism, and its main function is to provide timely and accurate information and intelligence to decision makers, usually including special systems and integrated systems. Special systems refer to intelligence systems in different fields, different scopes, and different approaches, including military security information systems, economic security information systems, scientific and technological security information systems, etc.; An integrated system is a composite system composed of two or more specialized systems. The think tank system is the leading element of the national aerospace security decision-making mechanism, which can usually be divided into core think tanks and general think tanks. Core think tanks refer to those senior staff who are highly trusted by the decision-making center and have a special relationship with the decision-making center; General think tanks refer to those regular academic institutions or specialized strategic research institutions that have a reference relationship with decision-making. The institutional system is the basic element of the national aerospace security decision-making mechanism, which stipulates the functions of the decision-making system, intelligence system and think tank system, and stipulates the interaction between each other, which can usually be divided into element function system, decision-making operation system and decision-making supervision system. The element function system is a regulation, rules and policies on the role of decision-making systems, intelligence systems and think tank systems in air and space security decision-making; The decision-making operation system is a clear stipulation of the relationship between the various elements of the aerospace security decision-making mechanism and the relationship between various institutions within the elements, so as to ensure the coordinated operation of each element system of the aerospace security decision-making mechanism; The decision-making supervision system is the law, rules and norms that supervise the decision-making process of aerospace security.

The main role of the National Aerospace Security Enforcement Mechanism is to ensure that the decision-making plan of the National Aerospace Security Command Institution is implemented and that the decisions of the National Aerospace Security Command Institution can be effectively cooperated by all sectors of society in the action of maintaining national air and space security. National air and space security activities are a huge system including national security, foreign affairs, national defense, intelligence, emergency handling and other departments, and the key to judging the effectiveness of this system depends on whether it can effectively implement the decisions of the national air and space security decision-making system and effectively mobilize all social resources in the shortest possible time to solve the problems faced by national air and space security. For example, Russia's national air and space security enforcement mechanism consists mainly of the Ministry of Defense, the General Staff, the Ministry of Foreign Affairs, the Ministry of Internal Affairs, the Security Service, the Foreign Intelligence Service, the Communications and Information Service and the Ministry of Emergency Situations. The basic tasks and functions of the Ministry of National Defense in the field of national aerospace security include the right to recommend air and space security policies, coordinate military policies, participate in the implementation of military diplomacy, and collect military intelligence.¹

¹ Wang Fan and Lu Jing, eds., *Introduction to International Security*, Beijing, World Knowledge Publishing House, 2010 edition, p95.

The main tasks of the General Staff are strategic planning, military training, strategic deployment and organization of intelligence activities for the use of the armed forces.

(2) Aerospace safety regulations

Aerospace safety regulations refer to the sum of laws and regulations used to adjust the relationship between national air sovereignty, public space and space security interests within a certain scope. The development and utilization of the aerospace field involves not only the relations between various departments within the country, but also the external relations between countries, and legal means are the most basic way to deal with all aspects of aerospace activities and realize national aerospace security. Aerospace safety regulations can be divided into national aerospace safety regulations and international aerospace safety regulations according to the scope of their roles.¹

National air and space safety regulations refer to laws and regulations on air and space safety promulgated by the state, central governments and local governments in various fields, at all levels and in each department. It not only has a guiding and guiding role for aerospace security behavior, but also has a guarantee role for the enforcement of aerospace security operations, which is embodied in three aspects: first, stipulating the composition, responsibilities and authority of various actors related to aerospace security; The second is to stipulate the rights and obligations of all actors in aerospace security, including domestic and foreign organizations and individuals; The third is to stipulate legal sanctions against organizations and individuals that violate their obligations under air and space security laws and regulations. At present, China's national air and space safety regulations are not perfect, especially the lack of relevant regulations to safeguard the national aerospace, public air activities and security interests, the existing air and space safety regulations are mainly limited to the aviation field, including the Civil Aviation Law, General Aviation Flight Control Regulations and Civil Air Defense Law.

International air and space security regulations refer to legally binding principles, rules and systems that are produced and gradually formed in the practice of aerospace security by the United Nations or international organizations in accordance with the needs of space security activities.

International air and space security laws and regulations are the basic basis for regulating the air and space activities of all countries and developing and utilizing space resources, and are also a powerful weapon to ensure national air and space security. However, there is great uncertainty about the role of international air and space safety regulations, and it is more a reflection of good intentions, and its implementation is mainly achieved through the consciousness and voluntariness of all countries.

¹ Li Xuezhong and Tian Anping, "The Theory of National Aerospace Security," Beijing, People's Liberation Army Press, 2010 edition, p199.

The existing international air and space legal system is also not perfect, only international air law such as the Paris Convention, the Tokyo Convention, the Hague Convention, the Montreal Convention, the Montreal Protocol and the Convention on International Civil Aviation, as well as international space law such as the Outer Space Treaty, the Convention on Liability, the Registration Convention, the Rescue Agreement and the Moon Agreement.¹

(3) Aerospace support resources

Aerospace support resources refer to the general term for various resources required to meet the strategic decision-making needs of aerospace security and ensure the implementation of strategic actions for aerospace security. Whether it is a decision on the development of air and space security in peacetime, or a decision on air and space security operations in times of crisis and war, it needs to be implemented on the basis of law and in accordance with the corresponding decision-making mechanism. The construction, management, and operation of the air and space security force system also require energy, information and human resources to ensure it. Aerospace support resources mainly include energy resources, information resources and human resources.

Energy resources are important material resources to ensure the construction, management and application of national aerospace security strategic forces. From the development and production of aerospace equipment to the use and support of aerospace equipment, a large amount of energy is consumed, and energy resources are important factors determining the scale and quality, operation speed and efficiency of the construction of the aerospace security force system. Energy is the carrier of energy, which generally has the characteristics of large total amount, low price, high energy density, sustainability, stable supply and storage, technical feasibility and convenient transportation. Energy can be divided into primary energy and secondary energy according to its source, primary energy is the energy that exists in nature, can be found, and cannot be produced, such as coal, oil, natural gas and other fossil energy, as well as solar energy, wind energy, biomass energy, etc.; Secondary energy is converted from primary energy and is more convenient to serve human energy, such as heat, mechanical energy, electrical energy, hydrogen energy, etc.²

Information resources refer to the collection of useful information that has been processed and processed in an orderly manner and accumulated in aerospace security activities, and is an important supporting resource to ensure the realization of strategic decisions on aerospace security and the implementation of strategic actions on aerospace security. In the field of air and space security, according to the scope of information resources, it can be divided into strategic information resources, campaign information resources and tactical information resources, but the distinction between strategic, campaign and tactical information resources is relative and cannot be completely separated, and campaign and tactical information resources may also have strategic value;

¹ Edited by Chen Shanguang: Outline of Space Law, Beijing, China Aerospace Press, 2007 edition, p20~21.

² Bai Chunli, ed., Science and China—Energy Science and Technology Collection,” Beijing, Peking University Press, 2012 edition, p5~6.

According to the purpose of information resources, it can be divided into decision-making information resources, command information resources, control information resources, management information resources and support information resources; According to the attributes of information resources, it can be divided into enemy information resources, our information resources, friendly information resources and battlefield information resources; According to the content of information, it can be divided into political information resources, military information resources, diplomatic information resources, economic information resources, scientific and technological information resources, etc.¹

Human resources refer to talents with high management level, strong technical ability, wisdom, ability, emancipation of thinking, courage to innovate, and maximum benefits in the field of aerospace security. Human resources have the characteristics of superior intrinsic quality, innovation of labor process and labor results, extraordinary contribution, scarcity and irreplaceability of resources, so human resources are the most reliable, sustainable and potential strategic resources in the field of aerospace security, and the core resources for the construction and development of aerospace security forces. Aerospace talent resources can be divided into leadership and management talents, command and decision-making talents, professional and technical talents, professional skills talents, etc. according to the nature of work; According to the subject field, it can be divided into aviation talents, aerospace talents, air defense talents, anti-missile talents, etc.; According to social titles, they can be divided into scientists, engineers, technicians, etc.

3. Construction of an air and space security system

With the deepening development of economic globalization and political multipolarization, the international security situation and national security environment are undergoing major changes, and national aerospace security is facing many new situations, new problems, new opportunities and new challenges, which also puts forward higher requirements for the national air and space security system, and building a more scientific, reasonable and effective national air and space security system has become a major issue that the national air and space security strategy must focus on and strive to solve.

(1) Basic requirements for the construction of an air and space security system

The construction of the national aerospace security system should aim to serve the national aerospace security activities, and build a guarantee system suitable for the strategic needs of national aerospace security in line with the idea of "basing on national conditions, grasping reality and focusing on the future".

¹ LI Xuejun, Zou Hongxia et al., eds., *Military Information Resource Planning and Management*, Beijing, National Defense Industry Press, October 2010 edition, p44-45.

First, it is based on national conditions. China is a multi-ethnic country with a long history and one of the most complex and special major powers in the world. Therefore, when building China's aerospace security system, it is necessary to accurately reflect the universal problems facing national aerospace security, but also to take the solution of its own special problems of aerospace security as a foothold, base itself on its own current situation, focus on future development, and while absorbing advanced culture and advanced concepts, we must respect China's traditional culture and traditional concepts, prevent deviation from reality and imitation and copying, so that the national aerospace security system can serve national aerospace security activities in the most scientific and effective mode.

The second is to grasp reality. The construction of a national air and space security system is not to protect the past, but to solve practical problems and meet the practical needs of national air and space security activities to the greatest extent. Therefore, when building a national aerospace security system, it is necessary to adhere to the "three bases": based on responding to the real threats and challenges facing national aerospace security; Based on the current possible major air and space security crisis; It is based on responding to the current air-space security conflicts and air-space wars that may occur at any time. To evaluate whether the national air and space security system is reasonable and effective, the key indicator is to see whether this security system is conducive to solving a series of practical problems facing national air and space security.

The third is to focus on the future. The national aerospace security situation is in the midst of development and change all the time, and the construction of the national aerospace security system should also fully consider and adapt to such changes to ensure that the national aerospace security system has strong flexibility and forward-looking to adapt to the changes and uncertainties of threats and challenges facing national aerospace security. At the same time, it is necessary to focus on the development and changes of the national aerospace security environment, as well as the potential risks and threats, and scientifically determine the construction goals of the national aerospace security system closely around the strategic goals and strategic needs of the national aerospace security.

(2) Key contents of the construction of the aerospace security system

With the development and changes of the international air and space security situation, the national air and space security system has become more and more complex, and it is necessary to base itself on reality, aim at the future, scientifically build, and focus on the decision-making mechanism, legal system, resource allocation, service system, supervision system and other aspects.

The first is to establish an air and space security decision-making mechanism. The realization of the national aerospace security strategic decision-making requires not only the establishment of an aerospace security leadership and management structure system, but also a

sound aerospace security decision-making system to standardize the procedures and methods of interaction between decision makers, decision-making bodies at all levels, advisory bodies and their personnel. The most important manifestation of the decision-making mechanism of aerospace security is the organic law, which formulates principles, authority, duties, obligations, powers, and operation methods for the decision-making mechanism, the establishment of institutions at all levels and their personnel, and is the main carrier of decision-making procedures and methods. First, establish a national air and space security decision-making body. In view of the broad field and prominent status of national air and space security activities, it is necessary to change the current situation that China does not have a formal and definite organizational entity for air and space security decision-making bodies, focus on the practical needs of responding to air and space threats and maintaining air and space security, and establish a full-time decision-making body under the National Security Council to solve and handle national air and space security issues. Second, establish a national air and space security decision-making system. The national air and space security decision-making system not only stipulates the duties, obligations and rights of institutions at all levels, but also regulates the procedures and methods of national air and space security decision-making, as well as the decision-making mode of the highest decision-making body, relevant functional departments of the central government and functional departments of local governments. Since national aerospace security involves many fields such as politics, economy, science and technology, national defense, and military, there are many departments involved in the decision-making of national air and space security, and each department often pays more attention to its own local interests. In order to effectively eliminate the interest game between various departments, it is necessary to establish a complete air and space security decision-making system to ensure the scientific and efficient strategic decision-making of air and space security.

The second is to improve the air and space safety laws and regulations. National air and space security not only includes a country's territorial security and airspace security, but also includes international public air security and space security, and national air and space security operations are also carried out in land, sea, air, space, network, electricity and other fields. As a major developing country, China shoulders the important responsibility of safeguarding national air and space security and international air and space order, and should actively advocate and participate in the construction of international air and space security laws and regulations while strengthening the construction of domestic air and space security laws and regulations. First, strengthen domestic air and space security legislation. It is necessary to further improve the operational rules of the national aerospace activities, promulgate the state's "Space Law" and "Aerospace Safety Law" as soon as possible, clarify the basic laws of the state for safeguarding aerospace safety and handling abnormal situations in space and space, and improve the national air and space security laws and regulations guarantee system with territorial space security as the core. Second, actively advocate and participate in international air and space security legislation. Public space and space are common resources shared by all mankind, and all countries should have equal rights to peaceful use, joint development and sharing of resources. As a fast-growing aerospace power, China should actively advocate and participate in the establishment of the Near Space Security Law and the Space Security Law in order to better carry out air and space exchanges and cooperation, maintain air and space security order and build a harmonious space environment, clarify the rights and obligations of all countries in public space, near space and space, and improve the international air and space security laws and regulations guarantee mechanism with the protection of national public space and space interests as the main content.

The third is to improve the allocation of strategic aerospace resources. National aerospace security activities require sufficient resources to guarantee, aerospace strategic resources are the key elements influencing and restricting strategic decision-making on aerospace security, it is necessary to regularly carry out research on the national aerospace security environment, scientifically predict possible major crises, conflicts and wars, and allocate strategic resources in accordance with the priorities of national aerospace security strategic goals and tasks, mainly including five aspects: First, aerospace human resources. It is necessary to establish the concept that human resources are the first strategic resource, do a good job in the design of the allocation of human resources, and build a dynamic mechanism for the cultivation and use of human resources. Second, energy resources. It is necessary to implement the energy reserve hierarchy system, according to different air and space security situations, choose different energy reserve levels, especially when external energy is difficult to sustain supply, energy compression and alternative energy selection. Third, strategic communication resources. The national commercial and civilian communication resources are powerful reserve resources for national aerospace security activities, and it is necessary to map and compile existing communication resources, and assign corresponding responsibilities and obligations to ensure that they can be borrowed and requisitioned at any time when necessary for national aerospace security activities. Fourth, strategic resource projection. Strategic projection resources are the sum of the strategic projection forces that the state can use to respond to the aerospace security crisis, and are the basic resources for the scientific, timely and effective distribution of strategic materials, and it is necessary to conduct statistics and analysis of the current situation of various strategic projection resources, formulate corresponding delivery support plans for the different needs of aerospace security, classify and hierarchically manage the delivery resources, strengthen the supplement and improvement of the shortage of delivery resources, and ensure that the submitted resources meet the needs of national aerospace security activities. Fifth, medical and health resources. Any activity involving national air and space security is inseparable from the efficient guarantee of medical and health resources, and it is necessary to conduct a unified survey of military and local medical and health resources, sort out and classify them according to the index of the correlation between various resources and national air and space security, and carry out scientific allocation to ensure that any type of air and space security activities can be guaranteed by corresponding medical and health resources.

The fourth is to build an aerospace information service system. Aerospace is not only the main space for information acquisition, but also the main field of comprehensive information application, any kind of national aerospace security activities need the support of aerospace information, in order to ensure the effective implementation of national aerospace security activities, it is necessary to build a sound aerospace information service system. First, it is necessary to strengthen the integration, distribution, and utilization of space-based information and the integration with information on aerospace equipment, so as to realize information sharing within and among various aerospace security forces. From a military point of view, we should independently build, manage, and use space resources with the characteristics of various services in accordance with the operational characteristics and needs of different services and in accordance with the principle of being in charge of the main operations. Second, it is necessary to strengthen the integration of aerospace information. Aerospace information is complementary, and relevant policies and measures should be introduced as soon as possible to realize the interconnection of aviation information and aerospace information.

Third, it is necessary to strengthen the integration of military and civilian information. In order to effectively expand the acquisition and use of aerospace information, it is necessary to classify and manage civil aerospace information on the basis of in-depth research on civil aerospace information, classify and manage according to the use value of civil aerospace information, establish methods and channels for the use of civil aerospace information, realize mutual complementarity and high integration of military and civilian aerospace information, and meet the information guarantee requirements of national aerospace security activities.

Fifth, build an aerospace safety supervision system. Aerospace safety supervision is an important function of the aerospace safety guarantee system, which can ensure the safe and orderly operation of all kinds of aircraft in different airspace in peacetime, and can be used to monitor air crises such as air advances, accidental intruders in the air, air terrorist attacks, public space rights protection conflicts, competition for space resources, and space accidents in times of crisis. In order to avoid the occurrence of air and space crisis incidents and ensure national air and space security, it is necessary to build a sound air and space safety supervision system. First, unify the air and space security management organization. At present, China does not have a national-level competent authority for the overall management of the two major fields of aerospace, and it is necessary to change this status quo, establish a unified aerospace operation management agency, and clarify the management responsibilities and division of labor of the executive agency and related management agencies and units. Second, standardize the air and space security management mechanism. It is necessary to further standardize the air and space security law enforcement mechanism, and clarify the basis for the authorization of laws or decrees for air and space security management; Further improve the overall management mechanism for the safe operation of aerospace and space, stipulate channels for the aggregation and release of aerospace information, and clearly stipulate the assessment standards for the status of aerospace safety.

CHAPTER 9 CHINA'S STRATEGIC AEROSPACE SECURITY OPERATIONS

Action is the concrete application of strategy. The national air and space security strategic action is of great strategic significance to safeguarding national security and interests, organizing and using various forces and resources to shape the air and space situation, respond to air and space threats, and win the air and space contention.

The concrete practice of national air and space security strategic actions as a strategic means of military confrontation of national air and space security is the key to transforming the static functions of the national air and space security strategic system into dynamic capabilities and then achieving the strategic goals of national air and space security. We must take the national security strategy and military strategic principles for the new period as guidance, rely on the national air and space security strategic system, and actively respond to security threats from the air and space and resolutely safeguard the country's strategic interests in the air and space field through effective air and space reconnaissance and early warning operations, air and space deterrence operations, air and space strategic defense operations, and air and space strategic offensive operations, as well as our country's strategic non-military air and space activities.

Section 1 Aerial and Space Reconnaissance and Early Warning

Air-space reconnaissance and early warning is the activity of reconnaissance, surveillance and early warning of enemy air-space targets. "Knowing the other side and knowing oneself is invincible," and discovering threats is a prerequisite for eliminating threats and ensuring security. As an important form of national air and space security strategic operations, air and space reconnaissance and early warning is the basic basis and important premise for the air and space security command organ to make correct decisions, effectively control and win the strategic initiative in air and space security, the primary link in the implementation of air and space offensive and defensive combat operations, and the first barrier to ensure national air and space security, which is of great strategic significance for safeguarding the unity of the motherland, safeguarding national territorial sovereignty, and maritime rights and interests.

1. The basic tasks of air and space reconnaissance and early warning

The main purpose of air-space reconnaissance and early warning is to provide information support for the core of state decision-making and national strategic military institutions to judge the degree of air and space threats, make decisions on strategic air and space defense and strategic counterattack at an early stage, and leave sufficient time for the military and civil defense departments to take action. Aerospace-space reconnaissance and early warning is mainly aimed at air space targets, space space targets and ballistic missiles, timely reporting their activities, and issuing warnings against air-space threats.

(1) Full-dimensional monitoring of the air and space situation

Carrying out all-round reconnaissance and surveillance of the enemy is the primary task of air and space reconnaissance and early warning operations. In order to promptly determine the activities of enemy air and space targets and effectively deal with air and space threats, it is necessary to make full use of the monitoring function of the national reconnaissance and early warning system to conduct all-round monitoring of the status and activities of the enemy's air and space attack forces and weapons from land, sea, air, space, network, and electricity space, pay close attention to the activity situation of the enemy's military forces, and comprehensively grasp the activities of the enemy's land, sea, and air forces and the working status of its outer space military system, including the number, capability, deployment, and peacetime activity law of the enemy's air and space attack forces.

Provide timely information on the signs of an air-space attack to the national air and space security command organization, the air and space defense combat system, and the counterattack combat system, ensure that commanders and command organs correctly judge the enemy's air and space reconnaissance and attack attempts, and gain as much preparation time as possible for the national air and space security operations.

(2) Reconnaissance and judgment of air and space threats

Aerospace-space reconnaissance is an activity that relies on the air-space intelligence reconnaissance system to obtain information required for operations. There are mainly electronic reconnaissance, optical reconnaissance, acoustic reconnaissance, manual reconnaissance and network reconnaissance. Among them, electronic reconnaissance includes electronic countermeasure reconnaissance that uses electronic countermeasure reconnaissance equipment to obtain enemy tactics, technical parameters and data intelligence; Radar reconnaissance using space-based, air-based and ground-based radars to obtain important air and space intelligence of the enemy; Radio-technical reconnaissance through electronic reconnaissance satellites, electronic reconnaissance aircraft, ground-based electronic reconnaissance stations and throwing electronic reconnaissance equipment, etc. Optical reconnaissance refers to the use of optical reconnaissance satellites, reconnaissance aircraft, and nearby space platforms to conduct reconnaissance of enemy air and space activities. Manual reconnaissance mainly reconnoiters the enemy's air and space dynamics through various intelligence organs and personnel, and it is a very important and reliable way of air and space information reconnaissance, and it is generally of a high secret level. Network reconnaissance is the reconnaissance of enemy computer networks through certain reconnaissance techniques, entering the enemy's computer network as a legitimate user, mainly retrieving, browsing, intercepting, modifying, and deleting online materials and documents. We should use the integrated air-space three-dimensional reconnaissance means to conduct close reconnaissance of the various movements, signs, and activity postures of the enemy's forces, and to accurately determine as much as possible the enemy's air and space activities and the attempts, timings, and targets of the attack, so as to provide a scientific decision-making basis for commanders and command organs to analyze and judge the enemy's situation, adjust the deployment of troops, and organize and plan combat operations.

(3) Promptly release early warning information

On the basis of close reconnaissance and monitoring of airspace, air dynamics in surrounding areas, ballistic missile launch dynamics of relevant countries (regions), and space targets, timely issuance of air-space threat warning information is the core task of air-space reconnaissance and early warning operations. The fast change of the rhythm of air-space operations, the high strike accuracy, and the short reaction time require that the air-space reconnaissance and early warning system can efficiently process the threat information of incoming air-space targets, issue early warning information in a timely manner, provide more preparation time for air-space defense and counterattack operations, and provide accurate target indication for intercepting and striking weapons.

To this end, it is necessary to strengthen the study of various characteristics of air-space threat targets and the construction of target characteristics databases in peacetime to ensure the accuracy and efficiency of the processing of wartime airspace reconnaissance and early warning information; Give full play to the performance of air-space reconnaissance and early warning equipment, quickly and continuously grasp relevant information on enemy air-space threat targets, such as type, nature, flight elements, assault means, or the orbit and characteristics of space-based targets, so as to provide effective support for air-space offensive and defensive operations.

(4) Form a strategic deterrent posture

In the information age, the theory and method of deterrence have developed from a "nuclear umbrella" to an "information umbrella." With an advanced air-space reconnaissance and early warning system, it is possible to grasp the enemy's strategic trends, especially the strategic situation in outer space, at any time, weaken the enemy's confidence in victory, make it dare not act rashly, and achieve the goal of "surrendering without a fight." As a US military expert said: "If a country has better early warning, monitoring, and intelligence gathering capabilities, even if the number of fighters is only half that of its opponent, it can still win the war." "As an important force in national strategic deterrence, the air-space reconnaissance and early warning system can solve the problems that cannot be seen and fought in air-space combat operations, effectively improve air-space defense and counterattack capabilities, form an effective deterrent against the enemy, and thus strive for greater initiative for diplomatic and military activities."

2. Organization and implementation of air and space reconnaissance and early warning

Aerospace reconnaissance and early warning is an integrated operation jointly carried out by multidimensional space and various means; it is highly demanding, difficult, and complex to organize; it is necessary to follow the law governing the dominance of air-space confrontation information, focus on the main characteristics of air-space security operations, and focus on doing a good job in the following tasks in view of the basic tasks of air-space reconnaissance and early warning:

(1) Unified use and optimization of force allocation

Since the air and space reconnaissance and early warning forces belong to different branches of the armed forces and the forces carrying out the air and space strategic reconnaissance and early warning operations are diverse and complex, in order to ensure the close reconnaissance and monitoring of the enemy in the air and space attack, it is necessary to establish and improve a joint air and space reconnaissance and early warning mechanism, carry out unified command and overall coordination of various air and space reconnaissance and early warning forces and means, carry out unified planning, management and coordination from space deployment, working hours and spectrum resources, and build a wide range of information sources and diverse means. An air and space reconnaissance and early warning system with good confrontation and stability has formed an overall joint force.

To this end, it is necessary to adjust the reconnaissance and early warning forces in a timely manner, improve the overall force distribution system, use various communication methods and network technologies to integrate the reconnaissance and early warning platform, intelligence information center, command and control center, and air and space security forces into an integrated network, rationally use space-based, air-based, sea-based, and land-based reconnaissance platforms, and comprehensively use radar, optical, infrared, electronic, acoustic, and network and other reconnaissance means to build a large-space, multi-functional, focused, and three-dimensional airspace reconnaissance and early warning system, and comprehensively, timely, and accurately obtain air and space information. Timely grasp the situation of enemy activities to ensure the rapid processing and real-time sharing of various intelligence information.

(2) Multi-dimensional deployment to ensure intelligence continuity

On the one hand, the air and space threat not only comes from the periphery, but may also come from the other side of the earth, or even the vastness of space. In order to ensure real-time reconnaissance, timely early warning and continuous tracking, the air-space reconnaissance and early warning platform must be multi-dimensional and integrated in the ground, sea, air and space, and can carry out large-scale reconnaissance and surveillance of targets from different heights, different directions and different angles, so as to ensure that the information obtained is more comprehensive, accurate and timely; At the same time, multidimensional deployment is also conducive to the flexible use of air and space reconnaissance forces, highlighting the key points of reconnaissance and surveillance, and ensuring air and space intelligence for key seasons and key operations. On the other hand, once the country faces war in the future, "blinding war" will be the first "plank axe" for the opponent to destroy and paralyze our combat system, and the air and space reconnaissance and early warning system is facing the risk of failure.

(3) Organizing network reconnaissance to achieve complementary advantages

There are many types of air-space attack weapons and they are widely distributed, and the performance of different types of air-space targets is different, even if the information characteristics of the same target at different stages of operation are different; from the objective needs of the confrontation of the air defense system, any single means of reconnaissance and early warning has its advantages and limitations; especially in the case of comprehensive multi-channel information confrontation between the two sides of air defense, any "missing board" and "short board" in the detection means may be fatal. Therefore, it is necessary to use the ideological methods of systems engineering and advanced network communications, information processing, artificial intelligence, system analysis, operational planning, and other technical means to comprehensively integrate various resources and functional elements within the air-space reconnaissance and early warning system, form a grid network system with integrated system functions, and carry out network reconnaissance, so that various means of air and space reconnaissance and early warning can cooperate with each other, learn from each other's strong points, improve the reliability and continuity of obtaining information, and the overall information confrontation capability of the system, so as to meet the objective needs of the confrontation of the air and space security combat system.

(4) Combining peacetime and wartime operations to ensure rapid response

The sudden and accelerated pace of air-space combat operations requires that the air-space reconnaissance and early warning system must achieve rapid response on the basis of long-term operational preparations in peacetime. Peacetime combat preparations should be based on wartime needs, pay attention to the combination of reconnaissance and counter-reconnaissance, grasp the electronic signal characteristics and electromagnetic spectrum characteristics of the enemy's air and space weapons as accurately as possible, establish corresponding operational target information databases, constantly upgrade the software system for auxiliary decision-making, familiarize ourselves with the organizational procedures of combat operations, clearly understand the structural relationship of the enemy's informationized air-space combat system, identify the weak links in the enemy's architecture, and ensure the scientific nature of the combat action plan.

(5) Strengthen protection and improve survivability

At present, the confrontation between the world's major countries around air and space reconnaissance and surveillance and counter-reconnaissance and surveillance has become a normal and very fierce situation; once the enemy carries out an air and space attack against us, it will first comprehensively use electronic jamming, electronic suppression, electronic deception, electronic destruction, computer network attacks, and other means to carry out information attacks on China's air and space reconnaissance and early warning system. and the use of anti-radiation weapons and other precision-guided weapons for various fire attacks. Therefore, it is necessary to comprehensively adopt technical measures such as camouflage protection, engineering protection, and network protection to improve survivability; At the same time, it is necessary to flexibly use tactical countermeasures such as mobile deployment, electronic deception, and setting false targets to actively survive; Attention should be paid to retaining reserve forces, improving the regenerative capability of the reconnaissance and early warning system and the ability of sustained reconnaissance and early warning, so as to ensure the normal operation of the air and space reconnaissance and early warning system.

Section 2 Aerospace Strategic Deterrence

Aerospace strategic deterrence refers to the strategic actions and measures taken by the state to demonstrate its air and space strength and determination in order to force its opponents to give up their attempts and actions that threaten China's air and space security, with air and space forces as the main body. Practice has proved that a country's strong strategic deterrent can not only curb the provocative activities of opponents, but also an effective means to deter and win wars and safeguard national security and interests. In particular, air and space strategic deterrence is easy to demonstrate, has a wide impact on deterrence, has low confrontation costs, and has high strategic benefits, and has a more significant effect on containing the threat of war, deterring and handling non-war threats.

1. The basic tasks of strategic deterrence in air and space

The mission of air and space strategic deterrence operations is not only the concretization of the purpose of deterrence, but also the fundamental basis for planning and organizing the implementation of air and space deterrence. The tasks of strategic air-space deterrence operations are determined by the purpose of the operation. The purpose of the air-space strategic deterrence operation is to rely on the ability to win the war and the determination to dare to fight to force the opponent to abandon its attempts and actions that threaten China's air and space security. Aerospace strategic deterrence actions will have a strong psychological shock effect on the other side, affecting the country's political, economic, diplomatic and other fields, and are the preferred choice for dealing with air and space threats, preventing problems before they occur, and striving for "soldiers who surrender without a fight," and play a normal role in maintaining national air and space security operations. The basic tasks of the strategic deterrence operation of air and space are twofold: one is to demonstrate the country's air and space strength, and the other is to demonstrate the country's determination to use space power.

(1) Display air and space strength and form a deterrent posture

The purpose of the air and space strategic deterrence action is to comprehensively use air and space resources, build an air and space strategic deterrence posture, and form the enemy's air and space strike capability and posture, so that they can truly feel the air and space threat they face and dare not take rash action to curb the adversary's adventurous attempts. The credibility of air-space strategic deterrence depends on the possible formation of an air-space force posture, and the formation of this posture depends on "air-space strength" and "air-space deployment."

Aerospace strength is the basis for the implementation of air-space deterrence. It includes both "hard" forces such as air and space combat units and air and space weapons and equipment, and "soft" forces such as air and space military theory and the institutional structure of air and space forces. It can be used as a potential force for air and space deterrence, but its core manifestation is the air and space combat strength and ability of "being able to fight and win wars". The establishment of China's air and space power should be guided by the military strategy of "active defense" and in accordance with the requirements of "being able to fight and win wars," accelerate the development of air and space forces, and build a perfect air and space combat system. Focusing on coping with diversified air and space threats, strengthen actual combat exercises, transmit deterrence information to the opponent through air and space combat exercises, force mobility, weapon testing, etc., accumulate air and space prestige, form a perception and cognitive fixed position in the opponent's psychology, and establish the credibility of air and space strategic deterrence.

The deployment of air and space is a direct embodiment of "really fighting a war and really preparing for it," and establishing an effective air and space force deployment is an important way to achieve strategic deterrence in the air and space.

The essence of deterrence is "showing danger to control the heart," which is a psychological game based on demonstration. Deterrence requires the adversary to see that I am physically prepared for battle. Combat capability depends on the occupation and utilization of orbital, air, and information resources in peacetime, and the implementation of operations depends on the formation of an integrated operational arrangement of ground, air, and space before the war. In order to achieve the goal of strategic air-space deterrence, it is necessary to build an actual-combat combat system in peacetime, ensure the smooth operation of the combat system, enable the opponent to see the concrete results of our side's "real war and real preparation," make them confident of the determination, actions, and results of our air and space operations, and foresee the serious consequences that may arise from confrontation with us, so as to deter its will to fight and eliminate its threat to China's air and space security.

Practice has proved that having a strong air and space force in peacetime and forming a powerful air and space strategic deterrent posture can not only deal with all kinds of non-military air and space threats, but also deter military provocative activities from the air and space, so as to achieve the goal of "surrendering without a fight."

(2) Deter attacks at an appropriate time and demonstrate determination to use air and space forces

With the wide application of information technology in the field of aerospace and space, aerospace is playing an increasingly important role in safeguarding national security. Peacetime reconnaissance threats from space and space, infringement of space resources and interests, and competition for limited orbit and spectrum resources in space may require low-intensity conflicts to achieve aerospace security goals. Deterrence can not only show combat capability and determination to deter the enemy, but also prevent the occurrence of a large war with small wars, and low-intensity warning attacks are also an important task of air and space strategic deterrence operations.

If demonstrating strength is a normal air-space strategic deterrent action in peacetime, deterrent attacks are "war-fringe operations" that eliminate violations and deter the escalation of crises. Under our powerful air-space strategic deterrence posture, the enemy usually has two mentalities: one is forced by our air-space strategic deterrence posture, dare not take action easily, and stand still and watch; Second, there is a fluke mentality, speculating that our side does not dare to launch an air and space attack. When our space interests have been infringed upon, or an air and space crisis may escalate into a conflict, we may take air or space warning attacks according to the situation to eliminate the infringement, or by carrying out specific interference, suppression, and sabotage of the enemy's air and space information nodes, so as to show our determination to combat in the air and space and force the other side to retreat in spite of difficulties.

To fulfill the task of deterrent low-intensity air-space attack, it is necessary to improve the follow-up reactive action plan of the conflict, set up an echelon-connected air-space action chain, and form an action system that accurately matches the air-space threat.

Countervailing threat actions must be well-addressed and the response level coherent, otherwise deterrence without follow-up means and without preparation for escalation will not achieve a good deterrent effect. For example, in December 2008, our maritime surveillance ship went out to declare sovereignty over the waters of Diaoyu Dao, and Japan subsequently announced that it would strengthen its control over Diaoyu Dao. In contrast, since 2012, I have not only strengthened law enforcement in the waters of Diaoyu Dao, but also adopted political, military, diplomatic and other means simultaneously, and achieved remarkable results in rights protection actions. In short, the sensitivity and impact of air-space confrontation operations are strong, and in order to grasp the strategic initiative of deterrence, it is necessary to improve the response chain and set up complete response plans for various threats of intensity, so that the transformation of conflict intensity can be followed.

2. The basic requirements for strategic deterrence of air and space

Aerospace strategic deterrence requires a combination of powerful momentum and necessary strikes, the use of many forces, the wide range of involvement, the complexity of force deployment and operational control, and the following are required:

First, the system is supported. Aerospace strategic deterrence operations run through peacetime and crisis times, involving combat resources in multidimensional battlefield space such as land, sea, air, space, network, and electricity, and need to comprehensively design various types of deterrence patterns at all levels in a systematic manner, focus on the system, and form a comprehensive air-space deterrent capability that integrates the system. It requires that the air and space strategic deterrence means to deal with peacetime and crisis times are complete, strategic deterrence is coordinated with equipment development and military training, and various intensity deterrence means are complete.

The second is to the point. On the one hand, it is necessary to highlight the air and space deterrence of key directions, key areas, and key targets, and use the least air and space resources to achieve effective deterrence effects. On the other hand, it is necessary to display and convey to the opponent the intention, purpose, and determination of air and space operations, and even the forces used, in a timely and accurate manner, so that the other side can truly feel deterred.

Third, the scale is appropriate. Focusing on achieving the goal of shaking the enemy's will to fight, adhere to the close coordination of air and space strategic deterrence actions with political and diplomatic struggles, accurately control the escalation of crises, accurately select deterrence means, and effectively control the scale and process of deterrence; Fully consider the needs of deterrence escalation, and prepare for gradual escalation in theory, equipment, methods, training, command and policy; When deterrence fails, there should be countermeasures to solve the problem in real air and space combat, and the opponent should be subdued with actual punishment.

Fourth, it is authentic and credible.

The implementation of air-space strategic deterrence operations must be based on credible strength; it can be an ultimatum posture such as demonstrative missile and aviation assault exercises; it can also mobilize and deploy powerful air forces to create a situation of overwhelming the territory; and it can also be used simultaneously in various ways such as space launch and satellite orbit adjustment, demonstrating our determination to use air and space forces.

Fifth, it is mobile and flexible. In carrying out strategic air-space deterrence operations, we should attach importance to the use of strategy, be flexible and mobile, and combine fiction with reality and deception, so that the opponent will always be unable to understand our true intentions. For example, when the opponent has formed a large psychological panic, it suddenly creates a powerful air and space attack momentum, carries out a surprise attack on the weak point of the enemy's air and space system, and destroys the enemy's psychological defense line, so as to force the enemy to give up the infringement on China's air and space security, and achieve the purpose of air and space strategic deterrence.¹

3. The basic pattern of strategic deterrence in air and space

Specific methods commonly used in air-space strategic deterrence operations include issuing statements, announcing military policies, maintaining an air-space military presence, holding air-space military exercises, conducting actual combat air-space military deployments, and warning air-space strikes. Judging from the basic pattern of air-space strategic deterrence operations, it mainly includes two types: defensive air-space deterrence and offensive air-space deterrence.

(1) Defensive air and space deterrence

Defensive air-space deterrence is a deterrent method aimed at safeguarding national air and space interests and threatening to use defensive air-space strategic forces, including strategic early warning forces, air defense and space defense forces, and information confrontation forces, to deter and contain the opponent's attack. According to China's actual situation, the air-space defensive deterrence actions that can be taken in different strategic directions (regions) and against different air and space security threats include the following:

First, strategic air-space defense forces are preset. The national air-space defense system is the material basis for air-space defensive deterrence, and a perfect air-space defense system can effectively resist enemy aircraft, spacecraft, ballistic missiles, nearby space vehicles and other air and space targets, and prevent threats from air space and space.

¹ Cai Fengzhen and Tian Anping, "Aerospace Integrated Combat Science," Beijing, People's Liberation Army Press, 2006 edition, p133.

For this reason, it is necessary to strengthen and improve the construction of the main strategic directions and battlefields in key areas in a planned manner in view of possible air and space threats, pre-position strategic air and space defense forces, do a good job in material reserves, create necessary conditions for emergency use, effectively contain enemy air and space threats, and achieve preparedness.

Second, strategic reconnaissance, early warning and surveillance. Effective early warning and surveillance is a prerequisite for air and space defense, as well as for detecting the symptoms of enemy air and space attacks and taking initiatives. In view of the air and space threats that may be faced by the main strategic directions and key areas, we should establish an integrated air-space reconnaissance and early warning system in peacetime, and use ground, air, and space-based reconnaissance, monitoring, and early warning systems in times of crisis to collect and grasp intelligence information in an all-round way, closely monitor the enemy's activities, promptly find out its activity intentions and areas, provide necessary intelligence information for our side to organize corresponding strikes and counterattack operations, and make the information in our possession known to the world so that the enemy will retreat in spite of difficulties and achieve the goal of strategic air and space deterrence.

Third, it is necessary to adjust the deployment of defensive forces. Focusing on possible air and space threats, we should organize targeted force mobilization and adjustment in a timely manner, quickly form a favorable air and space defense position, strengthen regional offensive and defensive capabilities, display emergency mobility and rapid response capabilities, and create a powerful deterrent situation. When necessary, it is necessary to organize combat planes and support planes to take to the air in large numbers, assemble, and deploy formations to form a large-scale air offensive and defensive posture and prepare to suppress the enemy, so that the opponent will not dare to offend China's air and space security and interests.

Fourth, it is necessary to raise the level of defense and combat readiness. In view of the specific conditions of the direction and region where the situation occurred, raise the duty level of troops and command organs, strengthen reconnaissance and surveillance of air and space targets, and enhance the effect of air and space defensive deterrence. When necessary, we will organize reconnaissance aviation and fighter aviation units to conduct vigilance (reconnaissance) and patrol lines in specific airspace, conduct reconnaissance and surveillance of land, sea, and air conditions, handle abnormal (emergency) situations in the air, declare sovereignty or legitimate rights, and show determination and capability. Police (reconnaissance) patrol airspace can be set up inside the airspace line or the actual control line for airspace vigilance patrols; It can also be set up over the disputed area of the territorial sea of the territory and sea for reconnaissance and monitoring of the situation in the disputed area of land and sea, driving away enemy aircraft, and declaring sovereignty; It can also be set up over the high seas to reconnoiter and monitor the situation in the contiguous airspace of the territorial airspace and the adjacent sea of the territorial sea, declare legitimate international rights, and display long-range defense capabilities.

Fifth, targeted weapons tests and air and space training and exercises will be held. In accordance with the development plan for air and space equipment and the situation of potential air and space threats, we will organize tests of new air and space defense weapons (such as mid-course anti-missile weapons), hold live training and exercises of air and space defense forces, show their prestige to the opponent, and declare their defensive capability against air and space threats.

When organizing training or exercises with the dual intention of training and deterrence, when determining the theme, subject, background, imaginary enemy, time, space, scale, and strength of the training and exercise, it should be closely related to the situation of potential air and space threats, and timely adjustments should be made at any time according to changes in the situation, and when necessary, it should be prepared to cooperate with offensive deterrence and even transfer personnel to actual combat.

(2) Offensive air-space deterrence

Offensive air-space deterrence is a form of deterrence that deters and deters an adversary by threatening to use offensive air-space strategic forces, including strategic information forces, strategic strike forces, and strategic projection forces. Judging from the current level of technological development, the main form of offensive air-space strategic deterrence operations is air offensive deterrence supported by space-based information systems, which is usually organized in a step-by-step manner:

The first is to organize reciprocal flights over disputed areas. In the event that the enemy enters the disputed area first to occupy the main dynamic situation, in view of the intensity of the enemy's air threat in the disputed area, it may organize aviation units to fly reciprocally over the periphery of the disputed area or enter the disputed area to conduct reconnaissance, drive away enemy aircraft, declare sovereignty, and show the determination and ability to safeguard sovereignty. Reciprocal flight is the first step in offensive deterrence, and according to the principle of escalating air-space deterrence operations, aviation forces commensurate with the type and size of the enemy's aircraft can be dispatched first, leaving room for subsequent deterrence escalation or negotiations in 2013 China's air cruise flight in response to the Diaoyu Dao crisis.

Second, targeted air and space training and exercises will be held. In light of the situation in which China's air and space security is threatened, we should organize combat missions aimed at training and exercises of actual air and space troops that are clearly defined and related to assault targets, so as to demonstrate the combat capability of air and space forces, especially air offensive forces, and deter enemy actions. The pertinence and deterrence intensity of live military training and exercises are reflected through the organization of sorties, the type and scale of missiles used, the selection of the geographical location of the airspace for training and exercises, and the subjects and contents of training and exercises. When necessary, it can organize on-site training with pertinent, practical, and shocking subjects such as rapid assembly, electronic countermeasures, precision strikes outside the defense zone, and ultra-low-altitude penetration; It can also cooperate with the "killer" air and space weapons and equipment tests, such as air stealth penetration, anti-missile and space defense tests, etc., to show our air and space combat strength, and even use air power to enter disputed areas or deep airspace of enemy defense, conduct reconnaissance, aim and irradiation, and announce the situation of "penetration" and "surprise attack" afterwards; It is also possible to cooperate with the exercise to organize troops to quickly push forward and quickly form an offensive posture, and even organize a large number of planes to take off into the air, assemble, and deploy formations to display the large-scale air offensive deployment supported by space-based information systems, causing the enemy's nervousness, exhausting the enemy and disturbing the enemy, and achieving deterrent effects.

The third is to organize air escorts in relevant airspace. Air escort is an escort flight carried out by aviation to ensure the air safety of other aircraft. When our aircraft are lawfully free flight in the air (especially over disputed areas) or foreign aircraft are clearly threatened or actually attacked by external attacks in China's territorial airspace and the airspace under Chinese jurisdiction, we select air power to carry out protective flights of our aerial vehicles operating in the airspace where the incident occurred. Air escort operations should limit and strictly control the intensity of operations as much as possible, mainly use various means to force retreat, and when compelled, they should not exclude the implementation of air interceptions, air interceptions, air safaris, and other operations of limited intensity. In order to achieve the goal of strategic air-space deterrence, the number of air escort fighters should be determined according to the nature of the tasks carried out by the escorted aircraft, the degree of threat from the enemy's air, and the ability of escort and engagement, so as to be reasonable, beneficial, and restrained.

The fourth is to organize a flight ban in relevant areas. The purpose of the no-fly zone is to monitor and sanction a certain country or region, and to demarcate the airspace over a certain area where its aircraft are prohibited from flying aircraft. The establishment of a no-fly zone is an important means of air deterrence. In light of the activities of the enemy's air and space forces, the area over the disputed area and approaching the enemy's airspace is declared a no-fly zone, and in view of the specific activities of the enemy's aircraft in the no-fly zone, the enemy's freedom of movement in the no-fly zone is forcibly stopped or restricted through the threat or limited direct use of air power, forcibly compresses the enemy's air space for activities, gives necessary psychological hints and suppresses, and creates and maintains an air-space strategic deterrent posture. Most of the no-fly zones are set up when the comparative advantage of air and space forces is significant, and the strong side even forcibly demarcates the scope of the ground jurisdiction and control area of the weak side. Ju Guo's resolute attack on the targets of the forbidden side under close surveillance and in the no-fly zone forced the forbidden side to make continuous concessions to achieve its strategic objectives.

The scope of the no-fly operation can be gradually expanded according to the situation, and the focus of the no-fly operation will be extended from the ban on aircraft flight to the prohibition of ground air defense weapons searching, surveillance, and attacks on aircraft performing the no-fly mission, gradually increasing the deterrent strength until it is transformed into armed conflict.

Fifth, air blockade. Air blockade is the use of aviation, missiles and other air and space forces to block, limit or isolate the enemy's combat operations for a certain period of time. In view of the specific actions of the enemy's air and space forces, we should organize aviation and missile assault forces, select appropriate times, adopt air firepower to blockade enemy airfields, transportation lines, and important areas, and selectively block or effectively block enemy air, land, and sea communications. Air blockade can be carried out by setting up a no-fly zone, using aviation or long-range air defense missiles to track, surveil, drive away, and attack targets trying to enter the blockade zone, creating a strong air control posture, or escalating deterrence actions according to the situation until the deterrence goal is achieved, or turning to actual combat to carry out continuous air strikes against the enemy's subsequent high-value strategic targets.

Sixth, warning air engagements and ground assaults. Each of these offensive deterrent actions may include "gun-off" air engagements or warning strikes against ground (sea) targets. By organizing elite forces of fighter aviation, they should take the initiative to strike at enemy air forces that are conducting reconnaissance, harassment, advancement, and provocation against our side, or use long-range missiles and aviation to penetrate and carry out surprise attacks on enemy ground (sea) surface targets, and widely publicize the results of the strikes, so as to create a deterrent effect, deter further enemy activities, and achieve the purpose of deterrence. Warning air engagements and ground assaults are the highest level of air-space strategic deterrence actions, which have extremely high requirements for intensity control. Once warning air engagement and ground assault deterrence fail, they will quickly turn to actual combat and carry out continuous air strikes against the enemy's follow-up high-value strategic targets, so as to control the battle situation with overwhelming superiority and seize the initiative in war and peace.

Whether it is offensive air-space deterrence or defensive air-space deterrence, it is a flexible and effective strategic application of air-space military forces. Properly selecting and applying the mode of air and space strategic deterrence operations can achieve strategic objectives without bloodshed, which is of great strategic significance for realizing and safeguarding national air and space security and even the overall interests of the country. At the same time, this mode of action to maintain air and space security must be based on solid air and space strength and combat capability, which requires us to vigorously strengthen the building of air and space combat forces, accelerate the construction of an air and space offensive and defensive combat system based on information systems, and constantly improve the strategic capability of safeguarding national air and space security.

Section 3 Aerospace Strategic Offensive

Aerospace strategic offensive operations are combat activities that directly use strategic aviation, space forces, and strategic missile forces, or use air offensive forces and strategic missile forces with the support of aerospace forces to take the initiative to strike at important strategic targets of the enemy on land, sea, and space. Offense is the best defense. Aerospace strategic offensive is aimed at destroying and destroying the enemy's political, military and economic objectives of strategic value and weakening the enemy's war potential, and is the last and most effective strategic means to maintain national air and space security. At present and for some time to come, the strategic offensive operations of air and space will mainly be offensive operations of air forces and long-range missile strategic strikes supported by space systems.

1. The basic tasks of an air-space strategic offensive

Aerospace strategic offensive operations are a proactive form of strategic action to eliminate air and space threats and maintain national air and space security. Aerospace strategic offensive operations can give full play to the characteristics and advantages of long-range operations, high-speed mobility, and precision strikes of air and space forces, carry out "non-linear" strikes against the targets at the nodes of the enemy's combat system, and achieve great results in a short period of time. In several recent local wars, air offensive operations supported by space forces have achieved or basically achieved the purpose of war; In the future, with the further development of aviation, aerospace technology and information technology, the strategic offensive operation of air and space will certainly play a greater strategic role in informationized warfare. The basic tasks of air-space strategic offensive operations are to weaken the war potential of the enemy by carrying out practical @ strategic strikes against the enemy's ground targets on the basis of competing with the enemy and gaining superiority in air and space supremacy and winning the strategic initiative, to provide air-space firepower support to improve the effectiveness of joint operations, and to strike and deter the enemy's space military targets when necessary.

The first is to weaken the enemy's war potential. War potential is the potential force possessed by the enemy to maintain its combat capability, and it is also the fundamental hidden danger to the continuous threat to the enemy's air and space security. It mainly includes: directly attacking the enemy's heavy army groups, political and economic centers, transportation hubs, and energy bases, weakening the enemy's war potential and will to resist; Directly destroy the targets of key nodes (such as early warning and detection systems, command information systems, and information network systems) in the enemy's air-space offensive system, quickly paralyze the enemy's informationized combat system, and eliminate its threat to us. Therefore, weakening the enemy's war potential is the core task of strategic offensive operations in the air and space.

The second is air-space fire support. Air-space fire support is a combat operation that uses aviation and aerospace firepower to provide fire support to one's own land and sea forces in the performance of their missions. The main contents of air-space firepower support include: opening up channels to enable the smooth advancement of their own land and sea forces; Divide the battlefield so that enemy armies cannot contact each other. The air and space platform has the advantage of rapid mobility on a large scale in the world, and the air and space weapons and ammunition have the firepower advantage of long-range precision strike, which can provide powerful and effective fire support for the land and sea battlefields.

In the Libyan war, with the support of strong air firepower from France, Britain, the United States and other countries, the rebels reversed the situation of ground operations, defeated the government forces, and achieved the purpose of "reversing the card," which fully proved the powerful and effective strategic support function of air and space firepower. Therefore, air-space fire support is also an important task of air-space strategic offensive operations.

The third is space strike deterrence. The orbiter represented by the X-37B makes military experts full of expectations for the space missions undertaken by future space platforms. In fact, with the development of space weapons technology, the future space platform will inevitably become an effective means of space strikes, or weaken the enemy's air and space military systems by means of interception and deception, or use means such as capturing satellites to carry out "gentle" strikes against enemy space military targets, or carry out space-to-earth conventional impacts to achieve nuclear strike effects. In addition, the development of a large manned space carrier on the basis of the space station is highly likely. It can be used as an aerospace base flying in space for space-based training and operations, or as a space-based command and communication center for surveillance, early warning, command, and communication, or as a space-based weapon launch platform to deploy and use space attack weapons to launch attacks directly from space. Space strike weapons are a high-end means of attack, there is no effective means of defense at present, in addition to the effect of completing the aforementioned tasks, the deterrent effect is more significant. Space strike deterrence is likely to become an important task in future strategic air and space offensive operations. In this regard, we should make careful plans, make preparations in advance, and strive to take the initiative.

2. The basic requirements for a strategic air-space offensive

There are many elements of air and space strategic offensive operations, wide operational space, and great difficulty in command. In order to quickly achieve the goal of strategic offensive and safeguard national security through air and space strategic offensive means, the following points must be achieved:

First, prudent decision-making, concealed and sudden. Commanders and command organs must, on the basis of grasping the enemy's situation, our situation, and the battlefield situation, stand on the high plane of the overall situation, comprehensively consider, weigh the pros and cons, make meticulous plans, and organize them closely to ensure the smooth implementation of air-space offensive operations. Concealment suddenly is more applicable to air-space offensive operations; it can deceive and confuse the enemy with the help of information warfare, stealth technology, and other means, closely conceal offensive attempts, choose a concealed attack direction and favorable weather conditions, and adopt methods and means that are unpredictable to the enemy at a time and place unexpected by the enemy, so as to attack it unprepared.

Second, unified command and hierarchical control. Unified command means that the joint operation command organ implements integrated organization and command over the combat forces of all services participating in air and space strategic offensive operations in accordance with the overall intention of the high command, so as to give play to its comprehensive advantages.

Hierarchical control is the unity of centralized control and decentralized control, which is manifested in the commander's centralized and unified control over aviation and aerospace information, and decentralized control is manifested in the actual physical control of space-based, air-based and ground-based systems to different functional departments or systems at lower levels. The combination of the two can concentrate, disperse, and mobilize forces and firepower in a timely manner, skillfully use and change tactics, and maintain the operational initiative.

Third, it is necessary to be flexible and mobile and strike at the enemy's key points. Flexible mobility means paying attention to the flexible use of offensive tactics, emphasizing the combination of odd and positive, and achieving the goal of luring the enemy with positive and controlling the enemy with surprise; At unexpected times and places of the enemy, they should take covert and swift action and adopt unexpected means and tactics to deal a surprise blow to the enemy. To strike at the key points of the enemy is to select the key targets and links of the enemy that have the greatest impact on the course and outcome of the operation to carry out strikes, and strive to achieve the effect of paralyzing the enemy's combat system.

The fourth is to select targets and control the scale. Selecting targets means selecting those key enemy targets that are relatively fixed, weakly defended, exposed, easy to destroy, and have a major impact on the overall strategic situation, such as spacecraft systems, space bases, combat command systems, communication hubs, network nodes, airfields, missile launch positions, radar stations, and so on. To control the scale, the scale of offensive operations should be determined according to different combat targets and conditions. In dealing with a weak enemy, it is possible to organize large-scale air-space offensive operations, strive to fundamentally weaken the enemy's air-space offensive capability, and create conditions for follow-up action; In dealing with a strong enemy, the scale should not be too small, the number of targets for a surprise attack should not be too large, and the structure and means of the force should not be single. After the operation, the effect of the assault should be correctly evaluated to provide a basis for subsequent attacks.

Fifth, it is necessary to make careful preparations and strengthen safeguards. It is necessary to conduct careful reconnaissance, grasp the battlefield and the situation of the forces of both sides, optimize and combine the strategic offensive forces of air and space, and make use of air offensive mission planning technology to accurately plan offensive operations. It is necessary to rationally organize the strategic offensive support forces of the air and space, clearly distinguish support tasks, rely on information systems, and improve the effectiveness of support under the conditions of fierce confrontation.

3. The basic pattern of strategic air-space offensive

The pattern of air-space strategic offensive operations can be divided into attacking space-based targets, attacking ground-based targets and attacking air-based targets according to the spatial position of the attack target; According to the spatial location of the implementing entity and its relationship, it can be divided into air attack, space-based attack and ground-based attack. According to the means of using air-space strategic offensive operations, this chapter is divided into two basic types: air-space information offensive and air-space joint firepower strike.

(1) Offensive of air and space information

An air-space information offensive is a series of offensive operations carried out against the enemy's air-space information system and major information combat weapons in order to seize and maintain air-space information superiority, with the aim of suppressing, weakening, and undermining the enemy's information combat capability. Aerospace information offensive operations have strong initiative, direct means, high efficiency, and good organization, which can fundamentally weaken the enemy's ability to use information and quickly seize the initiative in information use. The main contents of the air and space information offensive include the following aspects:

One is electronic offense. Electronic offensive refers to the use of various electronic offensive means to sabotage the enemy's reconnaissance and surveillance systems, communication systems, command and control systems, and electronic equipment of air and space weapons and equipment, and activities that weaken their combat effectiveness generally include electronic jamming and anti-radiation attacks. (1) Electronic interference. Electronic jamming is the act of electromagnetic interference performed on an enemy's electronic equipment or system with the aim of reducing the effectiveness of the enemy's electronic equipment or system. The main actions include: jamming enemy spacecraft, blocking, shielding or jamming enemy spacecraft through companion satellite jamming and spray jamming, so as to disable or reduce the effectiveness of the target; suppress the enemy's air defense system, using methods such as air aircraft jamming, air balloon jamming, land-based station (station) jamming, and maritime ship (ship) jamming to jam and suppress enemy command and control centers, intelligence information centers, communication hubs, large backbone radar stations, aviation guidance radar stations, early warning aircraft, and combat aircraft; jamming the enemy's precision guidance weapons, using the electronic jamming equipment of the liftoff platform and the high-power jamming station on the ground to jam the enemy's GPS receiver, affecting the enemy's overall combat operations; Electronic deception, using electronic jamming feint and passive jamming to deceive the enemy, using electromagnetic momentum to confuse and mobilize the enemy, and ensuring our main combat operations. (2) Anti-radiation attacks. Anti-radiation attack is a combat operation that uses anti-radiation weapons to automatically find and accurately destroy targets using the electromagnetic waves of enemy radiation sources as guidance signals. At present, anti-radiation weapons mainly include anti-radiation missiles and anti-radiation drones. Anti-radiation missile attack refers to the use of unmanned aerial vehicles and other means to trick the enemy's radar, communication and other electronic equipment to turn on, and then measure the various parameters of its electromagnetic radiation, launch anti-radiation missiles from the air or ground, and destroy the ground/sea surface or air-space radiation sources; Anti-radiation UAV attack refers to the action of anti-radiation UAV flying over enemy radar positions and communication stations according to predetermined procedures, detecting and analyzing enemy radar and communication radiation signals, locating radiation sources through radiation signals, and destroying enemy radiation sources.

The second is cyber attacks.

Network attacks are based on the use of hacker attacks, virus attacks, electromagnetic pulse attacks, and other means to attack and sabotage various computer networks of the enemy's air and space information system and thwart the air and space threat of the enemy to our own space. There are three main attack methods: (1) Computer penetration attack. Organize the implementation of uninterrupted monitoring of the target network, promptly discover and exploit loopholes and weak links in the enemy's network operating system, network protocols, application software, and management operations, and adopt methods of forcibly breaking through the security protection measures of the enemy's network system, gaining the right to use and control over the target network, and undermining the enemy's effective control over its various actions. (2) Network spoofing disruption. After gaining the right to use and control of the enemy's network system, it can disrupt its network identity authentication mechanism, modify stored data, and issue false intelligence and false instructions when necessary, influencing and misleading its command decisions and combat operations. (3) Disruptive and paralyzing attacks. The use of virus attacks paralyzes the computer system of the enemy's air and space combat system and loses the command and control function; Or use electromagnetic pulse attack to destroy and destroy all kinds of electronic equipment in the enemy's combat system, so that the enemy's network system is in a state of paralysis.

The third is psychological attacks. Psychological attack is an important means of information attack. In air and space information offensive operations, it is necessary to flexibly use psychological attacks in conjunction with other attack methods to achieve iterative expansion of combat effects. Important means of carrying out psychological attacks on the enemy include: organizing and carrying out public opinion propaganda, using leaflets, radio and television, the Internet, and other media to carry out psychological deterrence and inducement against the enemy and shake the will of the enemy army and the people. Timely use of psychological warfare weapons such as aviation platform carrying and projecting noise simulators, thinking control weapons, and virtual reality means to attack and deter the enemy, causing the enemy to have psychological fear or various hallucinations, shaking its will to war, and reducing its combat capability.

Fourth, physical destruction. Physical destruction is the direct destruction and destruction of the enemy's air-space combat information system using firepower, electromagnetic lethality, etc. The physical destruction targets in the information offensive mainly include: attacking the enemy's space-based information system, using kinetic energy, directional energy, plasma weapons, etc.; Strike at enemy air-based information platforms, such as early warning aircraft, reconnaissance aircraft, electronic combat aircraft, etc., using air-to-air missiles and long-range surface-to-air missiles; Strike at the enemy's ground information systems, such as command and control centers, communication hubs, radar stations, reconnaissance and intelligence bases, space launch bases, space information support centers, spacecraft operation control centers, and so on. The means of physical destruction are diverse and should be used in combination. Special agents and special forces (subdivisions) can be used to attack deep behind enemy lines; fire assault using anti-radiation missiles, air-to-surface missiles, long-range missiles and advanced combat aircraft; Use microwave bombs, electromagnetic pulse bombs, particle beam weapons, etc. for destruction.

(2) Joint air-space firepower strikes

Aerospace-space strategic offensive operations mainly use aviation offensive forces, airborne combat forces, ballistic missiles, cruise missiles, anti-spacecraft missiles, laser weapons, particle beam weapons, microwave weapons, infrasonic weapons, kinetic weapons and other new mechanism weapons as means to carry out air assaults, space attacks, missile raids, and sabotage attacks behind enemy lines. Combined air-space firepower strikes can not only paralyze the enemy's aviation and aerospace attack systems, but also directly destroy the enemy's ground-based and space-based support systems, achieve the effect of defensive operations, and realize the unity of attack and defense. According to the current situation and future trend of the development of air-space operations, the basic contents of air-space joint firepower strike operations can be determined as follows:

The first is the crackdown operation to seize the power of heaven. Strikes to seize space supremacy mainly include two aspects: suppressing and destroying enemy spacecraft and space combat ground facilities, and are usually carried out simultaneously with information attacks to seize information supremacy. (1) Suppress and destroy enemy spacecraft. Use common orbit anti-spacecraft weapons to attack enemy spacecraft by means of soft destruction, hard destruction, and adsorption utilization. Soft killing refers to blocking, blocking, shielding or interfering with key components such as microwave sensing equipment, photoelectric sensing equipment and information links of the target, so that the target fails or reduces efficiency; Hard destruction mainly includes directed energy killing, kinetic energy killing, fragmentation killing, and nuclear energy killing; Adsorption and utilization refers to the use of space vehicles to accompany the target, orbit or attach a miniature intelligent vehicle to the target, to detect and intercept the signal of the enemy's satellite, and to transmit the information received by the enemy satellite to our ground station to realize the control and utilization of the target aircraft. In addition, ascent anti-spacecraft missiles can be used to attack enemy spacecraft. Ascending anti-spacecraft attack refers to the use of various offensive means on the earth's surface and atmosphere to strike at the opponent's spacecraft, or to deceive, jam, and counter-use its signals against enemy spacecraft on the ground. (2) Suppress and destroy the enemy's ground facilities for space operations. Use various forces in your own atmosphere to attack the ground system of the opponent's space combat system, with the aim of making its space combat system lose its ground support. Ballistic missile surprise attacks, combat aircraft raids, and even surprise attacks by special forces can be adopted to strike at enemy space launch bases, ballistic missile launch sites, space early warning and monitoring centers, spacecraft operation control centers, and space information support centers, so as to fundamentally reduce the enemy's space combat capability. (3) Combine the strike operation to seize space supremacy with the air and space information offensive operation, carry out information attacks in various combat spaces such as land, sea, air, space, network, and electricity, and at the same time safeguard and protect their own information systems, and seize the right to control information and electromagnetic supremacy.

The second is the strike operation to seize air supremacy. On the basis of seizing or maintaining the right to control space and information, we should give play to the powerful information support function of the space system, use the means of space ground strikes and air strikes to attack the opponent's reconnaissance and early warning systems, airfields, anti-missile systems, and air defense systems, sabotage its aviation industry and air bases, fundamentally weaken the enemy's air forces, and then seize air supremacy. It is necessary to reasonably select assault targets, collect, sort, analyze, and study target data, and verify positioning; Determine the range of targets and sort them by value; assessment determines the order of assault targets; Conduct assault force calculations; Verification and verification by various means to ensure the authenticity and accuracy of the target. Generally, the targets of the first wave of assault should be the enemy's air defense system and air counterattack combat system. Targets for assault attacks include airfields, combat aircraft, early warning radars, surface-to-air missiles, anti-aircraft artillery positions, command and control centers, communication hubs, etc. It is necessary to flexibly organize air penetration, and comprehensively use stealth penetration, system penetration, surprise attack, strong attack and defense to penetrate and attack selected targets; It is necessary to closely organize air assaults, attach great importance to the organization and implementation of the first wave of assaults, and concentrate the main air offensive forces to attack the enemy's main targets and key parts; It is necessary to closely coordinate the assault operations of air fleets, and at the same time take effective measures to ensure the number of high-intensity sorties; After the first wave of assaults, organize follow-up assaults by air power, completely weaken the enemy's air power, and consolidate and expand the victory.

The third is a surprise operation against the enemy's strategic targets. Combat operations aimed at the enemy's strategic targets refer to the comprehensive use of space ground strike systems, air offensive forces, ballistic missiles, and other direct strikes against the enemy's strategic targets, rapidly paralyzing the enemy's combat system, and achieving the goal of offensive operations. The timing of the operation to surprise the enemy's strategic targets is generally carried out on the basis of seizing air supremacy (including partial air supremacy), and can also be carried out simultaneously with the seizure of air supremacy. Its mode of action is more similar to that of operations to seize air supremacy, with the main difference being that it strikes different targets. It is necessary to give full play to the operational superiority of air offensive forces in high-speed mobility, long-range operations, and fierce assault, as well as the high penetration, high damage, and strong deterrent effects of space weapons and ballistic missile ground strike systems, to destroy and destroy the enemy's most sensitive political, military, economic, and other key targets, change the situation of struggle between the enemy and us, weaken, destroy or destroy their war potential, and affect the course and outcome of war; Under special circumstances, the political, diplomatic and military objectives of the country can be directly achieved. For example, surprise attacks on the opponent's nuclear and chemical facilities or other sensitive and critical targets to achieve specific strategic and campaign objectives.

The fourth is fire support operations for China's land and sea operations. The main contents include: destroying and suppressing the enemy's missile launch positions in the strategic, campaign, and tactical depths, destroying its command organs and fortifications, assaulting the enemy's transportation system, logistics supply network, battlefield facilities, and heavy force groups, blocking the enemy's mobility, isolating the battlefield, killing and injuring the enemy's effective forces, and supporting and cooperating with land forces in combat;

Assault the enemy's ship formation, focus on attacking enemy aircraft carriers, destroyers and other sea forces, and support maritime operations. To support China's land and sea operations, it is necessary to reasonably determine the timing of strikes, accurately grasp the timing and effect of air strikes, not only meet the operational needs of other services forces, but also strive to achieve the suddenness and surprise effect of air strikes. It is necessary to rationally select targets to strike, generally selecting targets such as enemy air bases, campaign tactical missile positions, long-range artillery positions, command and early warning systems, ammunition depots, and oil storage depots that pose a serious threat to land forces; when providing sea support, it mainly strikes aircraft carriers, integrated supply ships, early warning aircraft, anti-submarine patrol aircraft, and other platforms of the enemy's sea groups; In order to rationally determine the method of attack, it is usually necessary to first strike at the enemy's peripheral air alert system or air defense system that is relatively close to the enemy, and then strike at the enemy's main airfields, command and early warning systems, missile positions, ammunition depots, oil storage depots, and other relevant targets in depth as needed, and use multi-directional, ultra-low-altitude penetration, and off-zone strikes to strike at key targets of the enemy's maritime clusters. Before bombing, fighting, and assaulting aviation, they should use information combat forces to carry out information offensive operations, suppress and destroy the enemy's information combat systems, and seize the right to control information on the battlefield.

Section 4 Aerospace Strategic Defense

Aerospace strategic defense operations refer to interception and strike operations carried out against enemies that pose strategic air and space threats by using aerospace forces, air defense forces, and information combat forces of all services under the unified command of commanders at the strategic level of the state and armed forces and their command organs. Aerospace strategic defense operations are an important way to deal with air and space military threats and safeguard national security, and are an effective means of counterbalancing hegemonism and power politics.¹

1. The basic tasks of strategic air-space defense

Aerospace strategic defense operations are to destroy, block, and expel enemy air and space invading weapons or other threatening targets through air and space interception, eliminate threats from and through air space and outer space, and safeguard national air and space security.

¹ Li Xuezhong and Tian Anping, "The Theory of National Aerospace Security," Beijing, People's Liberation Army Press, 2009 edition, p229.

As the basic mode of action to maintain national air and space security, the main tasks of air and space strategic defense include:

The first is to resist an integrated air-space attack by the enemy. Informationized warfare usually begins with air-space attacks and runs through the course of the war. Air-space attacks in informationized warfare are integrated strikes by various air-space attack forces and various technical means. In order to ensure that important areas and targets of the country are protected from attacks from the air and space, it is necessary to make comprehensive use of the reconnaissance, strike and defense forces of various services to closely organize strategic air and space defense operations so as to protect the country from diversified threats from the air and space. Closely organizing and carrying out air defense and anti-missile operations, carrying out air interception and counterattacks with the support of space-based information, and effectively responding to the enemy's integrated air-space attacks are not only of great significance to defending important national targets from losses, but are also of great and even decisive significance for ensuring the smooth implementation of other air and space strategic operations, maintaining the sustained combat capability of the state and the armed forces, and seizing air supremacy, space supremacy, and even victory in the entire war. Therefore, an integrated air-space strike against the enemy is the core task of the air-space strategic defense operation.

The second is to ensure the security of our space-based system. Military confrontation in the information age is based on the system confrontation of information systems, and space assets have become the support of a country's military system and even a national strategic system. Strikes and destruction of space targets can directly paralyze a country's military system and even cause the paralysis of its infrastructure. With the development and application of China's space technology, space-based systems such as early warning and reconnaissance satellites, communication satellites, and navigation and positioning satellites in space orbit have become increasingly prominent in the national and military systems.

The strategic role is clear. Once our space-based system is attacked by the enemy, it will not only cause the loss of air-space combat resources, but also fatally affect the overall effectiveness of the national offensive and defensive combat system. In particular, military powers are vigorously developing co-orbit anti-satellite soft kill technology, which can "civilizedly" destroy each other's satellites in orbit without polluting the space orbit resources of the international commons, or disable satellites, thus changing anti-defense from a means of strategic deterrence to a campaign and tactical strike operation of great strategic value, and the threat faced by our space-based system is more realistic. Therefore, defending against attacks by hostile space-based systems and ensuring the security of our space-based systems have become key tasks in strategic air-space defense operations.

The third is to protect our important targets. The wide variety of weapons used in air and space attacks, the high accuracy of attacks, and the continuous enhancement of their ability to detect important targets and their ability to damage important targets have undoubtedly put forward higher requirements for the protection of China's key targets.

Strengthening the protection of key targets such as important national cities, production bases, infrastructure and combat systems can reduce the destructive effect of enemy air and space attack weapons, which is of great significance for maintaining social stability and ensuring the sustained combat capability of troops. Therefore, effective protection of important national targets and areas is also an important task of strategic air and space defense operations.

2. The basic requirements for strategic air and space defense

Aerospace strategic defense operations have the characteristics of multi-dimensional force allocation, diversified means of interception, integration of combat systems, and joint command and control. In order to effectively carry out strategic air and space defense operations and safeguard national security through strategic defense means, the following must be done:

First, it is necessary to make overall plans and make full preparations. Aerospace strategic defensive operations have certain passive characteristics. In order to effectively respond to a possible air-space attack by the enemy, it is necessary to carry out thorough and effective pre-war preparations. It is necessary to make unified plans for various forces in light of the political, diplomatic and military struggles, strengthen the defense system and battlefield environment construction, and improve the air-space early warning system, command and control system, air defense and space interception system, and corresponding service support system; Strengthen preparations for battle, carefully draw up battle plans in light of different enemy conditions, our own conditions, and combat missions, and organize targeted drills according to the combat plan.

Second, be always prepared and respond quickly. Strengthen the "awareness of air and space threats and dangers" of combat personnel, so that all types of combat personnel, especially combat duty personnel, always remain vigilant, closely monitor enemy dynamics, timely analyze and accurately judge the obtained enemy information, and quickly deal with it; Strengthen the rapid response capacity of air and space defense forces, improve their peacetime and wartime conversion and coordinated combat capabilities through drills, and quickly enter combat when there are signs of enemy air and space attacks, so as to seek the initiative in the early stage of air and space confrontation.

The third is comprehensive integration and joint counterattack. Establish a multi-service, lean, efficient, and highly authoritative air-space strategic defense operational command organization, build a comprehensive and integrated command information system, clarify command processes and command methods, and conduct unified command over air-space strategic defense operations to ensure that the air-space defense combat system can operate efficiently and coordinated, forming an overall synergy; Unified organization of air defense and space defense forces and related forces of all branches of the armed forces to conduct joint operations, and comprehensively use various combat means to resist enemy attacks.

The fourth is key protection and precise guarantee. Implement key protection for important nodes and targets of our defense and combat system to ensure safety; Establish and improve the support system, improve the guarantee mechanism, adopt a variety of support methods and means, implement "focused" support, and improve the efficiency of support.

3. The basic pattern of strategic air and space defense

The basic forms of air-space strategic defense operations include strategic counterattack, strategic counterattack and strategic defense. Aero-space strategic countermeasures are mainly countermeasures against enemy aviation, space, ballistic and new types of near space targets; The air-space strategic counterattack is an active defensive action that uses various offensive means to eliminate the enemy's air and space forces with the purpose of responding to air-space threats and safeguarding national security; Aerospace strategic protection operations are mainly aimed at protecting our key ground targets, air and space targets. In view of the fact that strategic counterattack operations are different from the above-mentioned strategic offensive operations in terms of operational purpose, nature, and timing of attacks, they are basically the same in terms of means of application, modes of action, and methods, so this section does not systematically discuss them.¹

(1) Strategic counterattack

Strategic counteraction is an operational activity that destroys and weakens the attacking enemy and smashes the enemy's air and space attack attempt by means of air and space interception. It is the basic means of strategic air-space defensive operations, the key to ensuring the stability and protracted operation of the entire combat system, and of crucial significance for achieving the strategic defense goal and even the entire purpose of war. The direct military purpose of strategic counterattack operations is to destroy, block, and expel the enemy's air-space attack weapons, reduce the effectiveness of their air-space attacks, undermine their air-space offensive operational structure, weaken their overall combat capability, and safeguard the security of important national strategic regions and important targets of the armed forces. Strategic countermeasures include countering aviation weapons, countering aerospace weapons, and countering ballistic missiles.

Counterattack enemy aviation weapons. Use fighter aviation, surface-to-air missiles, anti-aircraft artillery, etc., to strike at invading enemy aircraft, cruise missiles, unmanned aerial vehicles, and aviation support equipment, and thwart the enemy's air attack attempts. In particular, with the development and use of stealth targets and near space targets, the fight against stealth and near space targets has become a new topic in aerospace strategic defense. The main methods of countering aviation weapons: First, carry out multi-layer countermeasures. The outer counterforce annihilates the enemy before the long-range strike munition is fired;

¹ Li Xuezhong and Tian Anping, "The Theory of National Aerospace Security," Beijing, People's Liberation Army Press, 2010 edition, p229~256.

Medium-range combat forces to carry out mid-level counterattacks; Short-range anti-air weapons are used to carry out internal interdiction and obstruction is set up over important target areas. Second, it is necessary to give prominence to attacking the main air raid forces. When the enemy adopts multiple batches, directions, and means to attack at the same time, it will focus on attacking the enemy's air attack weapons and key support platforms that pose the greatest threat to its own defense targets. Third, it is necessary to flexibly use tactics. We should persist in combining full-dimensional defense with key defense, combining multi-layer interception with key strikes, combining frontal confrontation with hunting and annihilating the enemy, combining fixed deployment and mobile deployment of counterattack, and using a variety of means at the same time to win a comprehensive victory. Countering enemy space weapons. In the future, space weapons will become a high-end means for military powers to carry out air-space strikes, and China's space-based resources are facing the threat of high-end weapons such as anti-satellite missiles, space planes, and anti-satellite satellites. In order to effectively resist the enemy's attack on our space weapons, we should, according to the timing of the interception operation, carry out early interception in the ascending section of the enemy's anti-satellite missiles, aerospace planes, and other attack weapons, or carry out terminal interception when the attacking weapon approaches our space-based target. Early interception, which can use ground-based and air-based interceptor weapons to destroy enemy attack weapons in the ascending section; Terminal interception mainly relies on space-based systems, using kinetic and directed energy weapons deployed in space to cover the safety of one's own targets and space-based platform self-defense systems to intercept enemy attack weapons when they approach our targets. The basic procedures for early interception and end-of-line interception are generally the same. Firstly, the full-dimensional early warning system is used for monitoring and early warning, and the type, trajectory and speed of the incoming target are obtained and identified. Second, use distributed and networked command and control systems to make timely decisions and use ground-based, air-based or space-based missiles, laser weapons, particle beam weapons, electromagnetic guns, and space-based "smart pebbles" to carry out interception. In addition, an attack by the enemy from a space-based platform against our ground targets is also a potential air-space threat, and the main purpose of countering such targets is to strike at space-based platforms that have not yet de-orbited or have just de-orbited when they are found to be attacking me.

Countering enemy ballistic missiles. With the proliferation of ballistic missile technology, China is facing increasing ballistic missile threats, and effectively countering enemy ballistic missile attacks has become a realistic and arduous task for national air and space defense. Countering ballistic missiles can be carried out in the ascending stage, the middle interception, the terminal high-level interception and the final low-level interception. The earliest successful anti-missile experiment was the Soviet Union's use of B-1000 surface-to-air missiles to shoot down the P-12 ballistic missile warhead at an altitude of 25 km/s at an altitude of 3,000 m/s in 1961; The earliest example of successful combat in anti-missile operations was the low-level interception of the "Patriot" missile at the end of the "Scud" ballistic missile in the 1991 Gulf War. For example, the US mid-course anti-missile land-based interceptor missile and the "Standard-III" sea-based missile equipped with the "Aegis" defense system are all mid-course anti-missile interceptor systems that are actually in service;

The US military's THAAD surface-to-air missile is a representative of the terminal high-level interception system; The terminal low-level anti-missile system is mostly carried by both surface-to-air missiles and ship-to-air missiles against anti-aerodynamic targets, such as the C-300, "Patriot" and other third-generation surface-to-air missile improved equipment, all of which have the ability to intercept ballistic missiles with a range of less than 1,000 kilometers. From the perspective of development, new concept interception equipment such as laser weapons and particle beam weapons will be a new means of anti-missile warfare. With the improvement of the air-space surveillance and early warning system, the improvement of the trajectory tracking calculation and accurate target indication capability of the ground-based large phased array radar, and the continuous improvement of the anti-missile command and control system, the whole interception of ballistic missiles will be gradually realized.

In the future, with the further development of early warning detection, command control, interception and strike means, the interception capabilities of air space and space space will gradually be integrated, forming an air-space defense system integrating air defense, anti-missile and space defense, and implementing comprehensive strategic countermeasures against diversified air and space threats.

(2) Strategic protection

Aerospace strategic protection operations are various camouflage protection or reinforcement measures taken against ground or space targets in order to reduce the destructive effect of enemy air and space attack operations and reduce losses. Aerospace strategic protection operations are a necessary means of space defense operations and air defense and space defense operations, and are an important way to reduce the damage caused by air and space threats, ensure the security of important strategic targets, maintain the stability of the air and space combat system, and preserve the country's effective forces and war potential. As an important part of the national strategic air and space security operations, strategic air and space protection operations should adhere to the principle of combining military and non-military operations and complement counter-attack operations, counter-attack operations and information counter-action operations. The basic contents of the strategic air-space protection operation include: First, organizing evacuation and concealment. Organizing the evacuation of urban populations and important materials and facilities is an important strategic measure to deal with enemy air and space attacks, reduce casualties, preserve economic strength and war potential, and reduce the effectiveness of enemy air and space attacks. Due to the wide range of evacuation of population and important materials, strong policy, large workload and short preparation time, it is necessary to clarify the objects of population and material evacuation, rationally adopt the three evacuation methods of early evacuation, combat evacuation and emergency evacuation, select reasonable evacuation areas, forms and routes, and do a good job in various guarantees such as life during evacuation, medical rescue, and prevention of rape and confidentiality.

The second is to organize personnel protection. Personnel protection includes both personal and collective protection. The most important thing for personal protection is to equip and use protective equipment to defend against the harm of poisons, biological warfare agents, radioactive substances, etc. to the human body; Collective protection is mainly to establish reconnaissance and early warning systems and various protection organizations in important cities, regions, organs, factories and other densely populated areas, formulate protection action

plans, build protective fortifications, distribute protective equipment, select evacuation areas, ensure that if there is a situation, strictly organize all personnel to conceal.

The third is the protection of important organizational goals. As the foundation of the national economy and the potential force of war, important national targets are closely related to national life and are the key targets of enemy air and space attacks in wartime. Effective protection against or minimization of these priority objectives can stabilize people's morale and boost morale, and help preserve national economic strength, war potential and support for follow-up. With the development of air and space reconnaissance technology and the improvement of precision strike capabilities of military powers, I will face a difficult situation where discovery means destruction. Under such circumstances, it is necessary to set up false bridges, false positions, and false missiles in light of the nature and type of various targets aimed at the enemy's air and space reconnaissance means, and set up false bridges, false positions, and false missiles in combination with the infrared, thermal imaging, and electromagnetic reflection of real targets.

The fourth is to organize the elimination of the consequences of the attack. During or between enemy air and space attacks, we should promptly organize specialized civil air defense contingents and the broad masses of the people to rush to repair damaged important targets, extinguish fires and eliminate secondary disasters, rescue the injured, and restore the supply of water, electricity, coal, gas, and daily necessities for the residents. Eliminating the consequences of attacks is not only an effective way to reduce the losses of enemy air and space attacks and enhance the regeneration capability of targets, but also an important measure to maintain normal social order. While organizing emergency repairs, rescue, and confessions to eliminate the consequences of air and space attacks, we should also do a good job in propaganda and agitation, preventing rape, special terrorism, and rumors, maintaining order, and resuming production, so as to calm the people's minds and maintain social order and stability.¹

Section 5 Non-military air-space security strategic operations

Non-military air and space security strategic actions are a collective term for a series of non-military activities taken by the state to ensure its security and development interests in the airspace and the development, management, and international cooperation of public space and space that have a bearing on national interests. Non-military air and space security strategic operations include the use of non-military force to solve air and space security problems and the use of military force to deal with non-military air and space security issues, mainly through law enforcement and supervision, diplomatic coordination and seeking international cooperation, engineering protection and concealment to resolve air and space security crises and eliminate air and space threats or potential security dangers.

¹ Li Xuezhong and Tian Anping, "The Theory of National Aerospace Security," Beijing, People's Liberation Army Press, 2009 edition, p256.

With the proliferation of aviation technology and ballistic missile technology, ethnic separatist activities, cult organizations, social unrest (riots, riots), terrorist activities, etc. may launch actions from aviation space and even outer space that threaten national security. Under these circumstances, non-military strategic operations for air and space security will play an increasingly important role in maintaining national air and space security.

1. The basic tasks of non-military air and space security strategic operations

Non-military air and space security strategic operations are mainly carried out by the state and military air control forces, aerospace tracking and control forces, air defense forces, local public security law enforcement forces, national diplomatic forces, and national defense forces, and the main tasks of their operations include the following three aspects:

The first is to strengthen the capacity building of non-military air and space security operations. Under the premise of ensuring the safety of national airspace and aircraft, we will continuously enhance our air and space security capabilities through the development and utilization of space, adjacent space and public airspace. Strengthen space support capabilities, space information support capabilities, space resource utilization capabilities, space exploration capabilities and capacity building to respond to natural disasters such as space meteorites, and promote the development of the space industry; Strengthen the capacity building of information support in the near space and promote the development of technologies and industries related to the near space; Actively open up public airspace routes, ensure the safety of public airspace routes, establish mechanisms related to public airspace activities, and promote the establishment of a fair and just framework. In addition, the national defense forces play an important role in maintaining air and space security, and it is necessary to improve the emergency response mechanism, strengthen the construction of engineering protection and comprehensive protection means such as evacuation, concealment, camouflage, and control, improve the ability to deal with unconventional threats in the air and space and conventional military threats in the air, avoid or reduce the threat of air and space reconnaissance, and reduce the enemy's lethal and destructive effects.

Second, it is necessary to strengthen non-military security management in the air and space field. The main contents of the tasks of aerospace safety management include: compulsory unified surveillance, management and control of all flight activities in airspace, measurement, control and management of our own spacecraft in space, cataloguing and monitoring of other space targets, timely and effective handling of space crisis incidents, and ensuring the orderly development of space activities. The functions of airspace security management include airspace management, route management and route management; The main function of monitoring and management of the public space, space and other international public areas is to carry out measurement, control and protection of one's own targets, and to monitor and warn other targets. Through the effective management of air and space security, maintain air vigilance and deterrence, and make emergency preparations; Carry out space information support, spacecraft operation control, space early warning and monitoring duty, and ensure the normal operation of the space system;

Through counter-advancement, anti-disruption, anti-friction, handling space accidents, catastrophic event handling, aviation emergency rescue and other actions, effectively respond to air and space critical incidents and ensure air and space safety. To ensure national air and space security, it is necessary to pay attention to giving play to the supervisory role of public security law enforcement forces in peacetime, avoid hidden safety dangers, and prevent the occurrence of non-traditional security accidents, but also play the role of diplomatic notes, statements, and consultations in the event of air infringement of sovereignty, air friction, and security accidents, so as to avoid the escalation of security situations. When non-military means cannot maintain air and space security and protect national air and space interests, military means may be used to deal with it after the highest decision-making body has made a clear decision.

The third is to carry out non-military international cooperation in the field of air and space. While actively promoting the conclusion of treaties on the demilitarization of space and international public space, paying attention to strategies in developing space capabilities and using public space, and making preparations for flexible struggles using international air and space laws and regulations, we should actively publicize China's proposal for the peaceful development and utilization of space and space, establish an image of peaceful development and utilization of space, and create a harmonious environment for carrying out air and space cooperation. Actively participate in international aerospace security cooperation, strengthen exchanges and cooperation with other countries in the field of aerospace on the basis of enhancing aerospace strength and the voice of the international community, enhance mutual trust and mutual benefit, and play an important role in jointly building a joint management mechanism for international aerospace activities, establishing a fair and equal aerospace security order, and creating a safe and harmonious aerospace environment.

2. Basic requirements for non-military air and space security strategic operations

Non-military air and space security strategic operations are widely used, mobile and flexible, with a low degree of confrontation and a large room for maneuver. In order to achieve the strategic goals of national air and space security, the following must be done when implementing non-military air and space security strategic operations:

First, it is necessary to obey the political needs of the country. Non-military air-space strategic operations, as an important means of achieving certain political objectives, are also a continuation of politics. No matter what kind of non-military security actions are adopted in the air and space field, they will inevitably be constrained and affected by national political factors and cannot run counter to national politics and foreign policy. In order to meet the needs of national interests, non-military air and space security strategic operations must also firmly implement the national military strategy, take the air and space strength as the backing, take the national strategy of peaceful development and the military strategy of active defense as the general platform, and flexibly choose the mode and method of action according to needs to meet the political needs of the country.

Second, it is necessary to adhere to the non-military nature of action.

The main purpose of the non-military air and space security strategic operation is to maintain the national air and space security posture through the comprehensive use of non-military means and protect people's lives and property from encroachment from the air and space. Its core meaning is "competition," "cooperation" and "security management," and the state maintained is "air and space security under non-military conditions"; once the "non-military" line is crossed, it will inevitably switch to the military operation state of air and space security, which is what is explained in the first three sections. Therefore, non-military nature is the essential requirement of non-military air and space security strategic operations, and the forces used are mainly non-military forces, and when military forces are used, they are mainly used to carry out non-military security management activities, or to eliminate non-military air and space security crises and deal with non-military air and space security incidents.

Third, it is necessary to maintain an appropriate scale and controllable actions. When organizing and implementing non-military air and space security strategic operations, it is necessary to flexibly use the operational patterns of "development and utilization," "international cooperation" and "air and space security management," so as not to make the scale and form of non-military air and space security operations too large, to avoid the intensification of contradictions, and to put the country in a disadvantageous position in the game; If we fail to demonstrate our strength and strengthen management in a timely manner, it will inevitably cause the other side to form a situation of advancing against us, and eventually force our side to choose military action to solve the problem, causing damage to the interests of both sides. Non-military air and space security operations in peacetime should, on the premise of actively participating in international cooperation, continuously strengthen air and space security management, base themselves on the development of air and space strength, shape and create momentum, and maintain a certain posture of air and space security deterrence. When a crisis arises, it is necessary to strengthen the coordination between non-military security operations and military operations, based on deterrence to stop war, and war to promote deterrence.

We should respond flexibly and effectively, and strive to control the crisis and promote the transformation of the crisis into peace on the premise of ensuring that national interests are not lost. It is necessary to work both internally and externally to enhance the effectiveness of non-military air and space security strategic operations. On the one hand, we should proceed from the actual needs of war, constantly enhance our national defense strength, and be prepared to deal with extreme situations; On the other hand, it is necessary to continuously take non-military security actions abroad, form deterrent postures of different intensity and different forms against the enemy in the maximum space and scope permitted by international law, and force the opponent to give up attempts and actions that harm China's interests. It is necessary to grasp the proportion, control the escalation of the situation, give full play to the country's political influence under the international security system, and use various forms of diplomatic means to play games with opponents in a reasonable and advantageous manner.

Fourth, it is necessary to strengthen joint military-civilian action. In the development and utilization of air and space, it is necessary to give full play to the supporting role of aerospace technology and industry, and promote the capacity building of air and space military capacity with the help of national construction and development plans; Coordinate military and civilian space resources, and extensively carry out cooperation in resources, technology, talents and funds to achieve mutual benefit and win-win results. In terms of air and space security management, both air control and space monitoring and control involve both military and local systems, and the two must work closely together.

Due to the wide range of air and space, the huge number of aerospace vehicles, and the changes in the situation of aerospace crises, it has brought great difficulties to the management of aerospace security, and only by establishing a security management mechanism of "military-civilian integration, military-led and civilian cooperation" can we effectively reduce the difficulty of management and cope with possible security crises. In terms of international cooperation, we should give play to the "active" role of national diplomacy, promote cooperation in the military field with air and space cooperation in the field of mutual assistance and civilian and commercial use, and enhance the chips for air and space cooperation and exchanges with the backing of air and space military forces.

3. The basic pattern of non-military air and space security strategic operations

The basic forms of non-military air and space security strategic operations mainly include air and space development and utilization, air control and security, space monitoring and control, and air and space exchanges and international cooperation.

(1) Aerospace development and utilization

The aerospace field is an important direction for the expansion of national strategic space in the future, and the development and utilization of aerospace can effectively improve the national aerospace security capability and effectively drive the development of national economic construction. Aerospace development and utilization is the basic pattern of non-military air space security strategic operations, including space development and utilization, adjacent space development and utilization, and public airspace development and utilization.

The first is the development and utilization of space. Space development and utilization is an important strategic behavior of the country in the field of space and space, an important measure implemented to achieve the national space strategic goals and the expansion of national interests, and has important strategic value in maintaining national aerospace security. Space development and utilization mainly include space launch, spacecraft operation control, space information support, space resource utilization, etc. (1) Space launch. Space launch is mainly carried out by land, air or sea space launch using carrier rockets, space shuttles, spacecraft and space planes and other carrying platforms. Through space launch, satellites, personnel, equipment and various materials are delivered and deployed to space in a timely manner, and space stations and satellite networks are formed. With the continuous emergence of new technologies and materials, all countries are striving to develop a variety of reusable and frequently used low-cost space launch vehicles, such as the trans-atmosphere vehicle and orbital transfer vehicle that the United States is actively developing. (2) Spacecraft operation control. Spacecraft operation control is the use of measurement and control equipment to measure and control spacecraft, mainly including orbital spacecraft global operation and spacecraft service recovery.

The global operation of spacecraft in orbit refers to the global telemetry, tracking and command, daily maintenance management, working status monitoring, backup instrument management, energy management, use management and fault handling of satellites in orbit, and can adjust the orbit and configuration of satellites in orbit in a timely manner as needed. In-orbit spacecraft service and recovery refers to the replacement of parts and refueling services for spacecraft in orbit, and the ability to recover valuable and important payloads. (3) Space information support. Space information support is the use of space information systems to provide countries with information support such as reconnaissance, communications, navigation and positioning, meteorology, surveying and mapping, and earth resources surveying. For example, reconnaissance satellites use the sensor system on the satellite to observe various targets and physical phenomena on the earth's surface to obtain useful information for national development and construction; Navigation and positioning satellites use satellite constellations as the position and time reference of users within a certain range of the earth's surface to provide timely and accurate positioning, navigation and timing services for production and construction; Communication satellites use space-based platforms as relay stations for information transmission to provide flexible communication support for various users; Earth resources satellites provide services for national earth resources development and national economic development. (4) Space resource utilization. At present, the competition in space orbit and spectrum is very fierce, there are nearly 60 countries and government alliances participating in the competition, and nearly 22,000 man-made objects in orbit in space; the use of space ideal scientific experiment sites to carry out various experiments has played an important role in the development and use of space and biological science and materials science research for mankind. With the further development of space technology, more space resources will inevitably be developed and utilized, and will integrate all aspects of people's economic and social life, becoming a strategic choice to solve the resource crisis facing the survival and development of human society.

The second is the development and utilization of adjacent space. Near space (also known as near space, subspace, etc.) is the junction of traditional air space and outer space, usually refers to the airspace 20~100 kilometers from the ground. Among them, 20~50 kilometers from the ground is the stratosphere, although the air density is very small, the environmental conditions are stable, which is the main airspace used by new aircraft; 50~85 kilometers from the ground is the middle layer, the air is very thin, the temperature changes greatly, and the upper and lower convection of the atmosphere is active; More than 85 kilometers above the ground is the thermosphere (also known as ionosphere), the temperature increases with the increase of height, and most of the gas molecules ionize and show conductivity. At present and for a long time to come, the vast majority of air defense weapons will not threaten targets in near space, which is an important penetration channel for rapid and long-range strikes. In view of this, the development and utilization of adjacent space has attracted much attention from various countries in recent years. In addition to military operations such as rapid strikes and space-ground link blocking, the value of adjacent space in maintaining national air and space security is mainly reflected in three aspects in the non-military field: (1) Information perception. Equipped with electronic reconnaissance, visible light cameras, infrared cameras, radars and other loads, together with spacecraft, aircraft and ground information systems, it forms a stereoscopic observation information network to carry out continuous long-term surveillance and observation of areas requiring attention, and provide accurate and timely intelligence information for national construction and air and space security operations.

(2) Communication relay. Equipped with high-altitude communication relay equipment, it provides users within the coverage area of the platform with instant access network services, including communication, spatio-temporal reference, command and control, situation, information distribution and other comprehensive information support. (3) Navigation and positioning. The use of near-space platforms to load navigation equipment provides all kinds of users with more accurate spatio-temporal positioning accuracy than navigation satellites.

The third is air strategic support. Air power is a mature strategic support force for aviation, the main force for maintaining national air and space security, and the main force for providing non-military support to air and space security forces. The forms of strategic support for air power include: (1) strategic projection. With military long-range and large transport aircraft as the backbone, relying on the military or civilian support network, it can quickly deliver personnel and materials remotely and quickly throughout the country and even the world, use various forces to ensure the long-distance delivery of other emergency forces of our military, and provide delivery support for the state to deal with domestic or overseas emergency situations. (2) Strategic early warning reconnaissance. Comprehensively use the space-based reconnaissance and surveillance and early warning detection system to monitor the surrounding situation, detect, monitor, track and identify, analyze and judge and release information on air and space threat targets and air and space activities, so as to provide a basis for strategic decision-making on air and space security, and provide intelligence support for air and space security control and strategic air and space security operations.

Fourth, the development and utilization of airspace in public and disputed areas. The purpose of the development and utilization of public airspace is to gradually form the legal activity capability of public airspace, gradually form the activity practice in public airspace, realize a reasonable "space presence," fulfill international rights and obligations in the field of air and space, and increase the high-level impact on the national interests of air space and surface space. The main contents of the development and utilization of public airspace include: (1) effective aerial monitoring over land-sea disputed areas and areas of national maritime rights and interests, and monitoring relevant national strategic trends; Effectively supervise the overlying airspace of land and sea disputed areas, effectively monitor and use the overlying airspace on the high seas, and equally grasp the legitimate activity rights of international public airspace, forming a high-level impact on the country's overseas strategic interests. (2) Strengthen exchanges and cooperation with other countries, especially with countries with navigation and neighboring routes, and establish a mutual trust mechanism to ensure the effective use of public airspace.

(2) Public space surveillance and management

Strengthening the monitoring and management of public airspace of vital interest, establishing regulations and mechanisms for the monitoring and management of relevant public airspace, and establishing and improving mechanisms and plans for handling public airspace emergencies play an important role in effectively managing, controlling and utilizing the vertical space and adjacent airspace of the national strategic interest area, preventing and handling critical affairs in the airspace of strategic interest, and safeguarding national territorial sovereignty and maritime rights and interests.

Public air surveillance and management, the most important thing is the air defense identification zone system. An air defense identification zone, also known as an "air defense identification area," an "air defense identification circle," or an "air defense safety zone," is a specific airspace demarcated by a coastal country or region over the sea adjacent to its territorial airspace in order to maintain national security.

The air defense identification zone system was first established by the United States and Canada in the early 50s of the 20th century, and then emulated by other countries, and at present, more than 20 countries and regions have established this system; China's maritime neighbors South Korea, Japan, the Philippines, etc. have established their own air defense identification zone system, and China's Taiwan air defense identification zone extends to the sky over the mainland. Countries and regions with ADIZs have different regulations on the ADIZ system. At noon 1950, the United States announced the establishment of an "air defense identification zone" within a certain number of points of interconnection hundreds of kilometers beyond its territorial waters to identify, monitor and manage aircraft flying to United States airspace, requiring them to fill in flight plans and regularly report their locations. Canada's ADIZ was established in 1951 and requires all aircraft, including military aircraft, to report their location to Canadian authorities as long as they are on a flight path towards Canada and are ready to pass through the ADIZ along the Canadian coast, regardless of whether their final destination is Canada or not. Compared with the two models of the United States and Canada, the American model is more acceptable to other countries than the Canadian model, and the Canadian model has stricter control over the air defense identification zone than the American model, and the disadvantage is that some countries may refuse to accept it.

The establishment of an air defense identification zone is of great significance to ensuring the safety of air flight and avoiding miscalculation. Identifying and identifying aircraft of unknown intent and nationality as early as possible can take timely measures to eliminate the threat and minimize the damage. In particular, with the acceleration of aircraft flight speed and the improvement of stealth performance, the designation of air defense identification zones has become an urgent need for territorial air defense to achieve effective early warning. To this end, on November 23, 2013, China established the East China Sea ADIZ for the first time, with the Ministry of National Defense as its governing body, thus establishing China's ADIZ system.¹

China requires aircraft flying through the area to notify flight plans and relevant information, and aircraft located in the East China Sea Air Defense Identification Zone should provide the following identification methods:

¹ Lv Desheng: "China's establishment of the East China Sea Air Defense Identification Zone is reasonable and legal," Reference News, 25 November 2013.

The first is to notify the Ministry of Foreign Affairs or the Civil Aviation Administration of China of the flight plan and realize the identification of the flight plan; The second is to open and maintain two-way radio communication links, timely and accurately answer the identification inquiries of the management agencies or authorized units of the East China Sea Air Defense Identification Zone, and realize radio identification; Third, the aircraft equipped with a secondary radar transponder should be turned on throughout the process to achieve response recognition; The fourth is to clearly indicate nationality and register signs in accordance with relevant international conventions to achieve mark recognition. China's Ministry of National Defense requires aircraft located in the East China Sea Air Defense Identification Zone to obey the instructions of the zone's governing body or its authorized units. The Chinese armed forces will take defensive emergency measures against aircraft that do not cooperate with identification or refuse to obey orders.

With the establishment of China's air defense identification zone, there will be a situation in which the flight information region and the air defense identification zone coexist and overlap. The FIR, which is the area of space allocated for the provision of flight information and traffic control warning services, including the airspace of that State, the contiguous high seas and, for one reason or another, the airspace of neighboring States, is managed primarily by air traffic management units. The FIR over the high seas is defined in accordance with the ICAO Area Navigation Agreement and entrusts the States parties to the Convention on International Civil Aviation with operational support for air traffic.

To strengthen public and air surveillance and management, it is necessary to coordinate the management activities of the air defense identification zone and the flight information region, clarify the respective responsibilities and powers of the military and civil aviation management departments in maintaining order in the air defense identification zone, establish a coordination mechanism between the two, and straighten out the command and coordination relationship between the two in airspace management, flight control, flight command and situation handling.

(3) Air traffic control and security

Air traffic control and air security are the management of national airspace and the prevention of air threats in peacetime. The maintenance of safety and order of air traffic activities on civilian and military routes through air traffic control; Through air security, the air over key cities and core areas can be closely monitored, air violations can be effectively handled, and air safety of key targets can be ensured. Air traffic control and security are the main modalities of non-military strategic operations for air and space security, including both air traffic control and air security.

One is air traffic control. Air traffic control, also known as flight control, air traffic control, the National Air Traffic Control Commission leads the national flight control work, in accordance with the aviation regulations promulgated by the state, the mandatory unified supervision, management and control of all flight activities in the airspace.

The purpose is to identify air targets, maintain flight order, ensure flight safety, timely and effectively handle air critical incidents, and safeguard national security. At present, China's civil aviation flight and military training have an average of more than 3.6 million sorties a year, with an average of more than 10,000 flights per day, there are more than 40 civil aviation flight entry and exit points at the border and sea, and more than 2,000 international flights entering and leaving the country every day. Strengthening air control and ensuring airspace security have become the primary strategic tasks of the air and space forces with the air force as the main body. Air traffic control includes static management and dynamic control. The main contents of static management include: (1) formulating airspace management policies and regulations, organizing the implementation of airspace, route and route construction planning; (2) Set up and delineate flight control areas, flight control divisions and airport flight control areas, delineate air restricted areas, air restricted areas, air danger areas and air defense identification areas, and delineate air corridors for aircraft to enter and exit in areas with dense flights and near national (border) borders; (3) Examine and approve the construction and reconstruction of military and civilian airports, and review the installation of military and civilian shooting ranges and air firing points; (4) Allocate space for the use of various aviation activities (civil aviation and military aviation), handle applications for the use of airspace and routes, formulate flight rules and methods for the use of airspace and routes, coordinate the contradictions between the use of airspace and routes, and build facilities and equipment for airspace, route and route control and support. The main contents of dynamic control include: (1) review and approve flight applications within the flight control area, flight control area and internationally; (2) Implement flight deployment according to the characteristics of military and civilian flights, and supervise the implementation of flight plans; (3) supervise and regulate the flight activities of lawful aircraft in air defense identification zones and territorial airspace; (4) Directing flight activities in accordance with flight control regulations, providing relevant flight data and intelligence, informing air defense forces of the flight dynamics of national and foreign aircraft, and providing information on aircraft in distress that require search and rescue; (5) Exercise special control over flights, special aircraft flights and scientific test flights within the area of military exercises.¹

The second is air security. Air security is a special security vigilance over an area of major social activities, aiming to ensure air safety in the region. Major social activities refer to activities with major influence organized by international organizations, national or local governments or social groups. Compared with air vigilance, air security enforcement space and time are limited, the security area has a large density of personnel, great political influence and social significance, and a high security level. Security work is generally organized and implemented by local governments, and the Air Force assists in air security tasks in accordance with the unified arrangements of the state and the approval of the Central Military Commission.

¹ Editorial Review Committee of the Encyclopedia of the Chinese Air Force: Encyclopedia of the Chinese Air Force, Beijing, National Defense Industry Press, 2005 edition, p185.

Key air security measures include:

(1) Deploy air security vigilance forces composed of fighter aircraft, armed helicopters, early warning aircraft, air defense forces, radar troops and other units as needed, forming an air security and protection network combining far, medium, and near, medium, medium and low; (2) Establish no-fly zones and organize various forces to carry out full-time and spatial reconnaissance and surveillance of no-fly zones, especially to strengthen the detection, interference and interception of low, slow, and small targets; (3) Organize fighter aircraft, early warning aircraft, and armed helicopters to carry out air patrols, monitoring, and verification in small formations; (4) For aircraft (objects) entering the closed airspace, use air power to warn, intercept, expel, force land, destroy and other methods to prevent them from entering to ensure the safety of the airspace.

(4) Space monitoring and control

Space monitoring and control means detecting and closely monitoring space targets and their activities, implementing space activity regulations, promptly and effectively handling space violations, and ensuring the safety of national space assets and the orderly development of space activities. Space monitoring and control is an important form of non-military air and space security strategic operations, including space target monitoring and space resource control.

The first is space target monitoring. precise detection, tracking and cataloguing of space targets, determining target characteristics such as mission, size, shape and orbital parameters of spacecraft that may pose a threat to space systems; Classify and distribute target characteristic data, determine the space capability of potential threat objects, predict the orbit of space objects, and warn of possible collisions and attacks on one's own space systems. The United States has the largest space target surveillance system in the world today, which is used to monitor the movement laws of space vehicles and analyze and judge the military threats and hazards they may cause to the United States. As of June 2009, the U.S. Space Surveillance Network had detected, tracked and officially cataloged some 35,498 man-made objects, including 14,797 targets in orbit and 20,701 deorbited targets, including payloads, rocket bodies and space debris. Space target monitoring is to carry out activities such as detection and tracking, feature extraction, identification cataloging and environmental monitoring of these space targets, and timely issue warnings to threatening targets.

The second is the control of space resources. Space resource management and control can also be divided into static management and dynamic control. (1) Static management of space resources is actually the planning of the acquisition and use of space resources. The International Telecommunication Union is the international management and coordination agency for satellite orbit resources, and satellite orbits adopt a "first-come, first-served" allocation mechanism, with a maximum allowable time limit of seven years from registration to use, and must be launched within seven years of the declaration, otherwise the resources will be recovered.

With the development of space technology and the popularization of satellite applications, the orbit and frequency resources of earth satellites have become increasingly tight, becoming strategic resources competing among countries. Space resource use planning mainly includes: formulating national space policies and regulations, formulating national space development plans, plans and industry standards, organizing the demonstration and approval of major aerospace scientific research projects, and being responsible for supervising and coordinating the implementation of major aerospace scientific research projects; Carry out exchanges and cooperation between governments and international organizations in the field of space. (2) Dynamic management and control of space resources, mainly including space launch control and space operation control. Space launch control refers to pre-launch preparation, launch, safety control and tracking of the launch stage, organizing relevant units and satellite operators to do a good job in the international declaration and maintenance of frequency orbit resources used by various satellites or probes, organizing international coordination between various satellites and satellite systems of other countries and regions, approving satellite communication networks, satellite ground stations, etc., and the Radio Administration of the Ministry of Industry and Information Technology of China is the management and coordination agency of China's satellite orbit resources. Space operation control refers to the management and control of the operation of satellites in orbit, including monitoring and controlling the operation of our spacecraft in accordance with the predetermined orbit, avoiding collisions with other spacecraft or space junk, attitude control of various satellite states and payloads, effective communication, extraction of required data, completion of specific tasks, etc. In the Wenchuan earthquake rescue and relief, China made full use of its existing space forces to provide strong information support for the implementation of disaster relief.

(5) International air and space exchanges and cooperation

International air-space exchanges and cooperation is one of the important forms of non-military air-space security strategic actions, a common way to enhance mutual trust in the international community, achieve mutual benefit and win-win results, and an important way for China's aerospace forces to go abroad and expand their influence. The main purpose of international air-space exchanges and cooperation is to expand the scope of application in overseas areas and outer space in a non-war manner, and to play an important role in stabilizing the security situation in neighboring regions; Participate in the formulation of air and space rules, promote the establishment of an air and space order that respects each other's sovereignty over territorial airspace, equally owns public space rights, and shares public space resources, and strives to build a safe and harmonious air and space environment; Improve international laws and regulations related to aerospace security, promote international cooperation on aerospace security, and advocate the peaceful development and utilization of outer space resources; Fulfilling its international responsibility to maintain world peace and promote common development, the Aerospace Forces participate in international exchanges and military cooperation such as joint counter-terrorism, international peacekeeping, international humanitarian relief, military aid and joint exercises and training, and contribute to the maintenance of world peace and regional stability.

The main contents of international air and space exchanges and cooperation include four aspects:

The first is to develop bilateral relations with the world's aerospace powers, and pursue a multi-pronged approach in the political, economic, scientific, technological, and military fields to seek the initiative in resolving the aerospace issue and strengthen the prevention and management of aerospace crises. For example, the safety of space orbits and spacecraft, as well as possible conflicts of interest arising from the development and utilization of space, must be addressed through cooperation in establishing space prevention and management measures. The second is to actively organize and participate in multilateral activities, establish an air-space mutual trust mechanism, and strive for the corresponding dominance of aerospace affairs. For example, it has established channels of communication and dialogue on air and space security issues between the two countries, discussed issues such as air and space security strategies and policies, exchanged visits by high-level delegations, notified and exchanged observers for major military exercises, notified major air and space activities in advance, exchanged information on air and space forces and budgets, exchanged intelligence and information related to air and space security, held and invited other countries to participate in international aerospace exhibitions, determined international laws and regulations to be followed to ensure air and space safety, and agreed on procedures for handling aerospace accidents. The third is to actively create new types of air and space laws and norms and seek the right to formulate rules for space order. At present, the United States is trying to lead the establishment of air and space order and suppress the development of other countries' air and space capabilities. Under such circumstances, actively promoting the discussion of differences in understanding of international law and taking the lead in formulating a code of conduct on aerospace activities that is binding on all countries has become one of the important means for countries to pursue space activities in accordance with their own interests and wishes. The fourth is to strengthen cooperation in the field of non-traditional security, promote the growth of national aerospace capabilities, and obtain more voice in the international aerospace field. including joint operations of aerospace forces for the purpose of air and space information support and humanitarian relief; Manage space resources such as space orbits, outer space stars, international air routes, aviation technology and equipment; Adopt the "Nixing" model or the "satellite" model (to help Nigeria and Venezuela launch and manage satellites, provide services, etc.), or launch "turnkey projects" (to help other countries launch satellites, and the management and use are borne by other countries), to provide air and space support or services to other developing countries or regions in a purposeful, planned and step-by-step manner, and to pre-establish export-oriented strategic space.

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POSTSCRIPT

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Aerospace security is a major practical issue facing national security in the information age, and its research significance is great and challenging. After receiving the task, we actively organized relevant personnel, became a research group, clarified the expected goals, determined the research ideas, prepared the writing program, carried out the task division, from the formulation of the outline to the completion of the manuscript, successively solicited the opinions of experts in related fields for many times, on the basis of the accumulation of preliminary research, after more than four years of collective wisdom and research, several changes in the draft, finally into this volume.

Professor Tian Anping of the Air Force Engineering University served as the leader of the research group, organized the project declaration and research work, and carried out the overall draft. The book is researched and written by Tian Anping (Foreword, chapters 1, 4, 6), Zhang Jianye (Chapter 1), Chen Jiesheng (chapters 3 and 9), Zhou Lin (chapters 5 and 8), Li Zongpu (Foreword, chapters 2 and 7), Liang Xiaoan (first draft of chapter 4), Chen Gang (first draft of chapter 2), Li Qiang, Chu Peng, Yang Liwei, Li Xiaojun, Yang Jinming, Wang Feng, Liu Yong, Hu Zhenhua, Zhang Lei, Li Yang, Xie Hongwei, Huang Daxing, Yu Bo, Xia Yongjie, Yu Nana, Wang Lei, Xu Jinlong, etc. participated in the research of the topic.

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Research group
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