



**China Aerospace Studies Institute  
Commander's Toolkit for China**

**PLA Rocket Force**



# PLA Rocket Force

“The PLARF plays a critical role in maintaining China’s national sovereignty and security. It comprises nuclear missile, conventional missile, and support units, along with their subordinate missile bases. With strategic requirements of both nuclear and conventional capabilities and deterring wars in all battlespaces, the PLARF will enhance its credible and reliable nuclear deterrence and counterattack capabilities, strengthen its intermediate and long-range precision strike forces, and enhance its strategic counter-balance capability, so as to build a strong and modernized rocket force.”

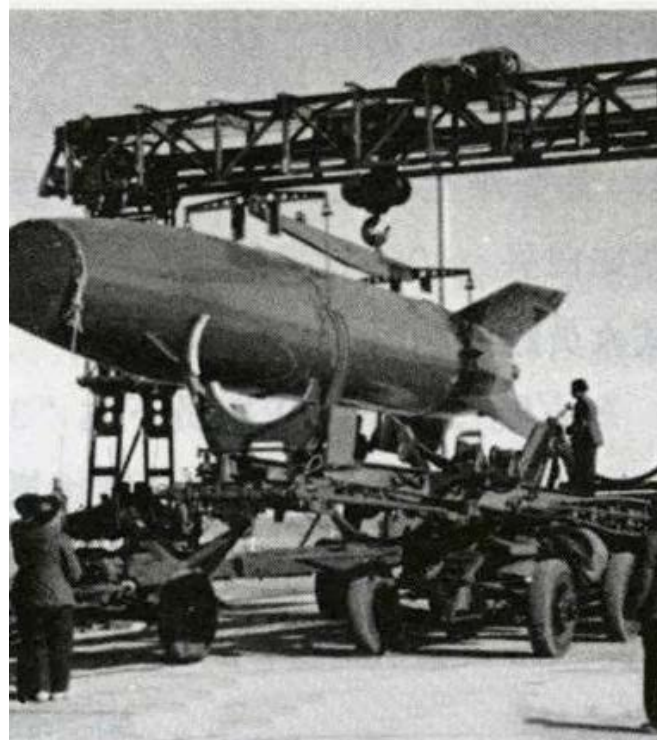




# PLARF

## History

- 1966: Established
  - Limited inventory, low sophistication, short range
- 1960s-1970s: Development of increasingly long-range systems
- Early 1980s: Introduction of first ICBM capable of hitting US mainland
- Late 1980s: Development of DF-21, first road-mobile ballistic missile
- Early 1990s: Introduction of first conventional missile systems





# PLARF

## Growth

- 1980-2000: Four new brigades
- 2000-2010: Eleven new brigades
  - Including first GLCM and first mobile ICBM
- 2010-2020: Thirteen new brigades
  - Including first ASBM, first HGV, and more capable IRBM and ICBMs





# PLARF

## Growth

- Grew more than 33% in only three years (2017-2019)
  - Addition of 10 new brigades
- Emerged as winner from PLA's 2015 reforms
  - Upgraded to full service
  - Maintained direct control over forces



### Base 61 HQ, Huangshan, Anhui

- 1 Brigade 611, Chizhou, Anhui, DF-21A
- 2 Brigade 612, Leping, Jiangxi, DF-21A
- 3 Brigade 613, Shangrao, Jiangxi, DF-15B
- 4 Brigade 614, Yong'an, Fujian, DF-11A
- 5 Brigade 615, Meizhou, Guangdong, DF-11A
- 6 Brigade 616, Gangzhou, Jiangxi, DF-15A/B/C
- 7 Brigade 617, Jinhua, Zhejiang, DF-16A

### Base 62 HQ, Kunming, Yunnan

- 8 Brigade 621, Yibin, Sichuan, DF-26
- 9 Brigade 622, Yuxi, Yunnan, DF-31A
- 10 Brigade 623, Luorong, Guangxi, DF-10A
- 11 Brigade 624, Danzhou, Hainan, DF-21D
- 12 Brigade 625, Jiashui, Yunnan, DF-26
- 13 Brigade 626, Qingyuan, Guangzhou, DF-26
- 14 Brigade 627, Puning, Guangzhou, U/I

### Base 63 HQ, Huaihua, Hunan

- 15 Brigade 631, Jinzhou, Hunan, DF-5B
- 16 Brigade 632, Shaoyang, Hunan, DF-31AG
- 17 Brigade 633, Huitong, Hunan DF-5A
- 18 Brigade 634, Tongdao, Hunan, U/I
- 19 Brigade 635, Yichun, Jiangxi, DF-10
- 20 Brigade 636, Shaoguan, Guangdong, DF-16A

### Base 64 HQ, Lanzhou, Gansu

- 21 Brigade 641, Hancheng Shanxi, DF-31
- 22 Brigade 642, Datong, Qinghai, DF-31AG
- 23 Brigade 643, Tianshui, Lanzhou, DF-31A/AG
- 24 Brigade 644, Hanzhong, Shaanxi, DF-41
- 25 Brigade 645, Yinchuan, Ningxia, U/I
- 26 Brigade 646, Korla, Xinjiang, DF-26
- 27 Brigade 647, Xining, Qinghai, U/I

### Base 65 HQ, Shenyang, Liaoning

- 28 Brigade 651, Dalian, Liaoning, DF-21A
- 29 Brigade 652, Tonghua, Jilin, DF-21D
- 30 Brigade 653, Laiwu, Shandong, DF-21D
- 31 Brigade 654, Dalian, Liaoning, DF-26
- 32 Brigade 655, Tonghua, Jilin, U/I
- 33 Brigade 656, Laiwu, Shandong, DF-100

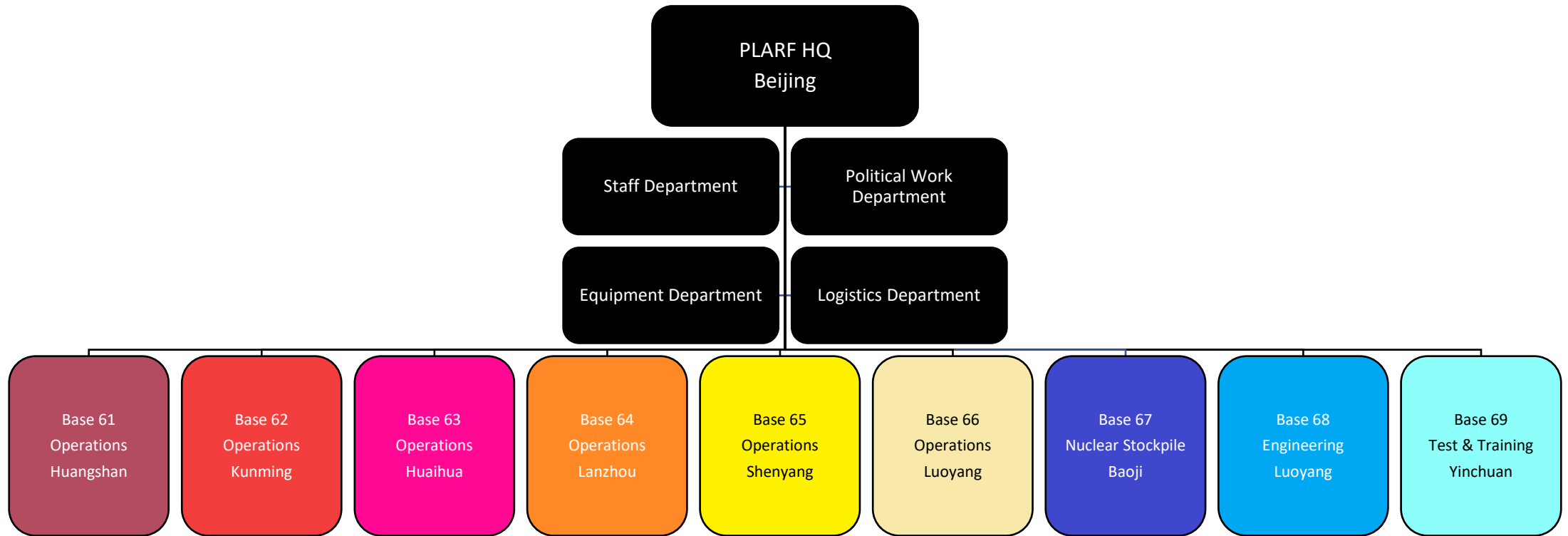
### Base 66 HQ, Luoyang, Henan

- 34 Brigade 661, Lushi, Henan, DF-5B
- 35 Brigade 662, Sundian, Henan, DF-4
- 36 Brigade 663, Nanyang, Henan, DF-31A
- 37 Brigade 664, Luoyang, Henan, DF-31AG
- 38 Brigade 665, Xinxiang, Henan, U/I
- 39 Brigade 666, Xinyang, Henan, DF-26

### Base 67, Nuclear Warhead Storage Facility, Taibai, Shaanxi

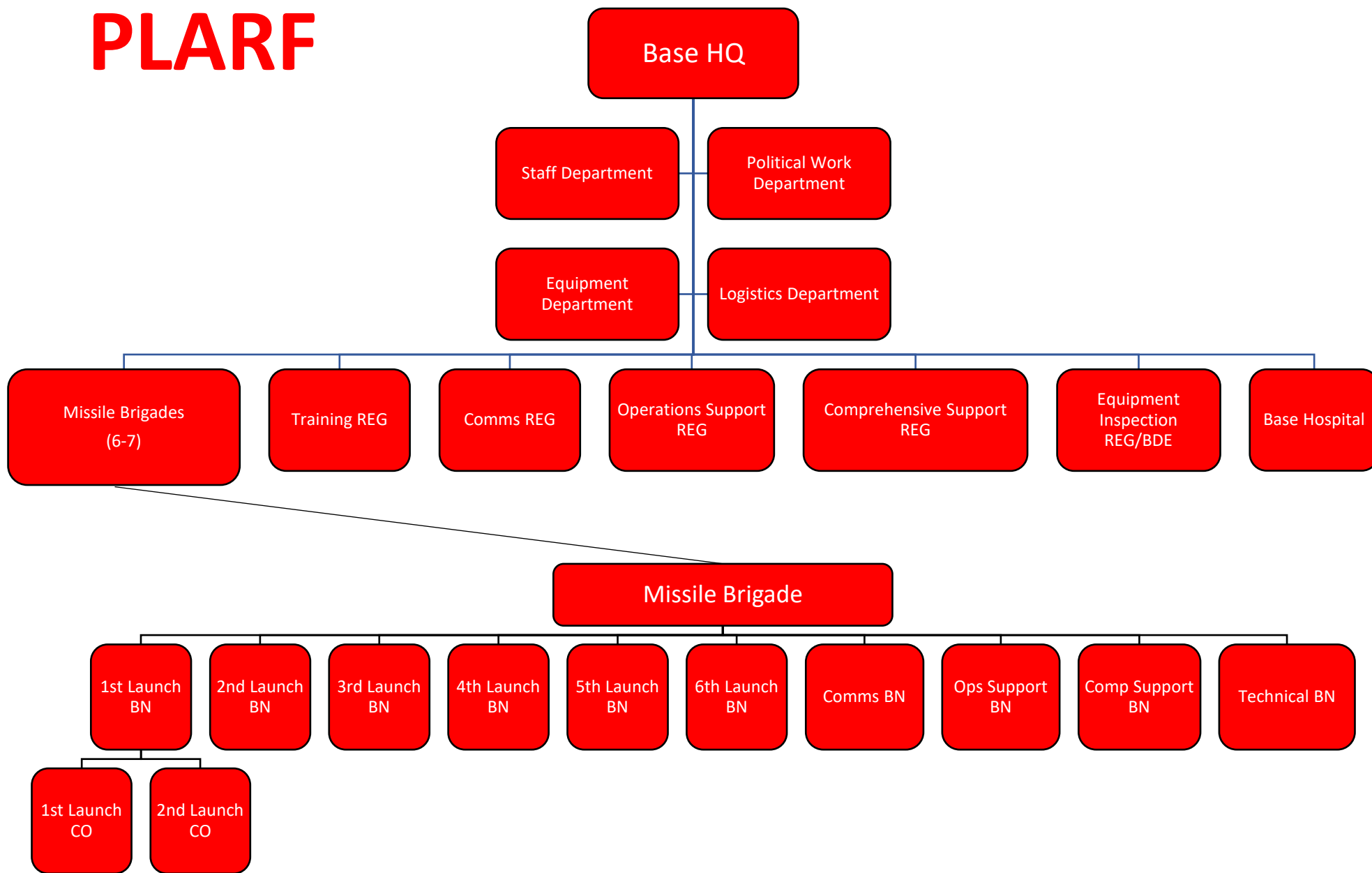


# PLARF





# PLARF





# PLARF

## Training

- No centralized site for basic training; basic training conducted by individual Bases
- Training emphases:
  - Night operations
  - Defense against satellite, UAV surveillance
  - Defense against enemy SOF raids
  - Ability to operate in NBC environment
  - Ability to operate in difficult EM environment
  - Ability to “shoot and scoot”
- Silo-based units practice being sealed off for up to 30 days
- All units train to maintain operations after heavy casualties







# PLARF

## Exercises

- Emphasis on more realistic training
- Has at least one OPFOR regiment, modeled on Ft. Irwin
- Four training districts, including desert and cold weather
- Regular Tianjian exercises, which include both OPFOR and participation of other PLA services





# PLARF

## Education

- Two four-year academic institutions: Rocket Force University of Engineering and Rocket Force Command College
- Both offer bachelor's, master's, doctorate's
- PLARF NCO School offers 2-3 year technical degrees
- Little apparent difference between them
- PLARF has also begun recruiting from civilian academic institutions





# PLARF

## Personnel Issues

- Relative dearth of educated personnel
- PLA has taken steps to improve recruitment
- PLARF has also begun pilot programs to improve education and technical skills at all levels
- PLARF is working toward a more professional NCO corps





# PLARF

## SRBMs & GLCMs

- DF-11, DF-15
  - Introduced in 1990s
  - Positioned opposite Taiwan
  - Periodically upgraded with new variants
  - Two DF-15 brigades, one DF-11
- DF-16
  - Introduced around 2011
  - Two brigades, positioned opposite Taiwan and South China Sea
- CJ-10
  - Introduced around 2006
  - Two known brigades
- CJ-100
  - Supplied to first brigade around 2020
  - Superior range and accuracy





# PLARF

## MRBMs & IRBMs



- **DF-21**
  - Introduced in 1980s, slowly being retired
  - 21A: Nuclear MRBM
  - 21C: Conventional MRBM
  - 21D: ASBM
  - 21E: Unknown
- **DF-26**
  - Introduced around 2015
  - Nuclear, conventional, anti-ship IRBM
  - “Guam Express” for ability to target Guam
  - Deployed to at least five brigades
  - Unlike DF-21, nuclear and conventional roles are not geographically distinct, and single brigades co-mingle both missions
- **DF-17**
  - PLARF’s first hypersonic MRBM
  - Still unclear if it has a nuclear mission
  - Deployed to at least three brigades so far



# PLARF

- **DF-5**
  - Introduced in 1980s
  - Upgraded A, B, C variants
  - MIRV-capable, possibly 3-5 warheads
  - PLARF's primary silo-based ICBM
  - Deployed to three known brigades
- **DF-31**
  - PLARF's first road-mobile ICBM
  - Upgraded MIRV-capable A and AG variants
  - Deployed to nine known brigades
- **DF-41**
  - PLARF's newest mobile ICBM, superior range to DF-31
  - MIRV capable, possibly 3-5 warheads
  - Silo-based DF-41 possibly in development
  - Deployed to one known brigade so far

# ICBM's

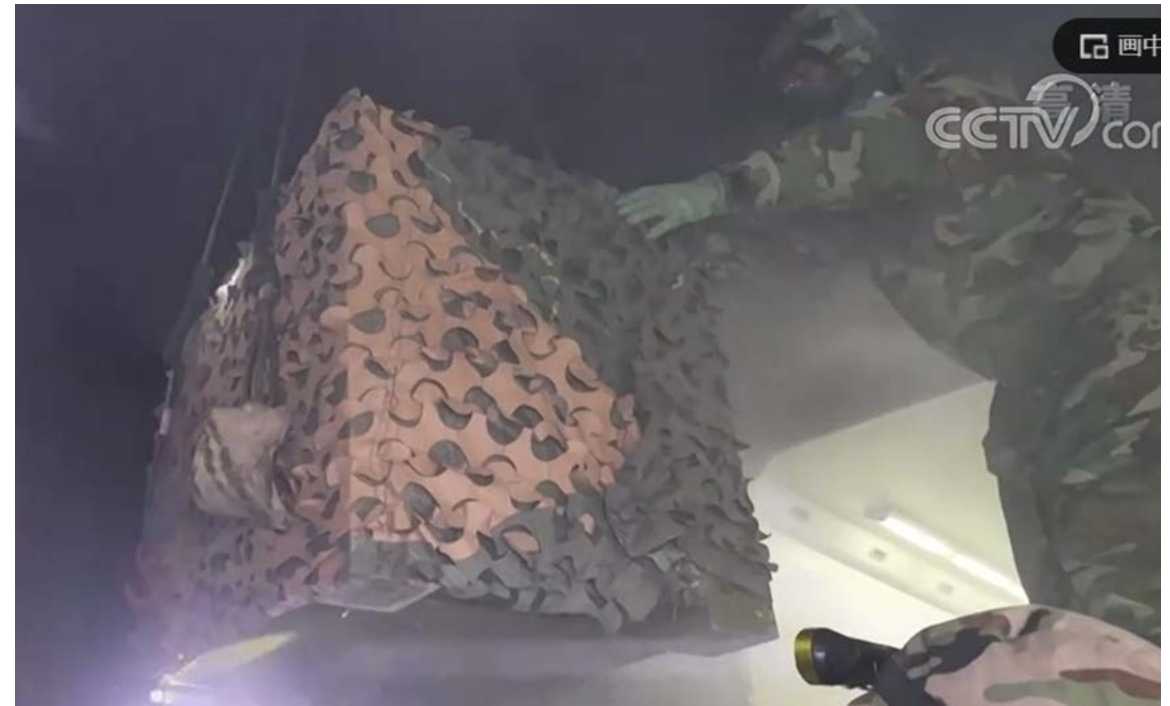




# PLARF

## Warhead Storage and Distribution

- Most warheads stored long-term at Base 67, hardened mountain facility
  - Ability to rapidly deploy warheads by road, rail, plane
- Small number of warheads forward deployed to each Base, managed by “Equipment Inspection Regiment”
- Warheads not regularly mated to missiles or stored on site in peacetime, precluding LOW





# PLARF

## Deployment & Communications

- Units stationed in garrison in peacetime
- In crisis, rapid deployment to hardened shelter, holding area, or launch site
- Launch from pre-established concealed sites if possible, ad-hoc sites if not
- Significant improvements to C4ISR
- Communications methods include fiberoptic, satellite, microwave, troposcatter







# PLARF

## Underground Facilities

- Extensive use of UGFs
- Dug out by Base 68, PLARF's Engineering Base
- Built to accommodate TELs, multiple exits to avoid being trapped
- Extremely difficult to destroy short of direct nuclear strike

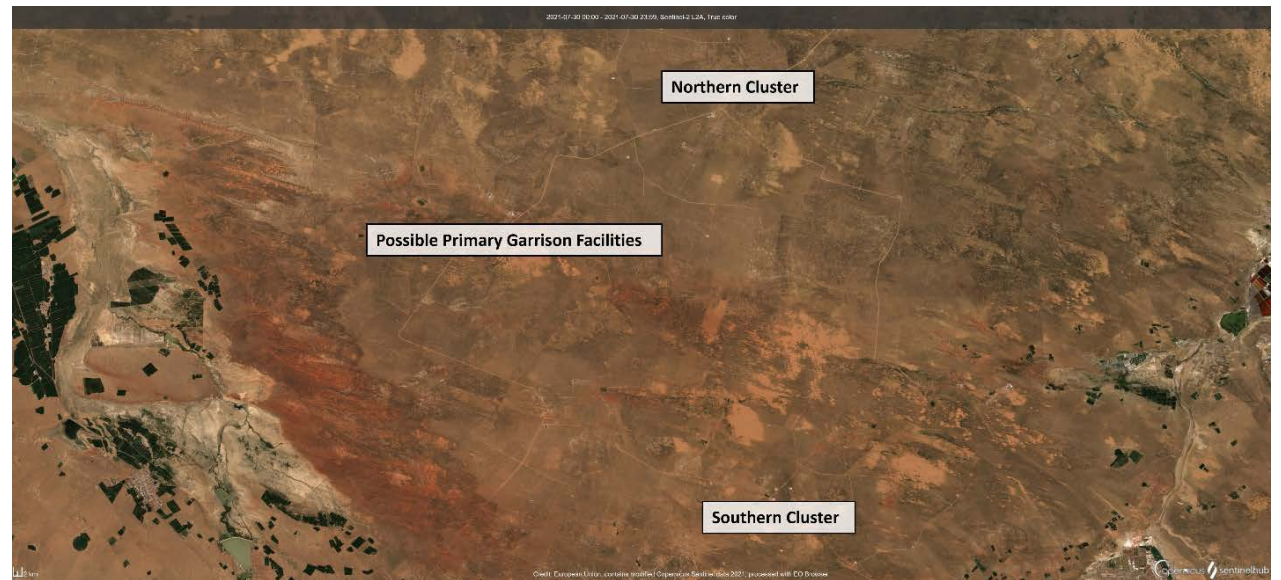
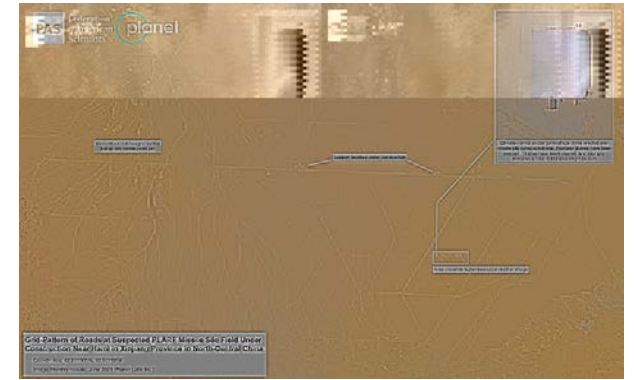
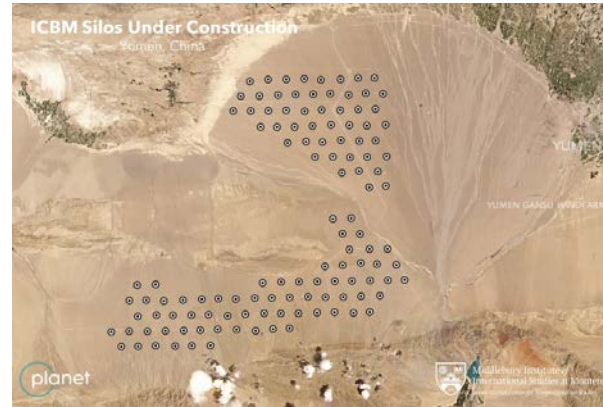




# PLARF

## Missile Silos

- PLARF has historically had small number of silos
- In 2021, began construction on 3 large silo fields
- Over 200 new silos, a more than ten-fold increase
- Unclear how many will be filled
- Unclear if this signals change in posture





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## Slide 1 – Mission

The PLA Rocket Force is responsible for the PLA's land-based nuclear and conventional missiles. China's 2019 defense white paper, the most recent white paper outlining China's national defense strategy, describes the role and near-term development goals of the PLARF as follows:

“The PLARF plays a critical role in maintaining China's national sovereignty and security. It comprises nuclear missile, conventional missile, and support units, along with their subordinate missile bases. With strategic requirements of both nuclear and conventional capabilities and deterring wars in all battlespaces, the PLARF will enhance its credible and reliable nuclear deterrence and counterattack capabilities, strengthen its intermediate and long-range precision strike forces, and enhance its strategic counter-balance capability, so as to build a strong and modernized rocket force.”

The PLARF thus maintains the dual mission set of both nuclear deterrence and counterattack, as well as conventional missile strike in support of PLA military operations. It would no doubt play a critical role in any potential conflict between China and its neighbors, with capabilities aimed at Taiwan, the South China Sea, the Korean Peninsula, Japan, India, and the Pacific forces of the United States.

## Slide 2 – Founding and History

The PLARF, formerly known as the PLA 2nd Artillery Force, until 2016, was formed in 1966, soon after China's first successful nuclear weapons test in 1964. It was given command of China's humble inventory of land-based, regional nuclear missiles. These first-generation missiles were largely categorized as unsophisticated and of limited range and capability. The story of the PLARF however, has been one of steady and progressive growth in both size and capability, beginning with the development of increasingly longer-range systems through the 1960s and 1970s and, with the introduction of the DF-5 in the early 1980s, the first intercontinental ballistic missile capable of striking the United States. The 1980s were a seminal decade for the 2<sup>nd</sup> Artillery in two other ways: first, through its development of the DF-21, the PLA's first road-mobile ballistic missile system, and second, through its decision to field conventional as well as nuclear missiles, leading to the introduction of the DF-11 and DF-15 short range ballistic missiles in the early 1990s.

## Slide 3 – Growth in Size and Capabilities

The steady diversification of platforms and improvement in capabilities assigned to the 2<sup>nd</sup> Artillery was matched by its equally steady growth in size. Four new brigades were stood up between 1980 and 2000. This expansion accelerated in the 2000s: between 2000 and 2010, the 2<sup>nd</sup> Artillery stood up as many as eleven new brigades equipped with its growing array of weapons, including its first ground-launched cruise missile, the CJ-10, and its first road-mobile

ICBM, the DF-31. The pace of growth continued to intensify between 2010 and 2020, as the 2<sup>nd</sup> Artillery (and, following its name change in 2016, the PLA Rocket Force) added 13 new brigades, as well as more important weapons systems such as the DF-21D anti-ship ballistic missile, the longer range and more capable DF-41 road-mobile ICBM, the dual nuclear-conventional DF-26 IRBM, and the DF-17 hypersonic glide vehicle.

## Slide 4 – Size Today

Incredibly, between 2017 and late 2019, a period of only three years, the PLARF added at least ten new missile brigades. This unprecedented expansion from 29 to 39 brigades represented a more than 33% increase in size in only three years. The PLARF has also emerged as the major winner of the PLA's 2015 reforms, being upgraded to a full service at the same time that the other services were either being reduced in size or losing direct control of their forces to the new joint theater commands. Thus, the PLARF has evolved from a small, unsophisticated force of short-ranged and vulnerable ballistic missiles to an increasingly large, modern, and formidable force with a wide array of both nuclear and conventional weapons platforms.

## Slide 5 – Top-level Organization

Now let's examine how the PLARF organizes itself to fulfill its missions. The PLARF is directly subordinate to the Chinese Communist Party's Central Military Commission, the PRC's supreme national defense authority. Like all other PLA services, PLARF Headquarters consists of four major departments. These are the staff, political work, logistics, and equipment departments.

The PLARF commander and political commissar, both four-star equivalents, are co-equals in leading PLARF Headquarters. However, formal decision-making authority regarding force-wide manpower, training, and equipment issues resides with the PLARF's Standing Party Committee. This party committee typically consists of the PLARF Political commissar as the secretary, the PLARF commander as deputy secretary, along with their deputies, the heads of the four major departments, and the secretary of the PLARF discipline inspection committee. Collectively, these individuals must reach a consensus for all major decisions related to the PLARF.

The PLARF oversees nine Bases. A quick note: the PLA uses the term Base, with a capital B, which refers to a permanent standing organization, the same as a regiment, brigade, or division. A Base is usually equivalent to a corps or corps deputy grade unit, one level above a division. Each Base in turn may oversee one or more small-b bases, that is, a physical location housing military forces. The operations Bases we are talking about here are Big B organizational structure Bases.

Six of these Bases, numbered sequentially 61 to 66, are responsible for missile operations, while the other three, Bases 67 to 69, conduct support missions. Each of the six operations Bases cover discrete geographical areas. The missile brigades of Base 61 cover eastern and some of

southeastern China, and would be the primary forces tasked with operations against Taiwan. Base 62 covers the rest of southeastern China, Base 63 covers inland southern China, Base 64 covers northwest and north-central China, Base 65 covers eastern and northeastern China, and Base 66 covers central China. Each Base oversees both nuclear and conventional forces, and features a unique makeup of nuclear and conventional capabilities depending on individual mission and strategic need. Base 61, for instance, is made up of mostly short-range conventional missile brigades for its Taiwan mission, while more inland Bases, such as Bases 64 and 66, are made up primarily of longer-range nuclear forces.

Unlike its PLA Army, Navy, and Air Force counterparts, the PLARF does not have theater rocket force commands within each theater command. The six operations Bases serve a similar role as a theater rocket force, but, given their smaller size, are a tier lower than the other services. Further, the Bases do not map perfectly with each theater command. For one, there are six Bases and only five theater commands, and some Bases cover multiple theater commands. The exact command relationship between the Bases and the joint theater commands remains somewhat unclear, but there is ample evidence to suggest that PLARF Bases increasingly cooperate closely with, and are being integrated into, the joint theater command system, and training to enable joint operations between the PLARF and its land, air, and sea counterparts.

Command authority of the Base's nuclear and conventional missile forces can be somewhat difficult to grasp. In peacetime, nuclear forces are administratively subordinate to their individual Bases, but in wartime are operationally placed under the direct control of the CMC. As stated above, initial evidence suggests that conventional missile forces are being integrated into the joint theater command, but it is unclear whether ultimate operational control in wartime will lie with the PLARF Base or the theater commander.

## Slide 6 – Base and Brigade Structure

Moving down a level, each Base controls six to seven missile brigades, along with several support regiments responsible for training, communications, operations support, maintenance & logistics, and nuclear warhead management. Each missile brigade typically oversees six launch battalions, as well as four to five support battalions. Each launch battalion in turn oversees two launch companies. Battalions can be widely dispersed and appear to be capable of independent launch.

Official and comprehensive estimates of missiles and launchers per brigade are lacking, but knowledgeable observers have given estimates ranging from 6-12 launchers per brigade for certain ICBMs, 12-24 for Medium Range Ballistic Missiles, 18-36 for Intermediate Range Ballistic Missiles, and up to 36-48 launchers per brigade for Short Range Ballistic Missiles and cruise missiles.

## Slide 7 – Training

The PLARF, unlike the U.S. military, lacks a centralized institution for training enlisted personnel such as Lackland Air Force Base or Parris Island. Rather, new enlisted personnel are typically assigned to one of the nine PLARF Bases, and then are trained by that Base's training regiment for three months before being assigned to an operational unit under that Base, where they will receive further on-site training in their specialty. The lack of a single centralized training location means that basic training can vary from Base to Base, although it is unclear to what extent this is true.

A close reading of PLA and PLARF media suggests that the PLARF has singled out several training areas for particular emphasis. These include nighttime training, as well as defense against enemy satellite and UAV surveillance, electronic warfare, Nuclear-Biological-Chemical attacks, and special operations raids, as well as the ability to remain highly mobile through rapid "shoot and scoot" tactics to avoid being targeted by an enemy. Units assigned to silo-based missiles frequently conduct sealed off underground silo training which can last up to 30 days.

In the event a launch unit takes casualties, PLARF soldiers train to take on multiple roles. Reports indicate a battalion can lose upwards of 40% of its personnel and still be able to maintain a minimal launch capability.

## Slide 8 – Major Exercises

The PLARF, as with the rest of the PLA, has in recent years placed great emphasis on more realistic training scenarios, including more frequent use of confrontation, aka Red-Blue OPFOR exercises. (A brief side note: the Chinese use the same Red-Blue terms, and mean the same things, Red is China, Blue is the U.S., we just differ on who the opposing force is). Traditionally, PLA confrontation exercises have suffered from being highly formulaic and always ensuring a Red Force victory, but the PLA has worked in recent years to remedy this situation and make these exercises more realistic and difficult. The PLARF has at least one dedicated OPFOR regiment, which was at least partially modeled on the equivalent American unit at Fort Irwin. It also maintains four test and training districts under Base 69 through which launch units regularly rotate for realistic training. These districts allow for training in a range of difficult weather and terrain conditions, including cold weather and desert conditions. PLARF Bases also seem to have their own indigenous OPFOR units, of perhaps company or battalion strength, to allow for additional confrontation training.

The PLARF has also increased training in joint operations with the other services. Beginning in 2016, the PLARF has begun holding annual Tianjian, or "Sky Sword" exercises, which feature joint cooperation with the other services, as well as extensive use of OPFOR.

## Slide 9 – Education

Most of the PLARF's officers graduate from one of the PLARF's two military academies. These are the Rocket Force Command College, in Wuhan, and the Rocket Force University of Engineering, in Xi'an. Both institutions also offer graduate degrees for continuing study. As part of its drive toward a more educated force, the PLARF has also begun recruiting officers from civilian academic institutions.

In addition to these two four-year academic institutions, the PLARF NCO School offers 2-3 year technical degrees for enlisted personnel.

## Slide 10 – Personnel Issues

The PLARF, as with the rest of the PLA, has traditionally suffered from a relative dearth of “quality” well-educated personnel. This has especially been true of its enlisted force. While this situation was acceptable when the PLA relied primarily on overwhelming manpower, it has become increasingly untenable as the PLA attempts to transform itself into a force relying on cutting edge technologies and complex joint operations. Despite oftentimes being placed into technically demanding roles, including roles which involve handling delicate explosive or nuclear materials, a significant proportion of the PLARF's enlisted and NCO force have only a ninth grade education and sometimes struggle to meet the technical requirements of these roles. The PLARF, and PLA as a whole, are well aware of this issue and have taken steps to improve the recruitment of personnel with high school and college education in its enlisted and NCO ranks, with some apparent success. Despite this, a significant proportion of the PLARF's enlisted and NCO force still have only rudimentary education, and this will continue to be true for the foreseeable future.

In addition to improving the quality of its recruitment, the PLARF has begun a variety of pilot programs to improve the education and technical skills of its existing personnel at all levels. These programs include short-term education at PLARF academic institutions, as well as partnerships with local civilian colleges, state owned companies, and factories where personnel can take classes or learn new skills.

As with the rest of the PLA, the PLARF views the creation of a professionalized NCO corps as an essential component for building a modernized force. The Rocket Force NCO School is the primary institution tasked with training this force, and annually trains approximately 20,000 NCOs. This includes training both new and existing personnel to become NCOs, as well as a newer training program to turn recent college graduates into NCOs, as part of the PLARF's drive toward a more educated force.

## Slide 11 – Equipment (SRBM & GLCM)

The PLARF fields a diverse and growing array of ballistic and cruise missiles supporting a range of strategic and operational objectives. The PLARF's missile inventory can be broken up into



five broad categories: short-range, medium-range, intermediate-range, and intercontinental ballistic missiles, as well as ground launched cruise missiles.

Short-range ballistic missiles, or SRBMs, generally have a range of under 1,000 kilometers. The PLARF currently has three SRBMs in its inventory: the older DF-11 and DF-15, which entered service in the early 1990s and have since been periodically upgraded with new variants, and the newer and more capable DF-16, which may have entered service around 2011. All of these missiles are road mobile and are deployed with conventional warheads. According to the Department of Defense's latest open source estimate, the PLARF has approximately 200 SRBM launchers and over 600 SRBMs. Currently, there are estimated to be two DF-16 and two DF-15 brigades, and one remaining DF-11 brigade.

The PLARF is also equipped with two types of conventional ground launched cruise missiles, or GLCMs. The CJ-10 entered service around 2006 and has a range of around 1,500 kilometers. It is likely deployed to two brigades. The newer CJ-100, with superior range and accuracy, may have been deployed to its first brigade around 2020.

## Slide 12 – Equipment (MRBM & IRBM)

Medium-range ballistic missiles, or MRBMs, generally have a range of 1,000 to 3,000 kilometers. The PLARF is currently equipped with two road-mobile MRBMs, the DF-21 and DF-17. The DF-21 is utilized in both the regional nuclear strike role as the DF-21A, the conventional strike role as the DF-21C, and in the anti-ship role as the DF-21D. A new nuclear variant, the DF-21E, is also alleged to exist, although information is scant. The DF-21 dates back to the 1980s, and is being slowly replaced by newer missile types such as the DF-26. The PLARF may have one to two nuclear DF-21A brigades still in service. As of 2019, all DF-21C brigades have likely converted to new missiles, and there is recent evidence that the PLARF's two DF-21D brigades may have already converted to new missiles as well.

The newer DF-17 is the PLARF's first hypersonic missile, with the attached DF-ZF hypersonic glide vehicle. It is believed to have been deployed to at least three launch brigades thus far.

Intermediate range ballistic missiles, or IRBMs, generally have a range of 3,000 to 5,000 kilometers. The PLARF is currently equipped with a single road-mobile IRBM, the DF-26, which may have entered service around 2015 and is sometimes called the "Guam Express" for its ability to hit targets in Guam. According to DoD estimates, the PLARF has at least 200 IRBM launchers and at least 200 missiles in service. It has been deployed to at least five missile brigades. The DF-26 is capable of firing nuclear, conventional, or anti-ship warheads. Notably, and unlike the DF-21, the DF-26's nuclear and conventional roles do not appear to be clearly geographically separated, and single brigades have been noted intermingling nuclear and conventional missions. This has led to concerns over whether the United States or another country would be able to differentiate if an incoming strike was nuclear or conventional, possibly leading to inadvertent nuclear escalation in a crisis.

## Slide 13 – Equipment (ICBM)

Intercontinental ballistic missiles, or ICBMs, generally have a minimum range of 5,500 kilometers. The PLARF is currently equipped with one silo-based ICBM, the DF-5, and two road-mobile ICBMs, the DF-31 and DF-41, all of which are capable of striking most of the continental United States. An older ICBM, the DF-4, may have already been retired. The silo-based DF-5 first entered service in the 1980s, but has been upgraded with A,B, and C variants. The B variant is capable of carrying up to five warheads. The DF-31 and newest DF-41 are notable for being road mobile and solid-fueled. The DF-41 is also MIRV-capable, possibly carrying three to five warheads, although this is still a matter of debate. Notably, the PLARF has begun a dramatic expansion of its ICBM silos, with construction on as many as 260 new silos in three new locations. We will talk more about these facilities later. As of 2021, the DF-5 may have been deployed to three brigades, the DF-31 to nine brigades, and the newest DF-41 to one brigade, although it will surely be deployed to more in time.

In addition to its new missile systems, the PLARF has also worked to improve the infrastructure needed to support these missiles, including over the horizon radars, satellites, and other sensors to enable long-range precision strikes. Development of these systems will be especially critical to realizing the full potential of the PLARF's anti-ship missile systems, which will be unable to successfully locate and strike far-off ships without these sensor networks. The PLARF also employs two UAV regiments for strike support and battlefield ISR.

## Slide 14 – Nuclear Warhead Storage and Distribution

Most of the PLARF's nuclear warheads are stored at a central hardened facility known as Base 67, deep in the Qinling mountains near the city of Baishan. This facility is able to rapidly deploy warheads by road, rail, or aircraft transport. A smaller number of warheads are forward deployed and under the administrative control of the individual Bases. These forward deployed warheads are controlled by each Base's "Equipment Inspection Regiment" and are kept in a centralized location where they can be rapidly deployed to the Base's nuclear brigades if needed. Warheads are not regularly mated with missiles in peacetime, or even stored on site, precluding the possibility of a launch on warning posture. Rather, in the event of a sudden nuclear war these brigades would attempt to ride out the first strike at a hardened underground facility, receiving their warheads if they had not already, and launching a counterstrike.

## Slide 15 – Deployment in Wartime

During peacetime, units are stationed at a garrison, which would be a likely target of enemy attack in the event of a crisis. On strategic warning, the unit will rapidly deploy to hardened shelters, a holding area, or proceed directly to a launch site. Mobilized weapons systems generally launch from pre-established concealed launch sites with concrete launch pads to enable the latest instructions and targeting data via fiber-optic links. Pre-established sites also reduce the risk of fires and injuries. Ad-hoc sites can also be used in the event of a conflict.

The PLARF has made significant improvements to its C4ISR infrastructure in recent years, laying thousands of miles of fiberoptic cables to maintain communications. Each Base also has a communications regiment responsible for communicating with both the higher (PLARF HQ) and

lower (brigade) levels. Each brigade in turn has its own communications battalion. Communications regiments and battalions utilize a variety of communications methods, including fiberoptic, satellite, microwave, and troposcatter.

## Slide 16 – UGFs

The PLARF also makes extensive use of underground facilities, or UGFs, which have been dug out by the engineering units of Base 68. It is unknown how many miles of underground tunnels the PLARF possesses, and stories of a contiguous 3,000 mile “underground great wall” are almost surely overblown, but the number is likely significant. Underground facilities and their connecting tunnels are built to be wide enough to accommodate large vehicles such as missile TELs, and feature multiple exits to avoid being trapped by a missile strike on a facility entrance. Hard rock and steel plating make these sites extremely difficult to destroy with anything short of a direct nuclear strike.

## Slide 17 – Silos

The PLARF has also traditionally made use of a small number of missile silos, perhaps 20 or so, for its ICBMs. However in the summer of 2021, open source analysts revealed a dramatic expansion of the PLARF’s silos. As many as three silo fields were discovered in Xinjiang, Gansu, and Inner Mongolia, revealing ongoing construction of as many as 260 new silos. It is unclear if these silos will all house missiles, or if they will be used as a kind of nuclear “shell game,” in which only some silos will be filled, but a lack of clarity around which silos are filled will force an adversary to target all silos, expending significant resources in the process. It is also unclear if this development presages a more aggressive nuclear posture, such as movement to a launch on warning posture, or even abandonment of China’s official “no first use” nuclear weapons policy.