



Building a Strong Informatized Strategic Missile Force

An Overview of the Second
Artillery Force with a Focus on
Training in 2014

Kenneth W. Allen
and
Jana Allen

The JAMESTOWN
FOUNDATION

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The theme for CASI's research in Fiscal Year 2015 was *Assessing Chinese Aerospace Training and Operational Competence*. This report by Kenneth Allen and Jana Allen, one of eight which were presented at the first CASI conference in June 2015, examines the PLA's Second Artillery Force in terms of its organizational structure and training guidance, with a focus on training that occurred during 2014.

Additional information about PAF and CASI is available on RAND's website:
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Summary

On December 31, 2015, China created the People's Liberation Army Rocket Force (PLARF) to replace the PLA Second Artillery Force (PLASAF). Whereas Second Artillery was an independent branch treated as a service, the new Rocket Force is a full service equal to the Army, Navy, and Air Force. Although the name change occurred, this paper addresses only PLASAF through mid-2015. Other than discussing the new name in the Organizational Status Section, the paper uses Second Artillery and PLASAF and does not discuss any of the changes that have taken place as the Rocket Force.

The PLASAF has served as China's main strategic deterrent force since its official establishment on July 1, 1966. Consisting solely of nuclear intercontinental ballistic missile (ICBM) forces for nearly three decades, in the early 1990s at the guidance of the Chinese Communist Party's Central Military Commission (CMC), the PLASAF embarked on a period of deliberate development of conventional missile forces, including intermediate-range (IRBM), medium-range (MRBM), and short-range ballistic missiles (SRBM) and land-attack cruise missiles (LACMs). Today the PLASAF not only constitutes the main body of China's nuclear forces and the core strength of China's strategic deterrence, but is also the primary component of China's conventional long-range strike capability. According to China's May 2015 white paper on military strategy, "In line with the strategic requirement of being lean and effective and possessing both nuclear and conventional missiles, the PLASAF will strive to transform itself in the direction of informatization, press forward with independent innovations in weaponry and equipment by reliance on science and technology, enhance the safety, reliability and effectiveness of missile systems, and improve the force structure featuring a combination of both nuclear and conventional capabilities. The PLASAF will strengthen its capabilities for strategic deterrence and nuclear counterattack, and medium- and long-range precision strikes." Although the PLASAF has made impressive gains over the past two decades in terms of equipment and technology, the force is not yet consistently operating at the level it desires. Overall, Second Artillery considers much of its training to be successful; however, some uncertainty exists regarding units' ability to conduct sustained military operations under actual combat conditions. In order for Second Artillery to successfully build a strong, informatized strategic missile force, it must overcome some lingering challenges related to both equipment and personnel.

Introduction

“第二炮兵是我国战略威慑的核心力量，是我大国地位的战略支撑，
是维护国家安全的重要基石。”

*“The Second Artillery is the core strength of our country’s strategic deterrence, the strategic bulwark
for our great power status, and an important cornerstone for safeguarding our national security.”*
Xi Jinping, addressing Second Artillery in December 2012¹

The People’s Liberation Army Second Artillery Force (PLASAF) has served as China’s main strategic deterrent force since its official establishment on July 1, 1966. Consisting solely of nuclear intercontinental ballistic missile (ICBM) forces for nearly three decades, in the early 1990s at the guidance of the Chinese Communist Party’s Central Military Commission (CMC), the PLASAF embarked on a period of deliberate development of conventional missile forces, including intermediate-range (IRBM), medium-range (MRBM), and short-range ballistic missiles (SRBM) and land-attack cruise missiles (LACMs). Today the PLASAF not only constitutes the main body of China’s nuclear forces and the core strength of China’s strategic deterrence, but is also the primary component of China’s conventional long-range strike capability.² Furthermore, it has emerged as one of the centerpieces of Chinese military modernization, rapidly progressing from a limited and vulnerable, non-mobile nuclear ballistic missile capability to one of the world’s most impressive nuclear and conventional ballistic missile, as well as cruise missile, forces.³

Along with the Second Artillery’s transformation in composition and capabilities have come increased expectations for its role in China’s national defense. Historically responsible only for nuclear deterrence, today the Second Artillery is expected to fulfill a range of roles spanning a credible second-strike nuclear capability to carrying out conventional deterrence and conventional operations.⁴ Although the PLASAF has made impressive gains in terms of equipment and technology, it is difficult to ascertain the true status of its operational capability. It remains to be seen if Second Artillery can fully meet the expectations of China’s political leadership and deliver the envisaged range of combat capabilities when called upon to do so.

While there has been a considerable amount of research on Second Artillery’s strategy, missions, equipment, and order of battle, two areas that have not received as much attention are its training and personnel. Drawing on authoritative Chinese-language resources that address Second Artillery training guidance, training events, and joint exercises, this report provides a review of training for the PLASAF during 2014. Through this effort, the authors seek to provide new insight into the personnel that make up the force and their strengths and weaknesses, which directly affect Second Artillery’s effort to build a strong informatized strategic missile force.

¹ “Xi Jinping: Building a Strong Informatized Strategic Missile Force” (习近平: 建设强大的信息化战略导弹部队), accessed at http://news.xinhuanet.com/politics/2012-12/05/c_113922221.htm.

² Shou Xiaosong (寿晓松), ed., *The Science of Military Strategy (战略学)*, 2013 Edition (2013 年版), Beijing: Academy of Military Science Press, December 2013.

³ Michael S. Chase, Daniel Yoon, and Mark Stokes, “The People’s Liberation Army Second Artillery Force (PLASAF) as an Organization” in Kevin Pollpeter and Kenneth W. Allen, eds., *The PLA as Organization Reference Volume v2.0*, 2015.

⁴ Shou Xiaosong (寿晓松), ed., *The Science of Military Strategy (战略学)*, 2013 Edition (2013 年版), Beijing: Academy of Military Science Press, December 2013.

Key Findings

Based on a review of reports on Second Artillery training in 2014, the authors identified the following ten key findings.

Key Finding 1: Second Artillery openly discussed a variety of challenges that it encountered in 2014, including not only technical issues but personnel issues as well. Some of these problems, such as a lack of qualified personnel, physical and psychological issues for personnel training in underground facilities, “training to the test,” a lack of standardized equipment among units, and equipment breakdowns, have persisted for many years.⁵ It appears Second Artillery is still seeking solutions for some of the same problems it has faced for a long time.

Key Finding 2: The enlisted force is in the process of transitioning from a conscript force that, until 2011, required two-thirds of all personnel to come from rural areas, where they received only a ninth grade education, to a combination two-year conscription and volunteer force that includes civilian college students and graduates who can now serve as noncommissioned officers for up to 30 years, depending on their specialty. The goal is to develop a highly-qualified, technical enlisted force.

Key Finding 3: Second Artillery conducts an annual training cycle that revolves around the annual enlisted force conscription and recruitment cycle. The PLA implemented a significant change to its annual two-year enlisted member conscription and recruitment cycle in 2013, which had cascading effects on Second Artillery’s annual training cycle. In 2014 new recruits arrived at Second Artillery units for basic training three months earlier than usual, which necessitated a corresponding adjustment to new soldier training as well as subsequent training.

Key Finding 4: PLASAF units conduct progressive training that begins with individual training and progresses to drills in the field or underground facilities at the squad, platoon, company, battalion, and brigade level. Training typically moves successively from single-equipment, single-item, and comprehensive training sessions to more intense field training and unit level exercises. However, there is some indication that units are trying to incorporate more complicated training earlier into the training cycle. In at least one instance a brigade deliberately increased the difficulty of training only two days into the new year to underscore that war could break out at any time.

Key Finding 5: Throughout the year, individual components of a brigade, including headquarters, launch, communications, and support organizations, conduct separate training until they conduct large drills or exercises. As units move up the training ladder, they conduct training in extreme weather conditions at different times of the year, under complex electromagnetic environment conditions, in all types of terrain from mountains to the desert, during the night and day, under informatized conditions, and in a nuclear, biological, and chemical environment.

Key Finding 6: Second Artillery provides annual guidance to the entire force at the beginning of the year, which, in turn, is based on guidance from the CMC and four General Departments. The Second Artillery’s main training priorities for 2014 were to ensure that training reflects conditions of

⁵ Unit (部队) is a generic term for operational and support organizations at the corps, division, brigade, and regiment levels. As a result, it does not include the Army, Navy, Air Force, or Second Artillery Force headquarters, or the fleet and military region air force headquarters.

actual combat, increase the difficulty and intensity of training to enable the force to fight winning battles, create a corps of high-quality talent, and correct the style of training, drills, and evaluations, presumably to bring them more in line with the requirements of actual combat.

Key Finding 7: Second Artillery conducted various types of training during 2014, including field training, underground training, communications and anti-satellite training, logistics training, live missile launches, and joint training. The goal is to move Second Artillery training from scripted to unscripted training under actual combat conditions, which includes dealing with “enemy” special forces, satellite reconnaissance, electromagnetic jamming, and air attacks.

Key Finding 8: Each year, several Second Artillery units conduct live launches in the Gobi Desert. In recent years live launch training in the Gobi has usually been held in the summer; however in 2014, in addition to summer live launches, at least one unit conducted live launch training in the winter.

Key Finding 9: In 2014 Second Artillery emphasized the need to increase joint force training, but few instances of actual joint training were reported. During September and October 2014, Second Artillery participated in the PLA’s largest joint exercise, identified as “Joint Action-2014” (联合行动-2014) actual-combat exercise (实兵演习), which involved the Army, Navy, Air Force, and Second Artillery. Few details were provided on Second Artillery’s actual participation. However, one component of the exercise was held in the South China Sea and included a conventional missile strike.

Key Finding 10: Second Artillery focuses much of its training on what it calls “command” (指挥) of its forces at every level and by every component, not just launch organizations. Throughout 2014 the PLASAF emphasized the need to improve command and staff capability for planning, coordination, organization, command, and response to contingencies.

This report is based predominately on exploitation of training-related articles published in the 2014 editions of the Second Artillery’s publically available newspaper, *Huojianbing Bao* (火箭兵报), which is published by the PLASAF’s Political Department (第二炮兵政治部).⁶ The paper does not have an official English name on the cover but is often referred to by the foreign media as *Rocket Force News*. It is published four times a week and is available to the public, although the newspaper’s target audience is PLASAF units and personnel. Second Artillery leadership utilizes *Huojianbing Bao* to communicate to personnel across the force on important topics such as CMC and Second Artillery leadership guidance, political work, training priorities, successes, challenges, and other key issues. Over the course of the year the newspaper published 199 four-page editions, which contained more than 300 articles that discussed PLASAF training. Although for reasons of operational security the authors deliberately leave out key details, such as referring to units, weapons systems, and equipment in generic terms using the Chinese term *mou* (某), which means “a certain”, they still provide useful information about Second Artillery’s current priorities, personnel, training, and major challenges.

⁶ Prior to 2007, *Huojianbing Bao* was published only three times a week. Starting in 2007, it has been published four times a week. In addition, Second Artillery has an official website (<http://ep.81.cn>); however, unlike the seven military region individual websites and the Air Force and Navy websites, it does not provide much substance. Other primary source material includes various Chinese language sources from the Internet, other newspapers, periodicals and books.

Before addressing PLASAF training in 2014 in detail, this report begins with a brief discussion of Second Artillery's status as a service or an independent branch, its organizational structure, and its goal to become an informatized force. The report does not discuss PLASAF's strategy, missiles, or equipment. The report is organized into the following six chapters:

- Organizational Status
- Organizational Structure
- Second Artillery Informatization
- Training Cycle
- Training Guidance
- Training Highlights

Organizational Status

When examining Second Artillery the first issues to address are 1) what is the proper English name and acronym, 2) what is its organizational relationship to the PLA Army (PLAA), Navy (PLAN), and Air Force (PLAAF), and 3) where does it fit into the PLA's 15-grade structure? (See Appendix A)

From at least 1997 through 2015, the PLA consistently used Second Artillery and the Second Artillery Force as the official English name.⁷ In the 2010 Defense White Paper, the PLA added the acronym PLASAF and sometimes just used SAF.⁸ Although the U.S. Department of Defense (DOD) annual report to congress on China's military previously used Second Artillery Corps and the acronym SAC, it began using Second Artillery Force in 2013 but has yet to add the PLASAF acronym.⁹ On December 31, 2015, the name was officially changed to PLA Rocket Force (解放军火箭军) and the acronym PLARF is now being used.¹⁰

Prior to December 31, 2015, the PLA had only three services (军种)—Army, Navy, and Air Force—of which each had subordinate branches/arms (兵种). Until December 31, 2015, Second Artillery was not a service. It was an independent branch treated as a service (作为一个相当于军种的独立兵种) and was directly subordinate to the CMC and four General Departments in what is considered a “vertical command” (垂直指挥) structure.¹¹ Whereas the PLA consistently identified the PLAA, PLAN, and PLAAF as “strategic services” (战略军种), it identified Second Artillery as a “strategic force” (战略部队).

As of December 31, 2015, however, the new PLA Rocket Force is a full service equal to the Army, Navy, and Air Force.

Within the PLA's 15-grade structure, Second Artillery (Rocket Force) is a military region (MR) leader-grade organization (正大军区职), which is the same grade as the PLAN, PLAAF, seven MRs, National Defense University, and Academy of Military Science.

⁷ Zheng Ti (郑惕) and Long Zhunan (龙祝南), “Second Artillery of the CPLA” (解放军第二炮兵) in *China Military Encyclopedia* (中国百科全书), Military History (军事历史), Part III, Volume 9, Beijing: Academy of Military Science Press, July 1997, p. 1567–1568.

⁸ *China's National Defense 2010*. MND website accessed at <http://eng.mod.gov.cn/ArmedForces/>.

⁹ U.S. Department of Defense (DOD) *Annual Report to Congress on Military and Security Developments Involving the People's Republic of China*, 1997 to 2015.

¹⁰ Zhang Tao, ed., “China establishes Rocket Force and Strategic Support Force,” China Military Online, 1 January 2016, accessed at http://eng.mod.gov.cn/TopNews/2016-01/01/content_4634922.htm.

¹¹ Zheng Ti (郑惕) and Long Zhunan (龙祝南), “Second Artillery of the CPLA”.

Organizational Structure

The operational command authority of the PLASAF is highly centralized. The chain of command runs from the CMC down through the General Staff Department to the Second Artillery Force Headquarters to missile bases to missile brigades and missile launch battalions; however, Second Artillery regularly practices a concept known as “skip echelon” (跨级), which allows higher echelon units to bypass subordinate units and give orders directly to the lowest echelon units. The operations of the PLASAF are expected to follow the orders of the CMC in the strictest and most precise manner.

As shown in Table 1, Second Artillery is mainly composed of the nuclear missile force (核导弹部队), the conventional missile force (常规导弹部队) [ballistic missiles and ground-launched cruise missiles], the support force, educational institutions, a research academy, and headquarters organizations. As shown on the map in Figure 1, the missile force is organized into six operational missile bases (导弹基地), each of which has multiple missile brigades (导弹旅), launch battalions (发射营), and possible launch companies (发射连). The support force (保障部队) is organized into technical and specialized support units, such as reconnaissance, intelligence, communications (signal), electronic counter measures (ECM), engineering, logistics, and equipment units. The educational institutions (院校) include a command college, an engineering university, and a school for noncommissioned officers (NCOs). The Second Artillery Equipment Research Academy includes both equipment and engineering institutes.

Second Artillery also has a single combined-arms¹² tactical training base (合同战术训练基地), which is identified as Base 28 in Jilin Province.¹³ The base has a “blue force” (蓝军) that simulates “enemy” forces and conducts reconnaissance and surveillance, electromagnetic jamming, and simulated precision strike, nuclear and chemical assault, sabotage-oriented special operations, psychological warfare attack, and network attack.

Table 1: PLA Second Artillery Force Organizational Structure

Grade	Organization
CMC Chairman	CMC Chairman and Vice Chairmen
CMC Member	Four General Departments
MR Leader	Second Artillery HQ
Corps Leader	Operational and Training Bases; Command College
Corps Deputy Leader	Engineering University; Equipment Research Academy

¹² Whereas combined-arms training (合成训练) for the three services (Army, Navy, and Air Force) refers to two or more branches in the same service, for Second Artillery, which is a branch, it refers to training conducted together by different units and fendui, including communications, launch, special operations, and logistics support.

¹³ *March 2014 Directory of PRC Military Personalities*, p. 108–109. Michael S. Chase, Daniel Yoon, and Mark Stokes, “The People’s Liberation Army Second Artillery Force (PLASAF) as an Organization” in Kevin Pollpeter and Kenneth W. Allen, eds., *The PLA as Organization Reference Volume v2.0*, to be published in 2015.

Division Leader	NCO School
Division Deputy Leader (Brigade Leader)	Launch Brigades
Regiment Leader	Technical and Support Regiments
Regiment Deputy Leader	
Battalion Leader	Launch Battalions; support battalions/fendui
Battalion Deputy Leader	
Company Leader	Support companies/fendui
Company Deputy Leader	
Platoon	Support platoons/fendui

Figure 1: Second Artillery's Six Operational Bases



Second Artillery Informatization

During 2014, numerous articles in *Huojianbing Bao* discussed how China is in the process of building a “big and powerful informatized strategic missile force.”¹⁴ Concerning training, Second Artillery seeks to “actively adapt to the requirements of the age of informatized warfare and to train in the operation of informatized weapons and equipment.”¹⁵ Second Artillery is also paying particular attention to building a command informatized system.

To accomplish its goals of informatizing the force, the PLASAF has set up various plans that include pilot programs. For example, in 2013, one base systematically drafted a three-year plan for informatization work.¹⁶ Relying on an integrated command platform, it put together a dedicated command and control net with the combat operations command structure vertically linked and the key elements of operational command horizontally merged, covering all combat operations sites and the launch *fendui*¹⁷ dedicated command and control net, and researching and developing a “five system network” for equipment, sites, military training, safety/security, and everyday office work.

Second Artillery has also created experimental units to carry out various aspects of informatization using specialized equipment. For example, one of the first experimental brigades used advanced technology to integrate military training, combat-readiness duty, political work, logistics support, and armament support into the integrated command platform through information integration.¹⁸ During drills and exercises, operational documents are systematically generated, operations orders are transmitted on the network, and material preparations can easily be seen on the integrated command platform at the headquarters and *fendui* levels. Most importantly, information is disseminated electronically.

One of the biggest challenges has been the lack of informatized systems and standardizing the equipment throughout the force. Additionally, although Second Artillery is using more fiber optic systems for communications, it must also be able to take the informatized systems to the field. For example, in early 2014, an unidentified base deployed over a hundred vehicles through mountains to

¹⁴ In the early 2000s the PLA began to use the term *xinxihua* (信息化), which has been translated as “informationized,” “informatization,” “informatized,” and “informationization”. According to the US Navy’s Office of Naval Intelligence, “‘Informationization’ describes China’s effort to incorporate modern information technology into all aspects of military operations, such as command and control (C2), logistics, and targeting. China’s leaders recognize that the information advantage is vital on the modern battlefield.” *The PLA Navy: New Capabilities and Missions for the 21st Century*, Office of Naval Intelligence, April 2015, p. 6, accessed at www.oni.navy.mil/Intelligence_Community/china_media/2015_PLA_NAVY_PUB_Print.pdf.

¹⁵ Wei Fenghe (魏风和) and Zhang Haiyang (张海阳), “2014 Second Artillery Military Training Mobilization Order” (第二炮兵二〇一四年军事训练动员令), *Huojianbing Bao*, January 1, 2014, p. 1.

¹⁶ Liu Bin (刘斌), Shi Yijie (时义杰), and Feng Jinyuan (冯金源), “Base Concentrates Effort on Fighting and Winning, Advances ‘Victory Through Information’” (某基地聚力打赢推进“信息制胜”), *Huojianbing Bao*, September 27, 2014, p. 1.

¹⁷ Different Chinese and English dictionaries translate *fendui* (分队) as subunit, detachment, element, or battery. This report just used the term *fendui*. Although *fendui* refers specifically to battalions, companies, platoons, and sometimes squads, which together comprise the grassroots level (基层), a *fendui* can also refer to an ad hoc grouping of personnel organized for a particular function.

¹⁸ Li Minzhen (李民振) and Yu Xihong (于夕红), “Encampment Training On Plateau in Cold Weather Guarantees War-Fighting Capability at All Times -- Unidentified Brigade Daringly Trod ‘Deepwater’ Through Training Innovation” (某旅接力训练新勇趟[深水区]高原寒区驻训确保随时能战), *Huojianbing Bao*, January 1, 2014, p. 2.

an underground command post.¹⁹ The main purpose was to test the base's "one network, five systems" that links the vertically-connected command structure at all levels with the 20 components of the horizontally-connected command operations structure that includes classified information, mapping, reconnaissance, control, and attack into what it calls the informatized "command tent." Yet another challenge is educating and training personnel to be able to use the relevant systems. To help solve this problem, the National University of Defense Technology (国防科技大学) has created a monthly teaching program at one base that includes 23 courses and involved over 1,000 personnel in January 2014.²⁰ The courses are televised to all subordinate units.

Although it is difficult to make a judgement whether the all of Second Artillery's informatized systems work correctly or not, it is clear that they are still working on different programs, which implies that there problems remain with standardization throughout the system.

¹⁹ Lan Hai (兰海), Shi Yijie (时义杰), and Feng Jinyuan (冯金源), "Base Creates Informatized 'Command Tent'" (某基地打造信息化'中军帐'), *Huojianbing Bao*, April 25, 2014, p 1.

²⁰ Shi Yijie (时义杰) and Feng Jinyuan (冯金源), "A Base Is Striving To Elevate Informatization to a Higher Level, With Stress Placed on Promoting the Ability To Win" (某基地聚焦打赢推动信息化建设上台阶), *Huojianbing Bao*, January 31, 2014, p. 1.

Training Cycle

Like the rest of the PLA, the PLASAF organizes its training into three levels: individual and unit training (训练), drills (演练) and exercises (演习).²¹ In terms of training priorities, the PLASAF takes specialized skills as the foundation, focuses on officers and core personnel, centers its attention on systems integration and aims at improving overall operational capabilities. It actively conducts specialized training (专业训练), integrated training (合成训练), and operational training drills (作战演练).²² Specialized training mainly involves the study of basic and specialized missile theories, and the training in operating skills of weapons and equipment. Integrated training mainly consists of whole-process coordinated training of all elements within a combat formation. Operational training drills refer to comprehensive training and drills by missile brigades and support units in conditions similar to actual combat. The PLASAF has adopted a rating system for unit training and an accreditation system for personnel at critical posts.²³ It enhances on-base, simulated, web-based and actual-combat training, explores the characteristics and laws of training in complex electromagnetic environments and integrated training of missile bases, and is conducting research and development of a new generation of web-based simulated training systems. Significant progress has been made in building the “Informatized Blue Force” and battle laboratories.

Every year, PLASAF units progress through an annual training cycle, the schedule of which is primarily dictated by the annual enlisted force and new officer accession cycles. Historically, the training cycle was fairly predictable, beginning with the PLA’s annual winter conscription and recruitment cycle. New enlistees were screened in November, reported to their individual units for basic training on 10 December, completed their basic training in approximately late February, and were then assigned to their permanent billet at the same unit. In 2013 the PLA implemented a significant change to its annual two-year enlisted member recruitment and conscription cycle, which had a consequent impact on the timing of unit training in 2014. New recruits arrived at Second Artillery units for basic training three months earlier than usual, which necessitated a corresponding adjustment to new soldier (新兵) training as well as subsequent unit training.

The PLASAF, like the PLA as a whole, does not have a central enlisted training center, so all new enlisted personnel are assigned directly to their new operational or support unit, where they are assigned to the unit’s new soldier companies (新兵连), which are subordinate to new soldier battalions (新兵营), to receive their new soldier training (新兵训练) for approximately two months. The PLA refers to these personnel as *xinbing* (新兵), which denotes new two-year enlisted personnel while they are receiving their basic training (入伍训练) in a new soldier company. For example, one

²¹ It is important to distinguish between a drill (演练) and an exercise (演习). Although the Chinese term *yanlian* (演练) is sometimes translated in English as an exercise, it actually refers to a drill.

²² Lu Jun (卢俊), Ding Rongzhen (丁荣桢), and Tian Liang (田亮), “All-Hands of Regiment Firm Up ‘Basic Skills’” (某团全员夯实“基本功”), *Huojianbing Bao*, January 7, 2014, p. 1. Liu Gang (刘刚) and Wang Jianwu (汪建武), “A Certain Brigade Creates an ‘Omni-Capable Elite Force’ for Communication Support” (“某旅锻造保通“全能尖兵”), *Huojianbing Bao*, January 8, 2014, p. 2. Specialized Training (专业训练) and Combined Training (合训), *PLA Military Terminology*, p. 305 and 312, respectively.

²³ Chang Juancheng (常娟成), Wang Xiaolin (王小林), and Song Haijun (宋海军), “Regiment Forges Chains of Coordinated Confrontation Operations through Integrating All Elements” (某团全要素嵌打造协同对抗作战链条), *Huojianbing Bao*, June 11, 2014, p. 1.

Huojianbing Bao article from February 2014 reported that one brigade had about 500 new personnel (*xinbing*).²⁴ It is difficult for a brigade to engage in a major exercise while a new group of two-year enlistees is conducting its basic training at the same unit. During this time period, in addition to overseeing basic training for new enlistees, PLASAF units also engage in a training preparation period (训预备期), typically lasting one to two months. As new recruits are further integrated into their unit, unit training gradually progresses from individual training to squad training to platoon training to company training to battalion training, etc.

Of note, the PLA is still in the process of moving from a pure conscription program for enlisted personnel, where, until 2011, two-thirds of new conscripts (义务兵) were mandated to come from rural areas and were only required to have a ninth grade (junior middle school) education, to a combination conscription and recruitment process, which includes high school and college students and graduates.²⁵ This change reflects the PLA's need for a more educated enlisted force, particularly for highly technical jobs in the PLASAF, PLAAF, and PLAN. However, training troops that lack higher education continues to be a challenge for the PLASAF. For example, an article in February 2014 in *Huojianbing Bao* acknowledged that troops lacking higher education face more challenges when trying to master technical skillsets. According to the article, of the approximately 500 new personnel in one brigade, 136 had a senior technical (associate's) degree or bachelor's degree, 23 had only a middle school education, and the remainder had a high school or high school equivalent degree.²⁶ The article discussed unspecified measures the brigade, commanded by Wang Houjun (王后军), took to help soldiers with lesser education "grow into competent specialists."

After enlistees are assigned to their permanent billet, they are considered *xin zhanshi* (新战士), which refers to two-year enlisted personnel after they have completed basic training, receive their initial rank, and have been assigned to their permanent billet.²⁷ At this point new enlistees begin to receive on-the-job training (OJT / 在职训练) for their billets (岗位) in a successive program that continues through the unit's training preparation phase and actual training phase, including common

²⁴ Cai Ruibin (蔡瑞宾) and Liu Jinglong (刘景龙), "Brigade Takes Multiple Measures to Help Soldiers with Less Education Grow into Competent Specialists" (谋旅多措并举推低学历战士成长成才), *Huojianbing Bao*, 26 February 2014, p. 2. The PLA uses a number of terms when referring to "new soldiers", and it is important to understand their different meanings.

²⁵ The 2004 Defense White Paper used the terms *zhengbing* (征兵) as conscription and *yiwubing* (义务兵) as conscripts to describe the situation at that time for the PLA's new two-year enlisted personnel. Although the 2006 and 2008 White Papers did not use either term, the 2010 White Paper translated *zhengbing* as recruitment and did not use the term *yiwubing* at all. This represents the PLA's overall attempt to move away from a draft/conscript system to a volunteer system for its enlisted personnel. Concerning references to conscripts, see Duan Kaisheng (段开尚) and Yang Yonggang (杨永刚), "A Second Artillery Brigade Taps The Political Education Talent and Resources of 9 Conscripts Who Are Selected Among the "Top Ten" Political Instructor" (第二炮兵某旅挖掘政治教育人才资源 9 名义务兵当选"十佳"政治教员), January 17, 2015, accessed at www.weshequ.com/gangaotaishixun/201501/236747.html. Li Shanshan, "China's Military Service System," *China Armed Forces*, No. 12, Volume 4, 2011, p. 31–33.

²⁶ Cai Ruibin (蔡瑞宾) and Liu Jinglong (刘景龙), "Brigade Takes Multiple Measures to Help Soldiers with Less Education Grow into Competent Specialists" (谋旅多措并举推低学历战士成长成才), *Huojianbing Bao*, February 26, 2014, p. 2.

²⁷ Yan Zuoren (严作人) and Chen Xianping (陈先平), "A Brigade's New Soldiers Rapidly Get into Position and Create Seamless Links of Combat Power" (某旅新战士快速上岗实现战斗力无缝链接), *Huojianbing Bao*, January 29, 2014, p. 2.

theory, specialty knowledge, simulated position changes, and actual equipment operation.²⁸ New soldiers are integrated into their unit's annual training, which successively moves from single-equipment, single-item, and comprehensive training sessions through to more intense field training (野外训练) and comprehensive drills. However, there is some indication that units are trying to incorporate more complicated training earlier into the training cycle. One article reported a brigade deliberately broke from the convention of not confronting troops with dangerous situations at the beginning of training, intentionally increasing the difficulty of training merely two days after the Second Artillery issued the military training mobilization order.²⁹ According to Brigade Commander Zhang Kebao, the rationale for this change was to “create an extremely adverse environment” at the start of training to demonstrate that war could break out at any time.³⁰

Historically, units did not typically begin field training and combined-arms training (合成训练) until late spring, however, in 2014 units across the PLA took to the field much earlier. This is likely a result of moving the enlisted force recruitment cycle forward by three months from a winter cycle to a summer cycle, with screening in July and August and basic training beginning in August and September. The following bullets explain the changes experienced by one brigade, commanded by Yang Juntao (杨俊涛), which likely mirror those experienced by other units across the force:³¹

- Pre-2014:
 - December-January: New soldiers arrived at their unit for basic training
 - March: Began their on-the-job training
 - April: Observing older enlisted personnel about how to do their job during field training
- 2014:
 - December-January: New soldiers already training in their operational billets
 - March: Already capable of operating actual equipment
 - April: Interacting with all enlisted personnel during training.

Completing new soldier training and integrating new soldiers into their operational billets earlier enabled Second Artillery to begin the next phase of their training cycle earlier as well. According to Chinese media reports, beginning in December and continuing through February, Second Artillery units, as well as units in the PLAN and PLA AF, had taken to the field to begin their “new” annual unit training cycle.³² Units had already incorporated new soldiers into their ranks and were conducting individual and small-unit proficiency training. This represents a significant change from previous years, where units typically suffered personnel shortfalls in winter to due to the annual

²⁸ Yan Zuoren (严作人) and Chen Xianping (陈先平), “A Brigade’s New Soldiers Rapidly Get into Position and Create Seamless Links of Combat Power” (某旅新战士快速上岗实现战斗力无缝链接), *Huojianbing Bao*, January 29, 2014, p. 2.

²⁹ Shi Yijie (时义杰), Yang Yuhao (杨玉含), and Feng Jinyuan (冯金源), “Completing Tasks Is Not the Same as Being Capable of Winning Battles -- The Record of the General Discussion on the Standard of Combat Power Held In-Depth by a Certain Brigade” (某旅深入开展战斗力标准大讨论纪事), *Huojianbing Bao*, April 1, 2014, p. 2.

³⁰ Ibid.

³¹ Yan Zuoren (严作人) and Chen Xianping (陈先平), “A Brigade’s New Soldiers Rapidly Get into Position and Create Seamless Links of Combat Power” (某旅新战士快速上岗实现战斗力无缝链接), *Huojianbing Bao*, January 29, 2014, p. 2. Yang Juntao (杨俊涛) was identified as the commander of Base 56’s 812th Launch Brigade (Tianshui, Gansu Province) in the *March 2014 Directory of PRC Military Personalities*, p. 107.

³² Dennis Blasko, “Analysis: PLA winter exercises – training not mobilization”, *Jane’s Defense Weekly*, March 28, 2014.

turnover of the enlisted force and were unable to go to the field in significant numbers for training. Winter field training as seen in early 2014 will likely become routine for Second Artillery units, as the PLA continues to implement its new recruitment and conscription cycle.

Historically, unit training began to draw down in late fall, as units prepared for the influx of the next round of new enlistees as well as the demobilization of a significant number of mid-ranking and senior enlisted personnel. In late November, all NCOs, referred to as “old soldiers” (*laobing*/老兵), who are not promoted to the next grade are demobilized. At that point, the lowest ranking NCOs are replaced by enlistees who have completed their two-year service and elect to remain on active duty. However, these personnel do not have any leadership experience or specialized technical skills outside of what they learned by OJT. Depending on the billet, they must receive some type of squad leader and/or technical training in order to fill the position.

When old soldiers retire from active duty every year, units normally experience a sudden drop in their operational capabilities.³³ To help alleviate this problem, one brigade, commanded by Zeng Aijun (曾爱军), has begun to select 100 new soldiers at the end of basic training to receive six months of specialized training. Although not stated, the goal is likely to retain them as NCOs at the end of their two-year commitment. Because Second Artillery is now bringing in more educated enlisted personnel, it believes that this is a viable program for the long term, even though the new soldiers are delayed from assuming their permanent billets. Additionally, as the PLA continues to implement its new enlisted recruitment and conscription cycle, NCO demobilization may gradually move forward, beginning in 2015 to match the demobilization of the new enlistees who started in 2013.

In addition to the enlisted recruitment and conscription cycle, the PLASAF annual training cycle is also affected by the annual officer (cadre) corps accession and initial training schedule.³⁴ The major turnover in officers occurs during the summer, when recently graduated cadets arrive at their unit and there is a ripple effect up the career ladder as older officers are promoted, demobilized or retire. As a result, during the peak exercise season, launch and support units at different levels have vacant slots at the same time for commander and deputy commander billets.³⁵

The PLASAF has the following two cadet academic institutions, which also serve as professional military education (PME/培训) institutions for officers as they move up their career ladder: 1) Second Artillery Command College (第二炮兵指挥学院) in Wuhan, Hubei Province, which is a corps leader-grade organization, and 2) Second Artillery Engineering University (第二炮兵工程大

³³ Su Zheng (苏政), Gao Mingjun (高明俊), and Wang Qingyong (王清勇), “Brigade Breaks Through a Bottleneck to Create a ‘Closed-Loop Model’ for Combat Power Generation” (某旅突破瓶颈造战斗力生成‘闭环模式’), *Huojianbing Bao*, January 11, 2014, p. 2. Zeng Aijun (曾爱军) was identified as the commander of Base 54’s 803rd Launch Brigade (Jingzhou, Hunan Province) in the *March 2014 Directory of PRC Military Personalities*, p. 106.

³⁴ In the PLA, the term officer (军官) and cadre (干部) are synonymous; however, the PLA also has civilian cadre (文职干部) who are not considered officers.

³⁵ Yang Hongpeng (杨宏鹏) and Wang Qingyong (王清勇), “Drawing of Lots at Combat Unit; Full of Confidence Despite Unannounced Change of Leadership in the Middle Course; No Reduction in Combat Strength Despite Transfer and Reassignment of Six Battalion Commanders at a Certain Brigade” (某旅同时调配 6 名发射营长战斗力不减), *Huojianbing Bao*, June 20, 2014, p. 1.

学) in Xi'an, Shaanxi Province, which is a corps deputy leader-grade organization.³⁶ New cadets, who receive either a three-year senior technical (associate's) degree or a four-year bachelor's degree, have already received their specialty education and training upon graduation in June, at which time they are assigned to their permanent billet at their operational or support unit.

In addition, Second Artillery also has six four-year bachelor's programs out of the PLA's 118 National Defense Student (国防生) programs in civilian science, technology, and engineering universities, which is a very rough equivalent to the U.S. military's Reserve Officers' Training Corps (ROTC) program.³⁷ The six institutions are: 1) Northwestern Polytechnical University (NPU/西北工业大学) in Xi'an, Shaanxi Province; 2) Hefei University of Technology (HFTU/合肥工业大学) in Hefei, Anhui Province; 3) Harbin University of Science and Technology (HUST/哈尔滨理工大学) in Harbin, Heilongjiang Province; 4) Wuhan University of Science and Technology (WUST/武汉科技大学) in Wuhan, Hubei Province; 5) University of Science and Technology Beijing (USTB/北京科技大学); and 6) Chengdu University of Information Technology (CUIT/成都信息工程学院), in Chengdu, Sichuan Province. Unlike their military cadet counterparts, these students have not received any technical training related directly to systems in operational or support units. As a result, upon graduation in June or early July, they are either assigned directly to their unit as a special technical officer or a commanding officer, where they receive OJT, or they are assigned to a training base (集训基地) for some technical training for an unidentified period before they are assigned to their permanent unit, where they then receive OJT.³⁸ As such, they must also work up the training ladder before being able to participate to any level of proficiency in an exercise.

³⁶ Zhao Yiping (赵一平), ed., *People's Liberation Army Military History* (中国人民解放军军史) Volume III in *China Military Encyclopedia* Second Edition (中国军事百科全书第二版), Beijing: Encyclopedia of China Publishing House, 2007, p. 764–768. Dong Huiyu (董会瑜) and Mou Xianming (牟显明), eds., *Dictionary of Modern Military Education* (sic) (现代军校教育辞典), National Defense University Press, August 2011. In 2001, the Second Artillery Engineering College (工程学院) was upgraded to a university.

³⁷ Information was accessed at <http://baike.baidu.com/view/3196.htm>.

³⁸ Information concerning training at a training base was accessed at http://difang.gmw.cn/hlj/2012-06/07/content_4298476.htm.

Training Guidance

At the end of each year, the General Staff Department reviews the overall training situation for the PLA for that year and provides guidance for the next year.³⁹ Based on this guidance, the PLAN, PLAAF, PLASAF, and MRs hold separate meetings to review their training situation and develop specific guidance for subordinate organizations for the coming year.⁴⁰ After guidance is disseminated, subordinate units hold their own meetings to discuss implementation of the training guidance and develop training plans.⁴¹ In January 2014 *Huojianbing Bao* published a series of articles that promulgated guidance from PLASAF senior leaders for Second Artillery training in the new year. The guidance conveyed in these articles is informed by important speeches on military affairs by CMC Chairman Xi Jinping, as well as direction from the 18th Party Committee and the General Staff Department. As such, it communicates the CMC's vision and goals for the force as well as Second Artillery leadership's training priorities for 2014.

On January 1, 2014 *Huojianbing Bao* reported that Second Artillery Commander Wei Fenghe and PC Zhang Haiyang issued the “2014 Second Artillery Military Training Mobilization Order” (第二炮兵二〇一四年军事训练动员令).⁴² This order is considered a foundational document for unit training planning. Commander Wei and PC Zhang instructed Second Artillery's “broad masses of officers and soldiers” to “boldly make great achievements on the broad stage of training made realistic to actual combat, satisfactorily complete every task with preparation for military struggle as the driving force, and make new contributions to the cause of building a big and powerful informatized strategic missile force.”

Although the order was not published in full, the following four overarching priorities for Second Artillery training in 2014 were identified:⁴³

- *Earnestly strengthen the shouldering of the mission of training for actual combat.* The article emphasized the need raise the level of actual combat in military training and continue to temper and hone units in environments similar to actual combat. The article characterized “actual combat training” as “essential for raising strategic deterrence and actual-combat capabilities of units.”
- *Strictly implement the strategic requirement to be able to fight winning battles.* The article discussed the need to see to specialized technical training, deepen drills made realistic to actual combat, do well in mission subject training, and see to senior officer and staff command confrontations and red vs. blue live-forces actual equipment opposing-forces training. Furthermore, the

³⁹ Staff Commentator, “Use the Spirit of Reforms and Innovation to Intensify Actual-Combat Training” (以改革创新精神化实战训练), *Jiefangjun Bao*, January 13, 2014, p. 1.

⁴⁰ Commander Wei Fenghe and Political Commissar Zhang Haiyang, “Second Artillery 2014 Military Training Mobilization Order” (第二炮兵二〇一四年军事训练动员令), *Huojianbing Bao*, January 1, 2014, p. 1. Xu Tongxuan (徐同宣), “PLA Air Force Holds 2014 Military Training Conference” (空军在京召开 2014 年度军事训练会议) *Kongjun Bao*, January 14, 2014, p. 1.

⁴¹ Dong Zhiwen (董志文) and Feng Jinyuan (冯金源), “Standing Committee of Unidentified Brigade Bravely Plays Role of ‘Pacesetter’ in Drill” (某旅党委演练勇当‘排头兵’), *Huojianbing Bao*, January 10, 2014, p. 1.

⁴² Commander Wei Fenghe and Political Commissar Zhang Haiyang, “Second Artillery 2014 Military Training Mobilization Order” (第二炮兵二〇一四年军事训练动员令), *Huojianbing Bao*, January 1, 2014, p. 1.

⁴³ Ibid.

article specifically called for an increase in the difficulty and intensity of drills while stationed in the field and live missile launches.

- *Thoroughly advance innovative development in the actual practice of training.* The article reiterated the need to “actively adapt to the requirements of the age of informatized warfare.” It alluded to the need to develop technical personnel capable of operating complex equipment in a high-tech environment. It also emphasized the need to advance the transformation of Second Artillery’s academic institution education and exert effort on “creating a corps of high-quality talent reflecting the characteristics of the Second Artillery.”
- *Exert effort to correct the style of training, the style of drills, and style of examinations.* This priority alludes to problems that persist across the force regarding how training is conducted and evaluated. These include the continued use of scripted training, conducting reviews only when “ace” personnel are present, training only in areas that units expect to be evaluated, and assessing units on criteria that are not based on the requirements of actual combat. The article specifically instructs the force to “resolutely investigate and correct the practices of not training due to the danger involved and passively ensuring safety.” Additionally, it emphasizes the need to handle training accidents correctly.

The priorities outlined in the 2014 training mobilization order do not necessarily represent novel concepts. For example, the 2000 Defense White Paper was the first White Paper to note that the PLA was emphasizing the need to conduct training based on the requirements of actual combat (实战).⁴⁴ Additionally, as early as 1990, former CMC Chairman Jiang Zemin utilized the term fight to win (打得赢) as a sub-component of the Party’s requirement to build a “strong and competent military.”⁴⁵ Even so, they do reflect Xi Jinping’s new principles for army building and war-fighting doctrine, particularly the increased emphasis Xi has placed on being able to fight and win wars (能打胜仗).⁴⁶ This is added nuance of Jiang’s concept of “fight to win.” Of note, from 2004 to 2012, CMC Chairman Hu Jintao did not use any combination of the terms fight and win. Instead, he emphasized that “the PLA takes as its objective to win local wars under the conditions of informatization.”

Second Artillery units utilize the annual training mobilization order and other senior leadership guidance as a basis for their training plans for the coming year. For example, in response to the training mobilization order, one base held an enlarged meeting of its Party Committee to examine their capabilities and make arrangements to meet the requirement to be “capable of fighting war and winning war.”⁴⁷ The Party Committee reviewed training from the previous year and “pinpointed weak spots and gaps,” including that studies on operational issues were not in-depth or specific enough and that “actual combat oriented training” needed to be intensified. A series of practical

⁴⁴ Review of the biennial 1998 to 2012 Defense White Papers.

⁴⁵ Andrew Scobell and Lyle Morris, “Chairman Xi and His Generals,” CAPS-RAND-NDU PLA Conference, 21–22 November 2014, to be published in 2015.

⁴⁶ “Xi Jinping: Work Hard to Build a People’s Army that Obeys the Party’s Command, Fights and Wins Wars, and Has a Good Work Ethic” (习近平: 努力建设一支听党指挥能打胜仗作风优良的人民军队), March 12, 2013, accessed at <http://cpc.people.com.cn/n/2013/0312/c64094-20755159.html>.

⁴⁷ Liu Gang (刘刚) and Zhou Xianren (周献人), “Strive for Realistic Environment, Strive for Difficult Contents, Strive for Strict Evaluations, and Strive for Practical Drills; Unidentified Base Acts Upon Order and Makes Clarion Call for Real Combat Oriented Training in New Calendar Year” (环球上求真,内容上求难,考核上求严,演练上求实:某基地闻令而动吹响新年度实战化训练号角), *Huojianbing Bao*, January 11, 2014, p. 1.

training measures were identified to strengthen “actual combat oriented training,” including “correcting problems of lenient training style, impractical training drill style, and incorrect evaluation style.” Although details on the training measures were not provided, one example of training included sending launch units from a conventional missile brigade to an unfamiliar area in the field to carry out continuous assault training at night.

Second Artillery’s initial training priorities are reinforced by subsequent articles published throughout year. The Fourth Plenum of the 8th Second Artillery Party Committee, which met in July 2014, reiterated the need to raise the intensity and effectiveness of actual-combat training.⁴⁸

Other articles discussed how units were failing to fully meet training expectations, such as “paying lip service to actual-combat training” and “failing to increase training difficulty so as to passively guarantee safety.”⁴⁹ These articles typically offer a solution for a particular problem. For example, one article reported that in early March an unidentified Base 53 brigade held a review on transferring missiles.⁵⁰ During the review, one soldier completed the required maneuvers 30 minutes earlier than the combat standard time. However, the supervisory team conducting the assessment found the demonstration to be a failure because the soldier had used an empty launcher. When the supervisory team had the soldier conduct the transfer with an actual missile, he barely met the combat standard time. After further questioning, the supervisory team determined that in order to ensure absolute safety, the units had all used empty launchers when conducting training on hosting and transferring. Furthermore, the units had made time spent on the task an assessment criterion. Although the units had been rated as excellent in several past appraisals, this incident raised questions regarding the units review standards and actual combat demands. This incident demonstrates how outstanding training records do not necessarily equate to combat capability, and prompted the brigade’s Party Committee to conduct an investigation into the inconsistency between unit training and actual combat.

The investigation identified other disturbing trends. For example, one launch battalion requested to postpone a review because four of its main gunners were on leave and the unit did not want to conduct a review without its “ace” gunners.⁵¹ Other units allowed the weather to dictate when and how to mobilize their equipment, using average equipment in lieu of special equipment in bad weather. Some units did not conduct combat readiness drills properly; they carried the same combat materials and armament repeatedly even when they were assigned to different missions. Following its investigation, the brigade Party Committee formulated policies and measures to organize training,

⁴⁸ Staff Commentator, “Grip the Key Link of Being Able to Fight and Win, Strengthen ‘Actual-Combat Training – Second Part on Implementing the Spirit of the 4th Plenum of the 8th Second Artillery Party Committee by High Standards (扭住能打胜仗加强“实战化”:二论高标准彻落实二炮党委八届四次全会精神), *Huojianbing Bao*, July 16, 2014, p. 1.

⁴⁹ Liu Chuanguo (刘传国), “It is Necessary to Grasp Three ‘Lines’ in Actual-Combat Training” (实战化训练需要把握三条“线”), *Huojianbing Bao*, March 25, 2014, p. 3.

⁵⁰ Luo Dayin (刘大银), “How Far Away Are Training Review Standards from the Standards of Winning Actual Combat? A Brigade Reveals Shortfalls and Exposes Its Inadequacies to ‘Measure’ the Disparity in Combat Capabilities” (演训考核标准实战打赢标准到底差多远?:某旅揭短丑“丈量”战斗力差距), *Huojianbing Bao*, March 22, 2014, p. 2. The 2014 Directory of PRC Military Personalities identifies Chen Zhihao as the Political Commissar for this brigade.

⁵¹ Luo Dayin (刘大银), “How Far Away Are Training Review Standards from the Standards of Winning Actual Combat? A Brigade Reveals Shortfalls and Exposes Its Inadequacies to ‘Measure’ the Disparity in Combat Capabilities” (演训考核标准实战打赢标准到底差多远?:某旅揭短丑“丈量”战斗力差距), *Huojianbing Bao*, March 22, 2014, p. 2.

exercises, and reviews in accordance with combat operations. Furthermore, they selected “backbone cadres” who possessed technical expertise, were well-versed in operations, and able to command to strengthen supervision, inspection, and review of training.

This brigade’s experience illustrates the challenges Second Artillery faces when trying to conduct training under more realistic combat conditions. Given that these are the same types of issues the rest of the PLA has dealt with for a long time, it is doubtful if the Second Artillery will actually solve these problems in the near future.

Training Highlights

This chapter discusses the types of training that PLASAF brigades conducted in 2014 and identifies some of the major challenges that persist. The information is a snapshot of each component of training during the year and does not go into depth for any particular drill or exercise. In 2014, PLASAF prioritized training for actual combat, increasing the force's informatized capabilities, and improving "Blue Force" and "confrontation training." Furthermore, PLASAF units focused on improving survivability and the ability to maintain combat operations during war, by conducting training under a variety of conditions, such as training at night, in cold weather and underground, as well as improving their ability to overcome enemy attacks, including air raids, electromagnetic jamming, and reconnaissance activity.⁵² Although the implication is that all field training involved real missiles, it is not clear if this is the case. The bottom line, however, is that all training was supposed to simulate actual combat conditions in different weather and terrain situations and moving the missiles between different launch sites.

Field (Bivouac/Encampment) Training

Over the past decade, Second Artillery has increased the pace and complexity of its field training (野外驻训), which is sometimes translated as bivouac or encampment training.⁵³ This training includes individual operational or support components, such as communications, engineering, and logistics components, or, sometimes, all components together.

Field training can last from a few days to 20 days under the guidance of a director (导演). The field sites can be as near as 100 kilometers (62 miles) or as far away as 500 kilometers (300 miles) from the home base.⁵⁴ Although Second Artillery units are directly subordinate to the CMC through the General Staff Department (GSD) and are not subordinate to MRs, their field training often crosses MR boundaries (跨区). While en route, the units can pass through dense forests, cross ravines, and fight high temperatures, wind, and rain. In addition, during field training, units often face multiple challenging tactical scenarios, including avoiding "enemy" satellite reconnaissance, passing through "enemy" fire blockade zones, and camouflaging vehicles while traveling and stopping, countering multiple harassing assaults by enemy special forces, airborne strikes, and nuclear and chemical warfare assaults. Additionally, various units have incorporated scarce or delayed rations as an

⁵² Liu Chuanguo (刘传国), "It is Necessary to Grasp Three 'Lines' in Actual-Combat Training" (实战化训练需要把握三条“线”), *Huojianbing Bao*, March 25, 2014, p. 3.

⁵³ Zhang Yue (张悦) and Tan Hubiao (谭虎彪), "Conducting a Military Drill on the Plateau To Forge an 'Iron Fist' for Support Service -- A Factual Account of an Unidentified Base Designating Logistic Contingency Support Personnel To Conduct Cross-Region Bivouac Training" (某基地抽组后勤应急保障力量跨区驻训纪实), *Huojianbing Bao*, November 1, 2014, p. 1. Duan Kaishang (段开尚), Xiao Pan (肖盼), and Wang Qingyong (王清勇), "Brigade Strengthens Combat Readiness Order, Eliminates 'Missing Items'" (某旅强化战备秩序杜绝“缺斤少两”), *Huojianbing Bao*, 5 August 2014, p. 2. Xiao Hang (肖航), "Accurately Aiming at 'Enemy Conditions' and Exploring Ways To Win, an Unidentified Brigade Closely Follows Actual Combat Needs To Persistently Enhance the Troops' Quick Reaction Capability" (某旅津贴实战持续提高部队快反能力), *Huojianbing Bao*, November 18, 2014, p. 2.

⁵⁴ Note: 1,000 li (千里) is often mistranslated as 1,000 kilometers; however, one li is one-half kilometer.

important subject in field training and drills.⁵⁵ In some cases, personnel go without food for at least 16 hours.⁵⁶

One article in March 2014 described a successful “actual-equipment operation training” in the field as follows: “The battalion rushed to the field to carry out an important mission; tested by adverse weather, unfamiliar environments, enemy situations, special situations and other highly actual-combat environments, the officers and soldiers met the challenges calmly and carried out field combat oriented deployment as required...their winning capability became increasingly stronger.”⁵⁷ Although the unit successfully met the requirements for that training event; however, it does not necessarily mean that the training event included everything the unit would do during a larger exercise, nor did the article discuss any specific problems it encountered during the training event.

While deployed for training, units sometimes have problems maintaining equipment.⁵⁸ When equipment does not work properly, the unit has to return it to the original defense industry factory for repairs, which greatly affects unit training sequences as well as restricting the development of combat power.

Underground Training

Second Artillery’s relevant units consistently conduct training in underground facilities (UGFs), which it identifies as *dixia longying* (“地下龙营”) or *diyong* (“地营”) and has been translated as “underground palace,” “underground dragon palace,” or “dragon’s lair”.⁵⁹ Second Artillery also identifies this as sealed-in survival training (密闭生存). In 2013, one unidentified missile brigade deployed troops 29 times to do survival exercises in UGFs.⁶⁰ As the time extended from one week to nearly one month, they explored all dimensions and all elements from eating, drinking, deploying, withdrawing, and sleeping to supply, rescue, transport, repair, and defense, as well as the quality of personnel psychological issues. In the past, in order to ensure training safety, some dangerous and difficult subjects were often replaced by simulated operation by all levels. The result was that troops were not prepared to operate the real equipment at full capacity and often made mistakes. As a result, they had no choice but to invite the factory personnel or military representatives from the factory to “protect and escort” them during tasks. This placed troops in the embarrassing situation

⁵⁵ Song Haijun (宋海军), Li Zhenhua (李振华), and Jia Bin (贾斌), “Why Eat ‘Roughage’ When You Live in a ‘Palace?’” (住“龙营”咋还吃“粗粮”?), *Huojianbing Bao*, February 12, 2014, p. 2.

⁵⁶ Chen Dehui (陈德挥), Su Zheng (苏政), and Wang Qingyong (王清勇), “‘Three Combat, One Invert’ Training Reinforces Brigade’s Combat-Readiness” (某旅“三抗一倒”训练锤炼部队大胜仗能力), *Huojianbing Bao*, June 10, 2014, p. 1.

⁵⁷ Zhao Simin (赵思敏) and Wang Qingyong (王清勇), “Brigade Installs ‘Upgrade Pack’ on 27 Training Subjects” (某旅给 27 个训练课目安装“升级包”), *Huojianbing Bao*, March 22, 2014, p. 2.

⁵⁸ Duan Kaishang (段开尚), Jiang Shan (江山), and Wang Qingyong (王清勇), “Equipment Maintenance On-Call System of a Certain Brigade Prepared to Fight at All Times” (某旅装备维修值班体系随时能战), *Huojianbing Bao*, January 14, 2015, p. 1.

⁵⁹ Song Haijun (宋海军), Li Zhenhua (李振华), and Jia Bin (贾斌), “Why Eat ‘Roughage’ When You Live in a ‘Palace?’” (住“龙营”咋还吃“粗粮”?), *Huojianbing Bao*, February 12, 2014, p. 2.

⁶⁰ Jiang Shan (江山), Qin Yong (勤永), and He Tianjin (何天进), “A Certain Brigade’s Realistic Battle Exercises at the Start of the Year are Filled with the Smoke of Gunpowder” (某旅新年伊始实战化演训燃硝烟), *Huojianbing Bao*, January 15, 2014, p. 1.

of needing a “babysitter” when fighting. To remedy this situation, almost all training now involves real equipment under actual combat conditions.

The biggest issues related to training in UGFs involve the physical and psychological impact on personnel. In the past, measures have been taken to reduce the impact on personnel; however, it appears that efforts are being taken to make underground training more realistic, at least regarding food and water. For example, one UGF has a sign that reads “Wartime water supply standards are in effect” and states that the length of time water could be turned on for washing your face and rinsing your mouth was limited, the amount of water is limited to three liters per person per day, and drinking water is limited to two liters per person per day.⁶¹ Additionally, instead of having cooks in field kitchens or UGFs prepare food they brought with them or purchasing fruits, vegetables, meat, and non-staple foods from the local area, personnel must eat packaged rations or find and eat wild vegetables and meat.⁶² For example, in the past one unidentified unit prepared plenty of food before the troops entered the tunnel, meals were provided at regular intervals during underground training, and the troops never went without hot food.⁶³ During 2014, however, the unit changed its training methods during a seven-day training event. By the end of the third day, they had no water and only meals ready to eat (MREs). Even after they left the UGF to continue their training, they continued to use MREs. Unfortunately, the article did not discuss the impact of not having any water or how the unit would deal with this in the future.

Night Training

Over the past decade, Second Artillery has been increasing the amount of training it conducts at night (夜间训练/夜训) primarily for operational security reasons.⁶⁴ Throughout the year, different Second Artillery units, such as communications and special vehicle units, train individually and together with the entire launch battalion during different levels of drills. This involves drills at field training sites as well as drills and exercises at live launch training sites.

When deploying to field training or drill or exercise sites, vehicles may travel in large convoys or in small groups either on the same road or different roads; however, the time to arrive and set up takes longer when they travel in small groups and take multiple routes. While en route, the vehicles often

⁶¹ Yan Zuoren (严作人) and Wang Shuwei (王述伟), “Honing Deep in an ‘Underground Palace’: A Base’s Staff Conducts Training in Survival While Sealed In” (“地营”深处的磨砺), March 26, 2014, p. 2.

⁶² Huang Depeng (黄德鹏) and Xu Hongjun (徐洪均), “Brigade Bivouac Training Support ‘Halts’ Periodic Procurements” (某旅业外驻训保障‘叫停’定期采购), *Huojianbing Bao*, August 22, 2014, p. 2.

⁶³ Song Haijun (宋海军), Li Zhenhua (李振华), and Jia Bin (贾斌), “Why Eat ‘Roughage’ When You Live in a ‘Palace?’” (住“龙营”咋还吃“粗粮”?), *Huojianbing Bao*, February 12, 2014, p. 2.

⁶⁴ Song Wei (宋玮), Li Honglin (李鸿林), and Zhang Jiangang (张建刚), “Surprise Attack at Night” (星夜突击), *Huojianbing Bao*, June 25, 2014, p. 4. Ren Yuan (任原) and Cao Wenxi (曹文希), “Train ‘Three Precision’ Capabilities to ‘Five Measures’ Standards—A Brigade Closely Adheres to Actual-Combat Requirements, Launching Remedial Training” (用“五度”标尺 练“三精”: 某旅紧贴实战需要开展补差训练), *Huojianbing Bao*, September 24, 2014, p. 2. Chen Xianping (陈先平), Wang Yousong (王友松), and Zhang Xianqiu (张显秋), “A ‘Sharp Sword’ for Defeating the Enemy Is Forged Using High-Frequency Confrontation -- Things Seen and Heard at the Scene of the Base-Oriented Actual Combat-Oriented Confrontational Exercises of Second Artillery Unit’s 5th Battalion” (二炮部队基地化实战对抗演练现场见闻之五), *Huojianbing Bao*, November 1, 2014, p. 2. Zhou Yubo (周雨波), “There is No Choice in the ‘Timing’ of War; ‘Blind Spots’ Are Refused in Training Soldiers; A Brigade Analyzes Typical Cases and Strives to Improve the Quality of Night Training” (某旅剖析典型事例着力提高夜训质量), *Huojianbing Bao*, January 1, 2014, p. 2.

travel through dense forests, winding mountain roads, and open areas. For operational security purposes, they often drive without any lights at night on narrow and sometimes unpaved roads. While en route, the vehicles often conduct “flanking maneuvers” at separate time intervals as they advance toward the target area. Upon arriving at the launch site, “cold light conductors” are used to guide equipment vehicles to their designated places. Various units have had problems meeting their schedule because vehicles have broken down while en route and personnel have not received adequate training to make repairs at night without lights.

Nuclear, Biological, and Chemical Training

Second Artillery units conduct nuclear, biological, and chemical (NBC) training at their home base and while deployed en route to and during field training and exercises, which includes personnel wearing chemical defense gear and washing down vehicles and equipment.⁶⁵ Unfortunately, little information is available about the success or problems encountered during this type of training.

Communications and Anti-Satellite Training

Second Artillery communications (signal) units at the regiment level and below conduct training to enhance their communications capabilities via satellites in a complex electromagnetic environment and to deny satellite surveillance capabilities.⁶⁶ Typically, these units conduct training individually at home and in the field, as well as with Second Artillery bases, brigades, and the operational components of a launch battalion. Some communications units also have included training near urban areas, where the accelerated pace of urbanization has led to complete confusion in the electromagnetic environment of the combat operations area. Those units have had to transfer the information it receives from wireless and mobile satellite communications into systems linked by underground cables.

To avoid satellite surveillance, some units have taken different measures as they move to field training sites and exercise launch sites. For example, previously, when units conducted long-distance mobilization activities, their security department would arrange for sentries and the local traffic police to be posted at intersections and residential areas in order to ensure a safe march and to clear traffic. However, this is no longer the case in some situations. In one case, a unit incorporated nine battlefield training topics throughout the entire course of the mobilization, including counter-high

⁶⁵ Li Pengyong (李鹏勇), Zhang Dongliang (张栋梁), and Zhu Wei (朱伟), “Chemical Defense ‘Crack Troops’ Take the Battlefield” (防化“尖兵”上战场), *Huojianbing Bao*, April 26, 2014, p. 2. Zhang Yanhe (张延合), Xiao Yunjian (肖云舰), and Tian Liang (田亮), “Brigade Analyzes Typical Case, Fixes Its Style of Training, Exercises and Testing” (某旅剖析典型事例纯正训风演风考风), *Huojianbing Bao*, April 5, 2014, p. 2. Li Mijia (李密佳), “Regiment’s Sealed-In Survival Training by the Combat Power Standard” (某团密闭生存训练坚持战斗力标准), *Huojianbing Bao*, June 28, 2014, p. 2. The PLA uses the terms *he sheng hua* (核生化) for nuclear, biological, and chemical, but sometimes lump them together simply as chemical defense (防化).

⁶⁶ Zhou Xianren (周献人), Zhang Chongyu (张翀宇), Liu Gang (刘刚), “Signal Regiment Focuses on Actual Combat As It Practices Assuring Communication” (某通信团着眼实战练保通), *Huojianbing Bao*, June 11, 2014, p. 1. Gao Wenchao (高文超) and Zhang Xiaoliang (张小良), “A Unit Conducts Sets Testing Grounds During Long-distance Mobilization” (某部远程机动沿途设置考场), *Huojianbing Bao*, July 19, 2014, p. 1. Hu Yikai (胡亦锴) and Feng Jinyuan (冯金源), “Regiment Tempers Communication Command Capabilities in Complex Environment” (某团复杂环境锤炼通信指挥能力), *Huojianbing Bao*, January 22, 2014, p. 2.

altitude satellite reconnaissance, march route changes, and complex electromagnetic jamming. During the mobilization, the unit frequently traversed complex roads. It crossed three large mountains, changed routes four times, and passed through more than ten villages and towns as “enemy” activities often took place. By selecting marching routes and making judgments about unfamiliar terrain, the ability of commanders to respond to any emergency situations and make impromptu adjustments was truly tested. The mobilization route did not have guidance sentries or security posts. It is clear that this type of training is different than that of just a few years ago. Unfortunately, none of the articles reviewed discussed technical details about whether they were actually observed, the problems encountered, or how the PLASAF intends to overcome them.

Additionally, communications regiments incorporate opposition force or “Blue Force” elements in their training. For example, an article reported on a communications [signal] regiment training event that involved fighting “back to back”, which means that neither the Blue Force nor the Red Force knew what the other had been told. The regiment’s commander, Zhou Chuangang (周传刚), stated that “the goal of meticulously creating a Blue Force for opposing forces training drills is to temper the ability of the contingency mobile communication detachments to move quickly and handle emergencies, as well as strengthen “move, communicate, and use” abilities with mobile communications equipment.”⁶⁷ During this training, the Red Force contingency mobile signal detachment had just arrived at its task location when a Blue Force detachment began emitting powerful electromagnetic jamming. The Red Force responded by changing frequency and frequency hopping, and set up short wave communication within 15 minutes. This article reported on a three-day drill which covered 40 unspecified tactical topics. Through this drill, the regiment identified shortcomings, which were incorporated into the training plan for the new year. Although the unit experienced these problems during 2014, it most likely had the same problems in previous years and, unless they are completely solved, it will continue to have the same problems in the future. Specifically, the challenges involve not just about equipment but about personnel training and capabilities.

Live Missile Launches in the Gobi Desert

Second Artillery brigades occasionally deploy one or more of their launch battalions to an unidentified testing base (试验基地) in the Gobi Desert to conduct live missile launches. During 2014, *Huojianbing Bao* had several articles that briefly discussed launches during 2013 and 2014, however, it is not clear from open source materials exactly how many total missiles were launched or which launch brigades or battalions were involved.⁶⁸ The following paragraphs provide a summary of PLASAF live launch activities that were reported in *Huojianbing Bao* for 2014. The launches were conducted by operational launch brigades’ subordinate battalions and companies, a test and training unit, and by graduate command officer students from the Second Artillery Engineering University. Although some brigades have deployed to the Gobi every year, it is not clear if the launches were conducted by the same subordinate battalions each year or by different battalions. Although most of the launches occurred in the summer, some also occurred in December.

⁶⁷ Deng Shi (邓识), “Regiment Starts Training with Actual Combat ‘Back to Back’ Opposition Force Training Exercise, Boosts Skills (某团开训对抗“背靠背”:实战化演练强技能), *Huojianbing Bao*, 18 January 2014, p. 2.

⁶⁸ The link between specific commanders and their units was accessed in the *March 2014 Directory of PRC Military Personalities*.

Second Artillery leadership called for an increase in live launches for 2014. The most likely reason for this is that Second Artillery is realizing that simulated launches without using real equipment do not allow the units to deal with actual problems that they could encounter if they had to launch a missile during wartime. During the Third Expanded Plenum of Second Artillery's 8th Party Committee on 31 December 2013, guidance was given to conduct actual combat live missile launch training.⁶⁹ Additionally, the "2014 Second Artillery Military Training Mobilization Order" stated that Second Artillery should increase the difficulty and intensity of drills while stationed in the field and while conducting live missile launches.⁷⁰ The following live launches were reported in 2014 *Huojianbing Bao* articles:

- Over a three-year period (2011-2013), an unidentified Base 54 Test and Training unit commanded by Yao Wenshan (姚文山) conducted five live missile launches.⁷¹ According to Yao, "The opportunities for live missile launching are rare, so the entire unit should participate in each task, and the entire unit should cultivate talents with each launch. Based on what it has learned from the launches, the unit has written 39 specialty textbooks and operation procedures and has trained more than 140 specialty personnel at multiple levels."
- In 2013, an unidentified brigade conducted its first live "independent missile launch;" (no information was provided explaining what an independent launch is).⁷²
- During summer 2013, Base 54's 813th Brigade, whose commander was Mu Shouqin (沐守勤), conducted three live launches in the Gobi Desert.⁷³
- From 2011-2013, Base 54's 804th Brigade, whose commander was Zhang Kebao (张可宝), deployed to the Gobi Desert each year to conduct live missile launches.⁷⁴
- In mid-June 2014, a Base 54 brigade, whose commander was Liu Chuanguo (刘传国), deployed an unidentified number of battalions to the testing base, where they launched several missiles.⁷⁵

⁶⁹ Wang Zhixin (王志新), Chen Xianping (陈先平), Ge Song (葛松), Liu Guiyang (刘贵阳), and Tang Xudong (唐旭东), "Second Artillery 8th Party Committee Holds Its 3rd Plenary (Enlarged) Meeting With Group Discussions and Written Speeches" (二炮党委八届三次全体(扩大)会议进行分组讨论和书面大会发言), *Huojianbing Bao*, January 1, 2014, p. 1.

⁷⁰ Commander Wei Fenghe and Political Commissar Zhang Haiyang, "Second Artillery 2014 Military Training Mobilization Order" (第二炮兵二〇一四年军事训练动员令), *Huojianbing Bao*, 1 January 2014, p. 1.

⁷¹ Shi Yijie (时义杰), Dong Zhiwen (董志文), Feng Jinyuan (冯金源), and Hu Yanning (胡延宁), "The Test and Training Unit Commander Known as 'Iron Warrior Yao' -- Profile of Experimental Training Unit Commander Yao Wenshan of a Certain Base" (试训队长"姚文山"), *Huojianbing Bao*, January 11, 2014, p. 2.

⁷² Shi Yijie (时义杰), Yang Yuhuan (杨玉含), and Feng Jinyuan (冯金源), "A Certain Brigade Makes 'Reverse Self-examination', Searches for Weaknesses in Its Combat Power" (某旅"逆向自查"反思战斗力短板), *Huojianbing Bao*, March 18, 2014, p. 2.

⁷³ Zhang Xinkai (张新凯) and Feng Jinyuan (冯金源), "A Certain Brigade Persists in Maintaining Combat Capability Standards To Temper Sharp Edge of Long Sword" (某旅坚持战斗力标准磨砺长剑锋芒), *Huojianbing Bao*, April 5, 2014, p. 1.

⁷⁴ Shi Yijie (时义杰), Yang Yuhuan (杨玉含), and Feng Jinyuan (冯金源), "Completing Tasks Is Not the Same as Being Capable of Winning Battles -- The Record of the General Discussion on the Standard of Combat Power Held In-Depth by a Certain Brigade" (某旅深入开展战斗力标准大讨论纪事), *Huojianbing Bao*, April 1, 2014, p. 2.

⁷⁵ Zhao Simin (赵思敏), Su Zheng (苏政), and Wang Qingyong (王清勇), "The Tracks of Missile Trajectories Reach to the Battlefield -- The Record of a Certain Brigade's Advancement of Combat Power Upgrading While Persisting in the

- During summer 2014, Base 54's 805th Brigade, whose commander was Zhang Hong (张鸿), set a new record for a missile type while performing a cross-region deployment to the Gobi Desert that resulted in a live missile launch.⁷⁶
- In July 2014, an unidentified brigade conducted a live missile launch(es) at night in the Gobi Desert.⁷⁷
- In 2009, the Second Artillery Engineering University created a command management graduate student pilot class in its "4+1" program, which emphasized the development of organization command and unit management skills.⁷⁸ In 2014, in order to further improve trainees' operation command capabilities, the university organized 20 of the first-year students into four groups of launch units to participate in live launches. On 19 July 2014, the students in the university conducted two live launches of a new type of missile in the Gobi Desert. One of the students actually pushed the button to launch the missiles.
- In mid-July 2014, Base 55's 824th Brigade, whose commander was Chen Qian (陈前), conducted a live missile launch(es) in the Gobi Desert.⁷⁹ This was the third straight year since the brigade was created that it had deployed to the desert and launched a live missile.
- In mid-2014, an unidentified conventional missile brigade, whose commander was Shi Xiangyang (施湘阳), sent over a thousand troops and more than 100 vehicles to the Gobi Desert to conduct live-launch drills.⁸⁰
- In December 2014, an unidentified brigade's 3rd Launch Battalion's 6th Launch Company launched several live missiles shortly after midnight in the Gobi Desert.⁸¹ Each missile was assigned to a subordinate numbered launch platform (发射架) (e.g., 1st launch platform) subordinate to the company. The drill included dealing with simulated

Standard of Combat Power" (某旅坚持战斗力标准进战斗力跨升纪实), *Huojianbing Bao*, 6 August 2014, p. 3. Liu Chuanguo was identified as the commander of an unidentified launch brigade located in Shaoguan, Gansu Province, in the *March 2014 Directory of PRC Military Personalities*, p. 101.

⁷⁶ Xiao Pan (肖盼), Su Zheng (苏政), and Wang Qingyong (王清勇), "Sharpening Swords and Showing One's Might on Shooting Range and Winning First Place in Military Competition on Examination Site" (靶场砺剑扬威; 考场比武夺魁), *Huojianbing Bao*, 25 October 2014, p. 2.

⁷⁷ Zhao Simin (赵思民), Wang Lu (王璐), and Dang Tong (党彤), "Sharpening Excalibur in the Gobi Desert" (大漠戈壁砺神剑), *Huojianbing Bao*, 22 July 2014, p. 2.

⁷⁸ Ning Fanshu (宁凡树), Yan Shaoshi (闫少石), and Zhong Fuming (周福明), "Engineering University's First Command Management Graduate Student Launch Units Trains on a Plateau" (工程大学首个指挥管理型研究生发射单元亮剑高原), *Huojianbing Bao*, 22 July 2014, p. 1.

⁷⁹ Han Xingbang (韩兴邦), Su Zheng (苏政), and Wang Qingyong (王清勇), "Facing Great Expectations of First 'Three-Consecutive-Launches' in Unit's History, Brigade Party Committee Remains Clear-Headed and Determines to Focus on Actual Combat" (面对单位历史上首个“三连发”的荣誉期盼, 某旅党委头脑清醒, 坚持从实战出发), *Huojianbing Bao*, 22 August 2014, p. 2.

⁸⁰ Ren Yuan (任原) and Cao Wenxi (曹文希), "Train 'Three Precision' Capabilities to 'Five Measures' Standards—A Brigade Closely Adheres to Actual-Combat Requirements, Launching Remedial Training" (用“五度”标尺练“三精”: 某旅紧贴实战需要开展补差训练), *Huojianbing Bao*, 24 September 2014, p. 2. Shi Xiangyang was identified as the commander of an unidentified conventional missile launch brigade in the *March 2014 Directory of PRC Military Personalities*, p. 102.

⁸¹ Cao Wenxi (曹文希) and Xu Changlei (徐昌磊), "Information about a Brigade Launch Detachment's Night Drills: 'Special Training' Seizes 'Night Supremacy'" ("特训"夺占“制夜权”: 某旅发射分队夜间演练见闻), *Huojianbing Bao*, December 16, 2014, p. 2.

problems, including problems with electric cables, as well as confrontation with the “Blue Force.”

Although it remains unclear if Second Artillery met its goal of increasing the difficulty and intensity of live launch training, on 30 December 2014 *Huojianbing Bao* reported a number of successful launches on the “actual combat-like battlefield.”⁸² In one example, a brigade leader decided to proceed with a launch even though the maximum instantaneous wind speed was near the limit and seven of eight operators were taking part in their first live-fire launch, including five conscripts with less than one year of military service. The missile reportedly hit the target one thousand kilometers away, and this training was described as “the epitome of promoting actual combat-like training under difficult conditions.” Another example described how the brigade command center issued an instruction changing the striking target within the last 15 minutes of the countdown. In a third example, a brigade completed a missile launch under dim lighting, then immediately took delivery of missiles and “within xx minutes” launched a second missile from the same launcher. Finally, it was reported that a certain military base bundled various types of missiles together in training. They conducted coordinated training step-by-step and “joined ‘hard fingers’ into an ‘iron fist’.”

Of note, in 2013 officers and enlisted personnel from a Second Artillery repair factory deployed to the Gobi Desert for the first time to support live missile launches.⁸³ The same factory sent personnel in 2014 as well.

Huojianbing Bao articles in 2014 provide information indicating that not every launch proceeds as planned. For example, a brigade, whose commander was not identified, was scheduled to conduct a live-fire launch task at the base; however, one minute before launch, it was called off due to an emergency malfunction in a system.⁸⁴ At the time, missiles were fitted with initiators, and dozens of explosive bolts onboard the missiles were already linked into a cable network. The missiles were one button-push away from launching. The situation was exceptionally critical. The chief engineer, Tan Qingquan (谭清泉), led a team of technical personnel and solved the problem in six hours. The team then conducted 50 tests to confirm the system worked, and the missile was finally launched the next day.

Logistics

The primary Second Artillery logistics support units include materials (warehouses), mess (food and water), medical, fuel, and transportation (rail and road). These units often train separately, including individual unit and field training, as well as with operational units. For example, in September 2014, the logistics components of one base conducted a 20-day field training drill in the Gobi Desert for

⁸² Xu Jing (徐晶), Chen Xianping (陈先平), and Ge Song (葛松), “Actual Combat-like Training Methods Show Conspicuous Bright Spots” (二炮部队 2014 年度着力加强实战化演训巡礼), December 30, 2014, p. 1.

⁸³ Tang Renjiang (汤仁江), Cheng Fengtao (程峰涛), and Feng Jinyuan (冯金源) “Liu Haichao: Smile Accompanies Missile As It Whistles Towards Sky” (刘海超:微笑伴着神剑飞), *Huojianbing Bao*, March 5, 2014, p. 3.

⁸⁴ Cao Yazhou (操亚洲), Wang Qingyong (王清勇), Wu Xudong (伍旭东), and Ge Song (葛松), “At a Post, a set of Shoulders of Iron Bear the Weight of Mountains – Series on Brigade Senior Engineer Tan Qingquan’s Dedication to Putting the Goal of a Strong Military Into Action” (某旅高级工程师谭清泉献身强军实践系列报道), *Huojianbing Bao*, April 16, 2014, p. 1–2.

the first time.⁸⁵ The drill included training subjects such as road transport, follow-along fuel supply, materiel receipt and issue, rescue and treatment of battle casualties, and emergency repair of equipment.

Concerning its transportation system, Second Artillery has issued the “Provisions for Implementing Railroad Transport Delivery of Second Artillery Units,” which systematically standardizes the workflow of railroad transport delivery and reportedly solves the difficulties in safe and secure transport delivery, as well as rapid loading and unloading.⁸⁶ It also established the Second Artillery transport combat-readiness emergency response command informatized platform with the support of the national transport combat-readiness network. The military transport system has also adopted extraordinary measures to strengthen the construction of battlefield transport installations, successively renovated thousands of kilometers of national defense highways, transformed hundreds of kilometers of military highways, dozens of special railway lines, dozens of loading and unloading stations, and preliminarily established a Second Artillery battlefield transport network system, which has greatly improved the battlefield transport environment and increased the level of emergency response mobility.

Given the complexities of moving so much material in a short period of time in difficult geographical locations, Second Artillery has consistently faced challenges. For example, in 2013, it took several hours to unload a train at a depot due to inadequate planning and training; however, the same depot finished the work in 30 minutes in 2014.⁸⁷ Yet another challenge has been training outside a fixed cycle. For example, one rail transport battalion normally carries out battle readiness drill every Friday morning; however, an unannounced emergency drill was conducted on a Thursday morning in June 2014, and the unit failed to meet the requirements.⁸⁸ Instead of being prepared at all times, they only prepared their gear on Thursday evening for the normal Friday training.

Remedial Training

After Second Artillery identifies certain problems, such as training to the test instead of training on all subjects, it conducts what it calls remedial training (补差训练). For example, after one launch fendui discovered problems in 2013 concerning inconsistent operation of equipment, poorly integrated tactical and technical skills, and inaccurate analysis and clearing of malfunctions, it conducted field remedial training.⁸⁹ Following a live missile launch at the Gobi base, another launch unit discovered that, although everyone had met their training requirements before the launch, several problems occurred during the launch sequence, including incorrect operations and slow

⁸⁵ Zhang Yue (张悦) and Tan Hubiao (谭虎彪), “First Trans-Regional Field Training for Base’s Logistical Contingency Support Force” (某基地后勤应急保障力量首次跨区驻训), *Huojianbing Bao*, September 6, 2014, p. 1.

⁸⁶ Li Ye (李晔), Xie Dubo (谢杜波), and Sun Xianfu (孙现富), “Three Dimensional Joint Strategic Delivery Capability of Second Artillery Achieves All-Around Enhancement (二炮立体联合战备投送能力实现整体跨升)”, *Huojianbing Bao*, March 21, 2014, p. 2.

⁸⁷ Guo Li (郭丽) and Yao Qiang (姚强), “The Aftermath of an Embarrassing Unloading Task” (缺装作业遭遇尴尬之后), *Huojianbing Bao*, p. 2.

⁸⁸ Hu Mingxin (胡明欣) and Sun Er (孙二), “A Certain Regiment Bids Goodbye to “Fixing Day” in Combat Readiness Drill” (某团战备演练告别“定日子”), *Huojianbing Bao*, June 17, 2014, p. 1.

⁸⁹ Zhang Hongliang (张洪亮), Ding Rongzhen (丁荣桢), and Tian Liang (田亮), “The Right Time for Remedial Training” (不差训练正当时), *Huojianbing Bao*, February 15, 2014, p. 2.

movements among some new launch crew members due to being too nervous under actual combat conditions and possessing inadequate basic skills.⁹⁰ Upon returning home, the unit immediately launched remedial training that focused on setting operational standards based on speed, precision, accuracy, difficulty, and intensity. It made specific provisions regarding the length of drills, including vehicle positioning, equipment deployment, and field training. It also made clear requirements regarding the accuracy of operations, including position capture, targeting, and launching. It then organized high intensity continuous firepower strike drills and nighttime blackout combat launch training. Overall, the unit focused on reinforcing troops' capabilities in precise operations, supervision, and command and control.

Joint Training

The PLA defines joint training (联合训练) as training that is conducted under a single command organization by two or more services, two or more militaries [e.g. foreign militaries for combined training], as well as the military and other armed forces or locations, in order to grasp the principles and methods of joint combat/operations and other joint military actions.⁹¹ Note that, technically speaking, Second Artillery as an independent branch does not fit into the definition.

During September and October 2014, the PLA held its largest ever joint exercise, identified as “Joint Action-2014” (联合行动-2014) actual-combat exercise (实兵演习), which involved the Army, Navy, Air Force, and Second Artillery. The exercise was organized into five separate components and were identified as Joint Action-2014A to 2014E. Of the five components, Second Artillery participated in 2014A and 2014C; however, little information was provided about Second Artillery's actual participation.

Joint Action-2014A, which involved the PLAN, PLAAF, and Second Artillery, was held in the South China Sea region starting on 23 September.⁹² The exercise focused on a range of competencies, including joint command of maritime operations based on an information system, air defense and anti-submarine operations, a conventional missile strike, and information countermeasures. It tested training in a joint combat environment that involved tactics and training methods of various services and branches/service arms on a multi-dimension battlefield. The exercise also involved the employment of reconnaissance satellites, electronic countermeasures, and maritime patrol, as well as protection and rescue forces.

⁹⁰ Ren Yuan (任原) and Cao Wenxi (曹文希), “Train ‘Three Precision’ Capabilities to ‘Five Measures’ Standards—A Brigade Closely Adheres to Actual-Combat Requirements, Launching Remedial Training” (用“五度”标尺练“三精”: 某旅紧贴实战需要开展补差训练), *Huojianbing Bao*, September 24, 2014, p. 2.

⁹¹ *China's PLA Military Terminology* (中国人民解放军军语), Beijing: Academy of Military Science Press, December 2011, p. 302.

⁹² Zhang Tao, ed., “‘Joint Action-2014A’ exercise held in South China Sea,” China Military Online, September 24, 2014, accessed at http://eng.chinamil.com.cn/news-channels/china-military-news/2014-09/24/content_6152740.htm. Li Youtao (黎友陶) and Wu Dengfeng (吴登峰), “‘Joint Action-2014A’ Actual-Combat Exercise Held in the South China Sea” (“联合行动—2014A”实兵演习在南海举行), September 23, 2014, accessed at http://news.mod.gov.cn/pla/2014-09/23/content_4539429.htm.

Joint Action-2014C, which involved the Army, Air Force, and Second Artillery, was held in the Lanzhou MR's Kunlun Mountains in northwest China from 15-20 October.⁹³ The primary Army unit involved was the Lanzhou MR's 21st Group Army, which is headquartered in Baoji, Shaanxi Province, and included special operations forces and Army Aviation. The Lanzhou MRAF's 36th Bomber Division dropped bombs on various ground targets as the ground forces moved forward during the land assault. Based on an after-action critique, it was determined that the joint command system functioned with high efficiency; however, three key shortfalls were identified: 1) a shortage of hardware for joint operations placed constraints on the exercise; 2) the overall procedures in place for joint operations were inadequate, which restricted everything they did; and 3) the quality and capability of the personnel involved were not high enough to meet the requirements for joint operations. In addition, the units confronted problems with operations at high altitudes and the need for effective logistics support.

Command Training

Second Artillery focuses much of its training on what it calls “command” (指挥) of its forces at every level and by every component, not just launch organizations. Although most training drills are successful in the general sense, Second Artillery consistently identifies problems with its command structure and personnel. For example, one support regiment noted that, during a drill, three of its staff personnel were not familiar with support processes, the command process for *fendui* contingency responses was not appropriate, a battlefield materials storage facility lacked pertinent materials for operational opponents, and the theoretical skills of commanding officers were generally weak.⁹⁴

As a result, Second Artillery spends considerable time trying to educate and train all of its command components, which is composed of multiple parts. Specifically, Second Artillery “command” elements fall into the following categories: leaders and command staff;⁹⁵ command information

⁹³ Liu Peng (刘鹏), Wang Guangli (王广利), and Du Hongxing (杜红星), “Stretching the Bow and Sword in the Snow; Pitched Battle in Kunlun Mountain – On-Scene Account of a Certain Red Army Division of the 21st Group Army Carrying out Mission Theme Training on Plateau” (第 21 集团军某红军师开展高原使命课题训练现场见闻), September 17, 2014, p. 1. Mo Fuchun (莫福春) and Sun Libo (孙利波), “How Many Thresholds One Has Yet to Step Over for Joint Training and Joint Operations – Thoughts From Observing the Live Force Joint Exercise Carried Out by Multiple Services and Arms of the Lanzhou Theater in a Frigid Highland Area” (联训, 还需迈过多块), Jiefangjun Bao Online in Chinese, November 25, 2014, p. 5. Liu Peng (刘鹏) and Du Hongxing (杜红星), “Use of Real Ammunition Throughout Exercises Has Become the ‘Calibrator’ of Tactical Innovation – A Certain Red Force Division Conducts Plateau Weapons Efficacy Testing to Boost Operational Precision” (全程实弹推演成为创新战法[校正器]), Renmin Jundui, August 12, 2014, p. 2.

⁹⁴ Wang Zhiyi (王志毅) and Yue Xiaolin (岳小琳), “Regiment Persists in Orientation of Problems, Organizes Commanders and Staff Evaluation” (某团坚持问题导向组织首长机关考核), *Huojianbing Bao*, December 12, 2014, p. 2.

⁹⁵ References to the leaders include the following terms: commander which sometimes includes the PC (指挥员), leaders (首长/领导/主官) (e.g., commander, PC, deputy commanders, deputy PCs, and directors of the four departments), leaders and command staff (首长机关), command duty position (指挥岗位), command group (指挥班), commanding officers (指挥军官), command personnel (指挥人员), command support elements (指挥保障单元), command team (指挥组), political commissar (政治委员), reserve command elements (预备指挥单元), and rotational command duties (指挥轮流制度). The term “command staff” (机关) normally refers to personnel in the four departments (Headquarters, Political, Logistics, and Equipment/Armament) in the relevant headquarters. It does not include the commander, PC, or deputy commanders.

systems;⁹⁶ command facilities;⁹⁷ command education; command training; command processes;⁹⁸ types of command;⁹⁹ and command equipment.

The first step is for cadets to receive basic command education, which includes theory, and follow up technical training at the Second Artillery Command College and Second Artillery Engineering University for cadets. Once they assume their operational and support billets and work their way up the career ladder, they may have the opportunity to return to one of the academic institutions for professional military education. For example, the Engineering University has a Command Management Graduate Course, whose students have participated in live launches.¹⁰⁰

During drills and exercises, the leaders and command staff are constantly evaluated.¹⁰¹ If they do not meet the requirements, they must receive remedial training.¹⁰² Throughout 2014 the PLASAF emphasized the need to improve command and staff capability or planning, coordination, organization, command, and response to contingencies. For example, one article recommended, “give training to the command and staff organ under difficult operational conditions, enhance its operation planning and command capability. Dare to set critical and risky scenarios for training, lay stress on training under complex and difficult conditions for the command and staff. Improve the physical, skill, knowledge, integrated command platform-use training for staff personnel and improve their capability of formulating and revising operation programs. Strengthen command training in combination with annual combined training and major combat readiness tasks.”¹⁰³ Another article discussed how training should be conducted by a random scheduling scheme without any advanced notice and original plan, no preset topics, and no prewritten script. It stated, “Let us organize confrontation training sessions in which commanders will be in a ‘cold sweat’ as they

⁹⁶ Command information systems (指挥信息系统) include links (链), networks (网络), platforms/terminals (平台), software (软件), and informatized command (信息化指挥).

⁹⁷ Depending on the level and event, command facilities include what Second Artillery calls command cabins/modules/shelters (指挥方舱), command centers (指挥中心), command halls (指挥大厅), command hubs (指挥枢纽), command offices (指挥室), command posts (指挥所), command tents (中军帐), command towers (指挥楼), command vehicles (指挥车), and command tunnels (指挥坑道).

⁹⁸ Command processes include command and control of organizations with a different grade, command and coordination between organizations at the same grade, command capabilities, command collaboration, command decision-making, command flowcharts, command levels, command methods, command planning, command procedures, using hand signals and oral command cards, command scenario, command strategy, and precision command.

⁹⁹ Types of command include battlefield command (战场指挥), command operations (指挥作业), command warfare (指挥对抗), and combat operations command structure (作战指挥机构).

¹⁰⁰ Ning Fanshu (宁凡树), Yan Shaoshi (闫少石), and Zhong Fuming (周福明), “Engineering University’s First Command Management Graduate Student Launch Units Trains on a Plateau” (工程大学首个指挥管理型研究生发射单元亮剑高原), *Huojianbing Bao*, July 22, 2014, p. 1.

¹⁰¹ Liu Gang (刘刚) and Zhou Xianren (周献人), “Strive for Realistic Environment, Strive for Difficult Contents, Strive for Strict Evaluations, and Strive for Practical Drills; Unidentified Base Acts Upon Order and Makes Clarion Call for Real Combat Oriented Training in New Calendar Year” (环球上求真,内容上求难,考核上求严,演练上求实:某基地闻令而动吹响新年度实战化训练号角), *Huojianbing Bao*, January 11, 2014, p. 1.

¹⁰² Zhang Hongliang (张洪亮), Ding Rongzhen (丁荣楨), and Tian Liang (田亮), “The Right Time for Remedial Training” (不差训练正当时), *Huojianbing Bao*, February 15, 2014, p. 2.

¹⁰³ Wei Guangrong (魏光荣), “More Quickly Enhance the Capability of Independent Launch in Actual Combat” (加快提升独立发射能实战能力), *Huojianbing Bao*, March 25, 2014, p. 3.

attempt to deal with challenges, risky situations, and chaotic moments...let us focus on hard challenges and weaknesses. Let us not be afraid that assessment will reveal additional problems.”¹⁰⁴

A third article reported how one regiment developed new measures to cope with “the relatively great disparity of commanders’ ability and proficiency in combat operations requirements”, among other deficiencies.¹⁰⁵ Through on-the-spot critiques and special-topic seminars, they compared the regiment’s performance against the requirements for actual combat training and introduced 22 new measures for regulating training. These included the practice of specifying personnel, specifying positions, and specifying locations; the running of actual combat-oriented maneuvering drills, the simulated training of commanders in contingency handling, and the actual combat-oriented rotational command duties. According to the regiment Commander Liu Mingyuan (刘明远), the following training was based on the new measures. The article described an “online informatized communications drill against an actual combat backdrop” as seen from a joint operations command hall at the headquarters of a regiment. According to the article, an electronic monitor screen showed smoke of gunpowder spreading around and armored vehicles moving fast. As various scenarios unfolded one after another, including electromagnetic jamming, enemy satellites flying past above, and Trojan virus hacking, commanding personnel quickly adjusted their objectives of combat and successfully carried out anti-jamming and anti-reconnaissance operations. This training was considered a success as it “effectively tested and evaluated the troops’ actual-combat reaction capability as well as commanders’ capability and proficiency.”

Finally, an article discussed how a virtual battlefield could be used to verify improvements in planning, decision making, and command and control, since conventional missile forces cannot simply deploy two units against each other in a “red vs. red” confrontation scenario.¹⁰⁶ The article focused on the need to intensify confrontation-oriented training to address specific operational missions or combat opponents. It emphasized that close attention should be given to “major rivals” to construct a realistic offensive and defensive environment. It recommended that key confrontation factors, such as missile warning, anti-missile interception, and precision attack should be simulated. Specifically, the article described how virtual simulation technology should be used to simulate actions taken by the Blue army in response to a surprise missile attack launched by the Red army, including early warning and anti-missile interception.

Seasonal, Climate, and Geography Issues

Second Artillery organizes its training around the four seasons—winter training (冬训), spring training (春训), summer training (夏训), and autumn training (秋训)—each of which is strongly affected by climate issues and geography. Second Artillery units train in several geographic areas, including plateaus up to 3,500 meters (11,500 feet) above sea level, the Gobi Desert in northwest China, and remote mountainous and forest areas of southern China, and what it calls regions north

¹⁰⁴ Sun Jinming (孙金明), “Push for Construction of Training Bases Driven by Training for Actual Combat” (以实战化训练为牵引大力推进训练基地建设发展), *Huojianbing Bao*, March 14, 2014, p. 2–3.

¹⁰⁵ Dong Guangpeng (董光鹏), Hu Yikai (胡亦锴), and Feng Jinyuan (冯金源), “Fighting Intensely on the Informatized Battlefield, Building Perfect Capability to fight Tough Battles – A Regiment Introduces 22 New Measures to Better Suit the Needs of Actual Combat” (鏖战信息化战场, 砥砺打胜仗硬功: 某团推出 22 项新举措向实战聚焦), *Huojianbing Bao*, February 19, 2014, p. 2c.

¹⁰⁶ Li Yuchao (李玉超), “Construct Actual Combat Capability Based on Confrontation Training” (以对抗训练为抓手推进部队实战化建设), *Huojianbing Bao*, March 14, 2014, p. 2–3.

of the Great Wall.¹⁰⁷ Winter and summer pose the biggest challenges for Second Artillery training due to extreme weather conditions. Depending on the location, winter training is conducted in temperatures reaching as low as minus 30 Celsius (minus 22 degrees Fahrenheit), and summer training occurs in temperatures reaching 50 degrees Celsius (122 degrees Fahrenheit).¹⁰⁸ Climate and geography take a toll on personnel as well as equipment and significantly impact Second Artillery training as shown in the following examples:¹⁰⁹

- The percentage of personnel reacting to high altitude sickness has increased drastically
- In icy and snowy areas, the effectiveness of camouflage is greatly reduced
- During the winter, large areas of water are frozen, so that there is no useable water
- Lack of fresh food
- Fatigue and disrupting sleep cycles
- Underground claustrophobia
- Mental health issues
- Dealing with blowing sand
- Dealing with skin diseases
- Dealing with high heat and dehydration
- Physical and psychological exhaustion
- Some equipment will not start when the battery and fluids are frozen.¹¹⁰

Concerning training in snowy areas, some units make use of snow area camouflage netting, sun shade netting, and snow area capes to enhance the effectiveness of camouflage of equipment and people.¹¹¹ They also use the methods of adding low-temperature starter fluid, starting engines regularly, and blowtorch heating to facilitate the startup of vehicles. By using preheaters, installing

¹⁰⁷ Li Minzhen (李民振) and Yu Xihong (于夕红), “Encampment Training On Plateau in Cold Weather Guarantees War-Fighting Capability at All Times” (高原塞区驻训确保随时能战), *Huojianbing Bao*, January 1, 2014, p. 2. Ren Yuan (任原) and Cao Wenxi (曹文希), “Train ‘Three Precision’ Capabilities to ‘Five Measures’ Standards—A Brigade Closely Adheres to Actual-Combat Requirements, Launching Remedial Training” (用“五度”标尺 练“三精”: 谋旅紧贴实战需要开展补差训练), *Huojianbing Bao*, September 24, 2014, p. 2. Zhou Bo (周波) and Ren Fangzheng (任方正), “With Mobile Repair Services, Battlefield Support Follows the Combat Forces Closely” (流动修理, 战场保障如影随形), *Huojianbing Bao*, March 15, 2014, p. 2.

¹⁰⁸ Cao Li (曹力), Wang Hongxu (王洪续), and Tian Liang (田亮), “A Base’s Winter Field Drills Forge All-Weather Combat Capabilities” (某基地冬季训练演练锻造全天候作战能力), *Huojianbing Bao*, December 17, 2014, p. 1. Zhang Dudu (张督都) and Wang Qingyong (王清勇), “A Regiment’s Focus on Combat Power Standards, Reinforcement of Actual-Combat Development” (某团聚焦战斗力标准加强实战化建设纪事), *Huojianbing Bao*, April 12, 2014, p. 2.

¹⁰⁹ Li Minzhen (李民振) and Yu Xihong (于夕红), “Encampment Training On Plateau in Cold Weather Guarantees War-Fighting Capability at All Times” (高原塞区驻训确保随时能战), *Huojianbing Bao*, January 1, 2014, p. 2. Huang Depeng (黄德鹏) and Xu Hongjun (徐洪均), “Brigade Bivouac Training Support ‘Halts’ Periodic Procurements” (某旅野外驻训保障‘叫停’定期采购), *Huojianbing Bao*, August 22, 2014, p. 2. Li Jie (李杰), Hu Yong (胡勇), and Liu Guiyang (刘贵阳), “Crack Medical Troops Go to the Exercise Area: Second Artillery Logistics Department Details People to Create Field Medical Stations for Follow-Along Support to Major Drill” (卫勤尖兵挺进演兵场: 二炮勤务部抽组野战户随保障重大演训任务纪实), *Huojianbing Bao*, August 19, 2014, p. 2.

¹¹⁰ Zhang Yanhe (张延合), Wang Chunyu (王春雨), and Zhang Jiangang (张建国), “Weapons Dance and Make the Snow Fly”, *Huojianbing Bao*, January 7, 2014, p. 4.

¹¹¹ Zhang Yanhe (张延合), Wang Chunyu (王春雨), and Zhang Jiangang (张建国), “Weapons Dance and Make the Snow Fly”, *Huojianbing Bao*, January 7, 2014, p. 4.

vehicle compartment sealing strips, and issuing heaters, they meet the requirements of keeping people and equipment warm.

Concerning heat, around 1400 and 1500 hours is the hottest time of the day to train.¹¹² Although historically one unidentified brigade typically avoided training in the sun and spent time during this period doing specialty training in shaded areas, it changed its practices in 2014. To accomplish this, it mobilized troops deep into a mountainous area, posed training topics according to changing situations, and set up a complex environment to organize troops in conducting a forest fire fighting exercise. Even so, many of the troops could not handle the training in the extreme heat. To enhance subsistence support and to ensure troops' well-being, the brigade prepared meals for the deployed troops, and the medical team's military doctors accompanied and supported troops at all times, providing heat-stress prevention medications.

With regards to equipment maintenance and support, climate, especially in higher elevations, is clearly a limiting factor.¹¹³ As individuals, maintenance personnel are impacted by natural environmental conditions in terms of their physiology, psychology, and behavior. This is even more obvious in high-elevation cold areas. Concerning problem of altitude sickness, when the majority of troops first enter a high-elevation area, they will experience symptoms such as dizziness, blurry vision, and difficulty breathing, as their bodies adapt to the low air pressure, low oxygen content, and dry climate. This makes it difficult for troops to work and train normally, and when severe, could even be life-threatening. During maintenance work in particular, because it is continuous for a long period of time and requires a great deal of physical force, personnel often experience insufficient energy and sleepiness, among other symptoms. To a certain degree, this reduces their effectiveness and ability in carrying out maintenance and support work. Another problem is that of frostbite. As maintenance personnel carry out training or repair work, they must use all kinds of maintenance facilities and equipment for long periods of time. Because the surface temperature of metal instruments is low, skin damage can easily be caused by grasping metal implements using bare hands. This is especially true when ground temperatures fall below minus 20 degrees Celsius (minus 4 degrees Fahrenheit), as skin and metal surfaces stick together. Wearing protective gloves becomes necessary while working, thus somewhat reducing the familiarity and precision with which soldiers operate equipment. To deal with these issues, units conduct frequent training to identify problems and solutions. They also use time between maintenance work for personnel to undergo periodic physical examinations in order to discover problems in a timely fashion. Troops who display poor reactions to extreme temperatures are sent for medical care.

Health Issues

The Second Artillery Logistic Department's Health Department, and its subordinate organizations at the base and brigade levels, has overall responsibility for all health issues, including physical and mental (psychological) health. It appears that, until 2014, Second Artillery did not deal well with health issues away from the unit. For example, from early June to the end of August 2014, the Second Artillery Logistics Department's Health Department for the first time detailed people to

¹¹² Tang Haihui (唐海挥) and Zeng Daorui (曾道锐), "A Brigade Toughens Troops in Extreme Heat" (某旅利用高温恶劣天候从严摔打部队), *Huojianbing Bao*, August 6, 2014, p. 3.

¹¹³ Deng Lizhong (邓立中), "Analysis of Equipment Maintenance and Support Issues in High-Elevation Cold Areas" (高原寒区装备维修保障问题探析) *Huojianbing Bao*, September 19, 2014, p. 3.

create a field combat operations medical station to provide follow-along support for units in a major training exercise.¹¹⁴ The medical station, which included a command team, an internal medicine team, a surgical team, a disease prevention team, and a psychological team, dealt with high plateau altitude sickness, training injuries, and skin diseases, as well as mental health issues. To better understand psychological issues, Second Artillery created an information system in 2014 to gather data and generate graphs to show psychological changes among personnel in the field.¹¹⁵ Finally, Second Artillery has attempted to deal with problems caused by noise pollution at launch sites, which it calls the “intangible killer” because it affects both the physical and mental health of all personnel, as well as the combat readiness training environment.¹¹⁶ To deal with this issue, one engineering training regiment constructed a large silencer test platform to determine the sources of the noise and make necessary improvements, which have reportedly had major military and economic benefits.

Training Successes

Although this report highlights many of the problems Second Artillery encountered during training in 2014, it is important to note that, overall, Second Artillery considers its training to be successful in the following five areas, despite shortfalls in each area. As one article noted, “failure is the mother of success.”¹¹⁷

- Launching live missiles
- Deploying to a field training or launch site
- Establishing communications along the way and at the final location
- Training all personnel to meet requirements
- Providing support for personnel and equipment during training at distances or in underground facilities.

Huojianbing Bao frequently reported on training successes during 2014. For example, an unidentified base satisfactorily completed more than 10 major exercises and drills and successfully launched nearly 100 missiles of various types.¹¹⁸ During one deployment, a huge convoy of vehicles crossed through mountains and forests in December, while successfully handling complicated “enemy

¹¹⁴ Li Jie (李杰), Hu Yong (胡勇), and Liu Guiyang (刘贵阳), “Crack Medical Troops Go to the Exercise Area: Second Artillery Logistics Department Details People to Create Field Medical Stations for Follow-Along Support to Major Drill” (卫勤尖兵挺进演兵场:二炮勤部抽组野战户随保障重大演训任务纪实), *Huojianbing Bao*, August 19, 2014, p. 2.

¹¹⁵ Zhang Hongliang (张洪亮), Tian Liang (天亮), and Wang Hongxu (王洪续), “‘Big Data’ Adds Wings of Information to Winter Training” (“大数据”,为冬训插上信息翅膀) *Huojianbing Bao*, December 19, 2014, p. 2.

¹¹⁶ Song Jingchun (宋景春), Qin Tao (秦涛), and Xu Yedong (徐叶栋), “The Training Regiment of a Certain Base Promotes Building of Ability to Strengthen Reform of Instruction and Training” (某基地训练团推进改革加强能力建设思录), *Huojianbing Bao*, September 30, 2014, p. 3.

¹¹⁷ Lu Zhaoyu (鹿兆玉), Gao Mingjun (高明俊), and Wang Qingyong (王清勇), “A Second Artillery brigade sets up a local area network “Failure Database” to keep reminding all personnel to learn from the unpleasant experience to step up their capabilities in combat” (勇亮“败仗”经历,补强攻防“短板”:某旅建立“败仗数据库”为打赢蓄智), *Huojianbing Bao*, January 8, 2014, p. 2.

¹¹⁸ Liu Gang (刘刚) and Zhou Xianren (周献人), “Strive for Realistic Environment, Strive for Difficult Contents, Strive for Strict Evaluations, and Strive for Practical Drills; Unidentified Base Acts Upon Order and Makes Clarion Call for Real Combat Oriented Training in New Calendar Year” (环球上求真,内容上求难,考核上求严,演练上求实:某基地闻令而动吹响新年度实战化训练号角), *Huojianbing Bao*, January 11, 2014, p. 1.

situations” such as bridges having been bombed and harassment by enemy operatives to arrive on time at a pre-designated launch site.¹¹⁹ Concerning establishing communications, within 30 minutes of entering a drill site, one unit made use of field combat operations command support components that it had researched and built on its own, and succeeded in installing and debugging military-civilian telephone, videoconferencing, and a dedicated command network, thereby achieving a plug-and-play, peacetime-wartime combined, field combat operations interconnected network.¹²⁰ Within a day and a half, the regiment successfully constructed more than 10 communication networks. One unit successfully resolved over 50 problems revolving around training in an underground facility, including the lack of water sources connected to outside sources, mismatches in mess hall equipment, and the difficulty of disposing of daily garbage.¹²¹ Finally, although there are always training issues, one support regiment stated that it had successfully implemented a new system whereby new two-year soldiers were placed immediately into their combat billets and had to perform up to standards.¹²²

¹¹⁹ Zhou Yubo (周雨波), “There is No Choice in the ‘Timing’ of War; ‘Blind Spots’ Are Refused in Training Soldiers; A Brigade Analyzes Typical Cases and Strives to Improve the Quality of Night Training” (某旅剖析典型事例着力提高夜训质量), *Huojianbing Bao*, January 1, 2014, p. 2.

¹²⁰ Hu Yikai (胡亦锴) and Feng Jinyuan (冯金源), “Regiment Tempers Communication Command Capabilities in Complex Environment” (某团复杂环境锤炼通信指挥能力来), *Huojianbing Bao*, January 22, 2014, p. 2.

¹²¹ Liu Daikun (刘代坤), Su Zheng (苏政), and Wang Qingyong (王清勇), “Blazing Fire Tempers Real Metal - Record of a Certain Brigade Persisting in Building Battlefield Environments Using Combat Effectiveness as Their Standard” (某旅坚持战斗力标准构设战场环境纪事), *Huojianbing Bao*, August 30, 2014, p. 3.

¹²² Li Pengyong (李鹏勇) and Zhao Jilei (赵吉垒), “New Position Management Soldier ‘Take Position,’” (阵管新兵上“战位”), *Huojianbing Bao*, January 8, 2014, p. 2.

Conclusion

The PLASAF is determined to develop a strong, informatized strategic missile force in accordance with CMC Chairman Xi Jinping's guidance. It has made significant progress over the past two decades in strengthening its deterrence and combat operations capabilities. With the successful deployment of road-mobile ICBMs, the PLASAF is increasingly able to provide credible nuclear deterrence and an assured nuclear retaliation capability. Additionally, the PLASAF's increasingly accurate and longer-range conventional missile force provides a credible precision strike option, an essential part of any counter-intervention strategy. However, *Huojianbing Bao* reporting on PLASAF training in 2014 indicates that the force is not yet consistently operating at the level it desires. Some problems continue to hinder Second Artillery's modernization, such as the need for highly technical personnel capable of operating complex weapons systems, a lack of standardized equipment among units, and equipment breakdowns. In 2014, Second Artillery attempted to overcome these problems by training for actual combat, increasing the difficulty and intensity of training to enable the force to fight and win battles, creating a corps of highly competent personnel, and correcting the style of training, drills and evaluations, presumably to bring them more in line with actual combat requirements. PLASAF units conducted training under a variety of conditions, such as training at night, in cold and hot weather, and underground, as well as improving their ability to overcome enemy attacks, including air raids, electromagnetic jamming, and reconnaissance activity. However, progress appears to be inconsistent and some uncertainty exists regarding units' ability to conduct sustained military operations under actual combat conditions. The ability of the Second Artillery to finally surmount lingering challenges related to equipment and personnel will ultimately determine if it can deliver the range of operational capabilities envisioned by China's leaders.

Appendix A: PLA Grade and Rank Structure

This appendix discusses the PLA's officer 15-grade and 10-rank system. Since 1988, *all* PLA officers and organizations have been assigned one of 15 grades. Table 2 shows the current grade and rank system as it applies to the PLA. This book uses the word “leader” rather than “commander” because, in the PLA, the commander and political officer are co-equals and have the same grade.¹²³ Note that each grade from Military Region (MR) leader down to platoon has a primary and secondary rank (一职两衔).¹²⁴ The ranks in the left column are the most common. The reason why each grade has two possible ranks is because rank and grade promotions rarely occur at the same time. Specifically, company and field grade officers receive their next higher rank about every three years and receive a promotion in grade every four years. In addition, only the uniformed, not civilian, Central Military Commission (CMC) vice chairmen are assigned grades.

Table 2: Officer Grades and Assigned Ranks

Grade	Primary Rank	Secondary Rank
CMC Chairman (军委主席) Vice Chairmen (军委副主席)*	N/A General	N/A
CMC Member (军委委员)	General	N/A
MR Leader (正大军区职)	GEN/ADM	LTG/VADM
MR Deputy Leader (副大军区职)	LTG/VADM	MG/RADM
Corps Leader (正军职)	MG/RADM	LTG/VADM
Corps Deputy Leader (副军职)	MG/RADM	SCOL/SCPT
Division Leader (正师职)	SCOL/SCPT	MG/RADM
Division Deputy Leader (副师职)	COL/CPT	SCOL/SCPT
Regiment Leader (正团职)	COL/CPT	LTC/CDR
Regiment Deputy Leader (副团)	LTC/CDR	MAJ/LCDR
Battalion Leader (正营职)	MAJ/LCDR	LTC/LCDR
Battalion Deputy Leader (副营职)	CPT/LT	MAJ/LCDR
Company Leader (正连职)	CPT/LT	1LT/LTJG
Company Deputy Leader (副连)	1LT/LTJG	CPT/LT
Platoon (排职)	2 LT/ENS	1LT/ENS

*Note: the chairman and civilian vice chairman are not assigned ranks.

¹²³ Some USG organizations use “principal” rather than “leader”. The acronyms equivalent to the U.S. Army come from www.defense.gov/about/insignias/officer.aspx, which also has the acronyms for equivalent U.S. Air Force, Navy, and Marine ranks.

¹²⁴ From 1988 to 1994, each grade had three assigned ranks (一职三衔).