

U.S.-China Economic and Security Review Commission

Staff Research Report



March 20, 2017

China-Russia Military-to-Military Relations: Moving Toward a Higher Level of Cooperation

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Acknowledgements: The author thanks Yu Bin, Paul Schwartz, and Richard Weitz for their helpful insights and reviews of early drafts. Their assistance does not necessarily imply any endorsement of this report's contents, and any errors should be attributed solely to the author.

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Executive Summary

Since the normalization of relations between China and the Soviet Union in 1989, Beijing and Moscow have prioritized defense and security ties, which are now among the most important components of the overall relationship. This emphasis is reflected in their 1996 “strategic partnership of coordination,” which remains the foundation for high-level cooperation. In the decade following the initiation of the strategic partnership, the two sides gradually resolved tensions in the defense relationship—culminating with the settling of all border disputes—while China steadily increased arms imports from Russia, eventually becoming Russia’s leading destination for arms exports. Following the peak of Russian arms sales to China in 2005–2006, defense ties entered a cooling-off period, due in part to a decline in arms sales and a divergence in the respective security priorities of the two countries. During this period, Moscow appeared increasingly suspicious of Chinese reverse-engineering of Russian weapons systems and hesitated to provide its most advanced systems to China. Since 2012, however, closer defense ties have been a key driver of warming China-Russia relations.

Indeed, China and Russia appear to be moving toward a higher level of defense cooperation. The three main areas of the bilateral defense relationship—military exercises, military-technical cooperation,* and high-level military-to-military contacts—show increases in the level and quality of engagement, collectively reflecting closer defense ties. Nevertheless, policy differences and mutual distrust likely will prevent a more comprehensive alliance-like security relationship from taking shape, at least in the near term. It is doubtful, for example, the two countries would reach any defense agreement compelling either side to respond militarily in support of the other in a conflict scenario involving a third party.

Still, recent developments in China-Russia military-to-military relations have important implications for U.S. security interests and the Asia Pacific.

- Russia’s sale of Su-35 fighter jets to China (deliveries of which began in December 2016) will help the People’s Liberation Army (PLA) contest U.S. air superiority, provide China with technology that could help accelerate the development of its own advanced fighters, and serve as a valuable training and learning platform before China fields its next-generation aircraft.
- The Russian sale of the S-400 surface-to-air missile (SAM) defense system to China (with deliveries starting in 2018) should help China improve capital air defense and could assist the PLA in achieving increased air superiority over Taiwan if deployed to the Eastern Theater Command (bordering the Taiwan Strait). This SAM system would pose a challenge for Taiwan’s air assets in a potential cross-Strait conflict, the air assets of U.S. allies or partners in a South China Sea or East China Sea contingency, and U.S. aircraft, should the United States decide to become involved in such potential conflicts. The S-400 also could be used to help enforce China’s East China Sea Air Defense Identification Zone (ADIZ).†
- The increased complexity and focus on joint operations of military exercises between the PLA and Russian Armed Forces help provide both sides with valuable experience in pursuing their defense objectives. The exercises are particularly useful for the PLA—which lacks recent combat experience—because they provide much-needed insights and knowledge that help China pursue its military modernization goals.
- The recently expanded geographic scope of Sino-Russian military exercises, along with a new focus on missile defense, reflects increasingly aligned security interests and suggests the two countries are both signaling their respective support for the other’s security priorities. Greater alignment between the two countries in the security realm could pose challenges to the United States, its allies, and partners.

* Military-technical cooperation consists of a wide range of defense industry engagement, including arms sales, joint research and development, weapons licensing agreements, technology transfer, sharing of technical knowledge, and maintenance of weapons systems.

† An ADIZ is a publicly declared area, established in international airspace adjacent to a state’s national airspace, in which the state requires civil aircraft to provide aircraft identifiers and location. Its purpose is to allow a state the time and space to identify the nature of approaching aircraft before those aircraft enter national airspace in order to prepare defensive measures if necessary. An ADIZ does not have any legal bearing on sovereignty claims. Kimberly Hsu, “Air Defense Identification Zone Intended to Provide China Greater Flexibility to Enforce East China Sea Claims,” *U.S.-China Economic and Security Review Commission*, January 14, 2014, 1.

Background

After decades of largely nonexistent defense ties,* the implementation of the U.S. and European arms embargos on China after the 1989 Tiananmen Square Massacre and the fall of the Soviet Union in December 1991 prompted renewed cooperation between China and Russia. At the time, China had vastly inferior military equipment (mostly outdated Soviet arms and equipment from the 1950s) compared to Russia, and sought to modernize its military rapidly, particularly its navy and air force. The PLA sought Russian arms for several reasons: Russia was one of the few countries willing to sell weapons to China following the arms embargos; Russian arms were compatible with the PLA's Soviet-era equipment; and Russian weapons were relatively cheap compared to those from the West.¹ Meanwhile, Russia's economy was struggling in the aftermath of the Soviet Union's collapse, and following the Cold War it lacked reliable defense partners from which it could seek profits by selling arms.²

The two sides gradually expanded defense ties in the 1990s and early 2000s, seeking to overcome areas of distrust and setting the foundation for current military-to-military relations. In 1996, Beijing and Moscow began a "strategic partnership of coordination" that established high-level dialogues on a range of issues, including security and military affairs.³ One year later, building on a 1993 border security agreement for responding to unplanned incidents, the two militaries reached an agreement to reduce border troop levels.⁴ Marking a further step in coordinating at the defense level, the China-Russia Treaty of Good Neighborliness and Friendly Cooperation signed in 2001 stated that if either party felt their security interests were threatened, the two countries would establish consultations.⁵ Finally, China and Russia settled their final existing border dispute in 2004 (the agreement was implemented later in 2008), resolving a longstanding strain in the relationship.⁶

Despite strengthening defense coordination and settling areas of tension, some frictions have remained.† Mutual distrust is at the heart of these frictions and manifests primarily in three areas: First, although Beijing and Moscow were allies during World Wars I and II and share some security interests in Central Asia⁷ as well as general opposition to U.S. actions perceived as containment, they are geostrategic competitors.⁸ This dynamic at times comes to the forefront of the relationship and is driven by the progress of China's military modernization and increased Chinese assertiveness in the Asia Pacific. For these reasons, Russia generally has been more cautious in embracing China as its primary defense partner, reflected by Moscow's expanding defense cooperation with other countries in the region that largely view Beijing as a threat, such as Vietnam and India.⁹ Second, xenophobic attitudes toward China are prevalent in Russian culture, particularly due to a contentious history, growing Chinese influence in the Russian economy, and the presence of Chinese workers and businesses in the sparsely populated Far East of Russia.‡¹⁰ In China, some hold negative perceptions of Russians, stemming from historical grievances and incidents involving Russian harassment of Chinese citizens in Russia's Far East.¹¹ Third, actions taken by both

* From 1960 to 1989, bilateral relations were severely strained due to political and ideological differences. At the onset of this period, Beijing and Moscow disagreed over how to establish a socialist society domestically and on how socialist countries should conduct policy toward the capitalist world. While Beijing pushed an anti-Western Stalinist approach, Moscow pursued a policy of avoiding direct conflict with the United States though the two countries engaged in a series of proxy wars (i.e., Afghanistan, Angola, El Salvador, Cuba, Vietnam, and others). Alongside these differences, in the early period of the Sino-Soviet split, then Chinese leader Mao Zedong exploited the rift in relations to facilitate his domestic and foreign policy goals. Lorenz M. Lüthi, *The Sino-Soviet Split*, Princeton University Press, 2008, 1-13; John Lewis Gaddis, *The Cold War: A New History*, Penguin Press, 2005, 79-82; 156-237.

† Although relations between the leaders of both countries are at a high point, Beijing and Moscow are occasionally at odds over certain diplomatic issues, such as development strategies in Central Asia and overlapping interests in the Arctic. Nevertheless, the two sides usually avoid publicly criticizing each other on such issues; for example, China did not take any side on Russia's annexation of Crimea despite its non-intervention policy, and Moscow has not opposed China's "One Belt, One Road" initiative even though it focuses on economic development in Russia's traditional sphere of influence. Regarding bilateral economic ties, implementation of key agreements, such as a 2014 gas deal worth \$400 billion, have stalled due to falling gas prices, Russia's weakened economy, and other barriers. Alexey Eremenko, "Russia-China Economic and Trade Partnership Faltering," NBC News, September 12, 2016. <http://www.nbcnews.com/news/world/russia-china-economic-trade-partnership-falters-n645291>; Alexander Gabuev, "Friends with Benefits? Russian-Chinese Relations after the Ukraine Crisis," *Carnegie Moscow Center*, June 29, 2016, 8-17, 25-29. <http://carnegie.ru/2016/06/29/friends-with-benefits-russian-chinese-relations-after-ukraine-crisis-pub-63953>; Michael Lelyveld, "China-Russia Project Stalls as Energy Prices Plunge," *Radio Free Asia*, January 25, 2016. http://www.rfa.org/english/commentaries/energy_watch/china-russia-01252016152633.html.

‡ However, it appears many Chinese citizens have left this region during Russia's economic downturn. Alexander Gabuev, "Friends with Benefits? Russian-Chinese Relations after the Ukraine Crisis," *Carnegie Moscow Center*, June 2016, 23. http://carnegieendowment.org/files/CEIP_CP278_Gabuev_revised_FINAL.pdf.

sides continue to hurt mutual trust. These actions include China reverse-engineering Russian Su-27 fighter jets and marketing indigenous copies of them in the global arms market in the mid-late 2000s,¹² and Russia's October 2016 announcement that it would sell four to five S-400 SAM system battalions to India just a year and a half after it announced an S-400 sale to China, a development Beijing almost certainly views with consternation due to China's geopolitical rivalry with India.¹³

This mutual distrust notwithstanding, one of the underlying factors that has helped improve bilateral defense relations in recent years has been how the two countries' leaders view each other and their respective evolving security environments. Chinese President and General Secretary of the Chinese Communist Party (CCP) Xi Jinping and Russian President Vladimir Putin seem to share a personal affinity: the two have held 20 summit meetings since President Xi took office in late 2012.¹⁴ Moreover, President Xi's first foreign trip after taking office was to Russia, where he was the first foreign leader to visit Russia's military command center.¹⁵ In terms of security environment perceptions, Beijing claims to face an increasingly hostile security situation along its periphery. It perceives U.S. policy in the Asia Pacific as designed to contain China, limit Chinese influence in the region, and strengthen U.S. partnerships and alliances in the region to counter China's objectives.¹⁶ Meanwhile, Moscow shares Beijing's view that the United States is pursuing a containment strategy and interfering in other countries' affairs, a view informed by U.S. leadership in passing UN sanctions on Russia following its 2014 annexation of Crimea.¹⁷ Given the tightened sanctions imposed on Russia by the United States and Europe since then,¹⁸ along with an economy in recession and facing dismal growth prospects,¹⁹ Russia has increasingly relied on China for cooperation.²⁰ On the defense side, this has included facilitating long-stalled Russian arms sales of advanced systems to China—the S-400 SAM defense system and Su-35 fighter jet—which have helped support Russia's defense industry and secure hard currency.²¹

Although China's rapid military modernization contributes to Russian security concerns about China, it also plays a role in advancing bilateral defense ties. Supported by nominal double-digit increases to its defense budget almost every year since 1989,* China is rapidly catching up to Russia in terms of military capability. Following decades of acquiring Russian military technology and know-how through arms sales and other military-technical cooperation,²² China is now producing its own fourth- and fifth-generation combat aircraft. China also continues to build or update ships—such as the Type 052D LUYANG III-class destroyer—that are largely based on Russian technology (or Chinese derivatives of Russian technology) in terms of design components, and/or munitions.²³ The PLA's advanced capabilities have placed it on a more level playing field with the Russian Armed Forces, helping to support more complex exercises and advanced arms sales, in addition to furthering force projection.

Overview of Military Engagement

The evolution of the China-Russia military relationship toward a higher level of cooperation and coordination is evident in the three main areas of bilateral defense engagement: (1) military exercises, (2) military-technical cooperation, and (3) high-level military-to-military contacts. In recent years, all three areas have deepened in terms of the level and quality of engagement. Regular bilateral and multilateral exercises are increasing in complexity, particularly in the maneuvers, coordination, and weapons systems used, notably expanding into missile defense. With the exception of the two large deals on major systems mentioned above, Russian arms sales to China over the last decade have trended away from complete platforms toward smaller components, resulting in a decline in the volume and monetary value of sales, while the overall level of defense-industrial cooperation has increased. Finally, military-to-military contacts increasingly consist of meetings at higher levels of the defense bureaucracy, providing opportunities for military officials to facilitate arms packages, prepare exercises, and discuss regional and global security concerns.

* This measurement is according to China's announced defense budgets, not actual aggregate spending. China's announced budget omits major defense-related expenditures such as purchases of advanced weapons, research and development programs, and local government support to the PLA. For more information on China's significantly understated defense budget, see U.S.-China Economic and Security Review Commission, *2016 Annual Report to Congress*, November 2016, 207–209.

Military Exercises

Of the three major areas of defense engagement, military exercises most visibly demonstrate to the international community the commitment shared by China and Russia to close cooperation in the security realm. During a visit to Beijing in September 2015, Russian Defense Minister Sergei Shoigu said, “The most important issue of the Russian-Chinese military cooperation are the ... military exercises. They contribute to improving combat training of the Armed Forces of [the] two countries, and demonstrate our readiness to counteract modern threats.”²⁴

Since 2003, when China and Russia first participated in a combined* military exercise, the two countries have conducted approximately 25 exercises[†] together that have shown increasing complexity in terms of joint[‡] operations and coordination, particularly since 2014 (see Appendix 1 for a description of each exercise).²⁵ Ten of these exercises were held under the auspices of the Shanghai Cooperation Organization (SCO)[§] focusing on antiterrorism, including all of the PLA and Russian Armed Forces’ exercises conducted together at the multilateral level. For the PLA, these exercises have been valuable for gaining experience and useful information. The exercises have allowed the PLA to interact with the Russian military leadership; operate in unfamiliar environments outside China; address linguistic, cultural, and other barriers to effective communication with Russian troops; practice battlefield tactics and combat methods; and apply lessons learned to joint operations.²⁶ They also enable China to collect intelligence on Russia’s military capabilities and defense organization.

Moreover, Beijing and Moscow use these exercises to signal their respective preferences, intentions, and capabilities to each other, in addition to international and domestic audiences.

- China and Russia use the exercises to demonstrate their increasing military capabilities and the strength of China-Russia defense ties to the international community, particularly the United States and countries in the Asia Pacific. When Russian Defense Minister Shoigu announced Joint Sea-2015 (I) would be staged in the Mediterranean Sea, after a meeting with Chinese Defense Minister Chang Wanquan, he said, “[The

* For the purposes of this report, “combined” is defined in line with the U.S. Department of Defense *Dictionary of Military and Associated Terms* (with the exception of “countries” in place of “allies,” given the lack of a formal alliance between China and Russia): “A term identifying two or more forces or agencies of two or more [countries] operating together.” U.S. Department of Defense, *Joint Publication 1-02: Dictionary of Military and Associated Terms*, February 15, 2016, 40. http://www.dtic.mil/doctrine/new_pubs/jp1_02.pdf.

[†] This number does not include international military competitions in which the PLA and Russian Armed Forces participate, though these competitions serve as another venue for the militaries to train together and build mutual trust. In recent years, the PLA has participated in prominent events in Russia. From July 30 to August 13, 2016, the PLA Army, Navy, and Air Force attended International Army Games 2016 hosted by Russia. Joining 21 other countries, the PLA delegation reportedly included more than 1,000 officers and soldiers participating in 21 competitions—a larger footprint than previous years. According to Russian Defense Minister Sergei Shoigu, several competitions in the 2017 edition will be held on Chinese territory for the first time. Ivan Petrov, “They Assessed Threats, Sergei Shoigu Holds Talks in Beijing,” *Rossiyaskaya Gazeta*, November 24, 2016. Translation; Russian Defense Ministry, “Countries Participating in International Army Games 2016.” <http://eng.armygames2016.mil.ru/page196793.html>; China Military Online, “International Army Games 2016 Wraps Up in Russia,” August 15, 2016. http://english.chinamil.com.cn/news-channels/china-military-news/2016-08/15/content_7207950.htm; China Military Online, “China Sends Troops to Participate in International Army Games 2016,” July 18, 2016. http://english.chinamil.com.cn/news-channels/china-military-news/2016-07/18/content_7161199.htm; China Military Online, “All Chinese Teams Arrive in Russia for Int’l Military Contests,” July 27, 2015. http://eng.chinamil.com.cn/news-channels/china-military-news/2015-07/27/content_6602503.htm.

[‡] As outlined in the authoritative PLA text *Teaching Materials on Joint Operations* (联合作战教程), the PLA defines “joint” as “two or more arms and services” and “two or more armed forces.” In the Chinese media and China’s own English-language publications, all China-Russia exercises are described as joint exercises. For the purposes of this report, “joint” in a military exercise or operations context is defined according to the U.S. Department of Defense *Dictionary of Military and Associated Terms*: “Connotes activities, operations, organizations, etc., in which elements of two or more Military Departments participate.” An exception to this definition is any mention of “joint” by PLA or Chinese sources; in these cases, “joint” may refer to combined, joint, or both. U.S. Department of Defense, *Joint Publication 1-02: Dictionary of Military and Associated Terms*, February 15, 2016, 121. http://www.dtic.mil/doctrine/new_pubs/jp1_02.pdf; Tan Yadong ed., *Teaching Materials on Joint Operations*, Academy of Military Sciences Press, February 2013, 2–3. Translation.

[§] The SCO, established in 2001 by China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan (and which plans to admit India and Pakistan as new members in 2017), is the primary vehicle for China’s security engagement with Central Asia. Currently there are six SCO observers (Afghanistan, Belarus, India, Iran, Mongolia, and Pakistan), six dialogue partners (Armenia, Azerbaijan, Cambodia, Nepal, Sri Lanka, and Turkey), and three guests (the Association of Southeast Asian Nations [ASEAN], the Commonwealth of Independent States, and Turkmenistan). Agence France-Presse, “India, Pakistan Edge Closer to Joining SCO Security Bloc,” June 24, 2016. <http://tribune.com.pk/story/1129533/india-pakistan-edge-closer-joining-sco-security-bloc/>.

militaries] believe that the main goal of pooling our effort is to shape a collective regional security system. We also expressed concern over U.S. attempts to strengthen its military and political clout in the [Asia Pacific].”²⁷ In addition, China uses the multilateral SCO exercises to boost its influence and security cooperation in Central Asia.²⁸

- Although both countries regularly deny the exercises are directed against any particular country,²⁹ the location of each major exercise between China and Russia and the drills involved could be interpreted as such. For example, following the ruling of an arbitral tribunal at the Permanent Court of Arbitration in The Hague invalidating China’s territorial claims in the South China Sea,^{*} the two sides conducted their annual naval exercise, Joint Sea-2016, in the South China Sea with a focus on “island-seizing.”³⁰ Months before the exercise, Moscow expressed its support for Beijing’s position in the South China Sea,³¹ and weeks prior to the start of the exercise, President Putin said Russia did not recognize the tribunal’s decision,³² which made the exercise appear to be a show of unity regarding the ruling. South China Sea claimants may have interpreted the exercise as directed against them due to its sensitive location, timing, and inclusion of an “island-seizing” drill.
- The exercises—by virtue of Russia’s participation—also provide China an opportunity to operate in strategically important areas frequented by the Russian navy. The Mediterranean Sea, the location of the first phase of Joint Sea-2015, falls within Moscow’s traditional area of influence; and Russia’s Pacific Fleet is based in Vladivostok bordering the Sea of Japan, where the second phase of the exercise took place.³³
- For its domestic audience, China uses its antiterrorism exercises under the auspices of the SCO with Russia and the other member countries mostly to demonstrate its commitment to countering extremism and terrorism abroad and domestically in the Xinjiang Uyghur Autonomous Region (Xinjiang), where China perceives separatists pose a threat to its sovereignty and stability.[†] The exercises also help promote China’s “strong military dream”[‡] and thereby encourage nationalist sentiment. Displaying its most advanced weapons systems alongside the Russian Armed Forces, one of the world’s most advanced militaries, conveys to Chinese citizens powerful images that are designed to instill pride and perpetuate the nationalist narrative that only the CCP can safeguard China’s national security. The exercises could also help distract the Chinese public from domestic challenges—such as slumping economic growth, rising inequality, corruption, and increased unrest—that could give rise to discontent and instability.³⁴
- Some observers speculated that China used a recent exercise to market guided missile frigates for Russia to buy, an indication of how far China’s defense industry has progressed over the last decade from its reliance on Russian technology. For example, after the naval exercise Joint Sea-2015 concluded, two PLA Navy Type 054A JIANKAI II-class frigates that participated in the exercise sailed through the Black Sea to a Russian naval base in advance of Russia’s World War II Victory Day 70th anniversary military parade; some analysts assessed this was intended, in part, to advertise the platform.³⁵ Previously, the exercises mainly served as an opportunity for Russia to advertise its own arms, enabling China to observe systems

* For more information about the arbitration ruling adjudicating the Philippines’ case against China in the South China Sea, see Caitlin Campbell and Nargiza Salidjanova, “South China Sea Arbitration Ruling: What Happened and What’s Next?” *U.S.-China Economic and Security Review Commission*, July 12, 2016. http://origin.uscc.gov/sites/default/files/Research/Issue%20Brief_South%20China%20Sea%20Arbitration%20Ruling%20What%20Happened%20and%20What%27s%20Next071216.pdf.

† For more information on China’s perceptions of an evolving terrorist threat in Xinjiang, see Murray Scot Tanner and James Bellacqua, “China’s Response to Terrorism,” *CNA* (prepared for the U.S.-China Economic and Security Review Commission), June 16, 2016, 11–35. https://www.cna.org/cna_files/pdf/IRM-2016-U-013542-Final.pdf; for more information on unrest in Xinjiang, China’s response, and how Xinjiang fits into China’s Central Asia policy, see U.S.-China Economic and Security Review Commission, *2015 Report to Congress*, November 2015, 393–395.

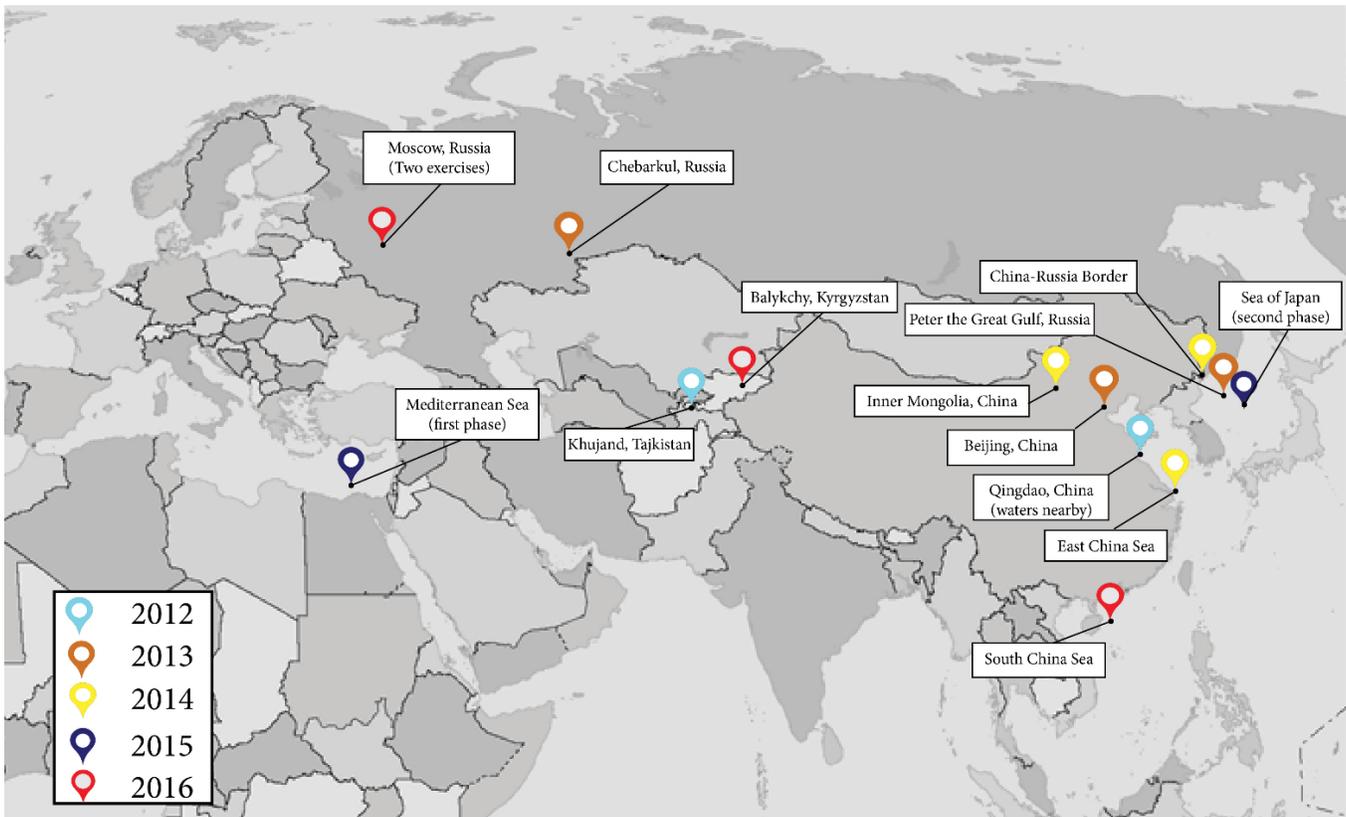
‡ President Xi has emphasized his vision of a “China Dream” to include a “strong military dream.” During an inspection of the Guangzhou Military Region shortly after he assumed leadership of the CCP, government, and military in 2012, President Xi said, “In order to achieve the great rejuvenation of the Chinese nation, it is necessary to uphold the unity of making our country prosperous and our armed forces powerful.” Tai Ming Cheung, “The Riddle in the Middle: China’s Central Military Commission in the Twenty-First Century,” in Phillip Saunders and Andrew Scobell, eds., *PLA Influence on China’s National Security Policymaking*, Stanford University Press, 2015, 111; Xinhua, “Xi Jinping Stresses during his Inspection of Guangzhou Military Region the Need to Uphold the Unity of Making Our Country Prosperous and Our Armed Forces Powerful and Strive to Consolidate National Defense and Build a Strong Army,” December 12, 2012. Translation. http://news.xinhuanet.com/politics/2012-12/12/c_114003822.htm.

up close and in action. For example, during the height of Russia-China arms sales in 2005, following the SCO's multilateral Peace Mission-2005 exercise, the Russian Armed Forces purposefully left some of their systems and equipment—including Tu-22M long-range bombers, Tu-95 strategic bombers, and an Il-78 tanker aircraft, among others—on display for several days to allow the PLA to examine them, likely to encourage China to include the arms in a future procurement order (China ordered Russian Il-78s in a \$1 billion deal several weeks later).³⁶

These benefits notwithstanding, some experts assess that recent exercises lack the scope and level of complexity of U.S.-led exercises, and are mostly scripted events with limited interoperability³⁷ lacking the level of coordination necessary to fully undertake combined, joint operations between militaries in a contingency. For example, some observers point to linguistic challenges in multilateral and bilateral exercises. In SCO exercises, Russian is the common operating language used, which requires Chinese participants to rely heavily on translators.³⁸ Bilateral exercises outside the SCO framework have similar barriers, as Russian and English are the primary languages used.³⁹

In recent years, the PLA and Russian Armed Forces have continued to expand the scope of their bilateral and multilateral exercises, increasing the geographic reach (see Figure 1 below), level of integration between units and commanders, and the capability of platforms used. This is evident by examining the most recent set of major exercises and comparing them with previous iterations.

Figure 1: Approximate Location of China-Russia Military Exercises (2012–2016)



Note: For more detail on each exercise, see Appendix 1.
Source: See Appendix 1.

Joint Sea-2016

Since 2012, China and Russia have conducted Joint Sea, an annual bilateral naval exercise. In September 2016, both militaries conducted a single-phase exercise (in contrast to 2015, when they split the exercise into two phases

three months apart in different geographic areas [see Table 1]).* The eight-day exercise reportedly took place in undisputed waters close to the Chinese coastline east of Zhanjiang (Guangdong Province), where the PLA Navy South Sea Fleet is located: it was China’s first exercise with a foreign country in the South China Sea. As mentioned previously, the exercise’s timing was particularly sensitive, given that it was held just two months after the arbitral tribunal’s ruling invalidating Beijing’s South China Sea claims.⁴⁰ The exercise appeared designed to convey Sino-Russian unity in opposition to the ruling and its supporters (including the United States and several other Western countries) and to improve strategic coordination and mutual trust between both sides.⁴¹

The PLA sent its largest contingent of weapons systems to the exercise since the 2012 iteration, including some of its most modern warships—such as a Type 052C (LUYANG II) destroyer, a Type 052B (LUYANG I) destroyer, and three Type 054A (JIANGKAI II) frigates; the Russian task group included two 1980s-vintage UDALOY I destroyers, its largest Pacific Fleet warships.⁴² In the exercise, the two navies for the first time conducted drills on “three-dimensional seizing and controlling of islands and reefs” (involving coordinated air, sea, and land operations)⁴³ among other drills covering amphibious operations, air defense, anti-submarine warfare, and search and rescue.[†] ⁴⁴ According to PLA Navy sources, the exercise for the first time used a unique “joint command information system” developed specifically for the exercise, allowing for “posture sharing, documents distribution ... [and] command orders transmission ... for command posts at all levels and for all combat units” with the capability to simultaneously transmit Chinese and Russian languages.⁴⁵ This advancement demonstrates improved efficiency and coordination compared to previous exercises, but according to Antony Wong Dong, a Macau-based defense analyst, the system could only exchange radar and sonar data, a far less sophisticated arrangement than the data link systems the U.S. military uses with NATO. Mr. Dong asserts this limited exchange of data demonstrates a lack of mutual trust.⁴⁶ Building on the first phase of the 2015 iteration of the naval exercise, the 2016 exercise again mixed ships from both sides into “red” and blue” teams. One new component of the exercise reportedly involved conducting “back to back” confrontation drills without preplanning, simulating more realistic training—a particular focus for the PLA.⁴⁷

Table 1: China–Russia Joint Sea Exercises, 2012–2016

Name	Dates	Location	Total Personnel	Major Weapons Systems Involved (and Units, if Available)
Joint Sea-2012	April 22–27	Qingdao, China (waters nearby)	10,000 (4,000 Chinese, 6,000 Russian)	China sent 16 surface ships, two submarines, 13 aircraft, and five helicopters; Russia sent four surface ships, three support ships, four helicopters, and a naval task force
Joint Sea-2013	July 5–12	Peter the Great Gulf, Russia	4,000	China sent six surface ships, one supply ship, three helicopters, and one special ops unit; Russia sent 12 surface ships, one submarine, three fixed-wing aircraft, two helicopters, and a special ops unit
Joint Sea-2014	May 20–26	East China Sea (waters near Shanghai, China)	Not reported	China sent six surface ships, two submarines, seven fixed-wing aircraft, four helicopters, and a marine commando unit; Russia sent six surface ships, two fixed-wing aircraft, two helicopters, and a marine commando unit
Joint Sea-2015 (I)	May 11–21	Mediterranean Sea (eastern part)	Not reported	China sent two frigates and a replenishment ship; Russia sent six surface ships

* Yu Bin, professor of political science at Wittenberg University, assesses the 2015 exercise may have been split to coincide with the timing of the two World War II Victory Day parades held in both Beijing and Moscow. The two phases were held just days from each parade. Yu Bin, “China-Russia Relations: Tales of Two Parades, Two Drills, and Two Summits,” *Comparative Connections*, September 2015, 153. https://cis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/1502qchina_russia.pdf.

† The Joint Sea-2015 (II) drill in the Sea of Japan also emphasized amphibious operations and island landing. China Military Online, “Navy Completes Joint Beach Drill,” August 26, 2015. http://english.chinamil.com.cn/special-reports/2015-08/26/content_6650902.htm.

Name	Dates	Location	Total Personnel	Major Weapons Systems Involved (and Units, if Available)
Joint Sea-2015 (II)	Aug. 20–28	Peter the Great Gulf, waters off Clerk Cape, and the Sea of Japan	Total not reported; 400 marines (200 Chinese, 200 Russian)	China sent seven surface ships, five fixed-wing aircraft, six helicopters, and 21 amphibious vehicles; Russia sent 16 surface ships, two submarines, 12 naval aircraft, and nine amphibious vehicles
Joint Sea-2016	Sept. 12–20	South China Sea (waters east of Zhanjiang in Guangdong Province, China)	Total not reported; 256 marines (160 Chinese, 96 Russian)	China sent ten surface ships, two submarines, 11 fixed-wing aircraft, and eight helicopters; Russia sent three surface ships, two supply ships, two helicopters, and amphibious vehicles

Source: See Appendix 1.

Peace Mission-2016

The most recent SCO joint anti-terrorism exercise, Peace Mission-2016, was the first held in Kyrgyzstan and for the first time overlapped with another major China-Russia exercise, Joint Sea-2016, in September 2016. Five of the six SCO members sent army and air force personnel to the six-day exercise (see Table 2). Consistent with previous Peace Mission exercises, its stated purpose was “to deter the ‘three evil forces’ of terrorism, separatism, and extremism.”⁴⁸ However, given the systems used and type of drills conducted, these exercises could be applied to a number of contingencies outside the counterterrorism realm. The drills focused on joint anti-terrorism operations in mountainous terrain and used tactics including surrounding and destroying an enemy using air support for ground operations, non-combatant evacuation operations, and air-to-ground precision strikes.⁴⁹ In contrast to the previous Peace Mission exercise in 2014, the 2016 iteration appeared to be smaller in scope, involving the smallest number of Chinese and total participants in any SCO exercise and fewer major weapons systems.⁵⁰

While smaller in scope, the exercise included a number of areas of added complexity and the debut of several new systems. According to China’s commanding officer of the exercise’s joint task group, then PLA Deputy Commander of the Xinjiang Military Region He Bing, the exercise marked the debut of the new Western Theater Command participating in training abroad.⁵¹ He also emphasized that China used several of its latest systems and equipment—including self-propelled artillery and armored vehicles—and noted that joint operational capacity among participants had “clearly improved” over past exercises.⁵² In addition, Russia used unmanned aerial vehicles (UAVs) for the first time in a Peace Mission exercise (Orlan-10 and Zala UAVs), following China’s debut of its CH-4 UAV at Peace Mission-2014.⁵³

Table 2: SCO Peace Mission Exercises, 2005–2016

Name	Dates	Participants	Location	Total Personnel	Major Weapons Systems Involved (Specific Chinese Systems and Units, if Available)
Peace Mission-2005	August 18–25	China, Russia	Vladivostok, Russia; Weifang and Qingdao, Shandong Province, China	9,800 (8,000 Chinese, 1,800 Russian)	Fighters, early-warning aircraft, helicopters, destroyers, frigates, tanks, artillery, and light armored vehicles (China sent Su-27 fighters, helicopters, three destroyers, three frigates, tanks, and armored vehicles)
Peace Mission-2007	August 9–17	China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan	Chelyabinsk, Russia	7,500 (1,600 Chinese, 2,000 Russian)	Fighter-bombers, helicopters, supply aircraft, and tanks (China sent eight JH-7 fighter-bombers, 32 helicopters, transport aircraft, and army, air force, and integrated support groups)

Name	Dates	Participants	Location	Total Personnel	Major Weapons Systems Involved (Specific Chinese Systems and Units, if Available)
Peace Mission-2009	July 24–26	China, Russia	Taonan, Jilin Province, China	2,600 (1,300 Chinese, 1,300 Russian)	Fighters, attack aircraft, helicopters, tanks, and armored vehicles (China sent 20 fighters, fighter-bombers, attack aircraft, helicopters, and tanks)
Peace Mission-2010	September 10–25	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan	Zhambyl region, Kazakhstan	5,000 (1,000 Chinese, 1,000 Russian)	Combat aircraft, helicopters, armored vehicles, and tanks (China sent two J-10 fighters, four H-6 bombers, tanks, and ground force, air force, and logistics combat groups)
Peace Mission-2012	June 8–14	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan	Khujand, Tajikistan	2,000 (369 Chinese, 350 Russian)	Combat aircraft, helicopters, and armored vehicles (China sent six helicopters, a motorized infantry company, and an artillery squad)
Peace Mission-2013	July 27–August 15	China, Russia	Chebarkul, Russia	1,500 (600 Chinese, 900 Russian)	Bombers, helicopters, UAVs, artillery, armored tanks, and special forces units (China sent JH-7A fighter-bombers, helicopters, gunships, tanks, self-propelled guns, and army, air force, and logistics groups)
Peace Mission-2014	August 24–29	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan	Zhurihe Town, Inner Mongolia Autonomous Region, China	7,000 (5,000 Chinese, 1,000 Russian)	Fighters, helicopters, UAVs, tanks, and ground vehicles (China sent J-10 and J-11 fighters, JH-7 fighter-bombers, early warning aircraft, helicopters, and UAVs)
Peace Mission-2016	September 15–21	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan	Balykchy, Kyrgyzstan	1,100 (270 Chinese, 500 Russian)	Fighter-bombers, helicopters, UAVs, tanks, and armored vehicles (China sent Z-9 helicopters and armored vehicles)

Source: See Appendix 1.

Missile Defense: An Emerging Area of Military-to-Military Cooperation

In 2016, China and Russia expanded their exercise portfolio to include missile defense, signaling opposition to the U.S.-led missile defense network in Northeast Asia and representing another step forward in bilateral defense cooperation. The decision to hold Aerospace Security-2016—the first computer-simulated missile defense exercise between China and Russia—in May 2016 appeared to be a direct response to the start of U.S.-South Korean discussions earlier in the year about deploying a Terminal High Altitude Area Defense (THAAD) battery in South Korea following a period of increased North Korean provocations.* While China and Russia officially repeated the

* China and Russia strongly opposed the prospect of a THAAD deployment at the time the United States and South Korea first publicly considered deploying a THAAD battery in South Korea in early 2016. The two countries signed a joint statement expressing their opposition to THAAD when President Putin visited Beijing in June. Beijing views the missile defense system as a direct security threat complicating its security environment, mainly because the system's radar is capable of reaching into Chinese territory, and because it fears a strengthened U.S.-allied missile defense network in its immediate neighborhood. Moscow has long opposed U.S.-led missile defense systems in Eastern Europe and sees another missile defense system in the Asia Pacific as a threat to regional stability. U.S.-China Economic and Security Review Commission, *2016 Report to Congress*, November 2016, 447–449. http://origin.www.uscc.gov/sites/default/files/annual_reports/2016%20Annual%20Report%20to%20Congress.pdf; Laura Zhou, “China

refrain used in other bilateral exercises that the exercise is not directed at third parties, retired PLA colonel and military commentator Yue Gang said, “THAAD is a common threat to both China and Russia. This [bilateral] exercise will serve as a warning to the U.S. and also spark the beginning of the two countries’ military cooperation following their diplomatic consensus [over the missile system].”⁵⁴

The five-day exercise in Moscow involved “defending territory against accidental and provocative ballistic and cruise missile strikes” and was aimed at improving interoperability between Russian and Chinese missile and air defense groups, according to a Russian defense ministry spokesperson.⁵⁵ Vassily Kashin, senior fellow at the Institute of Far Eastern Studies of the Russian Academy of Sciences and a senior researcher at the Higher School of Economics in Moscow, asserts that the exercise represented “a new level of trust” between the two militaries, due to the sharing of information in the sensitive area of missile launch warning systems and ballistic missile defense.⁵⁶ Since the exercise, some Russian and Chinese experts have discussed the possibility of eventually deploying a coordinated missile defense system.⁵⁷ Several months after South Korea and the United States reached an agreement to deploy THAAD in South Korea by late 2017,⁵⁸ China and Russia announced another missile defense exercise planned for 2017,⁵⁹ indicating continued emphasis on cooperation in this area moving forward.

Military-Technical Cooperation

Since the early 1990s, Russia’s perceptions of China’s end-use of its technology and equipment have largely dictated the pace and scope of military-technical cooperation. During the height of Russian arms sales to China in the early to mid-2000s, Beijing was an ideal partner for Moscow to buy its outdated systems and to license older generations of defense technology, given Chinese weapons’ compatibility with Soviet-era systems and China’s dependence on foreign arms imports.⁶⁰ Russian sales and military-technical cooperation diminished later in the decade, due in large part to concerns about Chinese reverse-engineering of advanced Russian systems.⁶¹ Since the United States and Europe imposed and then tightened sanctions on Russia following its annexation of Crimea in 2014, however, Russia has relaxed its opposition to arms transfers of some of its most advanced systems to China and engaged in more extensive defense industry cooperation with China. Russia’s weakened economy (resulting from the sharp decline in global oil and natural gas prices, among other factors) and its growing economic dependence on China (due to its increasing isolation from the United States and Europe) likely contributed to this development.⁶²

Russian arms sales to China, including the transfer of major weapons systems and defense technology as well as licensing agreements, have yielded benefits for both sides. According to the Stockholm International Peace Research Institute (SIPRI), since the fall of the Soviet Union nearly 80 percent of China’s total arms imports have come from Russia, and more than a quarter of all Russian arms exports have been shipped to China.⁶³ From 1992 to 2006, Chinese military equipment procured from Russia totaled approximately \$26 billion, according to some estimates.⁶⁴ China’s major systems imported from Russia over this period helped to vastly improve PLA Air Force and Navy capabilities. Some of the notable procurements included Russian export versions of the Su-27 and Su-30 fighter, the S-300 SAM defense system, SOVREMENNY-class guided missile destroyer, and KILO-class diesel electric submarine.⁶⁵

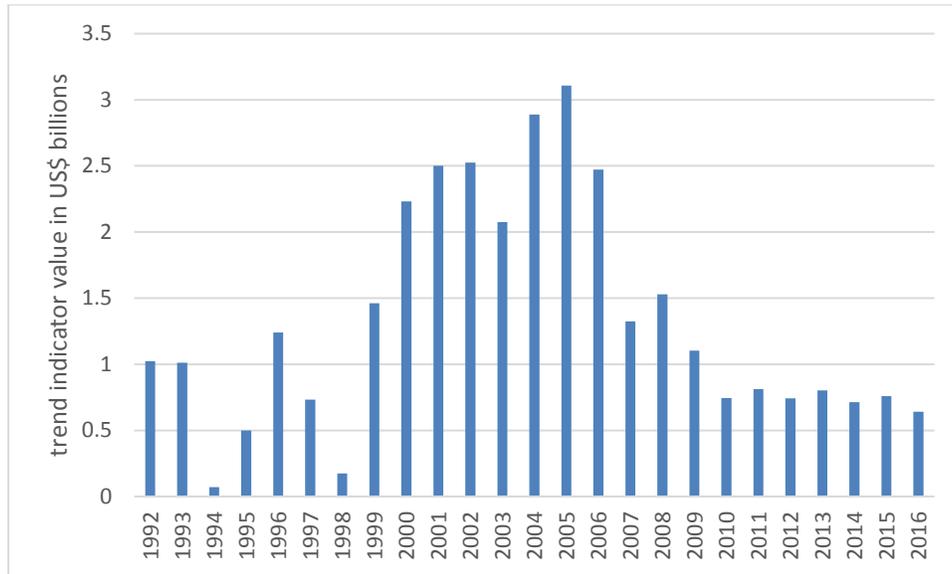
A sharp drop in Russian arms sales delivered to China occurred around 2006–2007 (see Figure 2). U.S., Russian, and Chinese experts offer several explanations for this sudden decline: First, Chinese demand for Russian arms waned as most of Beijing’s orders had been fulfilled and China’s defense industry had become advanced enough to fulfill more PLA requirements domestically. Second, the Chinese side expressed concerns about quality control deficiencies and contract disagreements involving the remaining orders. Third, Russia was unwilling to sell the higher-end systems that China was beginning to demand likely due to concerns that China’s increasing military capabilities could pose a future threat to Russia and that China’s practice of reverse-engineering Russian platforms would enable China to compete directly with Russia in the arms market.⁶⁶ Finally, debate in Russian policy circles

and Russia Criticize THAAD Missile Defense System as Destabilizing Region,” *South China Morning Post*, July 9, 2016. <http://www.scmp.com/news/china/diplomacy-defence/article/1987103/china-and-russia-criticise-thaad-missile-defence-system>.

* In 2007, for example, China’s Shenyang Aircraft Corporation unveiled an indigenous copy of the Russian Su-27SK fighter, the J-11B, which China had been producing under a licensing agreement with Russia until Beijing cancelled the deal after having produced about half

at the time raised China’s military modernization as a growing strategic concern, which may have been reflected in Moscow’s decision to diversify its arms sales to new customers.⁶⁷

Figure 2: Trend in Russian Arms Exports Delivered to China, 1992–2016



Note: “Trend indicator value” is a measure of the volume of arms transferred and not actual total cost. Here it is calculated using the number of weapon systems and subsystems delivered in a given year from Russia to China and the estimated cost of each transfer at constant 1990 U.S. dollar prices. Using constant prices allows for analyzing trends in arms sales over time. See SIPRI’s Arms Transfers Database for their detailed methodology used to calculate trend indicator value: <https://www.sipri.org/databases/armstransfers/sources-and-methods>.

Source: Stockholm International Peace Research Institute, “SIPRI Arms Transfers Database,” February 2017. <https://www.sipri.org/databases/armstransfers>.

The sudden decline in Russian arms exports delivered to China in 2006–2007 began a new phase of China-Russia military-technical cooperation characterized by diminished Chinese imports of complete Russian platforms and more modest levels of engagement.⁶⁸ By 2012, Russia’s share of arms imported by China was 43 percent, far below the high of 87 percent between 2000 and 2005.⁶⁹ Much of this drop coincided with China’s increased imports from Ukraine* (see text box on page 16 for the implications of Russia’s annexation of Crimea for China-Russia military-technical cooperation).⁷⁰ In 2016, the Russian share of Chinese arms imports grew to over 64 percent, but remained well below levels achieved at the height of Russia’s arms sales to China.⁷¹ Although China was Russia’s top foreign arms importer through much of the 1990s up until the mid-2000s, Russia’s dependence on Chinese arms purchases declined over the last decade. China is now fourth in Russian arms imports, according to SIPRI’s year-end 2016 data (behind India, Algeria, and Vietnam).⁷²

China continued to depend on Russian defense technology—particularly aircraft components—even as Russian concerns about reverse-engineering grew. China’s defense industry has long struggled to produce indigenous jet engines for its most advanced combat aircraft.⁷³ In recent years, China has acquired Russian engines for its newest fighters and bombers,[†] as they are more reliable and have better performance than Chinese versions. According to

of the Su-27SK fighters on order. Reuben F. Johnson, “Russian Industry Wary of Su-35 Sale to China,” *Jane’s Defense Weekly*, March 15, 2012; Jeremy Page, “China Clones, Sells Russian Fighter Jets,” *Wall Street Journal*, December 4, 2010. <http://www.wsj.com/articles/SB10001424052748704679204575646472655698844>.

* These imports included 250 AI-222 turbofan engines for L-15 trainer aircraft, three Il-78M tanker aircraft, and several ongoing licensing deals for gas turbine engines (used in LUYANG-class destroyers) and Zubr hovercraft. Stockholm International Peace Research Institute, “SIPRI Arms Transfers Database,” February 2017. <https://www.sipri.org/databases/armstransfers>.

† At China’s 2014 Zhuhai Airshow, defense officials announced a new contract with Russian defense firm Rosoboronexport for 100 Klimov RD-93 turbofan engines for China’s FC-1 fighter to be delivered by the end of 2016 (it is unclear if this contract was fulfilled on time), and another deal for upgraded RD-93 engines. China’s Ministry of Defense in 2011 placed an order worth \$500 million to buy 123 AL-

Dr. Kashin, all three of China's indigenous fourth-generation* fighter lines use Russian engines, and China appears to be interested in outfitting its prototype fifth-generation† J-31 fighters with next-generation Russian engines.⁷⁴ (China's other fifth-generation fighter, the J-20, which entered service in early March 2017, reportedly uses Chinese WS-15 engines, but the engines face reliability challenges and are only available in small quantities.)⁷⁵ China is investing heavily in its indigenous engine program and recently has been making progress in closing the gap with Russia in this area.⁷⁶

Given China's continued dependence on some Russian technologies, China's arms purchases from Russia have become more selective, seeking out Russia's latest weapons systems and defense technology, which may reflect the PLA's ability to absorb more sophisticated capabilities. In an apparent effort to ensure such deals would not lead to cheaper Chinese versions of Russian systems appearing in the global arms market, in 2008, Russia signed an intellectual property protection agreement with China at their annual Intergovernmental Joint Commission on Military Technology Cooperation meeting.⁷⁷ Without disclosing details, Russian sources indicated a new agreement was signed in 2012 aimed at strengthening the 2008 version, after China reportedly continued to copy Russian systems.⁷⁸ One year later, Russian Ambassador to China Andrei Denisov, speaking about Beijing's commitment to the agreement, said "There is still room for improvement, but we are inspired by the positive attitude of our Chinese partners."⁷⁹ However, subsequent intellectual property agreements have been signed for individual arms sales and joint production deals (detailed below), suggesting continued Russian apprehension about China copying its weapons systems and equipment.

In 2015, Russian defense officials appeared to be more amenable to selling advanced arms to China, seemingly indicating a major shift in Russia's thinking on arms sales. According to Alexander Gabuev, a senior associate and chair of the Carnegie Moscow Center's Russia in the Asia-Pacific Program, Moscow conducted a policy review following the 2014 Ukraine crisis and found China's defense industry was more advanced than previously believed. The review concluded that the benefits China could accrue from reverse-engineering Russian technology would be less than previously thought, reducing the risk that Chinese reverse-engineered systems would compete with Russian systems in the global arms market. Moreover, Mr. Gabuev notes Moscow found many of the systems it believed stolen by Beijing had actually been obtained through legitimate contracts with Chinese defense firms and weak regulation of Russian technology transfers to China.⁸⁰ Other factors that may have contributed to Moscow's shift to sell advanced arms to Beijing are Russia's weak economy and its deepening isolation from the West, in addition to China's efforts, however minimal, to implement intellectual property agreements. Russia moved to sell the following advanced systems to China after years of caution:

- *S-400 surface-to-air missile (SAM) defense system*: Since at least 2012, China sought Russia's most advanced SAM system to expand its missile defense coverage. Finally, in April 2015 Russia confirmed the \$3 billion sale of four to six S-400 SAM system battalions to China, and plans to deliver them no earlier than 2018.⁸¹ Some observers were skeptical that the deal would go through given Russian defense officials' previous statements indicating Russia would wait until it fulfilled its own military's orders before exporting the system to foreign militaries, and Russian fears that China would reverse-engineer it.⁸² Russian officials may have concluded that the S-400 would take years for China to copy due to its complexity, and that by the time China copied the SAM system, Russia would already have the more advanced S-500 model (reportedly due for delivery to Russian defense customers as early as 2017).⁸³

31FN engines from Russia for its J-10 fighters. The same year, China purchased Russian AL-31 and D-30 turbofan engines for its J-15 fighter and H-6K bomber, respectively, along with Y-20 and Il-76 transport aircraft. Stockholm International Peace Research Institute, "SIPRI Arms Transfers Database," February 2017. <https://www.sipri.org/databases/armstransfers>; Nikolai Novichkov, "Airshow China 2014: Russia to Supply China with More RD-93 Turbofans," *IHS Jane's*, November 17, 2014. <http://www.janes.com/article/45852/airshow-china-2014-russia-to-supply-china-with-more-rd-93-turbofans>; and Jack Jordan, "China Signs \$500 Million Russian Jet Engine Deal, Vedomosti Says," Bloomberg, July 4, 2011. <http://www.bloomberg.com/news/articles/2011-07-04/china-signs-500-million-russian-jet-engine-deal-vedomosti-says>.

* Compared with the previous generation, fourth-generation fighters are outfitted with more advanced avionics, including active electronically scanned array radars that help improve situational awareness.

† Fifth-generation fighters have improved stealth features over the previous generation, such as more advanced composite and masking materials.

- *Sukhoi Su-35 fighter jet*: In November 2015, Russian media, citing Russian defense officials, reported that Russia reached a \$2 billion deal to sell China a package of 24 4++-generation* Su-35 fighters, one of its most advanced fighters, along with spare engines and ground support equipment;⁸⁴ the first four aircraft were delivered in December 2016 (just days after Chinese sources shared images confirming the PLA's first J-20 fighters had become operational)⁸⁵ and the rest are expected to arrive by the end of 2018.⁸⁶ Discussions regarding a deal reportedly began in 2011, but progress was delayed due to cost disagreements and Russian concerns of Chinese reverse-engineering.⁸⁷ The two sides signed an agreement on intellectual property protection for the Su-35s in 2013; the agreement appeared to be a prerequisite for the sale.⁸⁸ According to some Russian defense industry sources, Russian officials pushed their Chinese counterparts to buy a larger quantity than China had initially wanted in hopes that the sale would be profitable even if China eventually reverse-engineered the fighter.⁸⁹ The Su-35s reportedly will be delivered "in the form in which [the fighters] are supplied to the Russian Aerospace Forces," but with Beidou satellite navigation[†] units integrated as well, suggesting the aircraft will enter regular service in addition to being used for field training and component learning purposes before the J-20 and J-31 are deployed in full.[‡]

These recent major platform sales are likely exceptions to a trend toward purchases of smaller but technically sophisticated components. In the future, China's arms purchases from Russia will probably focus on advanced components and technology it can absorb and adapt for indigenous systems. In the case of the Su-35, the PLA's official online news portal published an article in December 2016, shortly after Russia delivered an initial batch of four of the fighters to China, stating, "Now that the J-20 is about to be fielded, we eagerly look forward to the Su-35 being China's last generation of imported [combat] aircraft."⁹⁰

Deepening defense industry cooperation in recent years is another component of closer military-to-military ties. Although China-Russia coproduction arrangements for defense research and development (R&D) projects have been a part of military-technical cooperation since the early 2000s,⁹¹ until recently such cooperation has not included the most advanced systems. In recent years, China and Russia have pursued or signed several major agreements to jointly produce systems of common interest. These include the following:

- *Next-generation heavy-lift helicopter*: In May 2015, the Aviation Industry Corporation of China (AVIC) signed a framework deal with Russian Helicopters for joint production of a next-generation heavy-lift helicopter.⁹² Both President Xi and President Putin were present at the signing of the deal, signaling high-level support.⁹³ In June 2016, the two countries completed the intergovernmental agreement (the finalized contract is still forthcoming).⁹⁴ According to Russian sources, China will be the sole end user of the helicopter and provide all of the funding, with the Russian side acting as a subcontractor. Joint production of the first prototype is scheduled to occur in China within two years (followed by several years of testing), and over 200 helicopters could be built by 2040.⁹⁵ Before the intergovernmental agreement was signed, a deputy chief engineer at Avicopter, AVIC's helicopter wing, indicated China would be responsible for the avionics systems and materials, with Russia working on the design, transmission, and de-icing equipment.⁹⁶ The helicopter will improve the PLA's ability to conduct transport and evacuation operations in extreme terrain and weather conditions.⁹⁷

* The Su-35 has elements of a fifth-generation fighter but lacks the same level of stealth features and other technologies. Russia is currently working on the development of a true fifth-generation fighter, the PAK-FA or T-50, but the program continues to experience delays. Sukhoi, "Su-35," 2016. <http://www.sukhoi.org/eng/planes/military/Su-35/>; Robert Beckhusen, "Russia's Stealth Fighter Is in Serious Trouble," *War Is Boring*, April 5, 2015. <https://medium.com/war-is-boring/russia-s-stealth-fighter-is-in-serious-trouble-24ac3ef85227#.lykwrroqt>.

† Beidou is China's satellite navigation system alternative to the United States' Global Positioning System (GPS) currently with coverage over the Asia Pacific and projected to reach global coverage by 2020. Beijing originally decided to develop Beidou for military purposes, namely to shift away from its reliance on GPS for precision strike. Jordan Wilson, "China's Alternative to GPS and its Implications for the United States," *U.S.-China Economic and Security Review Commission*, January 5, 2017, 5–8. http://origin.www.uscc.gov/sites/default/files/Research/Staff%20Report_China%27s%20Alternative%20to%20GPS%20and%20Implications%20for%20the%20United%20States.pdf.

‡ Beijing reportedly wanted the cockpit displays on the Su-35s to be translated into Chinese, but the Russian side was unable to accommodate the request due to technical difficulties. Instead, the Su-35s will display all information in Cyrillic similar to the PLA's Su-27 aircraft. Sputnik, "Adapt and Overcome: Chinese Pilots will Learn Russian to Fly Su-35 Fighters," October 10, 2016. <https://sputniknews.com/military/201610101046178395-china-fighter-aircraft-russian/>.

- *LADA-class diesel electric submarines*: In December 2012, Russia and China reportedly agreed on the framework for joint production of four LADA-class submarines (two to be produced in Russia and two in China), and signed the official agreement in March 2013 just prior to President Xi’s visit to Moscow—his first foreign trip since taking office.⁹⁸ Since then, the deal has evolved. According to the U.S. Department of Defense, China is now pursuing a joint design and production program with Russia for a new advanced conventional submarine based on the LADA-class.⁹⁹ These submarines would help advance the PLA Navy’s underwater combatant fleet, as LADA-class submarines make less noise than China’s quietest submarines, the KILO-class, and have more advanced sensors and combat systems.¹⁰⁰ In addition, China’s defense industry could absorb certain advanced Russian technologies and integrate them into the development of current and future Chinese systems.

Russia’s Annexation of Crimea and the Case of the China-Ukraine Hovercraft Deal

In 2009, China placed an order with Ukraine for four ZUBR-class hovercraft in a coproduction deal reportedly worth \$315 million. As part of the signed contract, both sides agreed to build two of the hovercraft in the Crimea region of Ukraine and the remaining two ships in China with Ukrainian assistance. Ukraine delivered the first vessel in 2013,¹⁰¹ but then in February 2014 pro-Russian forces seized government buildings and infrastructure in Crimea.¹⁰² Several weeks prior to Russia’s annexation of Crimea in March 2014, it was reported that Ukraine hastily shipped an incomplete and untested hovercraft to China, to avoid damage if the situation worsened.¹⁰³ Since then, Russia appears to have asserted control over the portion of Ukraine’s defense industry based in Crimea where more than half of Ukraine’s shipbuilding firms are located.^{* 104} According to Russian state media, Russian arms exporter Rosoboronexport Deputy Chief Executive Officer Igor Sevastyanov said the firm intends to fulfill the original hovercraft contract Ukraine signed with China, calling Feodosiya Shipbuilding Company (the firm responsible for producing the hovercraft) a “Russian plant.”¹⁰⁵ If Russia has indeed acquired Feodosiya, it is unclear if China will still be able to assemble and build the hovercraft domestically without support from Ukraine.¹⁰⁶ Nonetheless, Russia’s annexation of Crimea could contribute to its deepening defense industry cooperation with China.

Chinese and Russian defense firms and R&D centers in recent years have signed a number of other cooperation agreements across a wide range of sectors. These strategic agreements help China’s defense industries absorb know-how and technologies from their Russian counterparts and could help accelerate the R&D process for next-generation defense technology.

- In January 2017, the China Aviation Research Institute—a subsidiary of AVIC—signed a memorandum of understanding with Russian R&D center Central Institute of Aviation Motors to support potential collaboration in aero-engine technology development. According to *IHS Jane’s*, the Russian institute has participated in almost every aero-engine R&D program in Russia.¹⁰⁷
- During the annual China-Russia Prime Minister’s meeting in December 2015, the China National Space Administration and Russian Federal Space Agency signed an agreement on the development and production of space components and cooperation on the two countries’ satellite navigation systems, Beidou (China) and GLONASS (Russia).¹⁰⁸ The deal complemented an agreement reached earlier that year on satellite navigation cooperation and several related agreements in 2014.^{† 109} In December 2015, Russian state-owned nanotechnology firm RUSNANO also signed a strategic cooperation agreement with China Aerospace Science and Industry Corporation focusing on advanced materials with space applications.¹¹⁰

* *IHS Jane’s* estimates Ukraine lost 10 percent of its defense industrial organizations to Russia through the annexation of Crimea. In addition to the shipbuilding industry, Russia may have control over firms in Ukraine’s aircraft and armored vehicle sectors. *IHS Jane’s*, “Jane’s Sentinel Security Assessment: Defense Production and R&D, Ukraine,” September 13, 2016.

† These agreements include a partnership between the China North Industries Corporation and GLONASS establishing a joint venture to develop and market satellite navigation devices compatible with both Beidou and GLONASS and a deal to place three differential stations in each country. Jordan Wilson, “China’s Alternative to GPS and its Implications for the United States,” *U.S.-China Economic and Security Review Commission*, January 5, 2017, 7. http://origin.www.uscc.gov/sites/default/files/Research/Staff%20Report_China%27s%20Alternative%20to%20GPS%20and%20Implications%20for%20the%20United%20States.pdf; GPS World, “Russia and China Agree on SatNav Joint Venture,” November 14, 2014. <http://gpsworld.com/russia-and-china-agree-on-satnav-joint-venture/>.

- In November 2014 at China’s Zhuhai Airshow, Chinese defense firms AVIC, China Aerospace Science and Industry Corporation, and two subsidiaries of China Electronics Technology Group Corporation signed four agreements with Russian defense firm Russia Technologies (Rostec).¹¹¹ The agreement between AVIC and Rostec covers potential collaboration in fixed-wing and helicopter manufacturing, engine production, aircraft materials, avionics, and other areas.¹¹²
- In October 2014, China Aerospace Science and Technology Corporation signed an agreement with Rostec to promote joint development and production of dual-use technology, including electronic components, information technology, and new materials.¹¹³

Since 2015, the two sides have reportedly discussed a potential technology transfer deal in which Moscow would provide Beijing with the RD-180 rocket engine in exchange for unspecified space-grade microelectronic components.¹¹⁴ In April 2016, Russian media cited an unnamed Russian space agency official noting China’s non-membership in the Missile Technology Control Regime (MTCR), an informal grouping of countries that coordinate on nonproliferation, as a roadblock to signing the deal.¹¹⁵ Although China and Russia reportedly signed an intellectual property protection agreement on space and space utilization during President Putin’s state visit to Beijing in June 2016—providing a legal basis for the proposed deal¹¹⁶—the technology transfer could be in jeopardy. Later that year, Igor Arbuzov, general manager of NPO Energomash, the Russian firm that produces and exports the RD-180, reportedly said Russia is not willing to provide China with the production technology to build the engine, only the engine itself.¹¹⁷ If an agreement is reached, the engine would increase China’s lift capacity, which is needed for manned lunar and deep space missions. China is also currently working on developing a new generation of launch vehicles designed to meet its future launch requirements.¹¹⁸ However, according to Dr. Kashin, Beijing is in need of the RD-180 engine to carry out its missions in space, as its most capable launch vehicle in production, the Long March-5, is based on the Soviet-era RD-120 engine.¹¹⁹

High-Level Military-to-Military Contacts

China and Russia have maintained high-level* military contacts through a number of ongoing bilateral dialogues and international defense fora. These contacts provide opportunities for defense officials and officers to facilitate arms packages, prepare combined and joint exercises, and discuss regional and global security concerns. The primary venues for advancing defense cooperation include the following:

- *China-Russia Intergovernmental Joint Commission on Military Technology Cooperation*: Established in 1992 and usually co-chaired by Russia’s defense minister and China’s vice chairman of the CCP’s Central Military Commission (CMC), China’s highest military policy making body,[†] this commission is the most important annual meeting between the PLA and Russian Armed Forces on military-technical cooperation, particularly for facilitating arms sales.¹²⁰ In addition to the meeting co-chairs, regular participants include Russian deputy defense ministers, China’s defense minister, and other key officials and personnel in the respective defense establishments. The meeting typically discusses major arms sales and defense industry cooperation more broadly, reviews cooperation over the previous year, and decides on the upcoming year’s priorities.¹²¹ Notably, the commission did not meet in 2006 or 2007 during a downturn in arms cooperation.¹²²
- *Exchanges between Services*: The two militaries hold bilateral visits at the service head level and between the commanders of certain units within the respective military services, mostly to discuss technical maintenance of Russian systems, improve coordination and communication, and build positive ties.¹²³

* In this report, “high-level” contacts are defined as officials and officers holding a leadership position and corresponding rank in the military services at or above deputy commander of a particular service and assistant to the chief of the general staff department (“joint staff department” in the PLA context as of its reorganization in late 2015).

† At some meetings, China’s defense minister serves as the Chinese side’s co-chair instead of the vice chairman of the CMC; in recent years, this occurred in 2014 and 2012. Yu Bin, “China-Russia Relations: Russia’s Pride and China’s Power,” *Comparative Connections*, January 2015. https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/1403qchina_russia.pdf; Yu Bin, “China-Russia Relations: Tales of Different ‘Pivots,’” *Comparative Connections*, January 2013. https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/1203qchina_russia.pdf.

- *China-Russia Staff Headquarters Strategic Consultation*: This annual meeting, held since 1997, brings together the deputy chiefs of the Russian Armed Forces General Staff Department and the PLA Joint Staff Department to manage and improve cooperation between the two militaries and discuss regional and global security concerns (before early 2016, the PLA's Joint Staff Department was called the General Staff Department).¹²⁴ Despite arrangements at the 2014 consultation for the next meeting to be held in Beijing in 2015,¹²⁵ it did not occur. The two sides did meet, however, in May 2016.¹²⁶
- *Multilateral Defense Fora*: In recent years, the expansion of annual multilateral fora focused on defense and security issues has created more opportunities for interactions between high-level PLA officers and their Russian counterparts. These include China's Xiangshan Forum (expanded in 2015 to an annual track 1.5 defense dialogue),¹²⁷ the South and Southeast Asian Nations Defense Chiefs' Dialogue (first held in 2014),¹²⁸ Russia's Moscow Conference on International Security (first held in 2012),¹²⁹ and the Association for Southeast Asian Nations' (ASEAN) Defense Ministers Meeting Plus (ADMM-Plus) (first held in 2010).¹³⁰ The annual Shangri-La Dialogue also provides a venue for senior military officers to discuss relevant issues, and the two sides met on the sidelines of the event in 2015 and 2016.¹³¹
- *Shanghai Cooperation Organization (SCO)*: Established in 2001, the SCO is a multilateral entity through which China advances its security agenda in Central Asia (after China, Russia is the next most influential in the organization). It is also the main venue for the two militaries to coordinate multilateral exercises with the other member countries. In 2003, the PLA and Russian Armed Forces conducted their first major combined exercise under the auspices of the SCO (see Appendix 1). Defense ministers of SCO member countries meet annually at the SCO Defense Ministers Meeting to discuss regional security issues.¹³²

Analysis of publicly reported official exchanges between high-level PLA and Russian military officers suggests steady coordination between both sides and a shift toward more frequent coordination at the top level* (see Figure 3). Since 1990, China and Russia have had approximately 112 official high-level military-to-military contacts, more than half of these occurring since 2005.[†] ¹³³ Between 2010 and 2012, there was a drop in total exchanges, reflecting the decline of military-to-military relations as a whole during this period. As bilateral ties warmed again in 2013 and 2014, top-level and senior-level‡ exchanges increased slightly compared to the previous three years. 2015 was a landmark year for high-level contacts between the militaries, led by a surge in top-level contacts; that year, the five top-level contacts were the most since the two countries normalized relations in 1989.§ This momentum in high-level exchanges continued into 2016.

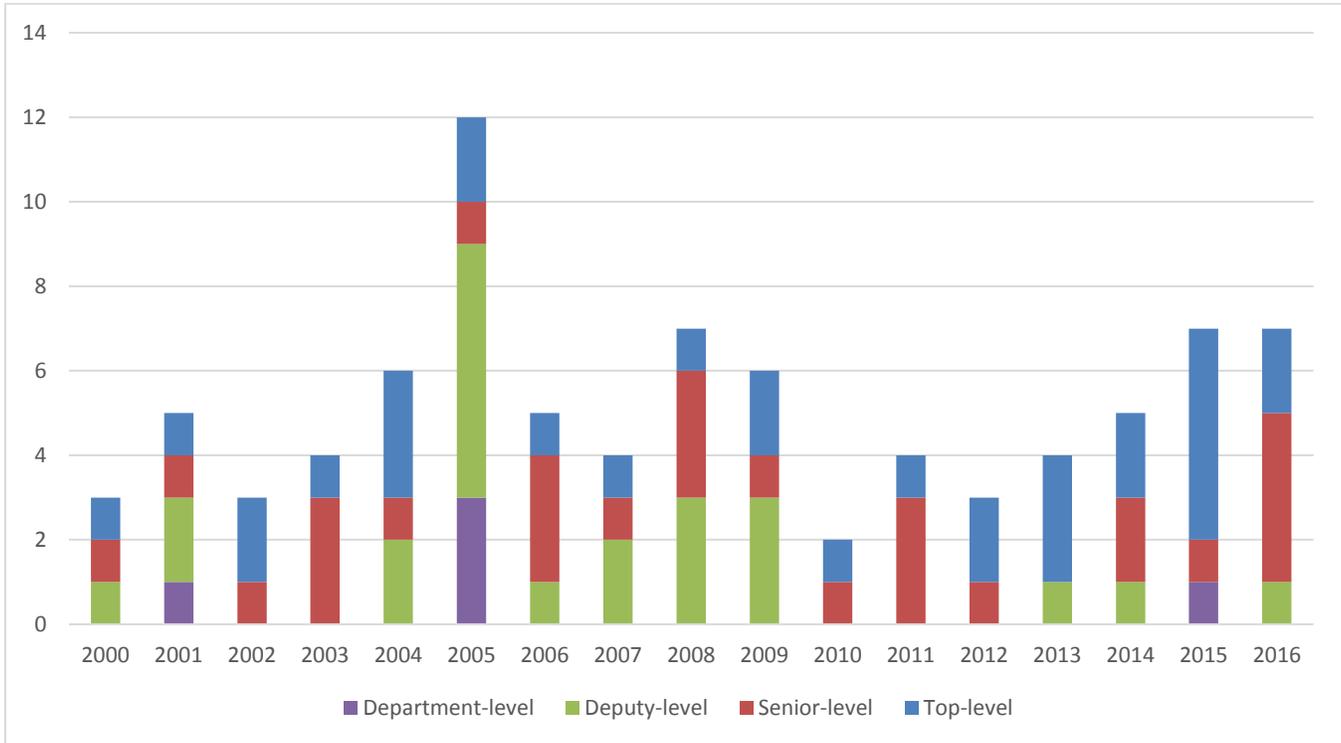
* "Top-level" contacts include meetings that involve the Russian Defense Minister and the Chinese Vice Chairman of the Central Military Commission.

† A majority of the record 12 contacts between defense officials in 2005 consisted of meetings held to prepare for the first bilateral exercise between the PLA and the Russian Armed Forces.

‡ "Senior-level" contacts include meetings between Russian deputy defense ministers, Chinese CMC members, and service commanders.

§ Two of the senior-level meetings in 2015 were held on the sidelines of the respective World War II Victory Day parades in Beijing and Moscow. China Military Online, "Senior Chinese Military Leaders Meets with Russian Defense Minister," September 3, 2015. http://english.chinamil.com.cn/news-channels/china-military-news/2015-09/03/content_6663657.htm; China Military Online, "Senior Military Leader Meets with Russian Defense Minister," May 11, 2015. http://english.chinamil.com.cn/news-channels/china-military-news/2015-05/11/content_6484445.htm.

Figure 3: China-Russia High-Level Military-to-Military Contacts by Position, 2000–2016



Note: These contacts omit presidential summits (during which defense issues are probably discussed), meetings between border security forces, and multilateral summits (unless a meeting between officials occurred on the sidelines). When meetings were held between officers of varying seniority, the most senior member is used to classify the meeting. “Department-level” meetings include those involving deputy commanders of the services and assistants to the chief of the general staff department (“joint staff department” in the PLA context as of its announced reorganization in late 2015); “deputy-level” meetings include those involving a deputy chief of the general staff (“joint staff” in the PLA context), and military region (PLA) or military district (Russia) commanders (the PLA is transitioning to “theater” commanders); “senior-level” meetings include those involving Russian deputy defense ministers, Chinese CMC members, and service commanders; and “top-level” meetings officials include those involving Russia’s minister of defense and China’s vice chairman of the CMC.

Source: Various.¹³⁴

The two militaries had seven high-level contacts in 2016, matching the previous year and marking the most such meetings since 2008. Although there were only two meetings at the top level, four of the meetings involved senior-level officers, indicating a sustained increase in higher-level military exchanges (see Table 3). Planning for larger and more complicated exercises between China and Russia and increasing military-technical cooperation necessitates greater top-level leadership, planning, and coordination. On the sidelines of the G-20 Summit hosted in Hangzhou, China in September 2016, President Xi told President Putin that military exchanges should be “strengthened,” and the two have exchanged similar intentions to boost high-level meetings in recent years as defense ties deepened.¹³⁵ With the leaders of each country supporting increased military contacts and closer defense ties more broadly, the PLA and Russian Armed Forces should be expected to experience a period of more frequent high-level contacts in the coming years.

Table 3: China-Russia Top- and Senior-Level Military-to-Military Contacts, 2016

Date	Visit	Location	Meeting Details
April 27	Chinese Defense Minister (and CMC Member) Chang Wanquan meets with Russian Defense Minister Sergei Shoigu	Moscow, Russia	Meeting on sidelines of the Fifth Moscow Conference on International Security

Date	Visit	Location	Meeting Details
May 27	Russian Aerospace Forces Commander-in-Chief Viktor Bondarev meets with Chinese Deputy Chief of Joint Staff Department Yi Xiaoguang	Moscow, Russia	Meeting on sidelines of the Aerospace Security-2016 missile defense exercise
June 3	Russian Deputy Defense Minister Anatoly Antonov meets with Chinese Deputy Chief of Joint Staff Department Sun Jianguo	Singapore	Meeting on sidelines of the annual Shangri-La Dialogue
July 22	Chinese Deputy Director of Foreign Affairs Office of Defense Ministry Ci Guowei meets with Russian Deputy Defense Minister Anatoly Antonov	Moscow, Russia	Meeting to discuss bilateral military and military-technical cooperation
November 4	Russian Navy Commander-in-Chief Vladamir Korolyov meets with then Chinese CMC Member and PLA Navy Commander Wu Shengli	Beijing, China	Meeting to discuss cooperation between navies
November 23	Russian Defense Minister Sergei Shoigu meets with Chinese Vice Chairman of the CMC Xu Qiliang and Defense Minister Chang Wanquan. Defense Minister Shoigu also meets with Chinese Politburo Standing Committee member Yu Zhengsheng and attends the annual military-technical cooperation meeting.	Beijing, China	Meetings at the 21st session of the China-Russia Intergovernmental Joint Committee on Military Technology Cooperation (chaired by Chinese Vice Chairman of the CMC Xu Qiliang) and on the sidelines of the committee meeting

Source: Various.¹³⁶

Implications for the United States and the Asia Pacific

Deepening security ties between China and Russia in recent years reflect a bilateral relationship that has moved to a higher level of cooperation since 2012, when President Xi assumed leadership and President Putin re-claimed the presidency in Russia, despite some frictions in the diplomatic and economic realms. According to Elizabeth Wishnick, associate professor of political science at Montclair State University and a senior research scholar at the Weatherhead East Asian Institute at Columbia University, Russia and China’s growing bilateral relationship is rooted in the common desire to oppose Western interference in other countries’ domestic politics and “[erode] Western dominance over global economic rules and information policy.”¹³⁷ These common worldviews, she asserts, help the two countries maintain closer strategic ties.¹³⁸ Yu Bin, professor of political science at Wittenberg University, assesses “China and Russia’s discomfort with the existing world order has more to do with their respective interactions with the West than their separate ‘national identities.’ It is an issue of [common] interests rather than identity.”¹³⁹ In either case, China and Russia appear drawn together by similar concerns about what they consider explicit U.S.-led efforts to contain them, particularly through the Obama Administration’s Rebalance to Asia policy and NATO expansion.¹⁴⁰

As the China-Russia military-to-military relationship experiences a warming period, arguably moving to its closest point since the two countries normalized relations in 1989, some observers suggest the two countries will form a new geopolitical axis or alliance that could threaten U.S. interests in the Asia Pacific region and beyond. They cite the increasing isolation of Russia in the international community, increased U.S. presence in the Asia Pacific, and deepening strategic ties between China and Russia.¹⁴¹ In fact, some Chinese scholars have discussed rationales for forming an alliance with Russia,¹⁴² despite the director of the National People’s Congress Foreign Affairs Committee and former vice foreign minister Fu Ying and the late former senior diplomat Wu Jianmin stating that an alliance with any other country is out of the question.¹⁴³ The development of a formal alliance is unlikely due to continued policy and strategic differences as well as areas of distrust; instead, common perceptions of self-interest

are likely to continue guiding the overall relationship. Nonetheless, the militaries' deepening cooperation has notable implications for the United States and the Asia Pacific.

- Russia's sale of 24 Su-35 fighters to China, announced in late 2015, with four of the jets already delivered, will help the PLA move closer to contesting U.S. air superiority.¹⁴⁴ Unlike the PLA Air Force's J-11 (a current fourth-generation fighter) and the J-20, the Su-35 utilizes passive electronically scanned array radar, added stealth capability, improved avionics, a pair of AL-117S turbofan engines with three-dimensional thrust vectoring technology* (allowing for added maneuverability), and potent jamming capabilities.¹⁴⁵ These advanced technologies will be critical as China works to make improvements for future iterations of its J-20 fighter over the lifecycle of the program. Observers note China is interested in some of the Su-35's advanced technology, particularly its sophisticated turbofan engine, which—if successfully copied—could enable significant leaps in the development of its indigenous fifth-generation fighters.¹⁴⁶ Some analysts remain doubtful of the PLA's ability to reverse-engineer the engine. Senior fellow at the Atlantic Council Roger Cliff asserts, "China has had access to [the AL-31 engine for the Su-27 and Su-30] for over 20 years and apparently is still struggling to make its own high-performance turbofan engines."¹⁴⁷ Due to difficulties the Chinese defense industry has had producing a reliable indigenous engine, some speculate the PLA may use the AL-117S engine from the Su-35 in the J-20;¹⁴⁸ according to Gabe Collins and Andrew Erickson of China SignPost, the engine could enable the J-20 to supercruise,[†] putting its performance on par with the F-22.¹⁴⁹
- Russia's sale of four to six battalions of S-400 SAM systems to China, set for delivery no earlier than 2018, could impact the balance of military power across the Taiwan Strait and in waters close to China, with implications for U.S. security interests. The S-400 will increase the range of China's SAM force from the S-300's 300 kilometers (approximately 186 miles) to 400 kilometers (approximately 249 miles)—enough to cover all of Taiwan, parts of the East China Sea, and parts of the South China Sea (see Figure 4).¹⁵⁰ When paired with China's increasingly advanced air force, the S-400 appears to further expand China's air superiority over Taiwan. In a potential conflict, China would be able to hold a wider range of Taiwan air assets at risk. In addition to an extended range, the S-400 features more advanced radar than the S-300 (currently China's most advanced SAM system), can track more targets at once, and is increasingly resistant to jamming and other countermeasures used against it.¹⁵¹ Depending on which missiles the PLA uses in tandem with the S-400 and where it places the launchers, China will soon have another platform that could pose challenges for Taiwan in a cross-Strait contingency, and for air assets of the United States and its allies and partners in a potential East China Sea or South China Sea conflict.¹⁵² The S-400 also could be used to help enforce China's East China Sea Air Defense Identification Zone (ADIZ) and potentially the northern portion of a South China Sea ADIZ should one be announced in the future, a development that would undoubtedly heighten tensions in the region.[‡] However, S-400 battalions will be limited in quantity when

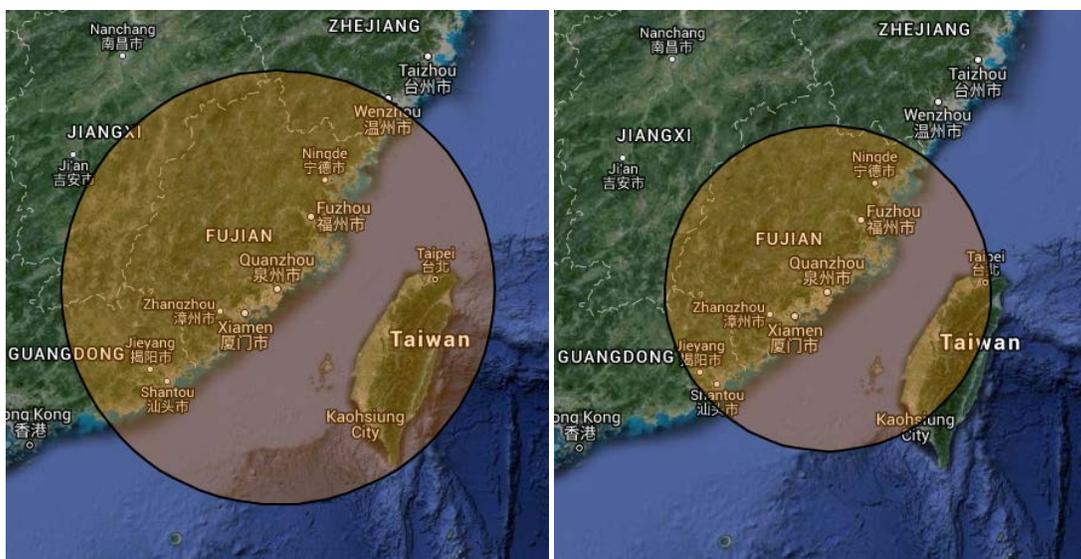
* This technology enables the engine's nozzles to independently point in different directions to help the aircraft pitch, yaw, and/or roll. (The U.S. Air Force fifth-generation F-22 Raptor has two-dimensional thrust vectoring to assist with pitching and rolling.) The Su-35 sale does not transfer thrust vectoring technology to China and is presumably protected under the intellectual property agreement signed by Moscow and Beijing prior to finalizing the sale. To date, Russia has not transferred turbofan engine technology to China. Russia recently demonstrated its willingness to share engine technology with China through a joint R&D collaboration on aero-engine technology, but it is unclear which technologies are included or permitted for sharing under the project. Jon Grevatt, "China and Russia to Collaborate on Aero-Engine R&D," *IHS Jane's Defense Industry*, January 26, 2017. http://www.janes.com/article/67235/china-and-russia-to-collaborate-on-aero-engine-r-d?mc_cid=fe7766b761&mc_eid=0bd2dbf419; Sebastian Roblin, "Why Russia's Enemies Should Fear the Su-35 Fighter," *National Interest*, July 16, 2016. <http://nationalinterest.org/blog/why-russias-enemies-should-fear-the-su-35-fighter-16995>; Wendell Minnick, "Russia-China Su-35 Deal Raises Reverse Engineering Issue," *Defense News*, November 20, 2015. <http://www.defensenews.com/story/defense/air-space/strike/2015/11/20/russia-china-su-35-deal-raises-reverse-engineering-issue/76102226/>; U.S. Air Force, F-22 Raptor, September 23, 2015. <http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104506/f-22-raptor.aspx>.

† Supercruise or supersonic cruise is the ability of a combat aircraft to achieve supersonic flight—traveling faster than the speed of sound (around 768 miles per hour)—without using inefficient afterburning thrust. National Aeronautics and Space Administration, *What is Supersonic Flight?* May 18, 2009. <https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-supersonic-flight-58.html>; Carlo Kopp, "Supercruising Flankers?" *Air Power Australia*, 2007. <http://www.airspacepower.net/APA-Supercruise.html>.

‡ The S-400 could be deployed to Hainan in the Southern Theater Command to cover the northern portion of a South China Sea ADIZ, while the HQ-9, a Chinese-produced strategic SAM system, could rotate through Chinese-occupied features with airfields in the South China Sea.

they are delivered in 2018, and based on defensive priorities, protecting Beijing would take precedence. For example, when China first received S-300 SAM systems from Russia, it chose to deploy them in Beijing for capital defense purposes.¹⁵³

Figure 4: Range of S-400 (left) vs. S-300 (right) SAM Systems if Placed Directly across the Taiwan Strait



Note: The range of the S-400 is 400 kilometers (approximately 249 miles), and the S-300's range is 300 kilometers (approximately 186 miles).

Source: GmapGIS

- The PLA's increasingly complex exercises with the Russian Armed Forces help provide both sides with valuable experience in pursuing their military objectives. Given the PLA's lack of recent combat experience,* the exercises are particularly useful for practicing how to conduct joint, informationized† campaigns and facilitating military modernization goals more broadly.¹⁵⁴ The PLA also benefits from these exercises because they involve more realistic training and practicing maneuvers that are important for its strategic missions—notably amphibious operations, which in recent years have been a focus of bilateral exercises and the related drills have demonstrated increased complexity.¹⁵⁵ China's developing amphibious capabilities could hamper the United States' ability to quickly respond to regional contingencies in the East and South China seas and those involving islands held by Taiwan.¹⁵⁶ Some observers, however, question the level of integration in China-Russia exercises, raising doubts about the exercises' value beyond some experiential gains for each side. Richard Weitz, director of political-military analysis at the Hudson Institute, notes, "Russia and China lack the interoperability or integrated command, control, and support mechanisms required to conduct an effective combined military campaign. The Chinese and Russian armed forces do not rehearse integrated military operations to the same degree as, for example, do the U.S. military drills with its NATO allies or South Korea and Japan."¹⁵⁷
- The China-Russia exercise agenda's expanded geographic scope in recent years—ranging from the Mediterranean Sea and Sea of Japan in 2015 to the South China Sea in 2016—along with a broadened agenda to include missile defense, reflects increasingly aligned security interests and suggests Beijing and

* The PLA's most recent large-scale military campaign was the 1979 Sino-Vietnamese War following Vietnam's invasion and occupation of Cambodia.

† In Chinese military doctrine, "informationization" refers to the application of advanced information technology to military operations. The PLA views informationization as a required enabler of its goal to be able to "[win] informationized local wars." M. Taylor Fravel, "China's New Military Strategy: 'Winning Informationized Local Wars,'" *China Brief*, June 23, 2015. http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews%5Btt_news%5D=44072&cHash=c403ff4a87712ec43d2a11cf576f3ec1#.VjkKsq6rSRs.

Moscow are signaling their respective support for the other's security priorities. If this is the case, one could expect to see greater Sino-Russian coordination or alignment in the defense and security sphere, which could pose a number of challenges to the United States. For example, China and Russia may more vocally support each other's positions concerning issues in which either China or Russia has a considerable stake (i.e. North Korean provocations and the Syrian civil war), and where China and Russia already tend to support one another, often times in opposition to U.S. objectives.*

- As the two sides advance missile defense cooperation, the United States could face a more complex strategic environment that would present further obstacles in a contingency in the Asia Pacific. Beijing and Moscow appear to be seeking to reduce the effectiveness of U.S.-led missile defense systems through advanced missile development and other coordination.¹⁵⁸

Conclusion

Despite areas of tension and distrust in China-Russia relations since Beijing and Moscow normalized relations in 1989, the two countries' militaries and defense establishments have steadily worked to minimize and overcome these differences and are now experiencing arguably the highest period of cooperation. The three major components of military-to-military ties discussed in this report demonstrate such a trend. In terms of military exercises, the two militaries are staging increasingly complex exercises with an expanded geographic reach in strategically important areas, recently adding a new set of exercises on missile defense cooperation. Military-technical cooperation similarly shows significant progress in recent years, highlighted by a major uptick in the technical capability of Russian arms sales to China, wide-ranging strategic industrial partnerships in key defense sectors, and joint production deals and other cooperation on advanced military and dual-use systems. Finally, Chinese and Russian defense officials are holding more meetings at higher levels in the military bureaucracy than they did in the past, signaling closer coordination.

As Beijing and Moscow increasingly share overlapping interests and maintain a shared resistance to U.S. leadership in the Asia Pacific, the two countries appear likely to further deepen defense relations in the coming years. In the years ahead, analysts and policymakers will need to closely watch this trend, especially as the Asia Pacific experiences rapid change and China continues to pursue its military modernization goals. In particular, Russian arms sales to China and military-technical cooperation could have significant consequences for the United States, challenging U.S. air superiority and posing problems for U.S., allied, and partner assets in the region.

* Since 2011, China and Russia have used their veto power together six times with respect to UN Security Council resolutions on Syria. United Nations, "Security Council – Veto List," March 1, 2017. <http://research.un.org/en/docs/sc/quick>.

Appendix 1: China-Russia Military Exercises, 2003–2016

Name	Dates	Participants	Location	Total Personnel	Major Weapons Systems Involved (and Units, if Available)
Apprehension of Illegal Border Crosser Exercise	January 2003	China, Russia	Border region of Heilongjiang Province, China	Not reported	Chinese and Russian border units
Coalition-2003	August 6–12, 2003	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan (SCO)	Ucharal and Ili, Kazakhstan; Xinjiang Uygur Autonomous Region, China	1,200 (700 Chinese)	Major systems from all participants included fighters, helicopters, tanks, and armored vehicles (China sent riflemen, infantry, artillery, armed police, and support forces)
Peace Mission-2005	August 18–25, 2005	China, Russia (SCO)	Vladivostok, Russia; Weifang and Qingdao, Shandong Province, China	10,000 (8,000 Chinese, 1,800 Russian)	Major systems from all participants included fighters, early-warning aircraft, helicopters, destroyers, frigates, tanks, artillery, and light armored vehicles (China sent Su-27 fighters, helicopters, three destroyers, three frigates, tanks, and armored vehicles)
Peace Mission-2007	August 9–17, 2007	China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan (SCO)	Chelyabinsk, Russia	7,000 (1,600 Chinese, 2,000 Russian)	Major systems from all participants included fighter-bombers, helicopters, supply aircraft, and tanks (China sent eight JH-7 fighter-bombers, 32 helicopters, transport aircraft, and army, air force, and integrated support groups)
Cooperation-2007	September 4–6, 2007	China, Russia	Moscow, Russia	1,000 (600 Chinese)	Major systems from all participants included helicopters and armored vehicles (China sent Snow Leopard Commando force of the People's Armed Police [PAP] and Russia sent its Warrior Special Force unit)
Border Blockade Exercise	February 26, 2009	China, Russia	Heihe (China)–Blagoveshchensk (Russia) border area	Not reported	Not reported

Name	Dates	Participants	Location	Total Personnel	Major Weapons Systems Involved (and Units, if Available)
Nurak-Antiterror-2009	April 17–19, 2009	Russia, Tajikistan, Kazakhstan, China, and Kyrgyzstan (SCO)	Fakhrabad, Tajikistan	1,000 (Russia and Tajikistan supplied most forces)	Major systems from all participants included attack aircraft, helicopters, and armored vehicles
Bogorodsk Disaster Relief Exercise	May 19–22, 2009	China, Russia, Kazakhstan, and Tajikistan	Noginsk and Moscow, Russia	200 (20 Chinese)	Major systems from all participants included 50 Mi-8 and Ka-32 aircraft
Peace Mission-2009	July 24–26, 2009	China, Russia (SCO)	Taonan, Jilin Province, China	2,600 (1,300 Chinese, 1,300 Russian)	Major systems from all participants included fighters, attack aircraft, helicopters, tanks, and armored vehicles (China sent 20 fighters, fighter-bombers, attack aircraft, helicopters, and tanks)
River/Port Emergencies Exercises	August 18 and 31, 2009	China, Russia	Heihe (China)–Blagoveshchensk (Russia) border area	240	Not reported
Peace Shield-2009	September 18, 2009	China, Russia	Gulf of Aden	Not reported	China sent two frigates and a supply ship; Russia sent three warships
Peace Mission-2010	September 10–25, 2010	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan (SCO)	Zhambyl region, Kazakhstan	5,000 (1,000 Chinese, 1,000 Russian)	Major systems from all participants included combat aircraft, helicopters, armored vehicles, and tanks (China sent two J-10 fighters, four H-6 bombers, tanks, and ground force, air force, and logistics combat groups)
Joint Sea-2012	April 22–27, 2012	China, Russia	Qingdao, China (waters nearby)	10,000 (4,000 Chinese, 6,000 Russian)	China sent 16 surface ships, two submarines, 13 aircraft, and five helicopters; Russia sent four surface ships, three support ships, and four helicopters, and a naval task force
Peace Mission-2012	June 8–14, 2012	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan (SCO)	Khujand, Tajikistan	2,000 (369 Chinese, 350 Russian)	Major systems from all participants included combat aircraft, helicopters, and armored vehicles (China sent six helicopters, a motorized infantry company, and an artillery squad)

Name	Dates	Participants	Location	Total Personnel	Major Weapons Systems Involved (and Units, if Available)
Cooperation-2013	June 10–20, 2013	China, Russia	Beijing, China	75 (46 Chinese, 29 Russian)	China sent Snow Leopard Commando force of the People's Armed Police [PAP] and Russia sent a special operations unit
Joint Sea-2013	July 5–12, 2013	China, Russia	Peter the Great Gulf, Russia	4,000	China sent six surface ships, three helicopters, and one special operations unit; Russia sent 12 surface ships, one submarine, three fixed-wing aircraft, two helicopters, and a special operations unit
Peace Mission-2013	July 27–August 15, 2013	China, Russia (SCO)	Chebarkul, Russia	1,500 (600 Chinese, 900 Russian)	Major systems from all participants included fighter-bombers, helicopters, UAVs, artillery, armored tanks, and special forces units (China sent JH-7A fighter-bombers, helicopters, gunships, tanks, self-propelled guns, and army, air force, and logistics groups)
Joint Sea-2014	May 20–26, 2014	China, Russia	East China Sea (waters near Shanghai, China)	Not reported	China sent six surface ships, two submarines, seven fixed-wing aircraft, four helicopters, and a marine commando unit; Russia sent six surface ships, two fixed-wing aircraft, two helicopters, and a marine commando unit
Peace Mission-2014	August 24–29, 2014	China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan (SCO)	Zhurihe Town, Inner Mongolia Autonomous Region, China	7,000 (5,000 Chinese, 1,000 Russian)	Major systems from all participants included fighters, helicopters, UAVs, tanks, and ground vehicles (China sent J-10 and J-11 fighters, JH-7 fighter-bombers, early warning aircraft, helicopters, and UAVs)
Border Defense Cooperation-2014	October 31, 2014	China, Russia	China–Russia border near Jilin Province, China	Not reported	Not reported

Name	Dates	Participants	Location	Total Personnel	Major Weapons Systems Involved (and Units, if Available)
Joint Sea-2015 (I) (first phase of Joint Sea-2015 exercise)	May 11–21, 2015	China, Russia	Mediterranean Sea (eastern part)	Not reported	China sent two frigates and one replenishment ship; Russia sent six surface ships
Joint Sea-2015 (II) (second phase of Joint Sea-2015 exercise)	August 20–28, 2015	China, Russia	Peter the Great Gulf; waters off Clerk Cape; and the Sea of Japan	Total not reported; 400 marines (200 Chinese, 200 Russian)	China sent seven surface ships, five fixed-wing aircraft, six helicopters, and 21 amphibious vehicles; Russia sent 16 surface ships, two submarines, 12 naval aircraft, and nine amphibious vehicles
Aerospace Security-2016	May 23–28, 2016	China, Russia	Moscow, Russia	Not reported	Not reported
Cooperation-2016	July 3–14, 2016	China, Russia	Moscow, Russia	100	Major systems from all participants included helicopters and armored vehicles (China sent Falcon Commando and Snow Leopard Commando forces of the People's Armed Police [PAP] and Russia sent its Warrior Special Force unit)
Joint Sea-2016	September 12–20, 2016	China, Russia	South China Sea (waters east of Zhanjiang in Guangdong Province, China)	Total not reported; 256 marines (160 Chinese, 96 Russian)	China sent 10 surface ships, two submarines, 11 fixed-wing aircraft, and eight helicopters; Russia sent three surface ships, two supply ships, two helicopters, and amphibious vehicles
Peace Mission-2016	September 15–21, 2016	China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan, (SCO)	Balykchy, Kyrgyzstan	1,100 (270 Chinese, 500 Russian)	Major systems from all participants included fighter-bombers, bombers, helicopters, UAVs, and armored vehicles (China sent Z-9 helicopters and armored vehicles)

Source: Adapted from Richard Weitz, "Parsing Chinese-Russian Military Exercises," *Strategic Studies Institute*, April 15, 2015, 5–32. <http://www.strategicstudiesinstitute.army.mil/pdf/files/PUB1266.pdf>; Yu Bin, "China-Russia Relations: Navigating through the Ukraine Storm," *Comparative Connections*, September 2014. http://csis.org/files/publication/1402qchina_russia.pdf; Andrew Scobell, Ely Ratner, and Michael Beckley, "China's Strategy toward South and Central Asia," *RAND Corporation*, 2014, 38–39. http://www.rand.org/content/dam/rand/pubs/research_reports/RR500/RR525/RAND_RR525.pdf; Dennis J. Blasko, "People's Liberation Army and People's Armed Police Ground Exercises with Foreign Forces, 2002–2009," in Roy Kamphausen, David Lai, and Andrew Scobell eds., *The PLA at Home and Abroad: Assessing the Operational Capabilities of China's Military*, June 2010, 427–442. <http://www.strategicstudiesinstitute.army.mil/pdf/files/PUB995.pdf>.

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