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Chinese Defense Industry Reforms and Their Implications for US-China Military Technological Competition

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Critical reforms are taking place in China's defense industry. New long-term plans and institutional arrangements, an emphasis on turnkey technologies and civil-military integration (CMI), research institute system reforms, and capital market access will help the Chinese defense industry move to higher-end innovation and away from reliance on foreign technology transfers. The main implication for the United States is an increased ability for China to forge an independent development path that will be more resistant to US competitive strategies. The pace and intensity of Chinese defense industry development represents a long-term challenge to US superiority in military technology.

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FORMULATING NEW LONG-TERM PLANS AND INSTITUTIONAL ARRANGEMENTS

At the Third Plenum of the 18th Party Congress in 2013, the Xi Jinping administration signaled its intention to carry out a major overhaul of the defense industry as part of an ambitious national program of economic and military reforms. A flurry of activity since then by defense industrial decision-makers has produced new medium- and long-term defense industrial development strategies, plans, and institutional arrangements that collectively represent a turning point in the defense industry's evolution from an innovation follower to a leader of original innovation.

Chief among these new initiatives are the 13th Defense Science and Technology (S&T) and Industry Five-Year Plan, with its focus on leapfrogging weapons development, targeting investments toward 'turnkey' areas, promoting CMI, and accelerating weapons exports; and the 2025 Defense Science and Technology Plan prepared by the State Administration for Science, Technology, and Industry for National Defense (SASTIND), which parallels the Made in China 2025 advanced manufacturing plan.

SASTIND announced in June 2015 that it was establishing a defense S&T Development Strategy Committee to conduct research and provide policy input to the country's leadership on defense research and development (R&D) over the next 20 to 30 years. The committee's primary goals are to implement the Communist Party leadership's strategic decisions and

plans; focus on strategic, comprehensive and forward-looking studies; and provide policy recommendations and consultation on defense S&T development and innovation.¹

Targeting Breakthroughs in Turnkey Technological Capabilities

Another trend in the Chinese national and defense S&T system under Xi is an emphasis on making breakthroughs in core technological capabilities, also referred to as turnkey technological capabilities.

At the 5th Plenum in November 2015, Xi stressed that there must be more "serious prioritization" of "technological innovation in key sectors and implementation of important technological projects that affect the national big picture and long-term future." Xi also called for China to pursue an asymmetric strategy to catch up with developed countries.²

A number of technological fields have been designated as turnkey. In his speech at the National Science and Technology Conference in June 2016, Xi confirmed that China has decided to speed up implementation of a subset of the sixteen megaprojects identified in the 2006–2020 Medium and Long-Term Science and Technology Development Plan, including high-end all-purpose chips, integrated circuit equipment, broadband mobile communication, high-grade numerical machinery, nuclear power plants, and new drugs.

Chinese authorities also announced plans in 2015 to establish large-scale national laboratories modeled on those in the United States and other countries. These would support the pursuit of breakthroughs

in big science endeavors. Xi has pointed out that "national laboratories are important vehicles in which developed countries seize the high ground in technological innovation."³ China views such national laboratories as critical platforms to accelerate fundamental and applied research that will enable it to reach the global technological frontier. Defense topics are expected to be a core part of their mission.

Intensifying Efforts to Realize the Potential of Civil-Military Integration

The Xi administration has made a renewed push to make CMI a viable policy tool. Foremost among these efforts was Xi's announcement in March 2015 that elevated CMI into a national strategy.

SASTIND remains the primary organizer and implementer of China's CMI push. SASTIND issued its first CMI Strategic Action Plan (SAP) in 2015, followed by a second SAP in March 2016. Both the 2015 and 2016 SAPs are designed to set actionable and achievable goals that can be reached in relatively short periods of time and that provide stepping stones to move toward full implementation of China's CMI goals.⁴ While the SAPs are issued solely by SASTIND, it appears to have become a major part of the agency's mantra to promote, coordinate, and implement CMI across all national and local-level agencies.

SASTIND and the Ministry of Industry and Information Technology remain in charge of CMI implementation, but other bureaucratically powerful agencies are becoming more directly engaged. These include the

1 Ministry of National Defense, 国防科技工业发展战略委员会成立 ["Defense Science, Technology, and Industry Development Strategy Committee Was Established"], June 6, 2015, http://news.mod.gov.cn/headlines/2015-06/05/content_4588445.htm.

2 Chinese Communist Party Central Party Literature Research Office, ed., 习近平关于科技创新论述摘编 [*Selection of Xi Jinping's Comments on Science, Technology, and Innovation*] (Beijing: Central Party Literature Press, 2016), 41.

3 *Selection of Xi Jinping's Comments*, 50–51.

4 State Administration for Science, Technology and Industry for National Defense, 国防科工局关于印发《2016年国防科工局军民融合专项行动计划》的通知 ["SASTIND Issues '2016 SASTIND Civil-Military Integration Special Action Plan'"], February 28, 2016, http://www.sdgfxh.com/zcfg_detail/newsId=213.html.

National Development and Reform Commission through its Economic and National Defense Coordination Development Department, and a CMI inter-ministerial coordinating small group that was initiated in 2012.

Supporting High-Tech Defense Industrialization

China is currently engaged in a comprehensive effort to boost its advanced manufacturing capabilities in high-tech industries. China's overall plan to develop its high-tech industries, particularly CMI-related industries, is a key factor that will enable the defense industry to produce innovation at higher levels.

Chief among China's actions to develop its manufacturing base is the Made in China 2025 Plan issued in May 2015, which outlines a three-step strategy to comprehensively upgrade China's industrial economy with the goal of becoming a world-leading manufacturer by 2049.⁵ Civilian and defense agencies coordinated closely in drafting the plan to emphasize CMI priorities, including space and aviation equipment, high-tech shipping, and new materials. SASTIND continues to be very involved in the plan's implementation. In June 2015, the State Council established a State Strong Manufacturing Power Building Leading Small Group administered by the Ministry of Industry and Information Technology to oversee the Made in China 2025 Plan. The SASTIND director is one of 20 members of this group.

There are many other efforts to

fortify specific sectors of significant strategic and defense importance. For example, the integrated circuit industry has benefitted from a host of state-led support, including State Council-issued guidelines, a leading small group, a \$25 billion investment fund, and additional CMI-focused initiatives.

Restructuring the Defense Research Institute System

Although the Chinese defense industry has made significant progress in its modernization, research institutes that belong to or are affiliated with the big ten defense corporations have been largely overlooked. These entities are a core component of defense firms' R&D capabilities and revenue. For example, 30 percent of China Shipbuilding Industry Corporation's (CSIC) 2014 profits came from its 28 research institutes.⁶

Three policy documents issued in 2016 cover major restructuring issues for defense research institutes, including asset management, personnel placement, social welfare, and taxation. The restructuring is expected to happen in the near future. The goal is to enhance higher-level innovation, facilitate CMI, and increase capital market investment in defense R&D.

Leveraging Capital Markets for Defense Investment

The defense industry is being opened up to the capital markets, and the big ten state-owned defense corporations seek to take advantage of the lucrative financial opportunities that

this may offer to better manage and leverage their assets. With firm orders on the books, a pipeline full of new generations of equipment under development, and high-level leadership support, the defense industry is attracting interest from a wide range of domestic investment vehicles that have appeared in the past couple of decades, and especially in the past few years.

SASTIND allowed firms to issue share placements using military assets as securitization beginning in 2013. CSIC became the first defense firm to undertake private share placement in September 2013. It raised US \$1.4 billion to acquire production facilities to manufacture warships.

The scale of transactions by the Chinese defense industry between 2010 and June 2016 has been impressive. Total equity and bond offerings from 2010 through June 2016 reached US \$62.87 billion, equivalent to 8.9 percent of the official Chinese defense budget. Total funds raised in public and private equity offerings totaled \$31.14 billion in the same period. The shipbuilding (US \$9.45 billion) and aviation (US \$9.75 billion) industries dwarfed the rest. Total bond issues from 2010 through June 2016 totaled \$31.73 billion. Shipbuilding led with US \$15.27 billion, followed by nuclear with US \$6.12 billion.⁷

Defense corporations will continue to raise large amounts from asset securitization deals and bond issues as well as from bank loans in the coming years. As of March 2016, the big ten defense companies had 80 subsid-

5 Ministry of Industry and Information Technology, 《中国制造2025》解读之六：制造强国“三步走”战略” [“Interpret ‘Made in China 2025’: ‘Three-Step’ Strategy to Become A Manufacturing Power”], May 19, 2015, <http://www.miit.gov.cn/n11293472/n11293832/n11294042/n11481465/16595227.html>.

6 军工科研院所分类改革文件或近期落地 [“Defense Research Institute Reform May Be Implemented Soon”], Xinhua, January 15, 2016, http://news.xinhuanet.com/finance/2016-01/15/c_128631763.htm.

7 Calculations for public and private equity offerings and bonds were aggregated from an IGCC database collecting capital market transactions of China's defense companies. Data for these transactions are compiled from numerous online sources for each of China's ten big defense conglomerates from 2010 through June 2016. Official announcements were referenced where possible. Data primarily reflects only capital market transactions of the parent companies. Data for Chinese domestic capital transactions is believed to be complete, but Hong Kong and overseas transactions may have missing data. Bonds do not distinguish between public bonds and interagency bonds. For private placement deals still being finalized, details such as investor and deal size are subject to change.

aries listed on China's stock exchanges, which accounted for around 25 percent of their total assets. Analysts estimate that if China follows the United States, which has around 70 percent of its defense industrial assets listed, Chinese firms could raise upwards of another RMB 1 trillion.

WEAKNESSES IN THE CHINESE DEFENSE INDUSTRY

The principal constraints and weaknesses that the Chinese defense industry faces at present stem from its historical foundations and uneven efforts to overcome this cumbersome legacy.⁸ The institutional and normative foundations and workings of the Chinese defense industry were copied from the former Soviet Union's command economy and continue to exert a powerful influence to the present day. The PLA and defense industrial regulatory authorities seek to replace this outdated top-down administrative management model with a more competitive and indirect regulatory regime, but there are strong vested interests opposed to any major

changes.

Other major structural weaknesses include the monopoly power of the state-owned industries; bureaucratic fragmentation; weak management mechanisms; an outdated pricing regime; and corruption.

Despite these failings, however, the top-down political system has strengths in its ability to mobilize and concentrate political interest, economic resources, bureaucratic coordination, and S&T capabilities on the handful of programs that receive close attention from the top leadership. Programs that fall within this category are unlikely to be challenged.

IMPLICATIONS FOR US-CHINA MILITARY TECHNOLOGICAL COMPETITION

The prospects for the Chinese defense industry to successfully transition from an innovation follower to an original innovator able to engage in higher-end technological development appears encouraging. As the Chinese defense industry becomes more self-reliant and less depen-

dent on foreign sources, it will have a greater ability to forge a more independent development path. As the pace and intensity of the Chinese defense industry's restructuring efforts quicken, the United States will find its window of opportunity to pursue the Third Offset Strategy and restore its strategic superiority narrowing.

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⁸ This section is based on "Weaknesses in PLA Defense Industries," chapter 6 in Michael Chase, et al., *China's Incomplete Military Transformation: Assessing the Weaknesses of the People's Liberation Army (PLA)* (Santa Monica, CA: RAND, 2015).