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China's Space Strategy and Modernisation

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"China has a space lab in orbit and it also plans to launch 100 satellites during its on-going five year plan from 2011-15. Twenty space craft will be launched this year including its third lunar probe and a manned space craft that will dock with China's space lab. There are indications that, by 2020, China may have more than 200 space craft in orbit accounting for about one-fifth of the world's total".

Above example is one of the illustrations that emphasises that sustained high growth is the key to become a "comprehensive national power".

Mr. P. Chidambaram

India's Finance Minister while delivering the K. Subrahmanyam Memorial Lecture on Feb. 6, 2013 at IDSA, New Delhi. The entire speech is available at

[http://www.idsa.in/keyspeeches/Indias National Security Challenges and Priorities](http://www.idsa.in/keyspeeches/Indias%20National%20Security%20Challenges%20and%20Priorities), accessed on February 7, 2013

Introduction

This Issue Brief offers a macro view of the Chinese Space Programme. It discusses notions of modernity in China, the Chinese space policy/agenda and its impact on the overall security calculus. It is an accepted notion that "China's general silence on its own space programme unfortunately makes speculation a primary source of information". The paper attempts more of an issue centric rather than data centric analysis.

Former Chinese premier Zhou Enlai could be credited as the pioneering advocate of the idea of modernisation in China. He introduced this concept as part of an overall national strategy around 1975 and identified areas to be targeted, including agriculture, industry, science and technology and

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national defence. The concept was further perfected during Jiang Zemin's regime. The importance given to national defence under his leadership should be viewed against the fact that 'by the time he gave this call [modernisation], China had already established itself in the agriculture and industry sectors'. With the basic tenets of national development taken care of, Zemin concentrated on national security. The Cold War experience had demonstrated the importance of technology in developing the national security architecture. For China, it naturally followed that investments in military technologies, configuration of revolution in military affairs (RMA) and development of the military industrial complex were the essential subsets of security architecture development. It was under Zemin's leadership that various military and strategic guidelines were formulated.

The People's Liberation Army's (PLA) approach to modernisation has focused on induction of the latest weapons system and technologies, undertaking systemic reforms and developing new war fighting doctrines. Though China has been investing heavily in space technologies and modernisation over the past few decades, it is necessary to make a distinction between the military and civilian use of these technologies. Recent Chinese modernisation and investments in space technologies should not be viewed only from a military perspective. Space technologies also have strong civilian and scientific uses. The developments in the space arena, with socioeconomic consequences, have a major impact on the lives of the people. Besides, these technologies have a major commercial relevance too.

China's Space Programme

The Chinese space programme has been perceived as a mystery within a maze. The Chinese government, as a policy, has kept military and other technological developments under cover. Likewise, the Chinese space programme can be viewed as a large, complex, and closed network. However, in the recent past, the Chinese government has been demonstrating some form of transparency and has issued three White Papers on the subject. These Papers were issued in 2000, 2006 and 2011, respectively. An analysis reveals that the Chinese Space programme has a long history and has overall been a success story. The space programme attempts to cater to both civilian and strategic requirements. Moreover, the space technologies and achievements have a significant role in China's military modernisation programme.

What lies behind the 'Chinese space philosophy'? The primary factor driving this programme has been the Chinese desire and zeal for the expansion of comprehensive national power. The Chinese goal to achieve space supremacy forms part of its grand strategic objective. The other aspect of the space programme and expansion of space technology is linked China working towards sustaining high levels of economic growth which are essential for preserving internal stability and neutralising external threats to its national security.

Being at the pinnacle of scientific endeavours, a space programme has significant beneficial spinoffs. Not only does it help raise the technological sophistication of industry in general but also stimulates

innovation. Many of these spinoffs touch the day to day lives of people and tangibly contribute to a higher standard of living. Overall, the Chinese space programme is pursuing a well laid out and well thought of road map.

Assessment of Chinese Space Capabilities

The Chinese space programme has progressed consistently and its most striking feature has been a well developed launcher service. The Long March Series has been successful and has established for itself a good reputation internationally. It is no surprise that Beijing has announced plans to launch 100 satellites during 2011-15.¹ This is a significant demonstration of their capabilities. While other space giants in Asia like India and Japan manage two to four launches a year, China has already demonstrated its capability to launch more than 15 rockets in one year and proposes to continue this trend for the next couple of years too. In 2012, China undertook 19 space launches, overtaking the tally of the United States.²

China has successfully launched communications, remote sensing/reconnaissance, navigation, and meteorological satellites. It claims that its space programme has been largely based on indigenous systems. However, it has also had access to foreign platforms and services. There has always been a shade of technologies of Russian origin on China's space programme and that continues even today. In recent years, China has also developed various Signals & Electronic intelligence (SIGINT/ELINT) platforms, electro-optical and SAR imagery satellites, and radar satellites.

Beijing showcased its Anti-Satellite capability in January 2007 when it destroyed one of its own aging satellites. Unconfirmed reports suggest that China has also developed satellite jamming technologies particularly laser technologies, to temporarily disrupt satellites. The Chinese are also believed to be investing in small (nano) satellites technologies which could be used as space mines.

Significantly, Beijing has been investing in land-based mid-air missile interception technology. The first test was conducted in January 2010 and the second test was successfully carried out on January 27, 2013.³ There have been reports suggesting that China may be planning to conduct another ASAT test. According to Gregory Kulacki, senior analyst and China project manager for the Union of Concerned Scientists Global Security Program, another ASAT test is a "strong possibility".⁴ Some experts speculate that this time it might be undertaken in the medium earth orbit. A second test by China, as scholars have argued, could lead to 'military space activities' by its neighbours.⁵

China has made certain significant investments in the space arena which were the monopolies of the US and Russia all these years. Its manned space programme is praiseworthy: it has undertaken a few successful manned space missions and its astronauts have also conducted a space walk. The Chinese are working on development of a space station which is expected to be operational by 2020/22. This

project began with the launching of the space capsule Tiangong 1 which could be viewed as the first portion of the space station.

The first batch of astronauts is likely to visit this portion of the space station in the near future. For this purpose, the first robotic space docking mission—Tiangong 1 and Shenzhou 8—has been completed.⁶ China had announced that Shenzhou 9 would be launched sometime between June and August 2012.⁷ It successfully conducted this launch in June 2012. This mission also saw the first Chinese woman astronaut visiting outer space. Shenzhou 9 returned after completing a 13-day mission.⁸ Shenzhou 10 is expected to be launched in June 2013.⁹

The Chinese space programme has made significant investments in their ambition of reaching the Moon and Mars. In this context they have successfully completed their first moon mission and the second one is in progress. In the near future they are proposing to land a robotic craft on the moon's surface; a manned moon landing is aimed for by 2030. Presently, Beijing is working towards achieving landing of an exploratory craft on the moon in 2013. According to reports, the third lunar probe will be launched during the second half of 2013. It is expected to land on the moon and also transmit data.¹⁰

China is also working towards undertaking a Mars Mission in November 2013 as at this time Earth and Mars are closest. However, if this attempt fails the next window available for launch would be 2016.¹¹ An earlier attempt of the Chinese Mars Mission had failed due to the failure of the Russian Phobos-Grunt spacecraft in November 2011.¹² According to reports, the spacecraft reached the Earth's orbit but its 'thrusters never fired to propel it' towards Mars.¹³

Military aspects of Chinese space capabilities

The 1991 Gulf War, which displayed the capabilities of satellite technologies in war fighting, was the trigger for China to make investments in the military space arena. This effort gained further momentum and commitment following the “accidental” bombing of the Chinese Embassy in Belgrade by United States in 1999. Realising the dual-use capabilities of space technologies, China has made intelligent investments in space assets. Some scholars have argued that “Beijing's investments in counterspace technology are driven by uncompromisable strategic concerns”.¹⁴

These investments in communication and remote sensing technologies have applicability for PLA as well. Some of the Chinese satellites, officially declared as remote sensing satellites for resources management purposes, are believed to have military applications like reconnaissance.

In January 2012, China launched Ziyuan III which is its first high-resolution, stereo mapping satellite.¹⁵ This is likely to be functional for about five years and would be helpful in a number of civilian spheres like disaster management, resource management, water management etc. China has plans to build a

remote sensing mapping satellite system over the next 10-15 years.¹⁶ Satellite navigation is one area where China is making significant investments, both for military and commercial purposes.

China's Beidou series, also known as the Compass series of satellites, is expected to have 30 satellites in space: providing the country with a global footprint. Presently, China has a constellation of 16 navigation satellites and four experimental satellites.¹⁷ In December 2012, China declared its regional navigational system operational. Currently, it is using its Beidou satellites for the Asia-Pacific region.¹⁸ Compass is an alternative to the United States Global Positioning System (GPS). China has plans to make Compass fully operational by 2014 with commercial applicability capable of providing global services.¹⁹

China has succeeded in putting more than 50 percent of the infrastructure in place within a short span of 12 years. The rate of the achievement can be judged from the fact that the first Beidou satellite was launched in 2000.²⁰ To have a functional and accurate navigation system is an unparalleled strategic advantage in case of a conflict. Beijing is also looking at it from a commercial point of view and developing it as an alternative to GPS.²¹ The degree of commercial advantage can be garnered from the fact that in 2020 the total turnover of China's navigation service sector is estimated to touch 400 billion yuan (\$64 billion).²²

While China's various endeavours in space have civilian utility, the inherent dual-use nature of technology should not be overlooked. For instance, navigational satellites and remote sensing satellites are dual use in nature. They can help in force enhancement and also 'weapons guidance'.²³

China's investments in areas like the manned space programme or Moon/Mars mission do not seem to have any direct military applicability. But, it would be important to 'read between the lines' to appreciate China's military space capabilities. Particularly, the telemetric, tracking and control networks developed for these programmes could allow China to tweak this knowledge for military purposes—probably from developing connectivity to military operations to counter-space technologies. Also, the developments in fields like robotics could have a wider applicability in other areas, including military.

China also has plans to develop Stereo mapping satellites, radar satellites for environment and disaster monitoring and upgraded Earth observation satellites. All these could have military utility. Beijing is planning to upgrade the Long March launchers. The Chinese media has reported that, “the Long March 5 rocket will be able to launch a 25-ton spacecraft or satellite into low-Earth orbit, or launch a 14-ton payload into geostationary orbit”.²⁴ According to China Aerospace Science and Technology Corp (CASTC), “by 2015 China is aiming towards achieving a 10 percent share in the international satellite market and almost 15 percent share in the commercial launch field”.²⁵

China's Space Potential: Impact on India

India and China share a delicate relationship. Should the progress of Chinese the space programme at breakneck speed unnerve India? Should India assume that Beijing's investments in space have a major anti-Indian bias? It is important to appreciate that China's space programme is far ahead of India's in many fields and the latter just cannot catch up. At the same it is also important to factor in that India's investments in space are based on its own appreciation about what it expects from investing in space for its own needs besides the technological and financial advantages. India's annual investment in space is about \$1.5 billion; much lower than that of China, Japan, Russia, Europe and the United States.²⁶

Should the Indian establishment be worried about the Chinese military becoming more and more sophisticated and its state-of-art space infrastructure? It is important to note that space is an important element of the security architecture but not an end in itself. There is much speculation about the credibility and capability of the Indian space programme. It is important to note that India has no military space programme. However, it uses its existing assets for military purposes too. This is possible because of the dual-use nature of technology.

India's space programme is driven more by socioeconomic compulsions: it has no intention to copy China in this field. India has devised a roadmap for itself based on its future requirements. In the military domain, it proposes to launch a dedicated satellite for the Indian Navy in the near future. Proposals for the other services are also in the pipeline. The country is planning to develop its own navigational system that would cater to its regional requirements. India has a well-established missile programme, hence it could be inferred that the theoretical possibility exists of the country developing its own ASAT capabilities. However, presently there is no such proposal. What is important for India is not to get unduly alarmed by the Chinese achievements in space. It should instead develop its own military space security architecture based on its own strategic assessment.

Conclusion

China has made rapid strides in space. These achievements have been highlighted in the three White Papers on Space brought out by Beijing. China has followed a planned path for undertaking developments in the space arena—strategic requirements form a major part of space modernisation and given its success rate one can conclude that the Chinese space programme has a very bright future. Other countries can learn and gain much from the trajectory of the Chinese space programme.

However, there is no need for countries like India to blindly imitate and follow the Chinese path of development in every field. Beijing's ASAT test has been widely inferred to be a step towards the achievement of 'Great Power Status' and a move to counter the United States supremacy in space.²⁷ India should not overlook the counter-space capabilities developed by China. New Delhi must factor

in the presence and growth of China's military space potential in its security architecture. It is also important is to appreciate the gains made by China in space commerce and how it is using space technology as a tool in its foreign policy. It has begun to support the space programmes of a few developing countries. For China, the 'medium of space' is important not only for strategic reasons but for exercising its soft power status globally.

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