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Indian Space Association (ISpA): India on the Move in Space Domain

Major General PK Mallick, VSM (Retd), was commissioned into the Corps of Signals. The General Officer has wide experience in CI Ops, Command, Staff and Instructional Appointments. The officer has interest in Electronic Warfare, Cyber Warfare and Technology. Currently, he holds the COAS Chair of Excellence at CLAWS.

Key Points

- ISpA is a premier industry association of space and satellite companies, which aspires to be the collective voice of the Indian space industry.
- SpaceX has been driving down prices of satellite launch services and planning the provision of an internet service enabled by a constellation of thousands to tens of thousands of satellites.
- The expansion of the Internet in India is crucial to the present government's project of a digital India where a majority of government services are delivered directly to the people.
- Establishment of ISpA, IN-SPACe, NSIL is a well thought out revolutionary process. This will give huge boost to Indian innovators to show their skills.

Introduction

Prime Minister Narendra Modi, on 11 October, 2021, launched the Indian Space Association (ISpA), an industry body comprising various stakeholders of the Indian space domain.

The Prime Minister said, "ISpA is a premier industry association of space and satellite companies, which aspires to be the collective voice of the Indian space industry. It will undertake policy advocacy and engage with all stakeholders in the Indian space domain, including the government and its agencies. These reforms will provide opportunities for both industry and academia."

The members of ISpA include government bodies Organisation (ISRO) and private telecom companies. The founding members include leading domestic and global corporations that have advanced capabilities in space and satellite technologies such as Bharti Airtel, engineering firm Larson & Toubro, and other companies such as Nelco of Tata

Group, Sunil Bharti Mittal's OneWeb, Mapmyindia, Walchandnagar Industries and Alpha Design Technologies and Ananth Technology Limited . Other core members include Godrej, Hughes India, Azista-BST Aerospace Private Limited, BEL, Centum Electronics, and Maxar India. The first few start-ups to become members include Astrome Technologies, Pixxel, Agnikul Cosmos, Digantra, and Skyroot Aerospace.[1]

Lt Gen AK Bhatt (Retd) from 11 Gorkha Rifles who commanded the Chinar Corps at Srinagar and had been Indian Army's Director General of Military Operation will be the first Director General of ISpA while Jayant Patil, senior executive vice president, defence, L&T-NxT, will serve as Chairperson.

Background

Since the 2010s, the arrival of private players in the space domain has given a new dimension to the use of space and space security. Termed as New Space companies, pioneered by SpaceX, founded by Elon Musk and Blue Origin established by Jeff Bezos, they have taken centre stage and have brought about innovations in the space industry. Cube and microsatellites now can provide high-resolution imaging, geolocation and remote sensing. These services are now available in the commercial market. Companies like SpaceX, Blue Origin and Virgin Orbit have come up in a big way and are attracting the best and brightest young minds.

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Ten cubic centimetres CubeSat, weighs about two pounds and generally costs less than $100,000 to build. About 60 companies now sell them. It permits governments and companies with less financial resources to put a satellite into orbit for tasks like agriculture, oil spill or border monitoring. A launch market has emerged that caters to the CubeSat market.[2]

SpaceX has revolutionised the satellite launch market with its partially reusable Falcon 9 rocket. Its Starlink constellation is the world's largest active satellite constellation. It makes up approximately a third of all operating satellites in space[3] now. These new satellites can transform many aspects of everyday life, from bringing internet access to remote corners of the world to monitoring the environment and improving global navigation systems.[4]

Starship is different from any rocket that has come before it. After it gets operational, its payload capacity, size, ability to land and fly again and the number of vehicles that will be

built, will eclipse anything built over the past 70 years of spaceflight. The dimensions of Starship are mind-boggling. When fully stacked, the 164-foot-tall vehicle is only the second stage of a much larger two-stage rocket. Combined, Starship and the SuperHeavy booster will stand some 400 feet.[5]

Unmanned orbital flights may commence in 2021 and private manned flights around the Moon as early as 2022. Recently SpaceX won the National Aeronautics and Space Administration contract to provide lunar landing services with a lunar variant of Starship. The company also plans unmanned flight tests to Mars in 2024. When it arrives, a single Starship/SuperHeavy will be able to place more mass in orbit during a single launch than the entire world managed in total in 2020.

The rise of commercial rocket and space services companies is not restricted to U.S. and Europe. Many private companies have come up in China and India which can offer affordable and reliable launch services for small, micro and nano-satellites. Both China and India can lead the micro and small satellite market in the world and become a hub for affordable and reliable launches and space services.

China's Initiative. China has entered into this bandwagon. As of 2018, 141 aerospace enterprises have been registered in China. China currently has 36 satellite manufacturing enterprises, 22 launch vehicle manufacturing enterprises, 39 satellite operation enterprises and 44 satellite application enterprises. Some examples are:

- Established in 2015, Beijing Commsat Technology Development aims to launch
- 72 IoT satellites into LEO by 2022.
- Founded in 2016, Galaxy Space, has a scheme to provide high-speed global communications by launching up to 1,000 5G satellites into LEO.
- In 2016, Beijing Interstellar Glory Space Technology (iSpace) became the first Chinese private rocket company to successfully launch satellites with an independently developed rocket in July 2019. The solid propellant rocket Hyperbola-1, developed by iSpace, was launched from Jiuquan Satellite Launch Center administered by the SSF.

Currently, China's private space firms are in their early stages. It is premature for the PLA to use technologies or services that the companies developed. However, the Chinese version of New Space is growing at a rapid pace, supported by the government and the military under the military-civil fusion strategy. In the future the military is expected to adopt the technologies developed by the private sector and use them. The State Administration for

Science and Technology and Industry for National Defense (SASTIND) which is the primary organisation for China's civil space activities and the CMC Equipment Development Department, in June 2019, jointly created and released rules on manufacturing, test flights and launches of commercial rockets. The specific rules made it mandatory for commercial rocket companies to obtain SASTIND's prior permission for research and manufacturing and give prior notice to relevant departments before actually beginning research and manufacturing. The rules encourage companies to make maximum use of national resources for technology research, manufacturing equipment and facilities and launch sites.

In December 2019, the China Commercial Space Alliance was launched by entities including the China Space Foundation, China Volant Industry (CASIC subsidiary), China Great Wall Industry Corporation (CASC subsidiary) and Chinese Academy of Sciences Holdings. The Alliance plans to support member organisations through such activities as providing information under the guidance of the China National Space Administration (CNSA).

The CNSA serves as the public face of China's civil space efforts. China is using these efforts to augment relationships with countries worldwide. CNSA, in April 2018, stated that China had signed 21 civil space cooperation agreements with 37 countries and four international organisations.[6]

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Indian Initiative

Till recently, the ISRO's private engagement model has been restricted to sharing technological know-how or intellectual property with companies. ISRO has a monopoly over the purchase of its products and services. Private players have been demanding greater involvement in India's space sector to make ISRO more competitive with leading global players. The present government's decision aim at long-term technological, economic and industrial gains.

The space based communications networks in India, have taken off with number of global and Indian companies showing interest in providing high-speed and affordable Internet connectivity to inaccessible areas also. This includes SpaceX's StarLink, Sunil Bharti Mittal's OneWeb, Amazon's Project Kuiper, US satellite maker Hughes Communications, etc. By late 2022, OneWeb is expected to offer its high-speed, low latency connectivity services in

India. StarLink and Amazon have shown interest in a licence to provide satellite-based Internet services. SpaceX is also willing to invest in the Indian space segment.[8]

The expansion of the Internet in India is crucial to the present government's project of a digital India where a majority of government services are delivered directly to the people. Though the government aims to connect all villages and gram panchayats with high-speed Internet through BharatNet, internet connectivity in hilly and far-flung remote areas are still a challenge. To overcome this problem, satellite Internet will be crucial where terrestrial networks have not reached.[9]

ISpA will drive space reforms based on "four pillars" of space technology. They are :

- The freedom to innovate in the private sector.
- Making the government act as an enabler.
- Preparing the next generation for the future of the space industry.
- Ensuring the space sector is used as a common resource for the progress of humanity. Development projects are being monitored by satellite imaging, space technology is being used in settlement of Fasal Bima Yojna claims and disaster management planning, and the NAVIC system is helping fishermen.

ISpA will focus primarily on capacity building and creation of space hubs and incubators in the country for private space start-ups. It will work in tandem with New Space India Ltd (NSIL), a central public sector enterprise under the Department of Space (DOS), which functions as the commercial arm for ISRO and secures launch contracts from customer satellites. The association will also work with IN-SPACe, which acts as a regulator facilitating the use of government facilities to private companies. IN-SPACe will ensure a level playing field for private companies to use Indian space infrastructure and a friendly regulatory environment.

ISRO will continue to function as the core space organisation in India with decision-making authority related to activities, missions and projects. It will focus more on Research and Development (R&D), exploring new technologies, and planning new space missions.

These reforms will enable and promote private players to carry out independent space activities, facilitate services and technology created by the ISRO to be utilised by the private sector, provide regulatory and policy inputs and inspire and promote a conducive ecosystem for start-ups, MSMEs and academia.[10]

ISpA is expected to do the following:

- Be the collective voice of the Indian space industry and undertake policy advocacy and engage with all stakeholders in the Indian space sector, including the government and its other agencies, NSIL IN-SPACe, among others.
- Make India self-reliant, technologically advanced and a leading player in the space arena.
- Support space start-ups and work towards facilitating and enabling private companies to work in coordination with IN-SPACe and ISRO.
- Formulate an enabling policy framework that fulfils the government's vision of leading commercial space exploration and space-based communication.
- Work towards building global linkages for the Indian space sector to bring in more investments and develop critical technology to create more high-skilled employment.
- Focus on the creation of space hubs and incubators and capacity building in the country for private space start-ups.

Why ISpA? The reasons are:

- Lack of policy revision in the past. Inadequate funding to ISRO.
- Shortage of private industries that specialises in space technology. They lack in developing world-class software, and advanced material science industries in India.
- Currently, most of the materials and software are imported. A huge gap exists between India and other advanced countries in the space field. Advanced countries develop most of their requirements in-house.
- To fill this huge gap between demand and supply more industries are needed.
- Has the potential to generate 10 to 15 times the current revenue. This will generate a lot of employment opportunities and develop much-advanced technology.
- Through the help of private agencies, invest heavily in material science, material industries, electronics industry, software industry, start-ups, and many more.

Conclusion

India is alive to the recent developments in cyber space and the role of private players and entrepreneurs. Establishment of ISpA, IN-SPACe, NSIL is a well thought out revolutionary process. This will give huge boost to Indian innovators to show their skills. No wonder the private industry is very excited about this initiative by the government.

End Notes

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CENTRE FOR LAND WARFARE STUDIES (CLAWS)
RPSO Complex, Parade Road, Delhi Cantt, New Delhi 110010
Tel.: +91-11-25691308, Fax: +91-11-25692347, CLAWS Army No. 33098; Email: landwarfare@gmail.com
Website: www.claws.in