SSPC Issue Brief

Comments on ISRO's Draft National Space Transportation Policy-2020

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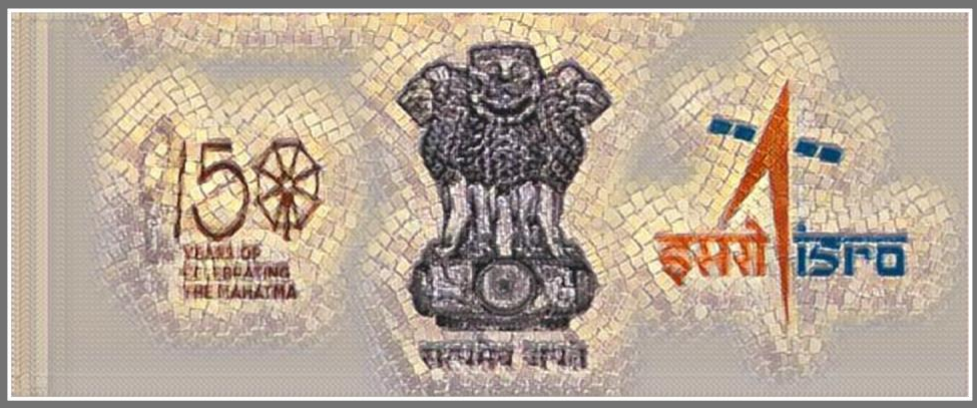
Indian Space Research Organisation (ISRO) has presented a Draft National Space Transportation Policy-2020 in the public domain for comments. This issue brief is a humble attempt toward that effect. It identifies why ISRO has come out (timing) with this policy and offers some observations on this draft policy.



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INTRODUCTION

Indian Space Research Organisation (ISRO) has put its Draft National Space Transportation Policy-2020 in the public domain and is keen to have comments on the draft policy by July 21, 2021.[1] Bringing reforms in the space sector has been ISRO's/GoI's priority for a long. Essentially, since the inspection of ISRO private sector has been associates with ISRO in some form or other. For more than a couple of decades, there has been a significant contribution by the private sector in various missions undertaken by ISRO. On occasions, this contribution has even exceeded more than 70%. It is also important to note that Hindustan Aeronautics Limited (HAL) plays a vital role in developing various satellite systems.

It is a crucial document that has been very thoughtfully prepared by ISRO, presenting various guidelines for the space sector regarding space transportation systems. Such systems comprise multiple classes of launch vehicles, provide secure and reliable access to space for building space infrastructure. As per ISRO, Indian space transportation systems also enable the commercial exploitation of increasing opportunities for launch services and human spaceflight to near-earth orbit & robotic space exploration.[2]

ISRO and Sanctions Regime

The US has imposed sanctions against the Russian space organisation Glavkosmos and the Indian Space Research Organization (ISRO) because of the transfer of rocket engine technology during May 1992.[3] Subsequently, after India conducted the Pokhran-II tests (1998), many Indian agencies were slapped sanctions, including various laboratories and private companies. ISRO was dealt a considerable blow owing to this. Finally, it was a success of the Indo-US nuclear deal, which eventually led to the removal of various Indian agencies, including ISRO, from the so-called Entity List. Officially, this is known to have happened during 2011. However, it took few more years for the actual start of high-tech trade and transfer of technology to happen. Hence, for long, it was challenging for ISRO to look at large-scale reforms involving private industry and thereby international collaborations since ISRO was put under the sanctions regime.

[1] ISRO, "Draft National Space Transportation Policy-2020," June 24, 2021, https://www.isro.gov.in/sites/default/files/draft_national_space_transportation_policy.pdf
[2] Ibid.
[3] "U.S. Sanctions Imposed On Russian, Indian Space Groups," *Federation of American Scientists*, November 05, 1992, https://fas.org/nuke/control/mtcr/news/920511-227224.htm

GSLV: An Overstretched Process of Development

ISRO took a significant amount of time to develop the cryogenic engine required for the Geostationary Satellite Vehicle (GSLV). The GSLV-D5, launched on January 05, 2014, was a successful mission, and the third stage of this rocket was the indigenous cryogenic stage. The first developmental flight (GSLV MkIII-D1) of India's heavy-lift launch vehicle GSLV Mk-III was successfully conducted on June 05, 2017, with an indigenous cryogenic upper stage.[4] India has an operational fleet of three launch vehicles, namely PSLV, GSLV and GSLVMkIII. Also, soon ISRO would be adding one more vehicle to its fleet called Small Satellite Launch Vehicle (SSLV). The availability of such indigenous end-to-end capabilities in space transportation systems acted as a confidence catalyst for ISRO to push for more reforms, thereby enhancing the role of private players.

On March 05, 2019, a Public Sector Enterprise of Government of India and commercial arm of ISRO called New Space India Limited was established.[5] Simultaneously, India was also witnessing new private players in the space sector with larger ambitions and capabilities. In May 2020, Union Finance Minister announced reforms in the space sector with significant thrust on privatisation. It was mentioned that the intention was to provide a predictable policy and regulatory environment to private players. With this as the backdrop, ISRO has presented Draft National Space Transportation Policy-2020 for discussion.

Draft in Action

As per this draft, the Indian National Space Promotion & Authorization Center (IN-SPACe), an independent body formed by the Government of India, under the Department of Space (DOS), is set to play a major role towards authorising space launches (orbital or sub-orbital) from Indian territory. This draft is comprehensive and covers several details associated with various aspects of space transportation systems, thus establishing different policy guidelines, authorisation processes, and norms. The clear enunciation of policies would be a considerable aid to the private sector to

[4] "All You Need To Know About Isro's Indigenous Cryogenic Engine Used In The Gslv Mkiii-D1 Mission, *First Post*, June 05, 2017, https://www.firstpost.com/tech/news-analysis/all-you-need-to-know-about-isros-indigenous-cryogenic-engine-used-in-the-gslv-mkiii-d1-mission-3704031.html

[5] NewSpace India Limited (NSIL) is the nodal agency for carrying out PSLV production through Indian Industry under consortium route. The industry consortium will be responsible for producing, assembling and integrating launch vehicles, incorporated on 6 March 2019 (under the Companies Act, 2013) is a wholly owned Government of India company, under the administrative control of Department of Space (DOS). https://www.isro.gov.in/about-isro/newspace-india-limited-nsil

establish itself methodically. Broadly, this policy document assures that IN-SPACe will provide a level playing field for private companies and also hand-hold, promote and guide the private industries through a friendly regulatory environment. ISRO also stands to offer testing facilities to private agencies. All this is expected to boost private investments in the space sector.

ISRO has been formulating various sector policies for a long time, with National Space Transportation Policy being third in this series. India released its first Satcom Policy in 1997 and, subsequently to cater to newer developments in the space sector, came out with a set of norms, procedures and guidelines during 2000. The latest update in this regard came in the form of the Draft Spacecom Policy 2020. ISRO's first commercial arm Antrix Corporation Ltd, established in 1992, is responsible for granting license for acquisition/ distribution of IRS (Indian Remote Sensing) data outside India.[6]

Today, if the Indian space sector was to evolve in a big way, then there is a requirement of investments from Indian industries as well as foreign investors. Unfortunately, barring very few exceptions, no major Indian business houses have shown any interest to invest in the space area. Hence, a lot is expected from foreign investments. Foreign Direct Investment (FDI) of up to 100% has been allowed in satellites-establishment and operation, subject to governmental clearances. The space transportation sector needs FDIs, but surprisingly the Draft National Space Transportation Policy-2020 is silent on this issue.

There are concerns in some quarters, particularly in the mind of possible foreign investors, about the possibility of the conflict of interest. Though the Department of Space is the regulator, it is also a critical service provider through ISRO. Hence, there is a possibility that ISRO would indirectly ensure that their commercial interests are not affected.[7] Deciding conflict-of-interest situation is crucial to good governance, and the Department of Space needs to ensure that the interests of the space industry are not unduly compromised to safeguard ISRO's turf.

Domestic Requirements

In 2019, the New Space India Ltd called for Expressions of Interest (EoI) from the domestic private sector to make five Polar Satellite Launch Vehicles (PSLV) rockets.[8] The space

[6] For more about Antrix Corporation Ltd, See, https://www.antrix.co.in
[7] "Policy black holes spook space investors", *The Hindu*, July 05, 2021, https://www.thehindu.com/business/policy-black-holes-spook-space-investors/article35157602.ece
[8] "Isro's new commercial arm invites private sector to make PSLV rockets", *Business Standard*, November 27, 2019, https://www.business-standard.com/article/economy-policy/isro-s-new-commercial-arm-invites-private-sector-to-make-pslv-rockets-119081700961_1.html

transportation policy is not expected to dwell in the details of any such specific programs. However, the formation of such policy offers an opportunity to frame guidelines for the consortium and public-private-partnership (PPP) model, which in reality, PSLV privatisation is expected to follow. The operationalisation of a small satellite launch vehicle (SSLV) could go in a big way to establish India as an important player in the small satellite launch business segment. With the development of this vehicle, ISRO could be reaching somewhat closer to the idea of 'Launch on Demand (LOD)'. The ability to place satellites into orbit as per the requirement is what LOD means. ISRO would be required to work on designing another launch vehicle for such purposes. Such conditions are expected to come from the armed forces. Also, in the ensuing years, Indian armed forces are likely to demand the launching of more military-specific satellites. Hence, before finalising this policy document, it would be prudent for ISRO to discuss in detail (if it has not been done already) the likely pros and cons with the Defence Space Agency (DSA).

On April 8, 2016, a SpaceX Falcon 9 rocket launched a payload into space and received the first stage of the rocket back on the earth. It was programmed to drop down onto a floating drone ship in the Atlantic Ocean.[9] It is expected that many launcher agencies would develop similar technologies in this direction because receiving the first stage back, which could be reused, helps in insignificant cost-cutting for future missions. Such stages usually splash down in the high seas. In 2007, ISRO had conducted the Space Capsule Recovery Experiment (SRE).[10] This spacecraft remained in orbit for 12 days, re-entered the Earth's atmosphere, and splashed down into the Bay of Bengal. Subsequently, the recovery of the SRE module was carried out by the Indian Coast Guard and the Indian Navy. Since ISRO and the Indian Navy were government agencies, it was easy to coordinate such operations. Now with the entry of private players, similar ease of coordinated operations may not exist. Hence, the transportation policy should enunciate guidelines in this regard. Also, states like Russia and China have already proven the efficacy of putting satellites in space by launching a rocket from an ocean platform. There is a possibility that ISRO or any other private agency could experiment with such launch platforms in future and thereby promoting a need to articulate its guidelines for such launches.

When India succeeds to establish its space station, there could be the traffic of robotic crafts to cater to the logistical needs of the space station. At the draft stage, it would be wiser for the drafters

[9] "SpaceX successfully lands its rocket on a floating drone ship for the first time", *The Verge*, April 08, 2016, https://www.theverge.com/2016/4/8/11392138/spacex-landing-success-falcon-9-rocket-barge-at-sea

[10] "SRE : Mission Successful", *Sainik Samachar*, March 2007, http://sainiksamachar.nic.in/englisharchives/2007/mar01-07/h4.htm

of this policy to ensure that the policy document is infallible in respect to various possible futuristic missions and new launch vehicles. It could be argued that the language used in the draft policy could cater to all such programmes. However, to avoid any possible exploitation by space lawyers, it could be prudent to work on some specifics at this stage. For the same reason, in the section of definitions of the draft document, there is a need to clearly define what 'Indian Territory' means.

Policy Considerations

Policy documents generally have a long-term validity and are expected to have less frequent reviews. Hence, it is imperative for ISRO to address futuristic issues of significance. This draft caters to regulations regarding sub-orbital launches and mentions that such launches would happen for technology demonstration/validation. Globally, technology testing is being carried out from the point of view of undertaking sub-orbital tourism, either by using balloons or by using spacecraft. It is crucial to have a specific regulatory mechanism from the point of view of using space transportation systems for space tourism. Also, 'sample return missions' have already become a reality. In future, if any such missions were to take place in the Indian context, then issue about the ownership of those samples brought from the Moon, Mars or Asteroids would arise, thereby demanding a need to have clarity in this regard.

Formulation of any policy document is incomplete if it is not approved in the parliament. Making a draft available publicly for comments is the first step. Subsequently, such documents are required to be finalised and presented to the parliament for approval. On October 15, 2020, to seek comments, ISRO had presented the draft Spacecom Policy-2020 and Spacecom NGP-2020.[11] But there has been no news about its further progress. More importantly, the draft Space Activities Bill was released in 2017, but it is yet to be introduced in the parliament. The need of the hour is that we require a separate legal structure for India's space sector. The growth of the space sector with a significant contribution from private industry cannot be feasible without considering its legal legs. The recently announced Draft National Space Transportation Policy-2020 is a decent and much-needed document but needs to be finalised in a definite period of time.

In Closing

ISRO has an excellent track record for undertaking space missions. Commercially also, ISRO is thriving, and there is no dearth of customers for them. Now India is planning to showcase various dimensions of its space power during the forthcoming World Expo. This is being organised in

[11] "Draft Space Based Communication Policy of India – 2020 (Spacecom Policy - 2020)", October 15, 2020, https://www.isro.gov.in/sites/default/files/draft_spacecom_policy_2020.pdf

Dubai from October 1, 2021, to March 31 2022. This offers an excellent opportunity for ISRO/ New Space India Ltd to display their technologies and network with various other space agencies globally. Apart from bagging commercial contracts, this opportunity should also be used for evolving new collaborations and checking on the technology transfer possibilities.

All in all, the growth of ISRO and India's space private sector would much depend on the availability of transparent policy structure. For this purpose, having ground rules for business is a must and Space Transportation Policy-2020 is one step in that direction. Having various norms, guidelines, procedures, and regulatory and legal structures in place is extremely important. Dept of Space/ISRO needs to ensure that along with the Space Transportation Policy-2020, the other pending policies like the Spacecom NGP-2020 and Space Activities Bill (2017 draft) are also tabled in parliament quickly for the fast governmental approval.

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The views expressed in this article are solely that of the author.

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