

Privatisation of PSLV

What the Law of Outer Space Demands

*Kumar Abhijeet**

Abstract

The Indian Space programme made a humble beginning in the year 1963 with experimental sounding rockets from Thumba, Kerala. For this launch everything including the payloads and rockets came from outside India. But by 1980 India developed its indigenous Satellite Launch Vehicle (SLV). Thereafter India has been continuously striving to develop its launch technology. The Polar Satellite Launch Vehicle (PSLV) first launched in September 1993 that has notched up 38 missions to date is the most active launch vehicle in India. Except for one failure during its maiden flight in 1993, the rest has been successful. To boost launch capacity and consequently increase the frequency of launches, India is working towards privatizing the PSLV operations. Hopefully by 2020 launch of the first privately built rocket is expected.

Though the private launch operation shall be opening myriads of opportunities for Industries but it shall open floodgates of liability for the Government because the Outer Space Treaty imposes unlimited liability for damages caused by space objects upon the 'launching state'. States bear international responsibility for national activities, whether such activities are carried by Governmental or non-governmental entity for ensuring that national activities are carried out in conformity with provisions of the Outer Space Treaty. The launching state also bears the responsibility of registering the space object. Though private players will operate future launches, the Government of India shall still bear liability for all such launches. There is no way by which this liability may be evaded but certainly a way for recourse can be devised. The privatization of PSLV demands the domestic law for such launches be accordingly developed in consonance with India's international obligations. This paper has been written in four parts. In the first part a brief overview of Indian Space programme shall be given. The second part shall reflect upon the international obligation for carrying out a space activity and the third part shall uncover the legal landscape for space activity in India. The fourth part shall discuss how the legal system in India must be developed to facilitate privatization of PSLV.

I. Introduction

Last June India set a record in its space programme, India successfully launched twenty satellites in a single mission on board ISRO's workhorse PSLV-C34 from the Satish Dhawan Space Centre (Space Port of India located

* National Law School of India University, India, Kumarabhijeet@nls.ac.in.

at Sriharikota). The PSLV is one of world's most reliable launch vehicles that has been in service for over twenty years and has proved its versatility by launching Geosynchronous, Lunar and Interplanetary spacecraft successfully.¹ Except for its maiden flight in 1993 there has not been any failure and it continues to support Indian and foreign satellite launches.² In order to step up the launch capacity India is in process of exploring the possibility of involving Indian industry in a greater role to meet the increased national requirements and possible commercial demand for launch services.³ With this objective it is expected by 2020 the operation of PSLV is likely to be privatized.⁴

Though private launch operation shall be opening myriads of opportunities for Industries but it shall open floodgates of liability for the Government because the Outer Space Treaty imposes unlimited liability for damages caused by space objects upon the 'launching state'. States bear international responsibility for national activities for ensuring that their national activities are carried out in conformity with provisions of the Outer Space Treaty, whether such activities are carried by Governmental or non-governmental entity. Activities of non-governmental space activity require 'authorization and supervision.

Privatization of PSLV demands a domestic law is accordingly developed in consonance with India's international obligations. This paper has been written in four parts. In the first part a brief overview of Indian Space programme is given. The second part uncovers the international obligation for carrying out a space activity and the third part highlights inadequacy of the existing legal landscape for space activity in India. The fourth part emphasize that the legal system in India must be developed to facilitate privatization of PSLV.

II. Five Decades of the Indian Space Programme

On 21 November 1963 with the launch of experimental sounding rockets from Thumba, Kerala, the birth of Indian space programme took place. For this launch – all that was required for the launch including the rocket, payload and tracking equipment came from outside India. Fifty years down the line of inception of space programme, India was aspiring for the Red planet with all its indigenously built space technology and ten months after

1 See <http://www.isro.gov.in/launchers/pslv> (accessed August 2016).

2 N. Narayanamoorthy, PSLV: The Workhorse of ISRO in P. V. Manorajan Rao et. al. (Eds.) From Fishing Hamlet to Red Planet – India's Space Journey, Harper Collins Publishers India, 2015 Pp. 137-166.

3 Press Information Bureau, Government of India, Department of Space, 20-July-2016; <http://pib.nic.in/newsite/PrintRelease.aspx?relid=147347> (accessed August 2016).

4 Srinivas Laxman, Plan to Privatize PSLV Operation by 2020: ISRO Chief in Times of India, 15 February, 2016. See <http://timesofindia.indiatimes.com/India/Plan-to-largely-privatize-PSLV-operations-by-2020-Isro-chief/articleshow/50990145.cms> (accessed August 2016).

the launch,⁵ on 24 September 2014, India became the first country in the world to put a satellite in the orbit of Mars in its maiden attempt. This bon voyage was on board PSLV itself.

Today Indian space programme has three vibrant facets or rather four facets launch vehicles; satellite manufacture & satellite application and inter-planetary exploration. The Mars Orbiter Mission⁶ and the Lunar mission – *Chandrayan 1*⁷ are just a beginning, there are many more to come. The vibrant satellite programmes of India are comparable to the best anywhere in the world, but what makes it different is the way in which these satellites deliver services to the society.⁸ The Indian National satellite System (INSAT)⁹ and Indian Remote Sensing satellite system (IRS)¹⁰ enabled India's telemedicine, tele-education, village resource center programme and many others exceptionally successful one. GAGAN¹¹ (GPS Aided GEO Augmented Navigation) and IRNSS¹² (Indian Regional Navigation Satellite System) are yet another robust evolving satellite application for navigation purpose in India.

The above mentioned space application and planetary exploration has been facilitated by self-reliant access to space technology. In the last five decades India has developed dynamic launching capabilities. Satellite Launch Vehicle-3 (SLV-3)¹³ was India's first experimental satellite launch vehicle, capable of placing 40 Kg payloads in Low Earth Orbit (LEO). The successful culmination of the SLV-3 project showed the way to advanced launch vehicle projects such

5 On 5th November 2013, India launched its Mars Orbiter Mission.

6 Was launched on 5 November 2013 by the ISRO and has entered Mars orbit on 24 September 2014. See <http://www.isro.gov.in/update/24-sep-2014/mars-orbiter-spacecraft-successfully-inserted-mars-orbit> (accessed August 2016).

7 ISRO launched the spacecraft on 22 October 2008. The vehicle was successfully inserted into the Lunar orbit on 8 November 2008. See <http://www.isro.gov.in/Spacecraft/chandrayaan-1> (accessed August 2016).

8 S.K. Das, *Introduction in Touching Lives – The little Known Triumphs of the Indian Space Programme*, Penguin Publishers, 2007, p. xii.

9 The INSAT (Indian National Satellite System) is a series of multipurpose geostationary satellites launched by India to satisfy the telecommunications, broadcasting, meteorology and search-and-rescue needs of India.

10 IRS (Indian Remote Sensing Satellites) is a series of earth observation satellites, built, launched and maintained by India. The IRS series provides remote sensing services to the country.

11 The GAGAN is a joint venture between Indian Space Research Organization and Airport Authority of India (AAI) to deploy and certify an operational Satellite-based augmentation system (SBAS) providing seamless navigation service to civil aviation.

12 IRNSS is the first regional satellite navigation system built by India with the objective to provide accurate positioning information to users in India.

13 SLV-3 was successfully launched on July 18, 1980 from Sriharikota Range (SHAR), when Rohini satellite, RS-1, was placed in orbit, thereby making India the sixth member of an exclusive club of space-faring nations. See <http://www.isro.gov.in/launchers/slv> (accessed August 2016).

as the Augmented Satellite Launch Vehicle (ASLV),¹⁴ Polar Satellite Launch Vehicle (PSLV)¹⁵ and the Geosynchronous satellite Launch Vehicle (GSLV).¹⁶ As of today India has two operational launchers: PSLV and GSLV. A third launcher of higher payload capacity, GSLV Mk – III,¹⁷ is being developed. India is also in the process of developing reusable launch vehicles.¹⁸ So far space activities were completely in governmental domain and so there was not much felt need for a law but with private sector involvement the scenario is much different. The next paragraph will discuss about need for a law in light of private sector participation.

III. Requirements of International Space Law

Privatization of PSLV raises two categories of legal issues; (i) obligations arising out of international space treaties (ii) legal issues that inevitably arises when private sector participates in the commercial space sector.¹⁹ In this section requirements of international space treaties have been discussed. India has signed and ratified the Outer Space Treaty, the Rescue Agreement, the Liability Convention and the Registration Convention. The Moon Agreement has been signed by India but not yet ratified.

Authorization and Supervision of Non-Governmental Activities

Article VI of the Outer space Treaty establishes an international responsibility for national activities upon States. States bear responsibility for assuring that such activities are carried out in conformity with the provisions of the Outer Space Treaty. Article VI of the Outer Space Treaty considers governmental as well as non-governmental activities alike which means States bear international responsibility not only for the governmental activities but also for their non-governmental activities. As part of this responsibility, the

14 The Augmented Satellite Launch Vehicle (ASLV) Programme was designed to augment the payload capacity to 150 kg, thrice that of SLV-3, for Low Earth Orbits (LEO). Under the ASLV programme four developmental flights were conducted. See <http://www.isro.gov.in/launchers/aslv> (accessed August 2016).

15 PSLV can take up to 1,750 kg of payload to Sun-Synchronous Polar Orbits of 600 km altitude. It has also been used to launch various satellites into Geosynchronous and Geostationary orbits.

16 GSLV can carry payloads up to 2,500 kg to Geosynchronous Transfer Orbits and up to 5000 Kg in in Low Earth Orbits. See <http://www.isro.gov.in/launchers/gslv> (accessed August 2016).

17 It will be capable of placing 4000 Kg class Geosynchronous satellites into orbit. See <http://www.isro.gov.in/launchers/lvm3> (accessed August 2016).

18 <http://www.isro.gov.in/launcher/rlv-td> (accessed August 2016).

19 Ranjana kaul and Ram S. Jakhu, Regulation of Space Activities in India in Ram S. Jakhu (Eds.) National Regulation of Space Activities, 2010, Springer, 164.

appropriate State shall authorize and continuously supervise the activities of non-governmental activities.²⁰

The question that arises is which is the appropriate state to authorize and supervise the activities of non-governmental activities? It is generally the state that has jurisdiction over an activity that bears international responsibility for space activities.²¹ According to general aspects of public international law a State has jurisdiction over an activity that is carried on from its territory as well as that is carried on by its nationals (natural or juridical persons).²²

From the above discussion It follows (i) States bear international responsibility for launch services offered from their territory or undertaken by their nationals (natural or juridical persons); (ii) all private launch services must be in accordance with the provisions of the Outer Space Treaty and (iii) all such launches must be 'authorized and continuously supervised'. Prof. von der Dunk has expressed even though activities are private but responsibilities are public.²³

Article VI of the OST only mandates for authorization and continuing supervision. The manner in which these requirements are to be fulfilled is left to the discretion of States. It could be fulfilled by way of contractual relation or through a specific legislation or through any other means. Legislation will be preferable because it will not only ensure predictability, transparency and stability establishing 'rule of law' but will also safeguard State interest.

Liability for Damages Caused

A 'launching state' bears international liability for damages caused by space object to another State Party.²⁴ The Liability Convention further elaborates that for damages caused on earth States bear absolute liability²⁵ and for damages caused elsewhere it is on fault based.²⁶ As narrated in the Outer Space Treaty²⁷ and reiterated in the Liability Convention²⁸ and the Registration Convention²⁹ a launching State is a State which launches or procures the launching of a space object and/ or from whose territory or facility a space object is launched. The term launching also includes failed

20 Sentence 2 of Article VI, Outer Space Treaty.

21 Frans von der Dunk, *Private Enterprise and Public Interest in the European Spaceage*, 1998, Leiden University 19.

22 H. Bittlinger, 'Private Space Activities – Questions of International Responsibility' (1987) *Proceedings of the 30th Colloquium on the Law of Outer Space*, 193.

23 F. G. von der Dunk, *The Origins of Authorisation: Article VI of the Outer Space Treaty and International Space Law in Frans G. Von Der Dunk (eds.) National Space Legislation in Europe*, 2011 Martinus Nijhoff Publisher, 3.

24 Article VII Outer Space Treaty.

25 Article II Liability Convention.

26 Article III Liability Convention.

27 See Article VII.

28 Article 1(C) of the Liability Convention.

29 Article 1 (a) of the Registration Convention.

launching.³⁰ Therefore damages resulting from the private launch services or failed launches shall be borne by the respective State. Since damages are future oriented, for every launch a launching state incurs unlimited liability forever. Concept of State liability that is ‘unlimited in time, quantum and territory’³¹ is strong incentive for states to take appropriate steps to minimize the risk of damage and to avoid this liability from being engaged.³² State has vital interest to ensure that technology used is safe and the operator is competent and reliable.³³ These can be better achieved through legislation. It is to be noted that international liability cannot be altered through domestic legislation but it can prescribe procedures and verification process to minimize the risk.³⁴

Registration of Space Objects

The Registration Convention regulates in detail the establishment of an international register of space objects with the UN Secretary-General³⁵ and demands the establishment of a national register for space objects by the respective states.³⁶ The obligation to register is incumbent on the ‘launching State’. In cases of joint launches only one of them shall register the space object because jurisdiction and control shall only be exercised by one state.³⁷ The operators of private launch service must furnish necessary information which can then be forwarded to the UN Registry.³⁸

IV. Space Law in India

It seems space law in India is still in its infancy stage. The International Treaties largely define the legal landscape for space activities in India.

It is the Constitutional obligation of India to foster respect for international treaty(s).³⁹ Constitutional mandate to respect international treaty obligation

30 Article 1 (b) of the Liability Convention.

31 Armel Kerrest de Rozavel & Lesley Jane Smith, Article VII, in Stephan Hobe, Bernard Schmidt-Tedd & Kai-Uwe Schrogl (Eds.) Vol 1. Cologne Commentary on Space Law 2009, Carl Heymann Verlag, 135.

32 Irmgard Marboe, National Space Legislation in Von der Dunk (Eds.) Handbook of Space Law 2015, Edward Elgar Publishing Limited, 137.

33 Ibid.

34 Irmgard Marboe, Setsuko Aoki and Tare Brisibe, Commentary on Recommendation on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space in Stephan Hobe, Bernard Schmidt-Tedd & Kai-Uwe Schrogl (Eds.) Vol 3. Cologne Commentary on Space Law 2015, Carl Heymann Verlag, 496.

35 Article III (I) of the Registration Convention.

36 Article II (I) of the Registration Convention.

37 Article VIII of the Outer Space Treaty read with Article II(2) of the Registration Convention.

38 Article IV Registration Convention prescribes for the kind of information to be furnished to the Un registry.

39 Article 51 (c) of the Constitution of India.

can be ensured either through legislative action⁴⁰ or through executive action.⁴¹ At present space treaty obligations are implemented through executive action exercised by the President of India without invoking the power of the legislature.

Article 77 of the Constitution of India lays the basic principle for conduct of business of the Government of India. All executive action of the Government of India is expressed to be taken in the name of the President who has the power to make rules for the more convenient transaction of the business of the Government of India. Pursuant to the power conferred to the President of India, the Government of India (Allocation of Business) Rules, 1961 has been enacted. The first schedule Rule 2(45) of the Allocation of Business Rules (AOB) accommodates Department of Space (DoS) and the second schedule allocates powers and functions to the DoS relating all matters to space science, space technology and space applications including international relations in matters connected with Space.

It is AOB rules that the Department of Space exercise unlimited, un-codified powers regarding space activities. The private actors have largely been participating in space activities through contractual relations with DoS, Antrix Corporation – the Commercial arm of Indian space activities.

The current practice of regulation of space activities is essentially limited to communication satellites and remote sensing satellites controlled through SATCOM Policy, Remote Sensing Policy and Norms and Guidelines and procedure for Satellite Communication. However it is not clear whether licensing requirements for commercial launches also include the issuances of authorization, continued supervision mechanism and matters related to financial risk management.⁴²

V. The Way Forward

The current legal regime for space activities in India is grossly inadequate to answer the legal concerns in the wake of privatization of PSLV. Therefore it will be in India's interest that it adopts appropriate legislation to that effect addressing the issues raised in this paper.

It is largely the trilogy of Article VI, VII and VIII of the Outer space Treaty read with the Liability Convention and the Registration Convention which

40 Article 253 – Legislation for giving effect to international agreements: “Notwithstanding anything in the foregoing provisions of this Chapter, Parliament has power to make any law for the whole or any part of the territory of India for implementing any treaty, agreement or convention with any other country or countries or any decision made at any international conference, association or other body.”

41 Article 53(1) – Executive power of the Union: “The Executive power of the Union shall be vested in the President and shall be exercised by him either directly or through officers subordinate to him in accordance with this Constitution.”

42 Supra n. 19 at 165.

draws immediate attention in the light of privatization of PSLV. Since Article VI of the OST demands for authorization of non-governmental activity. As an authorization condition first and foremost concern will be national security and safety.

Since it is the launching State that bears the liability for damage caused it will be legitimate expectation to seek indemnification from the authorized launch service provider should State has to pay for it. It can also prescribe for compulsory third party insurance to safeguard State's financial interest.

Space legislation addressing aspects of authorization and supervision; indemnification and liability related aspects; registration of space objects and other aspects must be brought into effect at the earliest.

Apart from addressing the international obligations; domestic concerns would include national security, financing, fair competition issues, technology transfer & export control issues, and intellectual property rights issues. Since the scope of this paper is limited to concerns regarding international space law these domestic concerns have not been addressed here but nevertheless they are also inevitable concerns to be addressed.

Privatization of launch services is just one aspect of commercialization. It is likely the private sectors will play much greater role in the days to come. It is desirable India have its national space legislation. Considerable help for drafting legislation can be sought from the United Nations recommendation on national legislation relevant to the peaceful exploration and use of outer space.⁴³ Based on state practices to national space legislation the space law committee of the International Law Association (ILA) at the ILA biannual conference (Sofia, Bulgaria) in 2012 proposed the model national space legislation.⁴⁴ This model law could also be of much help in this regard.⁴⁵

VI. Conclusion

Five decades of stupendous space programme has been possible with self-reliant technology and continuous governmental financial support. Now when India aspires to privatize its workhorse PSLV the aspirations are that launch services continues to be reliable and it lowers the cost without jeopardizing India's international treaties. Privatization of launch services might aid in capacity enhancement but accordingly a viable ecosystem must also be developed.

Privatization of launch service has both international and domestic legal implications. If by 2020 first private launch is expected, before that India must have a well-developed legal system in consonance with India's international obligations and domestic requirements.

43 UNGAR 68/74 of 11 December 2013.

44 International Law Association Resolution 6/2012.

45 For commentary on ILA Model Law see Stephan Hobe, "The ILA Model Law for National Space Legislation in German," *Journal of Air and Space Law*, 1 (2013), 81-95.