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Government of India  
Department of Space

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Antariksh Bhavan,  
New BEL Road,  
Bengaluru – 560 094

June 24, 2021

Subject : Draft National Space Transportation Policy-2020 – Norms, Guidelines & Procedures (NGP) for implementation – Hosting in public domain for comments/suggestions – reg.

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Department of Space being the administrative Ministry/Department in respect of space activities in India as per the allocation of Business Rules of Government of India, shall issue appropriate norms, guidelines and procedures including approval-mechanism from time to time for the services in space transportation systems along with possibility of promoting & fostering participation of Indian entities to carry out research and development activities in the area of space transportation.

Accordingly, the draft “National Space Transportation Policy-2020 – Norms, Guidelines & Procedures (NGP) for implementation” are hosted in website for public consultation.

Comments on the draft policy, if any, shall be forwarded to this Department to the email id :- ***dir.projects@isro.gov.in*** at the earliest, but not later than **21.07.2021**.

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# NATIONAL SPACE TRANSPORTATION POLICY

## POLICY DOCUMENT

Release 1.9

2020

DEPARTMENT OF SPACE  
GOVERNMENT OF INDIA

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## **1. INTRODUCTION**

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Space transportation systems comprising of various classes of launch vehicles, provide assured and reliable access to space for building space infrastructure that allows India to explore opportunities, not only for national needs but also for participation in global opportunities. In addition to sustaining & augmenting the national space infrastructure consisting of earth observation satellites, communication satellites, navigational satellites and satellites for space science & exploration, Indian space transportation systems also enable the commercial exploitation of increasing opportunities for launch services as well as human spaceflight to near earth orbit & robotic space exploration.

The recent reforms announced by the Government towards unlocking the potential of the space sector in the country are expected to attract entrepreneurs to invest in cost-effective & quick turn-around space transportation systems commensurate with the significant global commercial launch services market being projected for small satellites. The Indian space transportation sector is witnessing the emergence of new players in the private sector who in order to tap the commercial potential of small satellite launch services, are eager to leverage the national facilities already established by the Government.

Sustaining independent access to space and the continuous evolution of space transportation capabilities towards human and robotic space exploration along with the commercial exploitation of global opportunities require a robust national space transportation policy aimed at promoting & fostering national capabilities in the development of end-to-end space transportation systems and strengthening of Public Private Partnerships.

## **2. NATIONAL SPACE TRANSPORTATION POLICY 2020**

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The National Space Transportation Policy enables independent and reliable access to space towards harnessing space technology in the interest of national development, security & sovereignty and also to foster an environment for Indian entities to develop capabilities in space transportation systems and thereby gain a significant position in the global space economy. In order to promote and sustain the development of these capabilities within the country, the Government of India, through its Department of Space shall:

- Promote and foster an environment within the country for Indian entities to develop capability & capacity in space transportation systems.
- Enable the commercial utilization of the launch capacity and space transportation technologies developed by the Department through its commercial arm.
- Focus on advanced research & technology development towards improving access to space and supporting human/robotic space exploration.
- Engage in mutually beneficial partnerships with international space agencies/technology providers towards the joint development of advanced space transportation capabilities.

# **NATIONAL SPACE TRANSPORTATION POLICY 2020**

## **NORMS, GUIDELINES & PROCEDURES FOR IMPLEMENTATION**

## **1. Preamble**

- 1.1** ISRO's vision of "Harnessing space technology for national development" has enabled to work towards a strong set of space systems in several areas, with emphasis on self-reliance in space applications, building satellites, space transportation systems and associated ground segment. Space transportation systems comprising of various classes of launch vehicles provide assured access to space for building the space infrastructure required for national development & commercial exploitation.
- 1.2** From a family of Rohini sounding rockets, India's launch vehicles have grown with the development of SLV-3 and Augmented Satellite Launch Vehicle (ASLV) in the 1980s to the current operational fleet of launch vehicles consisting of PSLV, GSLV and GSLV MkIII through which India has established itself as one of the very few countries, which has indigenous end-to-end capabilities in the area of space transportation systems.
- 1.3** In addition to sustaining & augmenting the national space infrastructure consisting of earth observation satellites, communication satellites, navigational satellites and satellites for space science & exploration, Indian space transportation systems have also enabled the commercial exploitation of increasing opportunities for launch services. The significant achievements have been demonstrated through enhanced in-house capabilities, industry efforts and academia.
- 1.4** Globally, the participation of private agencies in providing launch services has increased and some of these agencies have become significant players in the commercial market for launch services. India is also witnessing the emergence of a "New Space" wherein the private players in the space sector aim to tap the commercial potential of small satellite launch services by developing small satellite launchers for the global market.
- 1.5** The Indian players, who are engaged in the launch vehicle development, are also eager to leverage the national facilities already established by the Government. The recent reforms announced by the Government towards unlocking the potential of the space sector in the country are expected to attract entrepreneurs to invest in cost-effective & quick turn-around space transportation systems commensurate with the significant global commercial launch services market.

## **2. Need for the policy**

- 2.1** Sustaining independent access to space and the continuous evolution of space transportation capabilities towards human and robotic space exploration along with the commercial exploitation of global opportunities require a robust national space transportation systems policy. The increasing number of startups in the country in the recent years, who are seeking to develop independent space launch systems to capture the global launch services market, require a seamless technological & regulatory pathway in the country so that the private ecosystem can prosper in the area while also bringing in innovative technologies including its spin-offs benefiting the Indian economy.
- 2.2** Considering the growing number of private enterprises in the country who are involved in space activities including launch vehicle development and in order to promote research & development and strengthen the capabilities of Indian entities to capture a significant share of the space economy, it is necessary to make available the relevant technologies developed by the Department along with the test facilities & installations including the launch sites through a suitable authorization mechanism.
- 2.3** It is essential to ensure that the independent launch activities undertaken by Indian entities are in accordance with relevant treaties & other international agreements due to the impact of such activities on public safety, domestic & global transport and in-orbit satellites. Therefore, an authorization mechanism needs to be in place to ensure compliance to the relevant regulations and safety requirements.
- 2.4** While promoting space industry in the country, sustaining launch capabilities for societal needs & national requirement is to be ensured. Further, it is essential for the Department to work towards advanced space transportation capabilities including new propulsion systems, reusability as well as heavy lift capabilities to undertake robotic/human space exploration.



### 3. Definitions

**Space Transportation system:** Any system that transports payloads (living or non-living) from earth to outer space or outer space to earth is referred to as a space transportation system.

**3.1 Indian entity :** Indian Entity refers to Indian government bodies, PSUs/CPSEs, Indian registered non-Government Private Entity (NGPE), companies, start-ups, MSMEs, industries, academic institutions, etc.

**3.2 Launch Campaign:** The gamut of activities that need to be carried out including the integration of vehicle stages, integration of satellite, vehicle & satellite checks and propellant filling operations that lead to the launch of a space transportation system.

**3.3 Launch Manifest:** The schedule of launches over a specified period.

### 4. Objectives

The National Space Transportation Policy 2020 aims to unlock the potential of the space sector in the country with respect to space transportation systems. This primarily involves the creation of a fertile environment within the country for Indian entities to develop launch vehicles and launch them from Indian Territory within the framework of international treaties and safety regulations. The policy seeks to provide opportunities for Indian entities to capture a share of the global launch services market while allowing the Government agencies to accelerate focused R & D to build space transportation capabilities for future space endeavours along with commercial exploitation. The establishment of space enterprises has the potential to boost the economy by creating direct & indirect employment.

### 5. Policy Directives

The National Space Transportation Policy 2020 enables space transportation activities in the country under four major statements. The policy states that the Government of India, through its Department of Space, shall -

- Promote and foster an environment within the country for Indian entities to develop capability & capacity in space transportation systems.
- Enable the commercial utilization of the launch capacity and space transportation technologies developed by the Department through its commercial arm.

- Focus on advanced research & technology development towards improving access to space and supporting human/robotic space exploration.
- Engage in mutually beneficial partnerships with international space agencies/technology providers towards the joint development of advanced space transportation capabilities.

## 6. Policy guidelines

The guidelines for implementing the policy directives are as follows:

### 6.1 Promoting and fostering an environment within the country for Indian entities to develop capability & capacity in space transportation systems.

From the advent of the Indian Space Programme, the Indian Space Research Organisation (ISRO) under Department of Space (DOS) had the exclusive mandate of realizing space transportation systems and launching satellites from Indian territory. These launch vehicles like PSLV, GSLV & GSLV MkIII have mainly served to establish the application of space technology to meet the development & societal needs of the country. These space transportation systems and associated infrastructure are being realized with the participation of several Indian industries, who play a major role at the component, sub-system or sub-assembly level. In addition, all efforts were made to utilize the spare capacity, as and when available, to provide commercial launch services for international customers. These efforts have established India as a major player in all aspects of space technology and any further addition in the country's capacity to provide commercial launch services and increase its share in the global space economy needs to be nurtured and encouraged.

While the Indian entities have the liberty to engage in research & development activities related to space transportation systems, the policy seeks to further facilitate and accelerate such initiatives by making available the spare capacity in the test facilities established by the Government subject to technical feasibility and priority for national programmes. In this way, the policy seeks to continuously strive towards strengthening the Indian space industry towards becoming significant players in the global space economy.

Since commercial space activities are strongly linked to the international space industry, it is inevitable that the successful space transportation technologies developed by the Indian Non-Governmental Space Enterprises will have export value either partially or in full. The export of such technologies

shall be permitted under the existing & applicable laws notified by the respective Government Departments/Ministries.

Space launch activities are safety-critical, with potential impact on range safety, public safety, liability & international commitment. The country, being a signatory to international treaties related to the launching of space objects from its territory, including liabilities, if any, it is essential that the Government of India has the knowledge and control of space launch activities from Indian territory. This necessitates that the launches and re-entry within Indian territory be permitted through a process of authorization. Accordingly, any Indian entity desirous of providing space transportation systems in the country is required to seek authorization for 1) the establishment & operation of a launch site 2) carrying out launches from the designated launch sites and 3) performing re-entry and recovery of space objects.

## **6.2 Enabling the commercial utilization of the launch capacity and space transportation technologies developed by the Department through commercial arm.**

Over the years, PSLV has established itself as a consistent and major player in the global market for commercial launch services by offering dedicated launches as well as co-passenger services onboard national launches. These services were provided through the commercial arm of the Department. Subsequent to the reforms announced by the Government of India, a significant number of domestic enterprises have expressed interest in building & deploying satellites for commercial purposes for which reliable launch services need to be provided along with ground support.

In view of the potential domestic demand for these vehicles from recently established & future Indian private commercial satellite operators, the policy seeks to enable the commercial utilization of the launch capacity including launch services and the launch complex through its commercial arm.

A host of technologies have been developed for the existing Indian Space Transportation systems in the form of critical materials, components, systems etc. which have potential applications in the respective launch vehicles developed by Indian entities. The policy also seeks to share these technologies through its commercial arm in accordance with a separately notified Technology Transfer Policy.

The policy also seeks to enhance industry participation towards the end-to-end realization of launch vehicles and thereby improve the national capacity for undertaking commercial & national missions.

### **6.3 Performing advanced research and technology development towards improving access to space and supporting human/robotic space exploration.**

The Indian Space Programme has evolved from space applications towards the technologies essential for deploying the space infrastructure to sustain & scale up the applications. Continuous R & D efforts have ensured that Indian Space Transportation systems are made versatile enough to undertake multi-satellite, multi-orbit, lunar & inter-planetary missions. Globally, efforts are underway in Government as well as private sector to improve the access to space beyond near-earth orbits towards the Moon & Mars for exploration and potential economic activity. The configuration & implementation of space transportation systems have witnessed a shift from traditional strategies and, technologies for stage recovery & reusability have gained prominence.

Department of Space, will continue to focus on ensuring sustained access to space and advancing the space transportation capabilities towards human spaceflight & robotic space exploration by developing the essential technologies and engaging in long term Research & Development Programmes for improving access to space. In order to enable such missions, the current capabilities have to be significantly enhanced towards heavy lift/super heavy lift and reusable space transportation systems along with associated infrastructure, to enable access to low earth orbit & beyond.

Focused research is essential on new propulsion systems based on semicryogenic, Liquid Oxygen-Methane & Green propellants and also to have more powerful rocket stages employing clustered engines that require a series of tests and the establishment of associated test facilities towards the validation & qualification of these systems. These developments may require new materials along with state-of-art design and manufacturing paradigms like additive manufacturing, which need to be explored through prototype validation & relevant facility establishment.

Access to space needs to be ensured for the orbital demonstration of cutting-edge technologies with potential scientific, societal & commercial benefits. Through this directive, the policy seeks to emphasize the role of the Department of Space in performing the necessary R & D activities to achieve

these objectives through the prevalent approval mechanisms. In addition, access to space has to be assured for critical space infrastructure, which are non-commercial in nature, especially the missions related to disaster management, societal development & safeguarding of national sovereignty, along with Space science & exploration missions for scientific research and to enhance scientific knowledge related to the Upper atmosphere, oceans, climate & weather, near-earth space, solar system & the Universe.

While continuously striving to enhance the capability, performance, reliability & associated infrastructure of space transportation systems in a timely manner to meet national requirements with minimal dependence on procured launch services, the Department shall also strive to create an effective Government-Industry-Academia triad towards innovation and self-reliance in the area of space transportation systems and derive societal benefits through spin-offs.

**6.4 Facilitating mutually beneficial partnerships with international space agencies/technology providers towards the joint development of advanced space transportation capabilities.**

Space technology has always served as a tool for cooperation & collaboration between countries, which has immensely benefited the stakeholders in advancing their respective capabilities and deriving the benefits. Through this directive, the policy seeks to continue & encourage partnerships & collaborations with international space agencies for the joint development of state-of-art technologies for future space transportation systems. In the current scenario of private players entering this segment, the policy also seeks to encourage partnerships & collaborations among Indian industry, academia & international space agencies for mutually beneficial research & technology development in the area of space transportation systems. Such collaborations also help to leverage Indian space transportation capabilities to undertake joint international expeditions leading to significant contribution of scientific knowledge along with potential upgradation in technological capabilities.

**7. Norms, Authorizations & Procedures for policy implementation**

The implementation of the National Space Transportation Policy 2020 shall be through the following norms & authorizations.

## **7.1 Norms & Guidelines**

- 7.1.1 Any launch (orbital or sub-orbital) from Indian territory can be carried out only with authorization from Indian National Space Promotion & Authorization Center (IN-SPACe), an independent body constituted by Government of India, under Department of Space (DOS). The launch could be from own or leased launch site and also from mobile platforms (land, sea or air).
- 7.1.2 Any Indian entity may seek authorization to launch (a) from a Government-owned launch site (b) from own or leased launch site (c) the establishment of launch pads and facilities for tracking & launch support specific to the respective launch vehicle on Government/own/leased launch sites (d) the use of Government-owned tracking and/or any other facility for launch support.
- 7.1.3 Sub-orbital launches, that are specifically undertaken to test or demonstrate the space transportation technologies leading to orbital launch systems, require authorization.
- 7.1.4 Launch or re-entry missions carried out by Central Governmental entities for the Government do not require authorization. However, such missions shall be duly informed and registered with IN-SPACe.
- 7.1.5 Indian National Space Promotion & Authorization Center (IN-SPACe) shall accord necessary authorizations and permissions for all launch related activities from Indian territory, as per the applicable acts, regulatory provisions & exemptions and statutory guidelines.
- 7.1.6 IN-SPACe shall formulate additional authorizations, if any, as and when needed and also bring out detailed guidelines for submission of applications, processing and grant of authorizations, from time to time.
- 7.1.7 The Department shall continue to perform advanced R & D activities towards the improvement & greater capabilities of space transportation systems in association with Academia & industry and/or international collaborations through established mechanisms of project approval & implementation.
- 7.1.8 The provisions brought out under this Norms & Guidelines for Implementation of National Space Transportation Policy - 2020 forms the basis for authorizations and operations of space transportation systems in India.

## **7.2 Authorizations**

- i. Any Indian entity is required to seek authorization from IN-SPACe to establish & operate a launch site and to undertake the launching of space object(s) from a designated launch site.
- ii. Any Indian entity, performing re-entry of space objects with or without recovery of the space object, is required to seek authorization.
- iii. The authorization is required even if an Indian entity is establishing a launch site or undertaking a launch outside the territory of India.
- iv. An Indian entity is required to seek authorization for sub-orbital launches of partial/full configuration space transportation systems, for the specific purpose of technology validation/demonstration leading to orbital space transportation systems.

### **A. Establishment of a Launch site within the territory of India**

Any Indian entity seeking to establish and operate a launch site within the territory of India is required to seek authorization from IN-SPACe.

- a) The proposal shall be submitted in a prescribed format for authorization for establishment of launch site.
- b) The technical details such as the layout of the facilities planned within the launch site along with the relevant details of the related space transportation systems and missions planned to be launched from the site shall be enclosed.
- c) The applicable environmental and safety clearances from stipulated authorities for the launch site shall be the responsibility of the proposer.
- d) The authorization shall be applicable to a specific configuration of the Launch site, and any change to the layout, facilities or establishments within the site shall require a fresh authorization.
- e) The authorization shall be applicable to a specific Indian Entity and any change of ownership shall require a fresh authorization.
- f) Authorization requires the financial guarantee or insurance cover by the proposer as part of its ownership towards fulfilment of nation's liability as per international agreements.

## **B. Establishment of a Launch site outside the territory of India**

Any Indian entity seeking to establish and operate a launch site outside the territory of India is required to seek authorization from IN-SPACe.

- a) The proposal shall be submitted in a prescribed format for authorization for establishment of launch site.
- b) All approvals necessary for undertaking the scope of activities in another nation or territory shall be under the applicable laws of the concerned nation/territory. Obtaining these approvals shall be the responsibility of the proposer.
- c) The compliance and approvals of the administration controlling the territory where the establishment of the Launch site is planned shall be ensured by the proposer and the proof of compliance/approvals shall be enclosed with the application for authorization.
- d) The authorization shall be applicable to a specific configuration of the Launch site, and any change to the layout, facilities or establishments within the site shall require a fresh authorization.
- e) The authorization shall be applicable to a specific Indian Entity and any change of ownership shall require a fresh authorization.
- f) All the financial guarantees or insurance cover towards fulfilment of liabilities, if any, shall be the responsibility of the proposer and IN-SPACe or the Union of India shall not have any liability related to this activity.

## **C. Launching from Indian Territory/ outside the territory of India**

Any Indian entity undertaking an orbital launch from a designated launch site within or outside Indian territory is required to seek authorization from IN-SPACe.

- a) The proposal shall be submitted in a prescribed format for authorization for launching from
  - (i) Self-owned launch site
  - (ii) Leased launch site
  - (iii) Government-owned launch site
  - (iv) Any mobile platform (Land, Sea or Air)
- b) The relevant technical details of the proposed space transportation system and the specific mission shall be enclosed with the application for authorization.



- c) Authorization requires the financial guarantee or insurance cover by the proposer as part of its ownership towards fulfilment of nation's liability as per international agreements.
- d) The authorization shall be applicable to a specific Indian Entity for the specified space transportation system and any change of ownership of the Entity or change in the space transportation system shall require a fresh authorization.
- e) In the case of launching from outside territory of India, all approvals necessary for undertaking the scope of activities in another nation or territory shall be under the applicable laws of the concerned nation/territory.
- f) The compliance and approvals of the administration controlling the territory from where the Launch is performed shall be ensured by the proposer and the proof of compliance/approvals shall be enclosed with the application for authorization.
- g) IN-SPACe shall authorize the launch by the Indian Entity after verifying the clearances accorded by the Ministry of External Affairs or any other Ministry, if applicable and also the approvals obtained by the Entity from the administration/agencies controlling the territory from where the launch is planned.
- h) IN-SPACe or the Union of India shall not have any liability related to launches performed outside of the territory of India.

**D. Re-entry or recovery of a space object**

Any Indian entity performing the re-entry of a space object within Indian airspace is required to seek authorization from IN-SPACe. Authorization is also required in case of recovery of the space object.

- a) Any Indian entity performing re-entry and/or recovery of a space object within Indian airspace/territory shall submit the proposal in a prescribed format for authorization.
- b) If the space object has to be retrieved or recovered from Indian territory after re-entry, the mechanism of retrieval/recovery has to be clearly indicated along with the agencies involved for recovery, if any.

- c) Authorization requires the financial guarantee or insurance cover by the proposer as part of its ownership towards fulfilment of nation's liability as per international agreements.
- d) The authorization shall be applicable to a specific Indian Entity and any change of ownership shall require a fresh authorization.

#### **E. Sub-orbital launches**

Any Indian entity undertaking a sub-orbital launch of a partial/full space transportation system (Referred to as test article) for the purpose of technology demonstration/validation towards the development of an orbital space transportation system is required to seek authorization from IN-SPACe.

- a) The sub-orbital launches of the test article must be undertaken from a designated launch site.
- b) The authorization shall be applicable to a specific configuration of the test article and any modification from the authorized configuration requires a fresh authorization
- c) The authorization shall be applicable to a specific Indian Entity and any change of ownership shall require a fresh authorization.
- d) Authorization requires the financial guarantee or insurance cover by the proposer as part of its ownership towards fulfilment of nation's liability as per international agreements.

- 7.2.1 Templates of the Applications Forms (A, B, C , D and E) seeking mandatory details for seeking the authorization from IN-SPACe as mentioned in Para 7.2 above are provided in the Annexure. These templates include the necessary & essential information from the applicants to process the respective authorization and is subject to refinements & seeking of additional information, if required.
- 7.2.2 The authorization process shall ensure that the sharing of Government-owned launch facilities shall not pose any constraint to the timely implementation of approved space programmes for societal development or safeguarding national sovereignty.
- 7.2.3 The authorization process shall ensure that there is no violation of non-commercial & space cooperation-linked launch agreements entered into with other countries.

7.2.4 Authorizations shall be issued with a fee prescribed from time to time. Non-compliance to the requirements and terms of authorizations will result in cancellation of the authorization.

**7.3 Space Transportation System activities by Department of Space**

- 7.3.1 In order to fulfil the mandate of continuing advanced research and technology development to improve the capabilities of its space transportation systems as well as to ensure access to space for space missions related to non-commercial societal development & advancement of space science, the Department of Space shall seek approvals from the relevant competent authority, Space Commission or Union Cabinet in line with established approval mechanisms.
- 7.3.2 As part of promoting innovation and R & D in space transportation systems, access to Government-owned facilities shall be facilitated within a framework of rules and guidelines that shall be notified by IN-SPACe.
- 7.3.3 The Department shall continue to leverage mutually beneficial international cooperation towards the advancement of its space transportation systems within the established framework of initiating & implementing such agreements.



# **TEMPLATE AUTHORIZATION FORMS**

**(Form A to Form E)**

## FORM A

### Pro forma for obtaining Authorisation for Establishment of Launch Site & Operation in the Indian Territory

(Completed Application Form may be submitted to IN-SPACe, Department of Space, Antariksh Bhavan, New BEL Road, Bangalore, 560231)

#### **A. Details of the Indian organisation / Institute / Company**

1. Name of Company, address, phone number and contact person
2. Nature of business and number of years in operation
3. Financial health
4. Details on stakeholders of the company highlighting foreign entity stake and ownership
5. Any agreement/s entered with any other organization/s or entity to execute the activities for which permission is being sought

#### **B. Details of the Launch Site**

1. Launch site location & coordinates, area and proposed layout
2. Number and Location of launch pads proposed including longitude & latitude
3. Name of the launch site operator, address and phone number
4. Necessary clearances from stipulated authorities

#### **C. Technical Details**

1. Launch vehicle(s) proposed for launch from the site - expendable/ reusable, configuration, typical mission profiles, payload class etc.
2. Vehicle tracking & visibility during launch operations
3. Range of flight azimuth
4. Flight corridor proposed for launches from the site
5. Spent stage Instantaneous Impact Points (coordinates with dispersion area)
6. Details of the populated/inhabited areas and areas of economic activity (fishing, oil exploration etc.) located within a flight corridor or spent stage impact dispersion area
7. Safety distance of inhabited areas in the vicinity of the spaceport
8. Analysis & simulation of launch vehicles which can be flown from the launch site safely

9. List of facilities and equipment planned on the site (Assembly, integration & check-out, propellant servicing, tracking, intra-site transport, testing facilities)
10. Details of launch control centre & launch pads
11. Launch site safety plan
  - a. Safety requirement with respect to space ordnance, fire & chemical hazard, pressure vessels, lightening protection, propellant storage & handling, safety distances etc.
  - b. Estimation of maximum damage potential for the purpose of risk, liability and insurance
  - c. Permission / license from appropriate authorities for handling explosives, propellant, pressure vessels, hazardous chemicals, fire & safety equipment, etc. as applicable
  - d. Launch operation safety plan must include measures, protocols & procedures for controlling hazards and returning the launch facility to a safe condition after a successful launch and also contingency procedures for controlling hazards associated with a failed flight attempt.
  - e. Access control provisions to prevent unauthorized access to the launch site, and other hazard areas
  - f. Accident management plan to investigate launch site accidents
  - g. Facilities and mechanism to activate launch destruct in case of any eventualities during the launch.

#### **D. Management information**

1. Project management team for monitoring, review and control of project activities
2. Project review mechanism
3. Project quality plan including management of non-conformances
4. Arrangements for third party liability insurance
5. Estimated budget and funding details
6. Schedule of construction and commissioning

#### **E. Terms & conditions**

1. We hereby affirm that we will comply with all applicable requirements / regulations and any issuance of authorisation does not confer proprietary, property or exclusive right of the use of any launch related facilities, airspace, and outer space.

2. We hereby agree to provide all the necessary technical and management details as per the requirements including any additional information sought.
3. We hereby agree to provide financial guarantee or insurance cover as determined by the authorizing authority for carrying out the launches for peaceful use of outer space.
4. We hereby agree to participate in the meetings/discussions, at our cost with the Indian authorities related to authorization, and also hereby agree to facilitate inspection & verification of the layout & safety procedures by authorized personnel from IN-SPACE at the proposed launch site.
5. We hereby agree to pay all the stipulated charges/fees incurred towards authorization.
6. We hereby agree to provide the necessary status reports as sought by the concerned authorities about the details of our project.

We hereby submit our proposal/ application for due consideration for authorization.

**Signature of the Authorized signatory with seal and date**

**Annexure/Attachments:**

a) ....

b) ...

c) ...

## FORM B

### Pro forma for obtaining Authorisation for Establishment of Launch Site & Operation in the Foreign Territory

(Completed Application Form may be submitted to IN-SPACE, Department of Space, Antariksh Bhavan, New BEL Road, Bangalore, 560231)

#### **A. Details of the Indian organisation / Institute / Company**

1. Name of Company, address, phone number and contact person
2. Nature of business and number of years in operation
3. Financial health
4. Details on stakeholders of the company highlighting foreign entity stake and ownership
5. Any agreement/s entered with any other organization/s or entity to execute the activities for which permission is being sought

#### **B. Details of the Launch Site**

1. Launch site location & coordinates, area and proposed layout
2. Number and Location of launch pads proposed including longitude & latitude
3. Name of the launch site operator, address and phone number
4. Necessary clearances from stipulated authorities

#### **C. Technical / Compliance Details**

1. Launch vehicle(s) proposed for launch from the site - expendable/ reusable, configuration, typical mission profiles, payload class etc.
2. Permission / license from appropriate authorities for the establishment of launch site at the foreign location.

#### **D. Management information**

1. Project management team for monitoring, review and control of project activities
2. Project review mechanism
3. Arrangements for third party liability insurance
4. Estimated budget and funding details
5. Schedule of construction and commissioning

#### **E. Terms & conditions**

1. We hereby affirm that we will comply with all applicable requirements / regulations and any issuance of authorisation does not confer



proprietary, property or exclusive right of the use of any launch related facilities, airspace, and outer space.

2. We hereby agree to provide all the necessary technical and management details as per the requirements including any additional information sought.
3. We hereby agree to provide financial guarantee or insurance cover as determined by the authorizing authority for carrying out the launches for peaceful use of outer space.
4. We hereby agree to participate in the meetings/discussions, at our cost with the authorities related to authorization.
5. We hereby agree to pay all the stipulated charges/fees incurred towards authorization.
6. We hereby agree to provide the necessary status reports as sought by the concerned authorities about the details of our project.

We hereby submit our proposal/ application for due consideration for authorization.

**Signature of the Authorized signatory with seal and date**

**Annexure/Attachments:**

a) ....

b) ...

c) ...

## FORM C

### Pro forma for obtaining Authorisation for launches

(Completed Application Form may be submitted to IN-SPACe, Department of Space, Antariksh Bhavan, New BEL Road, Bangalore, 560231)

#### **A. Details of the Indian organisation / Institute / Company**

1. Name of Company, address, phone number and contact person
2. Nature of business and number of years in operation
3. Financial health
4. Details on stakeholders of the company highlighting foreign entity stake and ownership
5. Any agreement/s entered with any other organization/s or entity to execute the activities for which permission is being sought

#### **B. Details of the Launch Site**

1. Name and location of the proposed Launch site, including longitude & latitude of the proposed Launch pad
2. Details of the mobile launch platform (Land/Sea/Air), if applicable, and the coordinates from where the launch is proposed from the mobile platform.
3. Identification of the facilities at the launch site that will be used for the proposed launch
4. Name of the launch site operator, address & phone number

#### **C. Technical Details**

1. Information pertaining to launch vehicle like
  - a) Launch vehicle name/model, configuration and payload capability
  - b) Identify structural, thermal, pneumatic, propellant, avionics, control system, destruct system, separation system, ordnance system used in the launch vehicle
  - c) Propulsive stages & its specifications (stage dry mass, propellant quantity, guidance margin, mixture ratio, thrust-time profile, etc.)
2. Information pertaining to spacecraft/satellite like (following details for each of the proposed satellite launch)

- a) Satellite name, class, configuration, physical dimensions and weight
  - b) Owner/s of satellite and end user/s or operators of spacecraft
  - c) Orbit parameters and estimated orbital life for all satellites
  - d) List of payloads & its specification
  - e) Frequency band for uplink/ downlink/ payloads
  - f) Mission operations plan including end of mission disposal
  - g) Type, quantity of Hazardous materials and radioactive materials in the satellite
3. Information pertaining to the proposed launch
- a) Launch window
  - b) Flight azimuth, nominal trajectory, associated ground tracks, spent stage instantaneous impact points with dispersion areas, vehicle tracking & visibility during launch, and ground stations
  - c) Sequence of events from lift-off to injection
  - d) Aerodynamic characterisation and validation
  - e) Design standards followed and minimum performance requirements
  - f) Testing, margin demonstration, qualification, and flight acceptance strategy for sub-systems and stages
  - g) Avionics and flight software design including testing methodologies
  - h) Quality assurance & control plan, and Non-conformance management
  - i) Materials and avionics parts screening and selection criteria along with guidelines adopted on usage of space-qualified & Commercial-off-the-shelf (COTS) components
  - j) Space ordnance design and safety aspects
  - k) Storage and traceability of flight systems
  - l) Flight system integration and checkout procedure
  - m) Telemetry and Telecommand requirements including frequency bands
  - n) List and orbital parameters of the space objects including payloads, rocket bodies and all other objects

- o) Space debris mitigation plan
- p) The range of intermediate and final orbits of vehicle upper stage, and its estimated orbital lifetime
- q) Details of flight termination/destroy system in case of off-nominal flight performance and the mechanism adopted for flight termination
- r) Risk management strategies including probabilistic risk modelling, identification of single point failures, design margins, redundancy and reliability measures, mission simulations & analysis with dispersions
- s) Launch commit and hold criteria
- t) Vehicle passivation and recovery procedure in case of launch hold/call-off
- u) Contingency plan, Launch turn-around procedure and duration after launch hold
- v) Propellant storage and servicing requirement for the launch vehicle
- w) Qualifications and trainings undergone related to personnel involved in launch operations
- x) Identification & readiness of mission control centre and ground stations including applicable contracts, approvals and agreements

#### 4. Launch pad safety plan

- a) Safety requirement & clearances with validity, if any, with respect to space ordnance, fire & chemical hazard, pressure vessels, lightning protection, propellant storage & handling, safety distances etc.
- b) Estimation of maximum damage potential for the purpose of risk, liability and insurance
- c) Permission / license from appropriate authorities for handling explosives, propellant, pressure vessels, hazardous chemicals, fire & safety equipment, etc. as applicable
- d) Launch operation safety plan must include measures, protocols & procedures for controlling hazards and returning the launch facility to a safe condition after a successful launch and also procedures for controlling hazards associated with a failed flight attempt.
- e) Access control provisions to prevent unauthorized access to the launch site, and other hazard areas
- f) Accident management plan to investigate launch site accidents

#### **D. Management information**

1. Project management team for monitoring, review and control of launch activities
2. Project review mechanism
3. Management and resolution of Non-conformances and deviations in flight systems
4. Arrangements for third party liability insurance
5. Overall Launch campaign schedule and plan
6. Proposed work force required for launch campaign operations and maintenance

#### **E. Terms & conditions**

7. We hereby affirm that we will comply with all applicable requirements / regulations and any issuance of authorisation does not confer proprietary, property or exclusive right of the use of any launch related facilities, airspace, and outer space.
8. We hereby agree to provide all the necessary technical and management details as per the requirements including any additional information sought.
9. We hereby agree to appoint a Range Safety Officer for the launch to interact with the Range Safety officer of the Department of Space for compliance with range safety regulations.
10. We hereby agree that the Range Safety Officer; appointed by the Department of Space shall be responsible for issuing of NOTAM (Notice to Airmen) and other essential procedures prior to launch.
11. We hereby agree that in the case of post-launch exigencies that require destruction of the vehicle to ensure range & public safety, the Range Safety Officer will strictly operate under the supervision of the Range Safety Officer appointed by the Department of Space.
12. We hereby agree to provide financial guarantee or insurance cover as determined by the authorizing authority for carrying out the launches for peaceful use of outer space.
13. We hereby agree to participate in the meetings/discussions, at our cost with the Indian authorities related to authorization and operation of the launch vehicle.
14. We hereby agree to pay all the stipulated charges/fees incurred towards authorization.

15. We hereby agree to provide the necessary status reports as sought by the concerned authorities about the details of our project.

We hereby submit our proposal/ application for due consideration for authorization.

**Signature of the Authorized signatory with seal and date**

**List of Annexures/Attachments:**

- a) ....
- b) ....
- c) ....

## FORM D

### Pro forma for obtaining Authorisation for Re-entry of space objects

(Completed Application Form may be submitted to IN-SPACe, Department of Space, Antariksh Bhavan, New BEL Road, Bangalore, 560231)

#### **A. Details of the Indian organisation / Institute / Company**

1. Name of Company, address, phone number and contact person
2. Nature of business and number of years in operation
3. Financial health
4. Details on stakeholders of the company highlighting foreign entity stake and ownership
5. Any agreement/s entered with any other organization/s or entity to execute the activities for which permission is being sought

#### **B. Details of the Launch Site**

1. Name, and location of the Launch site, including longitude & latitude of the Launch pad
2. Identification of the facilities at the launch site that will be used for launch processing and flight
3. Name of the launch site operator, address & phone number (including agreements for site access)

#### **C. Details of the Re-entry Site (without recovery)**

1. Re-entry site location/s (Land or sea) along with longitude & latitude and boundaries of the re-entry site
2. Contingency abort locations, if any

#### **D. Details of the Re-entry Site (with recovery)**

1. Landing site location/s (Land or sea recovery) along with longitude & latitude and boundaries of landing site
2. Identification of the proposed list of equipments & personnel to be used for recovery operations
3. Name of the operator carrying out recovery operations, address & phone number (including agreements for site access)
4. Contingency abort locations, if any

**E. Technical Details (re-entry without recovery)**

Information pertaining to the space object (following details for each of the proposed satellite launch)

1. Identification (name, class, configuration, physical dimensions and weight)
2. Owner/s and end user/s or operators of the space object
3. Parameters of orbit from where re-entry initiated
4. Frequency band for uplink/ downlink/ payloads
5. Mission operations plan
6. Type, quantity of Hazardous materials and radioactive materials in the space object
7. Designated re-entry site coordinates
8. Identify structural, thermal, pneumatic, propellant, avionics, re-entry, control system, destruct system, separation system, ordnance system for each of the object
9. Aerodynamic characterisation and validation of the objects
10. Flight trajectory analysis related descent of the vehicle through landing including its three-sigma footprint (dispersions)
11. Visibility & tracking mechanism
12. Details of the specific mission that launched the space object
13. Emergency and contingency plan during non-nominal landing
14. Communication procedures between the control site and the re-entry site
15. Re-entry safety plan - post launch & re-entry
  - a. Safety requirement with respect to handling propellant, fire & chemical hazard, fire & safety equipment, pressure vessels, etc.
  - b. Identification of the hazards w.r.t re-entry and risk assessment w.r.t public health & safety and safety of the property associated with the mission, including nominal and non-nominal operation, if any
  - c. Safety procedures w.r.t contingency and emergency abort plans during non-nominal flight & re-entry



- d. Estimation of maximum damage potential for the purpose of risk, liability and insurance
- e. Accident management plan to investigate re-entry accidents

**F. Technical Details (with recovery)**

Information pertaining to the space object (following details for each of the proposed satellite launch)

1. Identification (name, class, configuration, physical dimensions and weight)
2. Owner/s and end user/s or operators of the space object
3. Parameters of orbit from where re-entry initiated
4. Frequency band for uplink/ downlink/ payloads
5. Mission operations plan
6. Type, quantity of Hazardous materials and radioactive materials in the space object
7. Designated re-entry site coordinates
8. Method of location & recovery of space object
9. Identify structural, thermal, pneumatic, propellant, avionics, re-entry, control system, destruct system, separation system, ordnance system for each object
10. Aerodynamic characterisation and validation of recovery objects
11. Flight trajectory analysis related descent of the vehicle through landing including its three-sigma footprint (dispersions)
12. Agreements with various agencies for recovery operations
13. Visibility & tracking mechanism
14. Details of the specific mission that launched the space object
15. Landing site, date and earliest & latest landing time
16. Recovery procedure and safety protocols
17. Emergency and contingency plan during non-nominal landing
18. Communication procedures between the control site and the re-entry/landing site

19. Re-entry safety plan - post launch & re-entry with recovery

- a. Safety requirement with respect to handling propellant, fire & chemical hazard, fire & safety equipment, pressure vessels, etc.
- b. Identification of the hazards w.r.t re-entry & recovery and risk assessment w.r.t public health & safety and safety of the property associated with the mission, including nominal and non-nominal operation, if any
- c. Permission / license from appropriate authorities for recovery of the vehicle from sea/land as applicable
- d. Safety plan must include measures, protocols & procedures for controlling hazards and returning the re-entry to a safe condition after a successful re-entry and also procedures for controlling hazards associated with a failed re-entry attempt
- e. Safety procedures w.r.t contingency and emergency abort plans during non-nominal flight & re-entry
- f. Estimation of maximum damage potential for the purpose of risk, liability and insurance
- g. Access control provisions to prevent unauthorized access to the re-entry site, and other hazard areas
- h. Accident management plan to investigate re-entry including recovery accidents

**G. Management information**

1. Project management team for monitoring, review and control of project activities
2. Project review mechanism
3. Management and resolutions of Non-conformance and deviations in flight systems
4. Arrangements for third party liability insurance
5. Overall campaign schedule and plan
6. Proposed work force required for re-entry/ recovery operations

**H. Terms & Conditions**

1. We hereby affirm that we will comply with all applicable requirements / regulations and any issuance of authorisation does not confer proprietary, property or exclusive right of the use of any launch related facilities, airspace, and outer space.
2. We hereby agree to provide all the necessary technical and management details as per the requirements including any additional information sought.

3. We hereby agree that the Range Safety Officer; appointed by the Department of Space shall be responsible for issuing of NOTAM (Notice to Airmen) and other essential procedures prior to re-entry & recovery.
4. We hereby agree that in the case of post-launch exigencies that require destruction of the space object to ensure range & public safety, the Range Safety Officer appointed will strictly operate under the supervision of the Range Safety Officer appointed by the Department of Space.
5. We hereby agree to provide financial guarantee or insurance cover as determined by the authorizing authority for carrying out the launches for peaceful use of outer space.
6. We hereby agree to participate in the meetings/discussions, at our cost with the Indian authorities related to authorization and operation of the launch vehicle.
7. We hereby agree to pay all the stipulated charges/fees incurred towards authorization.
8. We hereby agree to provide the necessary status reports as sought by the concerned authorities about the details of our project.

We hereby submit our proposal/ application for due consideration for authorization.

**Signature of the Authorized signatory with seal and date**

**Annexure/Attachments:**

- a) ....
- b) ...
- c) ...

## FORM E

### Pro forma for obtaining Authorisation for Sub-orbital launches

(Completed Application Form may be submitted to IN-SPACe, Department of Space, Antariksh Bhavan, New BEL Road, Bangalore, 560231)

#### **A. Details of the Indian organisation / Institute / Company**

1. Name of Company, address, phone number and contact person
2. Nature of business and number of years in operation
3. Financial health
4. Details on stakeholders of the company highlighting foreign entity stake and ownership
5. Any agreement/s entered with any other organization/s or entity to execute the activities for which permission is being sought

#### **B. Details of the Launch Site**

1. Name and location of the proposed Launch site, including longitude & latitude of the proposed Launch pad
2. Details of the mobile launch platform (Land/Sea/Air), if applicable, and the coordinates from where the launch is proposed from the mobile platform
3. Identification of the facilities at the launch site that will be used for the proposed launch
4. Name of the launch site operator, address & phone number

#### **C. Technical Details**

1. Information pertaining to launch vehicle like
  - a) Launch vehicle name/model, configuration and payload capability
  - b) Identify structural, thermal, pneumatic, propellant, avionics, control system, destruct system, separation system, ordnance system used in the launch vehicle
  - c) Propulsive stages & its specifications (stage dry mass, propellant quantity, guidance margin, mixture ratio, thrust-time profile, etc.)
2. Information pertaining to spacecraft/satellite (following details for each of the proposed satellite launch), if any

- a) Satellite name, class, configuration, physical dimensions and weight
- b) Owner/s of satellite and end user/s or operators of spacecraft
- c) Sub-orbital parameters and estimated sub-orbital life for all satellites
- d) List of payloads & its specification
- e) Frequency band for uplink/ downlink/ payloads
- f) Mission operations plan including end of mission disposal
- g) Type, quantity of Hazardous materials and radioactive materials in the satellite

### 3. Information pertaining to the proposed launch

- a) Launch window
- b) Flight azimuth, nominal trajectory, associated ground tracks, spent stage instantaneous impact points with dispersion areas, vehicle tracking & visibility during launch, and ground stations
- c) Sequence of events from lift-off till final stage operation including impact on the earth's surface
- d) Aerodynamic characterisation and validation
- e) Design standards followed and minimum performance requirements
- f) Testing, margin demonstration, qualification, and flight acceptance strategy for sub-systems and stages
- g) Avionics and flight software design including testing methodologies
- h) Quality assurance and control plan, Non-conformance management
- i) Materials and avionics parts screening and selection criteria along with guidelines adopted on usage of space-qualified & Commercial-off-the-shelf (COTS) components.
- j) Space ordnance design and safety aspects
- k) Storage and traceability of flight systems
- l) Flight system integration and checkout procedure
- m) Telemetry and Telecommand requirements including frequency bands
- n) Space debris mitigation plan

- o) Details of flight termination/destruct system in case of off-nominal flight performance and the mechanism adopted for flight termination.
- p) Risk management strategies including probabilistic risk modelling, identification of single point failures, design margins, redundancy and reliability measures, mission simulations & analysis with dispersions
- q) Launch commit and hold criteria
- r) Vehicle passivation and recovery procedure in case of launch hold/call-off
- s) Contingency plan, Launch turn-around procedure and duration after launch hold
- t) Propellant storage and servicing requirement for the launch vehicle
- u) Qualifications and trainings undergone related to personnel involved in launch operations
- v) Identification and readiness of mission control centre and ground stations including applicable contracts, approvals and agreements.

#### 4. Launch pad safety plan

- a) Safety requirement & clearances with validity, if any, with respect to space ordnance, fire & chemical hazard, pressure vessels, lightning protection, propellant storage & handling, safety distances etc.
- b) Estimation of maximum damage potential for the purpose of risk, liability and insurance
- c) Permission / license from appropriate authorities for handling explosives, propellant, pressure vessels, hazardous chemicals and fire & safety equipment, etc. as applicable
- d) Launch operation safety plan must include measures, protocols & procedures for controlling hazards and returning the launch facility to a safe condition after a successful launch and also procedures for controlling hazards associated with a failed flight attempt
- e) Access control provisions to prevent unauthorized access to the launch site, and other hazard areas
- f) Accident management plan to investigate launch site accidents

#### **D. Management information**

- 1. Project management team for monitoring, review and control of launch activities

2. Project review mechanism
3. Management & resolution of Non-conformances and deviations in flight systems
4. Arrangements for third party liability insurance
5. Overall Launch campaign schedule and plan
6. Proposed work force required for launch campaign operations and maintenance

**E. Terms & conditions**

1. We hereby affirm that we will comply with all applicable requirements / regulations and any issuance of authorisation does not confer proprietary, property or exclusive right of the use of any launch related facilities, airspace, and outer space.
2. We hereby agree to provide all the necessary technical and management details as per the requirements including any additional information sought.
3. We hereby agree to appoint a Range Safety Officer for the launch to interact with the Range Safety officer of the Department of Space for compliance with range safety regulations.
4. We hereby agree that the Range Safety Officer; appointed by the Department of Space shall be responsible for issuing of NOTAM (Notice to Airmen) and other essential procedures prior to launch.
5. We hereby agree that in the case of post-launch exigencies that require destruction of the vehicle to ensure range & public safety, the Range Safety Officer will strictly operate under the supervision of the Range Safety Officer appointed by the Department of Space.
6. We hereby agree to provide financial guarantee or insurance cover as determined by the authorizing authority for carrying out the launches for peaceful use of outer space.
7. We hereby agree to participate in the meetings/discussions, at our cost with the Indian authorities related to authorization and operation of the launch vehicle.
8. We hereby agree to pay all the stipulated charges/fees incurred towards authorization.
9. We hereby agree to provide the necessary status reports as sought by the concerned authorities about the details of our project.

We hereby submit our proposal/ application for due consideration for authorization.

**Signature of the Authorized signatory with seal and date**

**List of Annexures/Attachments:**

a) ....

b) ...

c) ...