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SATELLITE-AS-A-SERVICE AND THE ATTRIBUTION GAP - RETHINKING LIABILITY, REGISTRATION AND CONTROL UNDER INDIA'S HOSTED-PAYLOAD REGIME

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Abstract

India's emerging Satellite-as-a-Service (SaaS) model represents a significant shift from the traditional satellite architecture in which ownership, operation, payload and regulatory responsibility largely rested with a single entity. The new hosted-payload framework issued by the Indian National Space Promotion and Authorisation Centre (IN-SPACe) on 17 September 2026 formally facilitates arrangements in which a satellite bus and its payload may belong to different entities, including foreign entities. While this model reduces the cost and time required to access space, it also fragments ownership, operational control, regulatory responsibility and financial risk.

This article argues that the hosted-payload model exposes an “**attribution gap**” between commercial space activities and the State-centric structure of international space law. The Outer Space Treaty, Liability Convention and Registration Convention continue to organise responsibility around States, launching States, registered space objects and jurisdictional control. Private contracts, however, can only redistribute commercial risk and cannot alter treaty-based State responsibility. The article examines this tension through the questions of liability, registration, jurisdiction, continuing supervision, operational control, data governance, spectrum and post-contract liability. It argues that India should move beyond contract-based regulation and develop a statutory framework specifically addressing hosted payloads and modular satellite architectures.

Keywords: Satellite-as-a-Service; Hosted Payloads; Space Law; Liability; IN-SPACe.

I. INTRODUCTION

India's commercial space sector is rapidly evolving. By late 2026, IN-SPACe reports 440 startups and has issued 113 authorisations to 52 private players, including numerous nano-satellite and launch ventures. As satellite costs fall and new launchers appear, an emerging business model is **Satellite-as-a-Service (SaaS)** or "hosted payloads": a satellite bus owned by one company carries instruments owned by another. In this model, a customer can buy space-based services without launching an entire dedicated spacecraft.

IN-SPACe's recent guidelines of 17 September 2026 formally regulate this model. Crucially, they allow Indian companies to sell satellite capacity on their buses to domestic or overseas payload customers, potentially as a package with spectrum filings, ground stations and data operations. The guidelines recognise that a satellite may now operate as a *platform* serving multiple operators rather than as a single integrated mission. For example, a telecommunications startup could host a communication payload on a satellite bus built by another Indian firm, while a foreign scientific instrument could also be hosted on the same platform. This innovation promises growth and reduced costs, but it also **fragments roles**: ownership, operation, regulatory authorisation and risk can be divided among different entities. International space law, however, remains focused on **States and space objects**. The Outer Space Treaty (OST) and related conventions assign rights and liabilities to launching States and registered space objects as a whole, rather than to individual commercial participants. Article VI of the OST requires States to remain internationally responsible for national space activities, including activities undertaken by non-governmental entities, and requires continuing supervision. Article VII and the Liability Convention 1972 place liability upon launching States. The Registration Convention 1975 requires launched space objects, including relevant component parts, to be registered, while Article VIII of the OST connects registration with jurisdiction and control.

India's new hosted-payload rules therefore create an "**attribution gap**". Contracts can allocate costs and duties between a host and a payload owner, but they cannot change which State is treated as the launching State or which State exercises jurisdiction and control over a registered space object under international law. If an Indian startup places an Indian-owned payload on a foreign satellite, India may authorise the payload while the foreign launching State remains internationally responsible for the space object. Conversely, if a foreign instrument is hosted on an Indian satellite, India may remain the relevant launching State even though the foreign payload owner has contractually indemnified the Indian host or Government.

The more difficult question concerns **control**. The host may control the spacecraft bus, power, attitude control and communications systems, while the payload owner may control the instrument and determine its mission operations. Registration may treat the entire spacecraft as one object even though different components have different owners and operators. The commercial concept of control therefore becomes fragmented while the international legal concept of jurisdiction and control remains substantially unitary.

This article examines these tensions. It first explains the SaaS model and why India is promoting it, before examining the key features of the September 2026 IN-SPACe hosted-payload framework. It then maps the functional division of ownership, control, authorisation and responsibility between the host, payload owner and State. The article analyses treaty liability against private indemnity, continuing supervision under Article VI, registration and jurisdiction under Article VIII, the significance of the host's "kill switch", data and spectrum regulation, and the problem of liability after the host-payload agreement ends. It concludes by proposing a statutory framework capable of aligning India's commercial space ambitions with its international legal obligations.

II. THE SATELLITE-AS-A-SERVICE MODEL

A. What Is a Hosted Payload?

A *hosted payload* is an independent instrument placed on a satellite bus owned by another entity. The payload may have its own mission, such as sensing, communications, scientific experimentation or remote observation, but it uses the host spacecraft's infrastructure, including power, communications, attitude control and orbital position.

The traditional satellite model assumes a relatively integrated relationship between ownership and operation. A single entity designs the spacecraft, owns the bus, owns the payload, controls the mission and assumes the associated regulatory obligations. Hosted payloads break this relationship apart.

Under the hosted model, the **host company** owns and operates the satellite bus and its core systems, while the **payload company** owns and operates the hosted instrument. The host integrates the payload physically and may provide communications, power, ground-station access and other infrastructure. The payload owner, however, retains responsibility for its instrument and mission.

Hosted payloads must also be distinguished from *rideshare* launches. In a rideshare arrangement, several independently functioning spacecraft are launched together on the same

launch vehicle. A hosted payload, by contrast, remains attached to and dependent upon the host spacecraft. It is therefore not simply a second satellite travelling on the same rocket; it is a separate commercial and functional component within a larger orbital platform.

This distinction is legally important. A rideshare model naturally produces multiple space objects. A hosted-payload model can produce **one physical space object containing multiple separately owned and operated components**. The latter creates the attribution problem that lies at the centre of this article.

B. Why India Encourages SaaS

For India's growing space-tech sector, hosted payloads offer lower barriers to entry. A startup developing an imaging sensor, scientific instrument or communications payload does not necessarily need to design and launch an entire satellite. Instead, it can lease capacity from an established satellite-bus provider.

In April 2025, IN-SPACe launched its Satellite Bus as a Service (SBaaS) programme to encourage domestic satellite-bus development. The programme reflects a broader policy objective of strengthening Indian manufacturing and positioning India as a global provider of small satellite-bus and hosted-payload services.

The commercial advantages are considerable. Hosted payloads can:

1. reduce the cost of entering the space sector;
2. reduce development and launch timelines;
3. permit better use of spare satellite capacity;
4. allow specialised companies to focus on payload development;
5. enable foreign customers to access Indian satellite infrastructure; and
6. create recurring revenue models for satellite-bus providers.

SaaS therefore changes the economic logic of satellites. Instead of selling a complete spacecraft, a company can sell **orbital capacity as a service**.

This commercial flexibility, however, creates a legal complication. The more a satellite resembles a platform, the less useful it becomes to assume that one entity owns, operates and controls the entire space object.

III. THE IN-SPACe 2026 GUIDELINES FOR HOSTED PAYLOADS

IN-SPACe's *Authorization Guidelines for Establishment and/or Operation of Hosted-Payload(s)*, dated 17 September 2026, implement the hosted-payload component of India's Space Policy 2023. The framework recognises three broad configurations: Indian-owned

payloads placed on non-Indian satellites, Indian or non-Indian payloads placed on Indian satellites, and payloads hosted on special platforms such as the PSLV Orbital Experimental Module (POEM) and similar orbital experimental platforms. The guidelines therefore seek to regulate the principal commercial configurations likely to arise in the hosted-payload and Space-as-a-Service (SaaS) market.

The principal regulatory mechanism is IN-SPACe authorisation. Indian entities placing payloads on Indian or foreign satellites require IN-SPACe authorisation, which may cover multiple payloads, including constellations. The position is different where a foreign payload is placed on an Indian satellite. In such cases, the foreign payload owner does not separately obtain IN-SPACe authorisation. Instead, the Indian host is required to disclose the foreign payload as part of its satellite authorisation application and submit the relevant host-payload agreement. India therefore effectively treats the **Indian host as the regulatory gateway** for foreign payloads operating through an Indian satellite.

The host-payload agreement forms an important part of this regulatory architecture. IN-SPACe requires the agreement to address matters including operations, control, liability and technical responsibilities, making the framework substantially **contract-driven**. This is commercially sensible because hosted-payload arrangements depend heavily on contractual allocation of risk and responsibility between the host and payload owner. It nevertheless raises an important legal question: **can a private contract perform a function that international space law assigns to States?** The answer is necessarily qualified. Contracts can allocate financial, operational and technical responsibilities between private parties, but they cannot alter the identity of the relevant launching State or extinguish the State's international obligations under space law.

The guidelines also address liability and indemnification by allocating commercial risk between the parties. In the case of an Indian payload hosted on a foreign satellite, the foreign host bears the relevant liability risk and is required to indemnify the Indian payload owner and the Government of India. Conversely, where a foreign payload is hosted on an Indian satellite, the foreign payload owner is required to indemnify the Indian host and the Government of India against third-party claims. These provisions are significant because they determine how economic and contractual risk is distributed between the parties. They do not, however, transfer or eliminate treaty-based responsibility or liability attributable to States under international space law.

Operational control is similarly divided. The Indian host retains control over the satellite bus and must have the technical capability to switch off or disable a hosted payload. IN-SPACe or

the Government may direct the host to shut down a payload or cease its emissions where this is necessary because of national security concerns, radio-frequency interference or other critical considerations. The **kill switch** is therefore a central feature of the regulatory design, ensuring that the host remains capable of exercising immediate technical control even where the payload is owned and operationally managed by another entity.

The framework also creates regulatory obligations relating to data collected by foreign payloads. Where a foreign payload captures data over Indian territory, the Indian host must maintain records concerning the relevant data collection, including the area captured, orbital information, and the date and time of collection. These records must be retained for at least six months and furnished to IN-SPACe when required, while dissemination of the data remains subject to applicable Indian requirements. The Indian host consequently functions not only as the physical and operational interface for the foreign payload, but also as an important **regulatory chokepoint** through which foreign payload activity can be supervised.

IV. FRAGMENTED OWNERSHIP AND CONTROL

The hosted-payload framework creates a division between ownership, operational control, regulatory control and international responsibility. These functions are distributed among different actors rather than being concentrated in a single entity.

Broadly, the **host company** owns and controls the satellite bus and remains responsible for the operation of the spacecraft's core systems. The **payload owner** owns and operates the hosted instrument and exercises control over its ordinary payload functions. The **launch provider** is responsible for placing the integrated spacecraft into orbit and may have responsibilities under the relevant launch arrangements. At the regulatory level, the **State** authorises and supervises the relevant space activities, while the **State of registry** retains jurisdiction and control over the registered space object in accordance with Article VIII of the Outer Space Treaty (OST).

This division becomes particularly significant in relation to operational control. The host company ordinarily retains technical control over the spacecraft and may possess the practical ability to interrupt or shut down the payload where necessary for spacecraft safety or compliance with its own operational requirements. The payload owner, however, exercises normal operational control over the instrument and its functions, subject to the host's technical and contractual constraints. The regulator may further require the suspension or cessation of particular activities through applicable authorisations or directions.

The same layered structure applies to regulatory matters. The host and payload owner may each

be required to obtain or support relevant regulatory approvals, including approvals relating to launch, spectrum use or other payload-specific activities. In India, IN-SPACe functions as the principal authorising body for space activities within the applicable regulatory framework. Where an Indian payload is hosted on a foreign spacecraft, the payload owner may also have to comply with the regulatory requirements of the relevant foreign jurisdiction.

Registration and international responsibility present a further layer of complexity. The satellite, including its hosted payload where treated as part of the registered space object, is associated with the relevant State of registry. International obligations under the OST and the Liability Convention attach to States rather than private entities. Accordingly, the relevant launching State may bear international responsibility and liability even though operational functions are contractually divided among private actors.

Contractual arrangements therefore become important in allocating risk between the host company, payload owner and launch provider. Agreements may contain indemnities, insurance requirements, limitations of liability and provisions dealing with loss of control, damage to the payload, failure of the spacecraft or regulatory non-compliance. Insurance may similarly be structured to address launch and spacecraft risks as well as risks that are specific to the hosted payload.

Data and security responsibilities are also divided. The payload owner ordinarily generates and controls the data produced by its instrument, while the host company remains responsible for the spacecraft systems through which that data is transmitted, stored or otherwise handled. Both parties may therefore have compliance and security obligations, particularly where the payload involves sensitive data or activities subject to additional regulatory controls.

The central difficulty is that the **host is the physical and technical gateway to space**, while the **payload owner remains the commercial and functional controller of the payload**. Regulatory authorities occupy a further layer of control through authorisation, supervision and directions, while the State of registry exercises jurisdiction and control over the registered space object under Article VIII of the OST.

This produces an important distinction between **operational control** and **legal or regulatory control**. A payload owner may exercise operational control over its instrument, the host may exercise technical control over the spacecraft, and the State or regulator may exercise regulatory control through authorisation and supervision. These forms of control may overlap without being vested in the same actor.

The resulting question is whether international space law, which was largely developed around

relatively unified space objects and State responsibility, can adequately accommodate this increasingly fragmented structure of ownership, control and responsibility.

V. LIABILITY AND RESPONSIBILITY: CONTRACTS VERSUS TREATIES

A. The Treaty Framework

The Liability Convention establishes the international framework governing damage caused by space objects. It defines a launching State broadly to include a State that launches or procures the launching of a space object, as well as a State from whose territory or facility a space object is launched. Under Article II, a launching State bears absolute liability for damage caused by its space object on the surface of the Earth or to aircraft in flight, while Article III adopts a fault-based standard for damage caused elsewhere in outer space. For hosted payloads, the significance of this framework lies in its reliance on the concepts of the launching State and the space object, rather than on the private ownership of individual components. The Convention does not determine responsibility by asking which private entity owns a particular instrument. This distinction becomes particularly important where a single satellite contains components owned by multiple private entities. If, for example, an Indian satellite carries a foreign-owned payload and the circumstances of its launch make India a launching State, India cannot avoid its treaty responsibility merely because the payload is owned by a foreign company. The foreign payload owner may contractually indemnify India for the resulting financial consequences, but such an indemnity operates only between the parties and does not alter the allocation of responsibility under international law. The same principle applies in the reverse situation: where an Indian company places an Indian payload on a foreign satellite, the relevant foreign launching State remains subject to the Liability Convention in accordance with the applicable treaty conditions.

B. Private Indemnity and International Liability

The IN-SPACe guidelines seek to address the allocation of financial risk through contractual indemnities. This approach is commercially rational because the party responsible for a particular risk should, as far as possible, bear its economic consequences. However, private liability and international responsibility are not the same thing. An indemnity clause may require a foreign payload owner to reimburse India for liabilities or losses arising from the payload, but it does not transform that private entity into a launching State under the Liability Convention. Similarly, a foreign host's undertaking to indemnify an Indian payload owner does

not extinguish or alter the international obligations of the relevant launching State. The distinction can therefore be stated as follows: a contract can determine who ultimately bears the financial burden; it cannot determine which State bears international responsibility. This distinction should form a foundational principle of India's hosted-payload regime, particularly because the commercial structure of hosted payloads may distribute ownership, operation, and financial risk among several private actors without correspondingly altering the State-centric framework of international space law.

C. Hypothetical One: Indian Payload on Foreign Satellite

Consider an Indian space company that develops a sensor and places it on a US-operated satellite launched from the United States. IN-SPACe may authorise the Indian payload, while the US operator retains control over the host spacecraft and the Indian company retains control over its own instrument. If the integrated space object subsequently causes damage, the determination of the relevant launching State would remain governed by the Liability Convention rather than by the contractual allocation of responsibilities under the host-payload agreement. The Indian company may therefore receive contractual protection through indemnities or other risk-allocation mechanisms, but the question of international liability would continue to be determined by the applicable treaty framework.

D. Hypothetical Two: Foreign Payload on Indian Satellite

Conversely, consider an Indian company that operates a satellite bus and hosts a European scientific payload. Where the applicable treaty conditions make India the relevant launching State, India may incur international liability if the satellite causes damage, notwithstanding the fact that the payload is owned by a European entity. The indemnity provided by the foreign payload owner may protect India against the resulting economic burden between the parties, but it does not eliminate or transfer India's international responsibility under the applicable treaty framework. This distinction demonstrates the need for Indian law to expressly separate treaty responsibility from commercial indemnification, ensuring that contractual arrangements are understood as mechanisms for allocating financial risk rather than as instruments capable of altering the international legal position of the State.

VI. REGISTRATION AND JURISDICTION

Article VIII of the Outer Space Treaty provides that the State of registry retains jurisdiction and control over a registered space object and its personnel, while the Registration Convention similarly recognises the concept of the space object and includes its component parts within

the registration framework. Hosted payloads complicate this structure because a single physical object may contain components that are owned and operated by entities from several different States. The central question is therefore whether a hosted payload should continue to be treated as part of the registered space object or, in certain circumstances, be regarded as a separate space object requiring separate registration. The IN-SPACe framework generally treats an attached hosted payload as part of the host satellite. Earlier Indian guidance similarly recognised that integral payloads which do not separate from the satellite and function independently are normally not separately registered, although separate registration may be considered where operational, jurisdictional, or control considerations justify such treatment. This approach is practical because requiring every instrument mounted on a satellite to be independently registered could create a substantial administrative burden. The difficulty, however, becomes more pronounced where a hosted payload possesses substantial independent operational capacity. Consider, for example, an Indian payload placed on a foreign satellite. The foreign State of registry may retain jurisdiction and control over the registered space object as a whole, while the Indian payload owner may exercise substantial operational autonomy over its own instrument. India's regulatory relationship with the payload may therefore depend heavily on the contractual arrangement between the Indian company and the foreign host. The reverse scenario creates a similar difficulty. Where an Indian company hosts a foreign payload, India may exercise jurisdiction through the registered Indian satellite, while the foreign payload operator may nevertheless retain operational autonomy over its instrument. The IN-SPACe "kill switch" partially addresses this problem by ensuring that the host retains the technical authority to disable the payload.

The deeper issue is that **jurisdiction and operational control may no longer coincide**. This matters because Article VIII operates on the assumption that the State of registry can exercise meaningful jurisdiction and control over the registered space object. Hosted payloads therefore demonstrate that the commercial distinction between a "host" and a "payload" does not necessarily produce a corresponding distinction under international space law. The registered object may remain legally unified even where its ownership and operations are commercially fragmented. India should therefore establish statutory criteria for determining when a hosted payload forms part of the host space object and when it constitutes a separately registrable object, which State should undertake registration, which State exercises jurisdiction, how jurisdiction should be coordinated where components have different national affiliations, and how separate registration interacts with liability.

VII. ARTICLE VI SUPERVISION AND THE “KILL SWITCH”

Article VI of the OST requires States to authorise and continuously supervise national activities in outer space, including activities conducted by non-governmental entities. This requirement becomes particularly difficult where a foreign payload is hosted on an Indian satellite because the State may not directly control or own the payload itself.

The IN-SPACe framework addresses this difficulty through a model of **indirect supervision**, under which the regulatory relationship can broadly be understood as Foreign Payload Owner—Host Company—IN-SPACe/Government. The host therefore becomes the regulatory gateway through which the State exercises supervision over the foreign payload. This model has an important practical advantage: because the host physically controls the satellite platform, it is in a position to implement regulatory instructions concerning the payload. However, it also raises a broader conceptual question: **can contractual supervision through a host adequately satisfy the international requirement of continuing State supervision?** The answer is likely to depend upon the effectiveness of the host’s actual control. If the host has no practical ability to inspect, restrict, or disable the payload, contractual supervision may become largely formal rather than substantive. The framework is therefore strengthened by the requirement that the host maintain a technical shutdown capability.

The Kill Switch

The kill switch is consequently more than a technical safety feature; it functions as a **regulatory instrument** through which continuing supervision can be made operational. Where IN-SPACe or the Government directs the cessation of payload operations, the host must be technically capable of complying with that direction. This gives the State a form of indirect operational control over an instrument that it does not own. At the same time, the effectiveness of such a mechanism raises several questions concerning its technical operation, the scope of governmental discretion, and its commercial consequences.

From a **technical feasibility** perspective, the shutdown mechanism must be sufficiently reliable to operate when required. This becomes particularly relevant where a host company operates several payloads simultaneously, since the system should permit the Government to disable the relevant payload without unnecessarily disrupting unrelated services. The existence of a shutdown mechanism is therefore meaningful only if the host possesses the technical capability to implement a targeted intervention when required.

The **scope of government discretion** also requires consideration. The grounds for shutdown include national security, harmful interference, and other critical concerns. While such

language provides the Government with necessary flexibility, broad discretion may create uncertainty for commercial operators. A foreign payload operator may reasonably require clarity regarding the circumstances in which a shutdown can occur, whether notice is required where feasible, and whether or how such a decision may be challenged. These issues become particularly significant where the payload forms part of a commercial service and the consequences of interruption extend beyond the immediate relationship between the host and the Government.

There are also significant **commercial consequences** associated with a shutdown. A satellite operator may have contractual obligations to its customers, while a payload owner may have research, telecommunications, or other commercial commitments that depend upon continued operation. A government-directed shutdown may therefore generate contractual disputes between private parties even though the underlying decision is regulatory in nature. The host-payload agreement should consequently address the financial consequences of regulatory shutdowns and allocate the resulting risks between the parties.

The kill switch nevertheless provides India with a credible mechanism for demonstrating continuing supervision under Article VI. Its significance lies not merely in the existence of a contractual obligation to comply with government directions, but in the host's ability to translate that obligation into actual technical control. In this sense, the host's operational capability converts an otherwise contractual relationship into a practical mechanism of State oversight, thereby strengthening the connection between private operation of the hosted payload and the State's continuing supervisory obligations under international space law.

VIII. DATA, SPECTRUM AND TAIL LIABILITY

A. Data Governance

The hosted-payload framework places particular obligations on Indian hosts where foreign payloads collect data over Indian territory. Hosts are required to maintain records concerning the relevant data capture and make them available to IN-SPACe. This raises an important question concerning the relationship between data ownership and regulatory control. While the payload owner may regard the resulting data as proprietary, the Indian host may nevertheless become responsible for maintaining and potentially disclosing information relating to that data. The host therefore occupies a position similar to that of a regulatory intermediary. The issue is consequently not merely who owns the data, but also who has the legal authority to control its collection, retention, dissemination and use. A future statutory framework should therefore

distinguish between ownership of payload data, possession of data, regulatory access, national-security access, commercial dissemination rights, and liability arising from unlawful dissemination.

B. Spectrum and ITU Filings

Satellite-as-a-Service also creates challenges concerning spectrum allocation and ITU filings. A host may already have an ITU filing associated with its satellite, while a payload owner may require spectrum arrangements for its own service. The IN-SPACe framework allows satellite capacity to be offered with or without associated ITU filings and ground-station or payload-operations support. Although this flexibility is commercially attractive, it creates potential overlap between space regulation and telecommunications regulation. IN-SPACe authorisation and spectrum authorisation perform distinct legal functions: the former regulates space activities, while the latter concerns the use of radio frequencies and telecommunications services. A hosted-payload framework should therefore clearly establish how these approvals interact and how regulatory responsibilities are allocated between the relevant authorities.

C. Tail Liability

One of the most important but underdeveloped questions concerns post-contract liability. The guidelines provide that authorisation ends with the host agreement or the host satellite's operational life, whichever is earlier. However, a satellite does not necessarily cease to exist when a commercial contract comes to an end. This creates the possibility of tail liability, particularly where the payload remains physically attached to the satellite after the contractual relationship has expired. Consider a five-year hosted-payload agreement that terminates at the end of the fifth year while the payload remains attached to a satellite that continues to operate in orbit. If the object subsequently causes damage, the host may argue that its contractual obligations have ended, while the payload owner may contend that responsibility remains with the host as the satellite operator. From the perspective of international law, however, the State cannot simply terminate its international responsibility because the underlying private agreement has expired. The resulting problem can therefore be expressed through a basic principle: contractual life is not necessarily the same as orbital life. Liability and indemnity arrangements should accordingly survive the commercial term where the relevant space object continues to exist and present potential risks. Insurance arrangements should similarly extend beyond the contractual period where necessary, while end-of-life disposal obligations should be addressed at the beginning of the hosted-payload relationship rather than only when the commercial or operational relationship comes to an end.

IX. COMPARATIVE PERSPECTIVES: UNITED STATES AND UNITED KINGDOM

Other jurisdictions have experience with hosted payloads, although their regulatory approaches differ.

A. United States

US agencies, including NASA and the Department of Defense, have extensive experience with hosted payload arrangements. NASA has used contractual mechanisms such as Space Act Agreements and hosted-payload arrangements in which private companies provide access to commercial spacecraft. The US approach relies significantly on **licensing, contracts, insurance and risk allocation**.

The important lesson for India is not that the US has solved every hosted-payload issue. Rather, it demonstrates that hosted payloads can be integrated into a regulatory framework without treating every payload as a completely independent spacecraft.

US practice also demonstrates the importance of contractual risk allocation and insurance. However, treaty responsibility remains a State-level matter. Private contracts cannot alter the international legal position of the United States as a launching State.

B. United Kingdom

The UK regulates space activities primarily through the Outer Space Act 1986 and Space Industry Act 2018. The UK framework relies heavily on licensing conditions, insurance and compliance with international obligations.

Although it does not provide an exact equivalent of India's 2026 hosted-payload guidelines, the UK approach illustrates the importance of using licensing conditions to impose operational and risk-management obligations on commercial actors.

C. Comparative Lesson for India

The comparative experience suggests that India is not unusual in relying upon contracts and licensing conditions. What is distinctive about the Indian framework is the explicit recognition of **hosted payloads as a category of regulated commercial activity** and the emphasis on the host as the regulatory gateway for foreign payloads.

The key lesson is therefore not that India should abandon contractual regulation. Rather, contracts should operate **within a clear statutory framework** that identifies which obligations are public-law obligations and which are private commercial obligations.

X. RECOMMENDATIONS AND CONCLUSION

India's hosted-payload regime represents a significant regulatory innovation, recognising that satellites are increasingly becoming platforms rather than single-purpose spacecraft. However, this transformation also creates legal challenges that contractual arrangements alone cannot adequately address. The most important reform, therefore, should be the development of a dedicated statutory framework for hosted payloads. Such a framework should clearly define the principal actors involved in hosted-payload arrangements, including the host satellite, hosted payload, host entity, payload owner, payload operator, satellite operator, and hosted-payload service provider, and should link these definitions to specific regulatory duties and responsibilities.

The statutory framework should also clearly distinguish international treaty responsibility from contractual indemnity. Indian law should expressly recognise that contractual indemnities cannot alter or transfer international responsibility arising under applicable space treaties. The launching State would continue to bear international responsibility under the relevant treaty framework, even where a private entity has contractually assumed financial responsibility for particular risks. Maintaining this distinction would provide greater certainty to both the Government and commercial actors by clarifying the difference between the allocation of financial risk under domestic contracts and the attribution of responsibility under international law.

A further reform should involve the codification of continuing supervision. The host entity should be recognised as an important regulatory intermediary, particularly where foreign or independently owned payloads are operated through an Indian satellite platform. Host-payload agreements should form part of the authorisation framework and should impose enforceable obligations on the host to monitor payload activities, maintain appropriate records, prevent unauthorised access, implement government directions, and maintain appropriate technical capabilities for intervention or shutdown. This would provide a clearer regulatory mechanism through which the State can exercise continuing supervision despite the fragmented commercial structure of hosted-payload arrangements.

The law should similarly clarify the registration status of hosted payloads. It should establish when a hosted payload is to be treated as forming part of the host space object, when it requires separate registration, and when it may become a separately registrable space object following deployment or separation. Such clarification would provide greater certainty to operators while bringing the domestic regulatory framework into closer alignment with the principles of the

Registration Convention.

Insurance requirements should also be strengthened to reflect the particular risks associated with hosted payloads. India could establish minimum insurance requirements proportionate to the risks generated by such arrangements, including third-party liability, payload damage, launch failure, operational damage, data-related risks where appropriate, and end-of-life liabilities. Insurance should not merely operate as a mechanism for addressing immediate operational risks but should also contribute to ensuring that financial responsibility remains available where liabilities arise after the commercial relationship between the parties has ended. The issue of tail liability requires particular attention. Indemnity and insurance obligations should, where appropriate, survive the commercial life of the hosting agreement for as long as the relevant space object remains in orbit and continues to generate potential risks. End-of-life disposal and debris-mitigation obligations should also form part of the initial authorisation rather than being addressed only when the satellite or payload approaches the end of its operational life. This would ensure that the regulatory framework accounts for liabilities that may persist beyond the contractual or commercial life of the hosted-payload arrangement.

The host's shutdown obligation should be retained because it provides an important mechanism through which continuing supervision can be made operational. At the same time, legislation or subordinate regulations should clarify the circumstances in which shutdown may be required, the applicable emergency procedures, notice requirements where feasible, relevant technical standards, responsibility for commercial losses resulting from a shutdown, and the obligations of the parties following such an intervention. Clear rules in this area would reduce uncertainty while preserving the Government's ability to respond to regulatory, safety, or security concerns.

Finally, the regulatory relationship between space activities and telecommunications regulation should be clarified. The interaction between IN-SPACe authorisation, ITU filings, and telecommunications licensing should be clearly defined so that hosted-payload and Satellite-as-a-Service providers are not required to navigate overlapping regulatory requirements without a clear allocation of institutional responsibility. A coordinated framework would reduce regulatory uncertainty and make the Indian hosted-payload regime more predictable for both domestic and foreign commercial actors.

Taken together, these reforms would allow India to preserve the commercial flexibility of the Satellite-as-a-Service model while addressing the legal difficulties created by fragmented ownership, control, responsibility, and risk. A dedicated statutory framework would therefore

provide a stronger foundation for reconciling the commercial architecture of hosted payloads with the State-centric structure of international space law.

ENDNOTES

1. Outer Space Treaty, opened for signature 27 January 1967, 18 UST 2410, 610 UNTS 205, arts VI–VIII.
2. Convention on International Liability for Damage Caused by Space Objects, opened for signature 29 March 1972, 24 UST 2389, 961 UNTS 187, arts I–II.
3. Convention on Registration of Objects Launched into Outer Space, opened for signature 14 January 1975, 28 UST 695, 1023 UNTS 15, arts II and IV.
4. Government of India, *Indian Space Policy*, 2023.
5. IN-SPACe, *Satellite-as-a-Service Hosted-Payload Guidelines*, 17 September 2026.
6. Chethan Kumar, “‘Satellite-as-a-Service’: IN-SPACe sets rules for hosted Indian, foreign payloads’ *Times of India* (Bengaluru, 28 September 2026).
7. IN-SPACe, *New Space India Guidelines (NGP) 2024: Space Activities*, ch 6, paras 6.1–6.2.
8. Ashok Jha, *Space Law in India* (Springer 2024), ch 4.
9. NASA, *Hosted Payload Interface Guide for Proposers*, NASA NPR 8610.1 (2012).
10. UK Space Industry Act 2018, ss 45–46.
11. US Commercial Space Launch Act, 51 USC § 50914.