NGN FORUM

Responses to the TRAI Consultation Paper No. 06/2026 dated 8/4/2026 on the framework for Satellite Communication Network (SCN) authorisation and spectrum assignment.

Introduction

Today Satellite systems are dual-use technologies operating beyond national boundaries, and TRAI must recommend that Indian laws governing them have global applicability. License conditions must mandate disclosure and 15-day updates of all technical details (payloads, bus structure, ISLs, routing, spot beams) and foreign contracts for national security evaluation. Violations or anti-national activities should attract penalties of 50%–70% of global turnover and revocation of authorisation. Further, Non-Terrestrial Networks (NTN), originally justified for remote connectivity, now compete directly with heavily regulated IMT systems under a technology-neutral regime. TRAI must ensure a level playing field while embedding deterrent clauses to counter covert use of LEO constellations. India's framework must balance innovation with sovereignty, ensuring no satellite system operates beyond national control.

Q1 "What should be the eligibility conditions, area of operation, validity period of authorisation and the scope of the proposed Satellite Communication Network (SCN) authorisation under Section 3(1)(b) of the Telecommunications Act, 2023? Kindly provide a detailed response with justification."

Response

Main Position: Eligibility must be restricted to **financially sound, technically capable, and security-cleared entities**. Area of operation should be **pan-India**, but subject to **DoT/Defence clearance in sensitive zones**. Validity should be **10**

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

years with mandatory 5-year reviews. Scope must cover all satellite communication services, but with **service-specific authorisation** to prevent dual-use risks.

Detailed Framework

1. **Eligibility Conditions**
   - Only Indian-registered companies or joint ventures with majority Indian ownership.
   - Proven technical capacity in satellite communications.
   - Financial stability with minimum net worth thresholds.
   - Mandatory security clearance from Ministry of Defence and Ministry of Home Affairs.
2. **Area of Operation**
   - Pan-India coverage permitted.
   - Special restrictions in border, defence, and sensitive installations.
   - International gateways only with explicit DoT/Defence approval.
3. **Validity Period**
   - Maximum **10 years**, with **mandatory 5-year reviews**.
   - Revocation rights if sovereignty or compliance obligations are breached.
   - Renewal subject to compliance audits and sustainability reporting.
4. **Scope of Authorisation**
   - Cover GEO, MEO, LEO, and HEO systems.
   - Service-specific authorisation (broadband, IoT, enterprise, defence).
   - Mandatory complete disclosure of technical details of Space segment, payloads both commercial and others, Internal bus structure, ISL, routing mechanism, etc.
   - Infrastructure sharing permitted only under DoT/Defence clearance.

Justification

- **Sovereignty Safeguards:** Prevents foreign constellations from bypassing Indian oversight.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Operational Clarity:** Ensures partnering telecom operators have visibility and control.

Q2 "What should be the terms and conditions (general, technical, operating, security related etc.) that should be made applicable for the proposed Satellite Communication Network authorisation? Kindly provide a detailed response with justification."

Response

Since satellite systems are dual-use technologies and operate beyond national geographical boundaries, it is essential that TRAI recommend to the Government of India the necessary measures to ensure that the jurisdiction of all laws governing any satellite systems has global applicability. There should also be a provision for imposing penalties of up to 50% to 70% of global turnover if such systems are found to be in violation of the terms and conditions of the licence agreement, or are involved in activities prejudicial to the security, sovereignty, or national interests of India.

The licensee must produce and regularly update (within 15days) complete technical details of space system, both commercial and otherwise payloads, bus structure, ISL, routing mechanism in space segment, complete spot beams details over India during the License period.

The licensee must disclose and regularly keep updating the concerned agencies (with in 15 days) of all contracts of space segment company with foreign, governments/ security agencies or any other organization etc for evaluation from national security/ sovereignty point of view and continuance of license.

All above conditions must be made part of licence.

"Terms & Conditions = Control + Compliance + Security."

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

Main Position: The terms and conditions of SCN authorisation must be **multi-layered** — covering **general, technical, operating, and security provisions**. These conditions should be harmonised with the **Telecommunications Act, 2023**, India's **Space Policy 2023**, and international best practices (ITU, COPUOS, ESA).

Proposed Terms & Conditions

1. General Provisions

- Authorisation limited to Indian-registered companies or JVs with majority Indian ownership.
- Validity period: **10 years**, with **mandatory 5-year reviews**.
- Service-specific authorisation (broadband, IoT, enterprise, defence).
- Mandatory compliance with TRAI, DoT, and IN-SPACe guidelines.

2. Technical Provisions

- Spectrum assignment tied to authorisation, revocable for violations.
- Payload disclosure in ITU filings.
- Infrastructure sharing permitted only under DoT/Defence clearance.
- Mandatory interoperability with terrestrial telecom networks.

3. Operating Provisions

- Real-time dashboards for partnering telecom entities (visibility, resource allocation, QoS).
- Annual compliance audits by DoT + Defence.
- Mandatory reporting of orbital manoeuvres and anomalies to NETRA + SBS.
- End-of-life deorbit plans and collision avoidance protocols.

4. Security Provisions

- Lawful interception and emergency shutdown capability.
- Mandatory localisation of gateways and traffic routing through India.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Defence clearance for payloads with dual-use potential.
- Multi-agency monitoring through a National SCN Monitoring Council (NSMC).

Q3 "Which type of authorised entities should be permitted to seek Satellite Communication Network as a Service (SCNaaS) from the entities holding the proposed Satellite Communication Network authorisation? Whether virtual network operators (VNOs) should also be permitted to seek SCNaaS? Kindly provide a detailed response with justification."

Response

"SCNaaS for All, But Sovereignty First."

Main Position: SCNaaS should be permitted for **licensed telecom service providers (TSPs), ISPs, enterprise connectivity providers, and government agencies**. **Virtual Network Operators (VNOs)** may also be permitted, but only under **strict compliance conditions** to prevent misuse and ensure sovereignty safeguards.

Detailed Framework

1. **Eligible Entities**
   - **Licensed TSPs/ISPs:** To extend broadband and IoT services using SCN capacity.
   - **Enterprise Providers:** For secure connectivity in remote areas, disaster recovery, and defence-critical applications.
   - **Government Agencies:** For national security, disaster management, and rural connectivity.
   - **VNOs:** Allowed, but only if they operate under a licensed parent TSP and comply with lawful interception and localisation norms.
2. **Conditions for VNOs**
   - Must have a binding agreement with a licensed TSP.

- Cannot directly interface with foreign constellation owners.
- Must route traffic through authorised Indian gateways.
- Subject to annual compliance audits by DoT/Defence.

3. **Operational Safeguards**
   - SCNaaS dashboards must provide visibility to partnering entities.
   - Resource allocation (bandwidth, QoS) must be transparent.
   - Emergency shutdown capability must be shared with DoT/Defence.

"Revocation of Authorisation"

1. **Validity Period**
   - Every Satellite Communication Network (SCN) authorisation shall be valid for a maximum period of **ten (10) years**, subject to **mandatory review at the end of each five (5) year cycle**.
2. **Grounds for Revocation**
   - The Government of India may revoke the authorisation, in whole or in part, prior to expiry of the validity period, if the authorised entity is found to have: a. Engaged in **Rogue Operator Action** as defined under law; b. Misrepresented payload specifications or activated undeclared payloads; c. Violated spectrum assignment conditions, including "use-it-or-lose-it" obligations; d. Failed to comply with lawful interception, gateway localisation, or national security directives; e. Defaulted on financial or performance guarantees; f. Obstructed oversight, refused summons, or concealed beneficial ownership; g. Caused harmful interference or cross-border spill-over contrary to ITU regulations. h) Any violation of terms and conditions of the license.
3. **Review Mechanism**

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- At the end of each five (5) year cycle, the authorised entity shall undergo a **compliance and security audit** conducted jointly by DoT, Defence, ISRO/IN-SPACe, and other designated agencies.
- Continuation of authorisation beyond the review period shall be contingent upon satisfactory compliance.

4. **Penalty & Enforcement**
   - In addition to any violation of terms of license, the Government of India may impose monetary penalties up to fifty to **seventy percent of the global annual revenue** of the operator, enforceable against the operator and its beneficial owners.
   - Revocation shall not prejudice India's right to pursue **cross-border enforcement** through bilateral treaties, ITU filings, and international arbitration forums.
5. **Emergency Override**
   - The Government of India reserves the right to **suspend or disable satellite services immediately** upon detection of hostile acts, pending formal revocation proceedings.

Definition of "Rogue Operator Action"

"Rogue Operator Action = Payload Deception + Sovereignty Violation."

"Rogue Operator Action" means any act or omission by a satellite operator, its affiliates, or beneficial owners, whether incorporated in India or abroad, which:

1. **Payload Misrepresentation**
   - Deploys, activates, or operates any undeclared, covert, dual-use, or hostile payload onboard a satellite serving Indian territory, contrary to

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

the payload specifications disclosed to the Government of India or international filings.

2. **Unlawful Spectrum Use**
   - Utilises spectrum assigned for authorised services to conduct unauthorised transmissions, surveillance, or interference, including cross-border spill-over that compromises India's sovereignty, security, or public order.
3. **Non-Compliance with Authorisation**
   - Provides services in India without valid authorisation, or in violation of licence conditions, gateway localisation requirements, lawful interception obligations, or national security directives.
4. **Obstruction of Oversight**
   - Refuses or fails to comply with summons, disclosure orders, or inspection by Indian authorities, including concealment of beneficial ownership or corporate control.
5. **Hostile Acts**
   - Engages in activities amounting to espionage, sabotage, cyber intrusion, or disruption of critical infrastructure through satellite networks.

Q4. Whether the SCN authorised entity establishing, operating, maintaining, or expanding the baseband system alongwith SCN should be mandated to extend control, visibility, resource allocation and management of the telecommunication services, being provisioned using SCN to users, to the partnering entity on mutually agreed terms and conditions? Please provide a detailed response with justification.

Response

"Visibility Shared, Sovereignty Secured."

Main Position: Yes, SCN-authorised entities must be mandated to extend **control, visibility, resource allocation, and management rights** to partnering entities —

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

but only under **mutually agreed terms and conditions duly approved by DoT/Defence**.

This ensures sovereignty, lawful interception, and prevents monopolisation by foreign constellation owners.

Prevents collusion between SCN licensees and constellation owners.

Ensures DoT/Defence can audit both SCN entities and their partners.

Q5. What provisions should be included in the terms and conditions of Satellite Communication Network (SCN) authorisation considering the policy/ Act in the Space sector? Kindly provide a detailed response with justification.

Response

"Terms & Conditions = Sovereignty + Sustainability."

Main Position: The terms and conditions of SCN authorisation must be **aligned with the Telecommunications Act, 2023** and harmonised with India's emerging **Space Policy and Space Activities Bill**. They should embed **sovereignty safeguards, compliance obligations, Sustainability norms, and global coordination clauses**.

Proposed Provisions

1. **Sovereignty & Security Clauses**
   - Mandatory localisation of gateways and baseband systems in India.
   - Lawful interception and emergency shutdown capability.
   - Payload disclosure and service-specific authorisation to prevent dual-use risks.
2. **Spectrum & Resource Management**
   - Spectrum assignment tied to authorisation, with revocation rights.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Transparent resource allocation dashboards for partnering telecom entities.
- Prohibition on spectrum hoarding or speculative filings.

3. **Compliance & Review**
   - Mandatory **5-year review clauses** to address evolving technologies and geopolitical risks.
   - Annual compliance audits by DoT + Defence.
   - Multi-agency monitoring through a National SCN Monitoring Council (NSMC).

Q7 "With respect to the interconnection with the proposed Satellite Communication Network Authorised Entities, whether there are any other issues in addition to those raised in TRAI's consultation paper on 'Review of existing TRAI Regulations on Interconnection matters' dated 10.11.2025, which require to be addressed in this consultation process? Please provide a detailed response with justification."

Response

*In new World of **Satellite media connectivity** employing LEOs which possess lethal Dual use an **INVISIBLE COVERT INTERCONNECTION** **IN THE SPACE hidden in payload needs to be addressed in this CP.***

"Interconnection Must Mean Inspection."

Main Position: Yes, there are **additional interconnection issues unique to SCN authorisation** that go beyond the scope of TRAI's 2025 consultation on terrestrial interconnection.

These must be explicitly addressed to safeguard sovereignty, ensure operational transparency, and protect consumers.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

A major concern in satellite regulation is that **payloads onboard a satellite are interconnected through internal circuitry**. Even if an operator declares that only the *communication payload* is active for SCN services, other payloads (e.g., surveillance sensors, imaging modules, navigation instruments) remain physically connected to the same bus systems (power, data handling, thermal control).

This hidden interconnection means covert activation of non-declared payloads is technically possible and **cannot be detected from ground monitoring alone**. Such dual-use risks directly affect **interconnection agreements**, because terrestrial operators may unknowingly carry traffic linked to undeclared payloads. Therefore, TRAI must embed **payload transparency and verification** into interconnection regulations.

Issues:

- Sovereignty: Gateway localisation, lawful interception, Defence override.
- Technical: Latency management, traffic visibility, hidden payload detection via NETRA/SBS.
- Commercial: Settlement models, cost allocation, dispute resolution.
- Benchmarking: FCC, Japan, Australia mandate payload disclosure at interconnection.

Additional Issues to Address

1. **Sovereignty & Security**
    - **Gateway localisation:** All interconnection points must be located within India.
    - **Lawful interception:** SCN entities must provide interception capability at interconnection points.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Emergency shutdown:** DoT/Defence must retain override rights at interconnection nodes.

2. **Technical & Operational**
   - **Latency management:** Satellite interconnection introduces higher latency; QoS standards must be defined.
   - **Traffic visibility:** Partnering TSPs must have real-time dashboards for traffic flows and resource allocation.
   - **Payload transparency:** SCN entities must disclose payload type and service category at interconnection stage.
3. **Financial & Commercial**
   - **Settlement models:** Clear rules for revenue sharing between SCN entities and TSPs.
   - **Cost allocation:** Transparent mechanisms for bandwidth and infrastructure costs.
   - **Dispute resolution:** Arbitration under Indian law for interconnection disputes.
4. **Global Benchmarking**
   - **FCC (USA):** Requires interconnection agreements between satellite operators and telecom carriers.
   - **Japan & Australia:** Mandate payload disclosure and interconnection transparency.
   - India must adopt similar norms to align with Quad practices.

Justification

- **National Security:** Prevents foreign SCN providers from bypassing Indian oversight.
- **Operational Clarity:** Ensures partnering telecom operators have visibility and control.
- **Consumer Protection:** Guarantees service continuity and grievance redressal.
- **Global Legitimacy:** Aligns India with ITU, COPUOS, and Quad norms.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

Q8 "Any other inputs or suggestions relevant to the proposed Satellite Communication Network authorisation may kindly be provided with detailed justification."

In new World of ***Satellite media connectivity*** *employing LEOs which possess lethal Dual use an* ***INVISIBLE COVERT INTERCONNECTION*** ***IN THE SPACE hidden in payload needs to be addressed in this CP.***

Response:

"**Beyond Authorisation: Transparency, Monitoring, and Sustainability."**

INVISIBLE COVERT INTERCONNECTION IN THE SPACE

In addition to our response to above questions (Q2 and Q3 above in particular), One of the most pressing concerns is that **satellite payloads are internally interconnected through shared circuitry**. Even if an operator declares only a communication payload for SCN services, other payloads (e.g., surveillance, imaging, navigation) may remain physically connected to the same bus systems. This hidden interconnection means **covert activation** is possible and **cannot be detected from ground monitoring alone**.

This risk underscores the need for **additional safeguards** in the SCN authorisation framework beyond those already raised in TRAI's consultation paper.

Additional Inputs & Suggestions

1. **Payload Transparency & Verification**
   - Mandatory disclosure of *all payloads* onboard.
   - ISRO/IN-SPACe certification of payload separation.
   - Service-specific authorisation to prevent dual-use misuse.
   - Independent orbital monitoring (NETRA + SBS) to detect anomalies.
2. **Multi-Agency Monitoring Council**

Dr. R. K. Mehrotra (Executive President) Satya N. Gupta (Secretary General) B. K. Mitra (Treasurer)
V K Arya (Chairman Programs)
G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Establish a **National SCN Monitoring Council (NSMC)** with DoT, Defence, ISRO/IN-SPACe, and MEA.
- Quarterly reviews and annual public reports to ensure accountability.
- Defence override rights for emergency shutdown.

3. **Review Clauses & Adaptive Licensing**
   - Mandatory **5-year review clauses** to recalibrate against evolving technologies and geopolitical risks.
   - Licence renewal contingent on compliance audits and sustainability reporting.
4. **Sustainability & Debris Management**
   - Adoption of ESA's **Zero Debris Charter** targets for 2030.
   - End-of-life deorbit plans and collision avoidance protocols.
   - Mandatory reporting to UN COPUOS on sustainability compliance.
5. **International Coordination**
   - ITU filings must match declared payload functions.
   - Payload verification by ISRO/IN-SPACe before international filings.
   - Alignment with Quad practices on orbital slot protection and transparency.

Justification

- **National Security:** Prevents covert activation of hidden payloads.
- **Operational Clarity:** Ensures partnering telecom operators have visibility and control.
- **Global Legitimacy:** Aligns India with ITU, COPUOS, and Quad norms.
- **Sustainability:** Positions India as a responsible actor in space governance.

Q9 "Which of the following services should be permitted to be provided by using the SCNs established by the proposed SCN authorised entities: (a) Fixed Satellite Service (FSS); (b) Mobile Satellite Service (MSS); (c) Direct-to-Device (D2D) Service via satellite by using MSS spectrum; (d) Direct-to-Device (D2D) Service via satellite by using IMT spectrum? Kindly provide a detailed response with justification.

Response:

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

NTN (Non-Terrestrial Networks) concept took shelter in the arguments that to supplement terrestrial services in remote and inaccessible areas only. Hence a lot of regulatory/ administrative privileges were provided (like no auction of spectrum/ administrative allocation etc etc.

As a matter of fact, these NTN systems after getting unfair privileges, in a technology neutral regime, are going to compete with heavily regulated IMT systems. TRAI (as an independent sectoral regulator) must recommend level playing field for all the technological solutions in technology neutral regime.

After that "Permit All Services, But Protect Sovereignty."

Main Position: All four services (FSS, MSS, D2D via MSS spectrum, and D2D via IMT spectrum) may be permitted under SCN authorisation, but **with differentiated compliance conditions**. Sovereignty safeguards, payload transparency, and spectrum management must be embedded to prevent covert dual-use risks and ensure consumer protection.

Exception & Caution:- India should **allow full authorisation of D2D services via IMT spectrum until after acceptance of WRC-2027 outcome**, but permit **limited pilot projects under strict compliance** in the interim.

Q10 "Whether D2D Service via satellite by using IMT spectrum should be permitted at this stage itself, or should this matter be examined after considering the outcome of WRC-2027? Kindly provide a detailed response with justification."

"Pilot Now, Decide After WRC-2027."

Main Position: India should **defer full authorisation of D2D services via IMT spectrum until after WRC-2027**, but permit **limited pilot projects under strict compliance** in the interim. This balances innovation with sovereignty safeguards, spectrum efficiency, and global harmonisation.

Framework for Decision

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

1. **Immediate Position (Pre-WRC-2027)**
   - Allow **pilot deployments** of D2D via IMT spectrum under DoT/Defence oversight.
   - Traffic must be routed through Indian gateways with lawful interception capability.
   - Payload transparency audits required to confirm only communication payloads are active.
   - Spectrum coordination with terrestrial IMT operators to prevent interference.
2. **Post-WRC-2027 Position**
   - Adopt ITU/WRC-2027 outcomes for global harmonisation of IMT spectrum use.
   - Align India's SCN framework with international coexistence rules.
   - Expand authorisation to commercial deployments only after WRC-2027 consensus.
3. **Risk Mitigation**
   - **Hidden payload interconnection risk:** Even if declared as communication-only, covert activation of surveillance payloads is possible.
   - **Spectrum interference risk:** IMT bands are critical for terrestrial 4G/5G/6G; premature authorisation could disrupt national networks.
   - **Global legitimacy:** India must avoid unilateral authorisation that conflicts with ITU/WRC norms.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Spectrum Efficiency:** Avoids interference with terrestrial IMT services.
- **Global Benchmarking:** FCC (USA) and Japan are permitting D2D via IMT spectrum only under strict coexistence rules; India should wait for WRC-2027 harmonisation.
- **Innovation Balance:** Pilot projects allow India to test readiness without committing prematurely.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

Q11 "From the perspective of holding spectrum for the feeder link and the user link on SCNs, which of the following combinations should be permitted at the SCNs established by the proposed SCN authorised entities:

1. SCN authorised entity – SCN authorised entity
2. SCN authorised entity – Partnering entity (service provider)
3. Partnering entity (service provider) – SCN authorised entity
4. Partnering entity (service provider) – Partnering entity (service provider)

Kindly provide a detailed response with justification."

"Spectrum Control Must Stay with SCN Entities."

Main Position: India should permit **Combinations 1 and 2** as the default, allow **Combination 3** under strict compliance, and prohibit **Combination 4**. This ensures sovereignty safeguards, spectrum efficiency, and accountability in SCN operations.

Combination-Wise Framework

1. **Combination 1: SCN authorised entity – SCN authorised entity** ☑
   - **Recommended as default.**
   - Ensures full control and visibility by the SCN entity.
   - Simplifies compliance, monitoring, and lawful interception.
   - Prevents spectrum hoarding and misuse.
2. **Combination 2: SCN authorised entity – Partnering entity (service provider)** ✅
   - **Permitted with safeguards.**
   - Enables partnering TSPs/ISPs to extend services using SCN capacity.
   - Requires transparent dashboards for resource allocation and QoS.
   - Spectrum assignment tied to SCN authorisation, revocable for violations.
3. **Combination 3: Partnering entity – SCN authorised entity** ▲

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Permitted only under strict compliance.**
- Partnering entity may hold feeder link spectrum, but SCN entity must retain user link control.
- Defence clearance required to prevent covert payload activation.
- Annual audits by DoT/Defence to ensure sovereignty safeguards.

4. **Combination 4: Partnering entity – Partnering entity ❌**
   - **Not recommended.**
   - Removes SCN entity oversight, risking sovereignty and compliance breaches.
   - Increases risk of collusion with foreign constellation owners.
   - Difficult to enforce lawful interception and payload transparency.

Justification

- **Sovereignty Safeguards:** Ensures SCN entities retain primary control over spectrum.
- **Operational Clarity:** Partnering entities can participate, but only under SCN oversight.
- **Consumer Protection:** Guarantees accountability and grievance redressal.
- **Global Benchmarking:** Aligns India with FCC and ITU practices, where satellite operators retain feeder link control.
- **Risk Mitigation:** Prevents hidden payload activation and spectrum misuse by non-authorised entities.

Q12 "Which of the following types of spectrum should be assigned to the proposed SCN authorised entities: (a) Spectrum in the frequency bands allocated for FSS (b) Spectrum in the frequency bands allocated for MSS (c) Any other? Kindly provide a detailed response with justification."

Main Position: SCN authorised entities should be assigned **spectrum in both FSS and MSS bands**, with **conditional access to IMT spectrum for D2D services** after WRC-2027. Spectrum assignment must be **service-specific, revocable, and tied to compliance obligations** to safeguard sovereignty and prevent hoarding.

"Assign FSS + MSS Now, IMT Later."

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

Spectrum Assignment Framework

1. **FSS Bands (Fixed Satellite Service)** 🟩
   - Essential for broadband backhaul, enterprise connectivity, and disaster recovery.
   - Must be tied to SCN authorisation and subject to revocation for violations.
   - Infrastructure sharing permitted only under DoT/Defence clearance.
2. **MSS Bands (Mobile Satellite Service)** ✅
   - Critical for mobility applications (maritime, aviation, remote area connectivity).
   - Payload disclosure mandatory to prevent dual-use misuse.
   - Interconnection with terrestrial networks subject to TRAI QoS standards.
3. **Other Bands (Conditional Access)** 🔺
   - **IMT spectrum for D2D services** may be permitted only after WRC-2027 outcomes.
   - Interim pilot projects allowed under strict compliance (gateway localisation, lawful interception, Defence override).
   - Spectrum coordination with terrestrial IMT operators required to prevent interference.

Justification

- **Sovereignty Safeguards:** Prevents foreign SCN providers from bypassing Indian oversight.
- **Operational Clarity:** Service-specific assignment ensures transparency and accountability.
- **Spectrum Efficiency:** Avoids hoarding and interference, ensures equitable access.
- **Global Benchmarking:** FCC and ITU permit FSS/MSS assignments; IMT spectrum for D2D is under study at WRC-2027.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Risk Mitigation:** Prevents covert activation of hidden payloads interconnected inside satellites.

It is recommended, **assigning FSS and MSS spectrum immediately**, while **deferring IMT spectrum authorisation until WRC-2027**, with pilot projects allowed under strict compliance

Q13 "What should be the broad policy and regulatory framework for the assignment of FSS spectrum and/or MSS spectrum to the proposed SCN authorised entities? Specifically: (a) NGSO-based FSS and GSO/NGSO-based MSS: Whether TRAI's recommendations dated 09.05.2025 (read with TRAI's response dated 08.12.2025) should be made applicable to SCN authorised entities with necessary modifications? If yes, what modifications would be required? If no, what should be the terms and conditions? (b) GSO-based FSS: Whether the terms and conditions for assignment of spectrum to SCN authorised entities for GSO-based FSS should be analogous to those recommended by TRAI for NGSO-based FSS and GSO/NGSO-based MSS, with necessary modifications? If yes, what modifications would be required? If no, what should be the terms and conditions?"

"Apply TRAI 2025, But Add Sovereignty Safeguards."

Main Position: Yes, TRAI's 2025 recommendations on spectrum assignment for satellite-based commercial communication services should be applied to SCN authorised entities, but with **necessary modifications** to embed sovereignty safeguards, payload transparency, and adaptive licensing.

(a) NGSO-based FSS and GSO/NGSO-based MSS

- **Apply TRAI 2025 Recommendations with Modifications:**
  - **Service-specific authorisation:** Spectrum assignment must be tied to declared payload/service (FSS or MSS).

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Payload transparency audits:** Mandatory disclosure and certification of payload separation to prevent covert activation.
- **Review clauses:** 5-year review cycles to recalibrate against evolving technologies and geopolitical risks.
- **Spectrum revocation:** Assignment revocable if obligations (QoS, localisation, interception) are breached.
- **Multi-agency oversight:** DoT, ISRO/IN-SPACe, Defence, and MEA must jointly monitor compliance.

(b) GSO-based FSS

- **Analogous Framework with Modifications:**
  - **Gateway localisation:** All feeder/user links must terminate in India.
  - **Lawful interception:** Mandatory interception capability at interconnection points.
  - **Spectrum efficiency:** Prevent hoarding by mandating "use-it-or-lose-it" clauses.
  - **Debris management:** End-of-life deorbit plans aligned with ESA's Zero Debris Charter.
  - **International filings:** ITU/COPUOS filings must match declared payload functions; discrepancies trigger compliance review.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Operational Clarity:** Service-specific assignment ensures transparency and accountability.
- **Spectrum Efficiency:** Avoids hoarding and interference, ensures equitable access.
- **Global Benchmarking:** FCC, ITU, and ESA frameworks emphasise payload disclosure, sustainability, and adaptive licensing.
- **Risk Mitigation:** Embeds sovereignty safeguards into spectrum assignment.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

TRAI's 2025 recommendations, strengthens them with **sovereignty safeguards, payload transparency, adaptive licensing, and sustainability norms**.

Q14 "What should be the eligibility conditions for seeking administrative assignment of FSS spectrum and/or MSS spectrum by the proposed SCN authorised entities? Kindly provide a detailed response with justification

"Eligibility Must Mean Security + Competence."

Main Position: Eligibility for administrative assignment of FSS/MSS spectrum must be restricted to **Indian-registered, security-cleared SCN authorised entities** that demonstrate technical competence, financial stability, and compliance readiness. This ensures sovereignty safeguards, prevents spectrum hoarding, and aligns India with global best practices.

Eligibility Conditions Framework

1. **Legal & Ownership Requirements**
   - Entity must be incorporated in India under the Companies Act.
   - Majority ownership and control must remain with Indian citizens/entities.
   - Foreign participation permitted only within FDI limits approved by DoT/Defence.
2. **Security & Sovereignty Safeguards**
   - Mandatory security clearance from Ministry of Home Affairs and Defence.
   - Gateway localisation within India.
   - Lawful interception capability at interconnection points.
3. **Technical Competence**

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Demonstrated ability to deploy and operate FSS/MSS systems.
- Payload transparency certification from ISRO/IN-SPACe.
- Compliance with ITU filings and COPUOS sustainability guidelines.

4. **Financial Stability**
   - Minimum net worth and financial guarantees to ensure long-term viability.
   - Performance bank guarantees to prevent speculative spectrum hoarding.
5. **Operational Compliance**
   - Service-specific authorisation tied to declared payload/service.
   - Mandatory 5-year review clauses for adaptive licensing.
   - Compliance with TRAI QoS standards and consumer protection norms.

Justification

- **National Security:** Restricts spectrum assignment to entities under Indian jurisdiction and oversight.
- **Operational Clarity:** Ensures only technically competent and financially stable entities can hold spectrum.
- **Spectrum Efficiency:** Prevents hoarding and speculative misuse.
- **Global Benchmarking:** Aligns India with FCC, ITU, and ESA practices on spectrum assignment.
- **Risk Mitigation:** Embeds sovereignty safeguards and payload transparency into eligibility.

Q15 "Whether there are any other inputs or suggestions relevant to the assignment of FSS spectrum and/or MSS spectrum to the entities holding the proposed SCN authorisation? Kindly provide a detailed response with justification."

"Assign Spectrum with Safeguards, Not Just Access."

Main Position: Yes — beyond the basic assignment of FSS and MSS spectrum, India must embed **additional safeguards and adaptive mechanisms** to ensure

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

sovereignty, prevent spectrum hoarding, and align with global sustainability norms.

Additional Inputs & Suggestions

1. **Service-Specific Assignment**
   - Spectrum must be tied to declared payload/service (FSS or MSS).
   - Prevents covert activation of hidden payloads interconnected inside satellites.
   - Enables revocation if obligations are breached.
2. **Adaptive Licensing & Review Clauses**
   - Mandatory **5-year review cycles** to recalibrate against evolving technologies and geopolitical risks.
   - Spectrum assignment validity linked to compliance audits.
3. **Spectrum Efficiency & Anti-Hoarding**
   - Introduce **"use-it-or-lose-it" clauses** to prevent speculative hoarding.
   - Performance bank guarantees to ensure genuine deployment.
   - Transparent dashboards for monitoring utilisation.
4. **Multi-Agency Oversight**
   - Establish a **National Spectrum Oversight Council (NSOC)** with DoT, ISRO/IN-SPACe, Defence, and MEA.
   - Joint monitoring of payload transparency, orbital behaviour, and interconnection compliance.
5. **Sustainability & Debris Management**
   - End-of-life deorbit plans must be mandatory.
   - Compliance with ESA's **Zero Debris Charter** targets for 2030.
   - Reporting to UN COPUOS on sustainability compliance.
6. **International Coordination**
   - ITU filings must match declared payload functions.
   - India must align with WRC-2027 outcomes for IMT spectrum use in D2D services.
   - Benchmark against FCC and Quad practices on spectrum assignment.

Justification

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Operational Clarity:** Service-specific assignment ensures transparency and accountability.
- **Spectrum Efficiency:** Avoids hoarding and interference, ensures equitable access.
- **Global Benchmarking:** Aligns India with FCC, ITU, ESA, and Quad practices.
- **Sustainability:** Positions India as a responsible actor in space governance.

Q16 "In case it is decided to permit the proposed SCN authorised entity to utilize the FSS spectrum and/or MSS spectrum assigned to a service authorised entity ('partnering entity') for the purpose of providing SCNaaS to the partnering entity — whether there is a need to establish a policy and regulatory framework for enabling the SCN authorised entity to enter into an agreement/arrangement with the partnering entity to utilize FSS spectrum and/or MSS spectrum assigned to such partnering entity for the purpose of providing SCNaaS to the partnering entity? (i) If yes, what should be the terms and conditions under such a framework? (ii) If no, in what manner such agreements/arrangements should be enabled and regulated? Kindly provide a detailed response with justification."

"Shared Spectrum Must Mean Shared Accountability."

Main Position: Yes — there is a clear need to establish a **policy and regulatory framework** for such agreements as mentioned in our response to earlier questions. Without it, spectrum utilisation risks becoming opaque, potentially enabling covert payload activation, spectrum hoarding, or bypassing sovereignty safeguards.

Framework Terms & Conditions (If yes)

1. **Service-Specific Authorisation**

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- SCN authorised entity may only utilise spectrum for the declared service (FSS/MSS).
- Payload transparency audits must confirm only authorised payloads are active.

2. **Gateway Localisation & Lawful Interception**
   - All traffic routed through Indian gateways.
   - Mandatory interception capability at interconnection points.
3. **Spectrum Efficiency & Anti-Hoarding**
   - "Use-it-or-lose-it" clauses to prevent speculative hoarding.
   - Performance bank guarantees to ensure genuine deployment.
4. **Multi-Agency Oversight**
   - Agreements subject to approval by DoT, Defence, ISRO/IN-SPACe, and MEA.
   - Annual compliance audits and quarterly reporting.
5. **Review Clauses**
   - Mandatory 5-year review cycles to recalibrate against evolving technologies and risks.
   - Revocation rights if obligations are breached.

Alternative (If No Formal Framework)

- Agreements may be enabled through **reference interconnection agreements**, similar to TRAI's 2025 model.
- Must be filed with TRAI/DoT for transparency.
- Subject to dispute resolution under Indian law.
- Defence override rights retained.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Operational Clarity:** Ensures partnering entities and SCN providers have transparent agreements.
- **Spectrum Efficiency:** Avoids hoarding and speculative misuse.

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Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Global Benchmarking:** FCC and ITU require disclosure and oversight in shared spectrum arrangements.
- **Risk Mitigation:** Embeds sovereignty safeguards into SCNaaS agreements.

Q17 "Whether there are any other inputs or suggestions relevant to the agreement/arrangement between the proposed SCN authorised entities and service authorised entities ('partnering entities') to utilize the FSS spectrum and/or MSS spectrum assigned to such partnering entities? Kindly provide a detailed response with justification."

"Agreements Must Safeguard Sovereignty, Not Just Enable Access."

Main Position: Yes — additional safeguards are required to ensure that agreements between SCN authorised entities and partnering service providers remain transparent, secure, and aligned with national sovereignty. These agreements must embed **payload transparency, compliance audits, and dispute resolution mechanisms** to prevent covert misuse of spectrum and ensure accountability.

Additional Inputs & Suggestions

1. **Payload Transparency & Verification**
   - Agreements must include clauses requiring **mandatory disclosure of all payloads** onboard satellites.
   - Independent audits by ISRO/IN-SPACe to confirm only authorised payloads are active.
   - Prevents covert activation of hidden payloads interconnected inside satellites.
2. **Gateway Localisation & Security Clauses**
   - All traffic must be routed through **Indian gateways**.
   - Mandatory **lawful interception capability** at interconnection points.
   - Defence override rights embedded in agreements.
3. **Spectrum Efficiency & Anti-Hoarding**
   - "Use-it-or-lose-it" provisions to prevent speculative hoarding of spectrum.

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Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Performance bank guarantees to ensure genuine deployment.
- Transparent dashboards for monitoring utilisation.

4. **Compliance & Review Clauses**
   - Agreements must include **5-year review cycles** to recalibrate against evolving technologies and risks.
   - Revocation rights if obligations are breached.
   - Quarterly compliance reporting to DoT/Defence.
5. **Dispute Resolution & Legal Oversight**
   - Disputes to be resolved under **Indian law and jurisdiction**.
   - Arbitration mechanisms embedded in agreements.
   - TRAI oversight to ensure consumer protection.
6. **Global Benchmarking**
   - FCC (USA) and ITU frameworks mandate disclosure and oversight in shared spectrum arrangements.
   - India must align with these practices while embedding sovereignty safeguards.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Operational Clarity:** Ensures partnering entities and SCN providers have transparent agreements.
- **Spectrum Efficiency:** Avoids hoarding and speculative misuse.
- **Global Benchmarking:** Aligns India with FCC, ITU, and Quad practices.
- **Consumer Protection:** Guarantees service continuity and grievance redressal.

Q18 "In case it is decided to permit D2D service via satellite by using the spectrum in the frequency bands allocated for MSS such as L-band and S-band, whether there is a need to establish a policy and regulatory framework for enabling and regulating such a service? If yes, kindly suggest a broad framework for this purpose and the key terms and conditions to be included under such a framework? Kindly provide a detailed response with justification."

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

"Permit D2D via MSS, But With Guardrails."

Main Position: Yes — there is a clear need to establish a **dedicated policy and regulatory framework** for D2D services via MSS spectrum (L-band and S-band). These bands are critical for mobility and safety-of-life applications, and premature authorisation without safeguards risks interference, covert payload activation, and sovereignty breaches.

Broad Framework for D2D via MSS Spectrum

1. **Service-Specific Authorisation**
   - D2D services via MSS spectrum must be tied to declared payload/service.
   - Payload transparency audits required to confirm only communication payloads are active.
2. **Gateway Localisation & Security**
   - All traffic routed through Indian gateways.
   - Mandatory lawful interception capability.
   - Defence override rights embedded in authorisation.
3. **Spectrum Efficiency & Anti-Hoarding**
   - "Use-it-or-lose-it" clauses to prevent speculative hoarding.
   - Performance bank guarantees to ensure genuine deployment.
   - Transparent dashboards for monitoring utilisation.
4. **QoS & Consumer Protection**
   - TRAI QoS standards must apply to D2D services.
   - Service continuity and grievance redressal mechanisms required.
   - Emergency priority access for disaster recovery and public safety.
5. **Compliance & Review Clauses**
   - Mandatory 5-year review cycles to recalibrate against evolving technologies and risks.
   - Revocation rights if obligations are breached.
6. **Sustainability & Debris Management**
   - End-of-life deorbit plans mandatory.
   - Compliance with ESA's Zero Debris Charter targets for 2030.
   - Reporting to UN COPUOS on sustainability compliance.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

7. **International Coordination**
    - ITU filings must match declared payload functions.
    - India must align with WRC-2027 outcomes for MSS/D2D coexistence.
    - Benchmark against FCC and Quad practices.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Spectrum Efficiency:** Avoids interference with terrestrial MSS services.
- **Operational Clarity:** Ensures transparent agreements and accountability.
- **Global Benchmarking:** FCC and ITU frameworks mandate disclosure and oversight in MSS/D2D arrangements.
- **Consumer Protection:** Guarantees service continuity and grievance redressal.
- **Sustainability:** Positions India as a responsible actor in space governance.

Q19 "In case with a view to enable D2D service via satellite using IMT spectrum, it is decided to permit the proposed SCN authorised entity to utilize IMT spectrum assigned to a service authorised entity ('partnering entity') for the purpose of providing SCNaaS to the partnering entity: (a) whether there is a need to establish a policy and regulatory framework for enabling the SCN authorised entity to enter into an agreement/arrangement with the partnering entity to utilize IMT spectrum assigned to such partnering entity for the purpose of providing SCNaaS to the partnering entity? If yes, what should be the terms and conditions under such a framework? If no, in what manner such arrangements should be enabled and regulated? (b) Which frequency bands identified for IMT should be considered for this purpose? Specifically, whether only FDD-based frequency bands should be considered? (c) For the frequency bands identified for IMT where D2D is decided to be permitted, whether the National Frequency Allocation Plan (NFAP) should be modified to include MSS on a secondary basis? If yes, kindly furnish your suggestion for the proposed modification(s). (d) To mitigate the issues related to cross-border interference, whether any other condition in addition to Article

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

4.4 of the ITU-Radio Regulations is required to be made applicable? (e) What regulatory framework should be established for ensuring interference-free operation of D2D service via satellite by using IMT spectrum within the country? Specifically, which of the following methods should be followed: (i) Single partnering entity holding IMT channel across all 22 LSAs; or (ii) Multiple partnering entities collectively holding IMT channel across all 22 LSAs; or (iii) Any other method? Kindly provide a detailed response with justification."

"IMT for D2D: Framework First, Deployment Later."

Main Position: Yes — a **dedicated policy and regulatory framework** is essential before permitting SCN authorised entities to utilise IMT spectrum for D2D services. IMT bands are critical for terrestrial 4G/5G/6G networks, and premature authorisation without safeguards risks interference, covert payload activation, and sovereignty breaches.

(a) Policy & Regulatory Framework

- **Mandatory Terms & Conditions:**
  - Service-specific authorisation tied to declared payload/service.
  - Payload transparency audits by ISRO/IN-SPACe.
  - Gateway localisation and lawful interception capability.
  - Defence override rights embedded in agreements.
  - "Use-it-or-lose-it" clauses and performance guarantees to prevent hoarding.
  - Quarterly compliance reporting to DoT/Defence.

(b) Frequency Bands

- **FDD-based IMT bands** should be prioritised for D2D services.
- FDD bands provide better coexistence with terrestrial IMT services and minimise interference.
- TDD bands may be considered later, subject to WRC-2027 outcomes and coexistence studies.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

(c) NFAP Modification

- NFAP should be modified to include **MSS on a secondary basis** in identified IMT bands.
- Suggested modification: "IMT bands [specify ranges] may be used for MSS (secondary basis) for D2D services under SCN authorisation, subject to DoT/Defence clearance and ITU coordination."
- Ensures legal clarity and international alignment.

(d) Cross-Border Interference

- Article 4.4 of ITU-RR already requires coordination, but India should add:
  - **Mandatory bilateral coordination** with neighbouring administrations.
  - **Power flux density (PFD) limits** at borders.
  - **Orbital slot coordination** to prevent spill-over interference.

(e) Regulatory Framework for Interference-Free Operation

- **Preferred Method: (ii) Multiple partnering entities collectively holding IMT channel across all 22 LSAs.**
  - Ensures nationwide coverage and avoids monopoly risks.
  - Agreements must be transparent and filed with TRAI/DoT.
  - Defence override rights retained.
- **Method (i): Single partnering entity** risks concentration of control and exclusion of other operators.
- **Method (iii): Hybrid approach** may be considered — consortium model with mandatory nationwide coverage obligations.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Spectrum Efficiency:** Avoids interference with terrestrial IMT services.
- **Operational Clarity:** Ensures transparent agreements and accountability.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- **Global Benchmarking:** FCC and ITU frameworks mandate disclosure and oversight in IMT/D2D arrangements.
- **Consumer Protection:** Guarantees service continuity and grievance redressal.
- **Sustainability:** Positions India as a responsible actor in space governance.

Q20 "Whether there are any other inputs or suggestions with respect to the delivery of D2D services via satellite through SCNs established by the proposed SCN authorised entities? Kindly provide a detailed response with justification."

"D2D Delivery Must Mean Secure, Transparent, and Sustainable Connectivity."

Main Position: Yes — additional inputs are essential to ensure that the delivery of D2D services via satellite through SCNs remains secure, interoperable, and sustainable. Beyond spectrum assignment and interconnection, India must embed **sovereignty safeguards, payload transparency, consumer protection, and global coordination** into the delivery framework.

Additional Inputs & Suggestions

1. **Payload Transparency & Verification**
   - Mandatory disclosure of all payloads onboard satellites.
   - Independent audits by ISRO/IN-SPACe to confirm only authorised payloads are active.
   - Prevents covert activation of hidden payloads interconnected inside satellites.
2. **Gateway Localisation & Security**
   - All traffic routed through Indian gateways.
   - Mandatory lawful interception capability.
   - Defence override rights embedded in authorisation.
3. **QoS & Consumer Protection**
   - TRAI QoS standards must apply to D2D services.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Emergency priority access for disaster recovery and public safety.
- Grievance redressal mechanisms for consumers.

4. **Spectrum Efficiency & Anti-Hoarding**
   - "Use-it-or-lose-it" clauses to prevent speculative hoarding.
   - Performance bank guarantees to ensure genuine deployment.
   - Transparent dashboards for monitoring utilisation.
5. **Compliance & Review Clauses**
   - Mandatory 5-year review cycles to recalibrate against evolving technologies and risks.
   - Revocation rights if obligations are breached.
   - Quarterly compliance reporting to DoT/Defence.
6. **Sustainability & Debris Management**
   - End-of-life deorbit plans mandatory.
   - Compliance with ESA's Zero Debris Charter targets for 2030.
   - Reporting to UN COPUOS on sustainability compliance.
7. **Global Coordination**
   - ITU filings must match declared payload functions.
   - India must align with WRC-2027 outcomes for IMT/MSS coexistence.
   - Benchmark against FCC, ESA, and Quad practices for D2D delivery.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Operational Clarity:** Ensures transparent agreements and accountability.
- **Spectrum Efficiency:** Avoids hoarding and interference, ensures equitable access.
- **Global Benchmarking:** Aligns India with FCC, ITU, ESA, and Quad practices.
- **Consumer Protection:** Guarantees service continuity and grievance redressal.
- **Sustainability:** Positions India as a responsible actor in space governance.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

Q21 "Any other inputs or suggestions related to the use of spectrum on SCNs established by the proposed SCN authorised entities may be submitted with proper explanation and justification."

Response

Please refer to our response to earlier questions. The TRAI recommendations must be based to provide level playing field in technology neutral regime while carefully protecting our national sovereignty and security. There is nothing special with satellite system, except the main control of the space segment and also the additional risks that entire network remains beyond Indian sovereign control.

India's policy framework to counter COVERT use of LEO constellations

"Spectrum Use Must Mean Sovereignty, Efficiency, and Sustainability."

India's policy framework to counter **covert use of LEO constellations and rogue satellite operator actions** by introducing Deterrent Clauses to check Rogue LEO Operators.Also proposed Definition of "Rogue Operator Action" must be included.

Main Position: Yes — beyond the specific allocations of FSS, MSS, and conditional IMT spectrum, India must embed **cross-cutting safeguards and adaptive mechanisms** into the overall spectrum use framework for SCNs. This ensures sovereignty, transparency, efficiency, and sustainability in spectrum utilisation.

Deterrent Clauses for Rogue LEO Operators

Below given are 6 clauses:

1. Extended Jurisdiction Clause

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

"Any satellite operator providing services within Indian territory, irrespective of place of incorporation or orbital registration, shall be deemed subject to Indian law and regulatory oversight."

Purpose

- Extends Indian jurisdiction to foreign operators whose satellites serve Indian users.
- Prevents operators from hiding behind foreign incorporation.

2. Mandatory Disclosure & Summons Clause

"The Government of India reserves the right to summon the beneficial owner, directors, or controlling shareholders of any satellite operator whose services are accessible in India, for compliance hearings, investigations, or enforcement proceedings."

- Ensures accountability of corporate leadership.
- Prevents shell companies or proxy ownership structures.

3. Heavy Penalty Clause

"Any satellite operator found guilty of covert surveillance, payload misrepresentation, or violation of Indian sovereignty shall be liable to a penalty not less than seventy percent (70%) of its global annual revenue, in addition to suspension of services and revocation of authorisation."

- Creates a **deterrent of existential scale**.

4. Cross-Border Enforcement Clause

"India shall pursue reciprocal enforcement of penalties and sanctions through bilateral treaties, ITU filings, and international arbitration forums, ensuring that rogue operators cannot escape liability by shifting jurisdiction."

- Extends deterrence across borders.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Uses ITU and COPUOS filings as leverage.

5. Payload Transparency Clause

"All satellite operators serving India must disclose payload specifications, orbital behaviour, and interconnection arrangements. Any covert or undeclared payload activation shall constitute a hostile act subject to immediate sanction."

- Prevents dual-use payload abuse.
- Enables India to act against covert surveillance.

6. Emergency Override Clause

"India reserves the right to disable, jam, or restrict access to any satellite service deemed hostile or non-compliant, without prejudice to international filings or commercial agreements."

- Provides **operational deterrence**.
- Signals India's readiness to act unilaterally if sovereignty is threatened.

⚖️ **Justification**

- **Sovereignty Protection:** Extends Indian law to foreign operators.
- **Accountability:** Summons and penalties target corporate leadership directly.
- **Deterrence:** 70% global revenue penalty is designed to be existential.
- **Global Benchmarking:** Builds on EU antitrust fines, ITU coordination, and COPUOS norms.
- **Operational Readiness:** Emergency override clause ensures India can act swiftly.

Definition of "Rogue Operator Action"

"Rogue Operator Action = Payload Deception + Sovereignty Violation."

"Rogue Operator Action" means any act or omission by a satellite operator, its affiliates, or beneficial owners, whether incorporated in India or abroad, which:

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

6. **Payload Misrepresentation**
   - Deploys, activates, or operates any undeclared, covert, dual-use, or hostile payload onboard a satellite serving Indian territory, contrary to the payload specifications disclosed to the Government of India or international filings.
7. **Unlawful Spectrum Use**
   - Utilises spectrum assigned for authorised services to conduct unauthorised transmissions, surveillance, or interference, including cross-border spill-over that compromises India's sovereignty, security, or public order.
8. **Non-Compliance with Authorisation**
   - Provides services in India without valid authorisation, or in violation of licence conditions, gateway localisation requirements, lawful interception obligations, or national security directives.
9. **Obstruction of Oversight**
   - Refuses or fails to comply with summons, disclosure orders, or inspection by Indian authorities, including concealment of beneficial ownership or corporate control.
10. **Hostile Acts**
   - Engages in activities amounting to espionage, sabotage, cyber intrusion, or disruption of critical infrastructure through satellite networks.

📌 Enforcement Clause (linked to definition)

"Any satellite operator found to have engaged in Rogue Operator Action shall be deemed to have committed a hostile act against the sovereignty of India, and shall be subject to penalties including but not limited to suspension of services, revocation of authorisation, and monetary fines up to seventy percent (70%) of global annual revenue, enforceable against the operator and its beneficial owners."

Additional Inputs & Suggestions

1. **Service-Specific Assignment**

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Spectrum must be tied to declared payload/service (FSS, MSS, or D2D).
- Prevents covert activation of hidden payloads interconnected inside satellites.
- Enables revocation if obligations are breached.

2. **Adaptive Licensing & Review Clauses**
   - Mandatory **5-year review cycles** to recalibrate against evolving technologies and geopolitical risks.
   - Licence renewal contingent on compliance audits and sustainability reporting.
3. **Spectrum Efficiency & Anti-Hoarding**
   - Introduce **"use-it-or-lose-it" clauses** to prevent speculative hoarding.
   - Performance bank guarantees to ensure genuine deployment.
   - Transparent dashboards for monitoring utilisation.
4. **Multi-Agency Oversight**
   - Establish a **National Spectrum Oversight Council (NSOC)** with DoT, Defence, ISRO/IN-SPACe, and MEA.
   - Joint monitoring of payload transparency, orbital behaviour, and interconnection compliance.
   - Defence override rights retained.
5. **Cross-Border Coordination**
   - Bilateral coordination with neighbouring administrations to mitigate interference.
   - Power flux density (PFD) limits at borders.
   - Orbital slot coordination to prevent spill-over interference.
6. **Sustainability & Debris Management**
   - End-of-life deorbit plans mandatory.
   - Compliance with ESA's **Zero Debris Charter** targets for 2030.
   - Reporting to UN COPUOS on sustainability compliance.
7. **Global Benchmarking**
   - ITU filings must match declared payload functions.
   - India must align with WRC-2027 outcomes for IMT/MSS coexistence.

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com

- Benchmark against FCC, ESA, and Quad practices for spectrum assignment and utilisation.

Justification

- **National Security:** Prevents covert activation of hidden payloads interconnected inside satellites.
- **Operational Clarity:** Ensures transparent agreements and accountability.
- **Spectrum Efficiency:** Avoids hoarding and interference, ensures equitable access.
- **Global Benchmarking:** Aligns India with FCC, ITU, ESA, and Quad practices.
- **Sustainability:** Positions India as a responsible actor in space governance.

THE END

G-40, Ground Floor, World Trade Center, New Delhi 110001
Tel: 011 – 43755344, Mob: +91- 7838450239
Email: msmonishadas@yahoo.com