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To,
Advisor (Network, Spectrum and Licensing),
Telecom Regulatory Authority of India,
4th, 5th, 6th & 7th Floor, Tower-F,
World Trade Centre, Nauroji Nagar,
New Delhi: 110029

Sub: - INPL Response to the TRAI Consultation Paper on Review of Existing Interconnection Regulations

Respected Sir,

This is with reference to the Consultation Paper on the Review of Existing Interconnection Regulations released by TRAI.

In this regard, please find enclosed INPL response to the Consultation Paper.

We hope that our submission will merit your kind consideration and support.

Thanking you,

For Ishan Netsol Private Limited

ISHAN NETSOL PVT. LTD. INPL

Authorized Signatory

CC:

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Response to TRAI Consultation Paper on Review of Existing Interconnection Regulations

Introduction and Contextual Overview

I. Appreciation for the Comprehensive Interconnection Review

We highly commend the Telecom Regulatory Authority of India (TRAI) for initiating a comprehensive review of the existing regulatory framework governing interconnection matters, as detailed in the Consultation Paper dated November 10, 2025. This review is timely and essential, driven by several critical developments:

- **Statutory Evolution:** The enactment of **The Telecommunications Act, 2023**, necessitates a corresponding update to regulatory oversight.
- **Market Dynamics:** The ongoing consolidation within the Indian telecom sector requires a re-evaluation of competitive and operational safeguards.
- **Technological Shift:** The fundamental and pervasive transition from legacy **Time Division Multiplexing (TDM) circuit-switched networks (E1-based)** to advanced **all-IP (Internet Protocol) packet-switched infrastructures (4G, 5G, and Next Generation Networks)** demands a complete overhaul of regulatory principles.

This technological transition profoundly impacts crucial aspects of network operations, including **cost recovery mechanisms, physical interconnection design, traffic management methodologies, and overall network security and resiliency**. We wholeheartedly welcome this long-overdue initiative to modernize the regulatory landscape.

II. Clarification on the Scope of the Consultation

We note and affirm the statement in **Para 2.139** of the Consultation Paper that this present exercise **does not envisage the review of regulatory aspects pertaining to Application-to-Person (A2P) SMS**.

The regulation of commercial mobile communications—including promotional, service, and transactional SMS, alongside the crucial topic of Unsolicited Commercial Communication (UCC) or spam—is correctly and rigorously dealt with under the existing framework of **'The Telecom Commercial Communications Customer Preference Regulations, 2018' (as amended)**.

III. Deep Appreciation for Measures Combatting Unsolicited Commercial Communication (UCC)

We wish to place on record our profound appreciation for the **proactive and stringent measures** undertaken by TRAI to combat Unsolicited Commercial Communication (UCC), which represents a significant effort to protect Indian consumers and enhance digital trust.

A cornerstone of this successful strategy is the systematic approach to **traffic segregation and number series allocation**, which clearly distinguishes legitimate business communication from spam and fraud:

- **The 140-series** has been successfully designated for purely **promotional calls**.
- The newly mandated **160-series (often utilizing 1600-series)** is reserved exclusively for essential **service and transactional calls** originating from regulated entities (such as banks and financial institutions).

This clear segmentation, combined with the mandatory migration of these communications to the **Distributed Ledger Technology (DLT) platform**, has significantly enhanced **traceability and accountability**. This systemic improvement makes it substantially more difficult for fraudulent activities, particularly **impersonation and phishing**, to thrive.

Furthermore, TRAI's implementation of **stricter penalty thresholds** for violations and the decisive action to **disconnect millions of fraudulent mobile numbers** represent robust steps toward cleansing the communication ecosystem. These measures are instrumental in instilling greater trust, security, and integrity for the public.

I. Review of The Telecommunication Interconnection Regulations, 2018 (Q1-Q13)

A. Interconnection Levels and Network Architecture (Q1–Q6)

Q1. For PSTN to PSTN, PLMN to PSTN and PSTN to PLMN, should the interconnection level be specified at LSA level? If yes, should the existing POIs at the LDCA/SDCA level also be migrated to the LSA level?

Interconnection for all voice traffic categories (PSTN to PSTN, PLMN to PSTN, and PSTN to PLMN) must be formally specified at the **Licensed Service Area (LSA) level**. Furthermore, all existing Points of Interconnection (POIs) currently demarcated at the **Long-Distance Charging Area (LDCA)** and **Short Distance Charging Area (SDCA)** levels require mandatory migration to the LSA level through a regulated, phased implementation plan.

Rationale for LSA Migration

The continued reliance on LDCA/SDCA-level POIs is fundamentally incompatible with the current state of telecommunications technology and market structure. The migration to the LSA level is essential for ensuring an efficient, modern, and coherent regulatory framework.

1. Technological Obsolescence and Network Modernization

The current regulatory definition of POIs at the SDCA/LDCA level is intrinsically rooted in the hierarchical, geographical structure of legacy **Time Division Multiplexing (TDM) circuit-switched networks (PSTN)**. The industry has decisively transitioned to **all-IP core networks (NGN, 4G, 5G)**. Modern network architecture features centralized core switching capabilities, enabling a single IP core/soft switch to efficiently manage all traffic across an entire LSA. This renders the historical LDCA/SDCA-based structure **technologically obsolete and economically burdensome**.

2. Regulatory Consistency and Operational Efficiency

Aligning the interconnection mandate with the **LSA**—which is already the established standard for mobile (PLMN) services—achieves necessary regulatory and operational consistency across both fixed and mobile domains. This alignment correctly reflects the contemporary reality of centralized traffic management and unified network operations, simplifying processes for all market participants.

3. Facilitation of All-IP Interconnection and Digital Transition

Mandating LSA-level POIs is critical to supporting the industry's broader transition to **IP-based interconnection**. Continuing to enforce POIs at the granular LDCA/SDCA level compels operators to maintain redundant, costly, and complex **TDM/SS7 interworking layers**. This requirement forces TSPs to unnecessarily prolong the life of legacy infrastructure, hindering full network modernization and delaying the realization of IP-network efficiencies.

4. Market and Traffic Dynamics

The substantial and continued decline in the relevance and volume of **National Long Distance (NLD) voice traffic** further reinforces the need to consolidate interconnection at the LSA level. The economic and operational justification for maintaining hundreds of localized LDCA/SDCA POIs has largely eroded.

Concerns and Mitigation

There may be some concerns raised by some incumbent operators (particularly PSUs) regarding the potential for this migration to strand their significant historical investments in legacy LDCA/SDCA infrastructure, thereby imposing a financial burden.

While respecting these historical expenditures, the long-term benefits to **national network efficiency, scalability, technological competitiveness, and consumer service quality** overwhelmingly mandate the shift. To mitigate the economic shock to incumbent TSPs and preserve the momentum of modernization, we propose a critical complementary measure:

- **Financial Relief Mechanism:** TRAI should recommend or introduce provisions allowing **accelerated depreciation** for certified, stranded TDM and associated SS7 assets. This measure would provide necessary economic relief while preserving the crucial strategic objectives of national network advancement.

Q2. For PSTN to PSTN, PLMN to PSTN, PSTN to PLMN and PLMN to PLMN, should interconnection be allowed at a level other than the LSA level, based on mutual agreement?

While mandating the LSA level as the standard point of interconnection for all regulated traffic, interconnection should be permitted at levels *other than* the LSA, provided that such arrangements are based solely on **mutual, voluntary agreement** between the participating Telecom Service Providers (TSPs).

Rationale for Flexibility

This operational and commercial flexibility is critical to fostering innovation and supporting highly specialized market demands that the standardized LSA model cannot efficiently address:

- **Support for Niche Requirements:** Flexibility allows TSPs to cater to specific enterprise requirements, dedicated Virtual Private Networks (VPNs), and industry-specific solutions that necessitate highly localized traffic exchange.
- **Low-Latency Applications:** Geographically specialized Points of Interconnection (POIs) facilitate **innovative, low-latency applications** and specialized services that benefit significantly from closer, direct exchange and minimal network hops. This supports applications such as localized edge computing and advanced real-time B2B services.

Necessary Regulatory Safeguards

Crucially, to prevent commercial discrimination, regulatory arbitrage, or technical workarounds, any such mutually agreed upon, non-LSA POI arrangement must adhere strictly to the following regulatory parameters:

1. **Technical and Commercial Parity:** The non-LSA POI arrangement must conform entirely to the **commercial and technical terms** (including all regulated charges, Quality of Service (QoS) standards, and security mandates) applicable at the primary, mandated **LSA POI**.
2. **No Regulatory Exemption:** These voluntarily agreed points cannot be used to circumvent existing regulatory obligations or to gain preferential treatment over the standard LSA-based interconnection.

This approach balances the need for regulatory standardization (LSA as the default) with the requirement for market flexibility to drive high-value, specialized service offerings.

Q3. Based on your response to Question 1 and 2 above, what changes, if any, are required in the level of interconnection / point of traffic handover as provided in the following: (a) Telecommunication Interconnection Regulations (TIR), 2018, and (b) Guidelines annexed to the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002?

Significant amendments are required in both regulatory instruments to reflect the proposed LSA-centric, IP-based framework.

(a) Telecommunication Interconnection Regulations (TIR), 2018:

- Regulation 9A, which currently addresses the interconnection level for PSTN calls by default to the LDCC (in case of disagreement) and providing for carriage charges between LDCC and SDCC, must be **substantially revised or repealed**.
- The revised regulation must establish the **LSA Core/Gateway Switch (IP)** as the default and mandated level for all interconnection traffic handover, irrespective of call type (PSTN or PLMN). This removes the reliance on TDM-era LDCC/SDCC defaults.

(b) RIO Guidelines, 2002 (Annex-C):

- Annexure-C of the Reference Interconnect Offer (RIO) Guidelines, which details the complex hierarchical structure of Points of Interconnection for PSTN-PSTN (Tables 1.1, 1.2), PLMN-PSTN, and PSTN-PLMN traffic (Tables 2.1, and 2.2), must be **completely overhauled**.
- These tables, structured around TDM-era switching levels (TAX, SDCC, LDCC), must be replaced with a simplified, technology-neutral structure specifying the **LSA Core/Gateway Switch (IP)** as the singular logical point of handover for all regulated traffic within the License Service Area.

Q4. Is there a need to mandate multi-path resiliency and redundancy in the Point of Interconnection (POI) framework...?

It is imperative that the regulatory framework mandates **multi-path resiliency and redundancy** for all forms of interconnection, encompassing PSTN-PSTN, PLMN-PLMN, and PLMN-PSTN traffic exchange.

Rationale for Enhanced Resiliency

The technological and economic decision to centralize interconnection points at the LSA level, while efficient, inherently creates a significantly increased risk associated with a **Single Point of Failure (SPOF)**. Failure of a single link or equipment set at a high-volume LSA POI could instantaneously lead to **widespread service disruption** affecting millions of subscribers.

Effective network resiliency requires an architectural approach that goes beyond simple equipment duplication (passive redundancy); it demands **planned, structural diversity** to ensure immediate recovery and business continuity in the face of localized failure events.

Mandated Architectural Framework: Geographically Diverse, Dual-Home POI

To mitigate the SPOF risk and ensure national communications infrastructure stability, we strongly recommend mandating a **Geographically Diverse, Dual-Home Point of Interconnection (POI) Architecture** within every LSA.

1. Redundancy and Diversity Requirement

Traffic exchange must occur through a **minimum of two physically distinct POI locations** within the LSA. Crucially, these two locations must be connected to the respective TSPs' networks via **diverse fiber routes** (i.e., not traversing the same trench or conduit). This ensures that localized physical damage (e.g., construction cuts, natural disasters) cannot simultaneously sever both links.

2. Functional Resiliency

This dual-home configuration transitions the network from passive redundancy to **active resiliency**. It guarantees that traffic can be **dynamically and automatically rerouted** (failover) to the secondary POI in the event of failure at the primary location due to physical damage, severe congestion, or human error. This architecture supports continuous operation, load-sharing across both links, and minimal service interruption.

Q5. Is there a need to incorporate security provisions in the interconnection framework to ensure network security? If yes, kindly provide details along with an appropriate architectural diagram.

Yes, incorporating stringent security provisions is mandatory, particularly as interconnection rapidly transitions to open IP protocols.

Rationale for Security Mandates:

The traditional security reliance on proprietary TDM/SS7 protocols is diminished in open IP environments, which are susceptible to generalized threats like Denial-of-Service (DoS), IP

spoofing, and malicious signaling exploits. The shift to open, universally accessible protocols at interconnect interfaces lowers the barriers to security breach attempts, risking interception, eavesdropping, and unlawful access.

Required Architectural Security Elements:

1. **Session Border Controllers (SBCs):** Mandate the deployment of robust SBCs at every IP POI (on the IP interconnect interface). SBCs function as application-layer firewalls, providing vital protection mechanisms such as:
    - **Topology Hiding:** Masking internal network details from the external peer.
    - **Security Protocol Normalization:** Ensuring all signaling conforms to expected standards.
    - **Protection against Signaling Floods:** Mitigating DoS and DDoS attacks.
2. **Encryption:** Mandate the use of robust encryption protocols (e.g., IPsec or TLS) for both signaling and media traffic traversing the interconnection link to ensure integrity and confidentiality.
3. **Authentication and Authorization:** Implement strict mutual authentication processes for interconnected network elements to ensure only authorized peer networks are exchanging traffic.

Q6. (a) Should IP-based interconnection be mandated for new interconnections in the regulatory framework? (b) Should TSPs be mandated to migrate existing TDM based E1 interconnection to IP-based interconnection within a specified period? If yes, suggest timelines.

We strongly advocate for a decisive regulatory mandate requiring the full transition from legacy Time Division Multiplexing (TDM) interconnections to modern Internet Protocol (IP)-based interconnection. This strategy is essential for realizing the full potential of Next Generation Networks (NGN) across India.

(a) Mandate for New Interconnections

Proposal: IP-based interconnection must be mandated immediately and universally for all new interconnection requests.

Rationale: This measure aligns the Indian regulatory framework with global consensus on NGN deployment. Mandating IP for new builds ensures that all future network expansions and new service launches are **future-ready, scalable, and operationally efficient** from the outset. It eliminates the risk of introducing costly, legacy technology into new projects.

(b) Mandate for Existing Interconnections

Proposal: Telecom Service Providers (TSPs) must be **mandated to migrate all existing TDM-based E1 interconnections to IP-based interconnection** within a fixed regulatory timeline.

Rationale: Continuing to operate a **dual architecture**—an IP core network tethered to a TDM interconnection layer—introduces significant technical and economic drag:

- **Inefficiency and Complexity:** The dual setup exponentially increases operational complexity, maintenance costs, and network failure points.
- **Service Limitation:** TDM's fixed bandwidth allocation inherently hinders the rollout of **high-quality, multi-service capabilities**, such as true end-to-end VoLTE-to-VoLTE (Voice over LTE) calls, which require the flexibility and scalability of IP.
- **Technological Disadvantage:** TDM systems suffer from inherent disadvantages in **reliability, scalability, and data suitability**, posing a substantial barrier to realizing the full economic and service benefits of NGN migration.

Suggested Mandatory Migration Timelines

To overcome industry inertia and ensure the swift realization of NGN benefits, a non-negotiable regulatory deadline must be established for this transition.

- **Mandatory Migration Period:** We recommend stipulating a maximum migration period of **36 months** from the date of the revised regulation's notification.

- **Justification:** This timeline is sufficient to allow for crucial industry activities, including:
    - Thorough capital planning and budget allocation.
    - Vendor procurement and contract execution (factoring in the increasing difficulty in sourcing legacy TDM equipment).
    - Coordinated technical planning and execution across all interconnected operators.

While arguments for TDM continuation until business viability ceases exist, a **firm regulatory timeline** is necessary to safeguard the national interest by pushing for timely modernization and realizing system-wide efficiency gains.

B. Operational Procedures and Compliance (Q7–Q10)

Q7. Should the existing processes of 'provisioning and augmentation of ports at POIs' under Chapter IV of the TIR in respect of following need revision: (i) Seeking of ports at POIs, (ii) Request for initial provisioning of ports, and (iii) Request for augmentation of POIs?

A thorough revision of the existing regulatory framework is necessary to strengthen the principle of **reciprocity** and eliminate **structural asymmetry** in the responsibilities and obligations of Telecom Service Providers (TSPs) regarding interconnection.

I. Achieving Structural Reciprocity and Equivalence

We propose two key revisions to move from an asymmetrical structure to a model of mutual obligation:

1. Abolition of Perpetual Seeker Status

The provision outlined in **Regulation 6**, which establishes an initial two-year period defining one party as the sole "seeker" of Points of Interconnection (POIs), must be strictly enforced as a **maximum transition phase only**. The concept of one party remaining a perpetual "seeker" must be formally abolished from the regulations.

Recommended Model: Equivalence of Inputs (EOI) All post-transition interconnection agreements must operate on a fully **reciprocal, bilateral basis**. Under this model, the obligations for port seeking, equipment provisioning, and cost sharing should be **proportional to the outgoing traffic requirements** of each party, based on the principle of **Equivalence of Inputs (EOI)**. This removes the unfair structural asymmetry that disproportionately burdens certain TSPs and ensures that both parties bear costs relative to the benefit derived.

2. Clearer Definition of Traffic Management Obligations

The regulation must clearly define reciprocal obligations for managing congestion and forecasting traffic demands. Interconnection should be viewed not as a service provided by one party to another, but as a **shared, two-way resource** that requires equivalent investment and maintenance responsibilities from both TSPs.

II. Streamlining and Reducing Timelines

The current cumulative regulatory timelines are outdated and create unnecessary friction, which can be exploited for deliberate delay. We propose an aggressive streamlining of the provisioning and commissioning cycle:

1. Comprehensive Timeline Review

The current cumulative timeline for provisioning and acceptance testing (which totals approximately **42 working days**) must be reviewed and significantly reduced to reflect the speed of modern network deployment.

2. Harmonization of Acceptance Testing

The acceptance testing period (currently **10 working days**, as amended in 2018) should be immediately **harmonized and substantially streamlined**. Given the mandatory transition to **IP-based interconnection**, provisioning primarily involves logical configuration and software updates rather than extensive physical cabling and hardware installation. This reduced complexity necessitates a shorter acceptance window.

Goal: The entire provisioning and commissioning cycle must be aggressively streamlined to minimize the regulatory window and **reduce the potential for deliberate delays**, ensuring rapid capacity augmentation and service scalability.

Q8. Should the existing framework for Interconnection process and timelines... be revised or continued. Kindly indicate challenges, if any, currently being faced in the implementation of the framework by the TSPs and their possible remedies.

The fundamental regulatory framework should be retained, but **enforcement and transparency must be significantly enhanced**.

Challenges and Remedies:

1. **Challenge: Delays in POI Provisioning:** Incumbent TSPs frequently fail to adhere to the mandated 42-day provisioning timeline, often citing legacy testing procedures that extend commissioning into several months. This delay acts as an artificial bottleneck, impacting service rollout, especially for new entrants.
2. **Challenge: Non-Reciprocity and Unilateral Terms:** Some operators insist on entering agreements based on terms dictated unilaterally, undermining the intent of a fair interconnection framework.
3. Remedies:

- **Mandatory Digital Reporting Platform:** Establish a centralized, TRAI-monitored digital reporting platform where TSPs must log the status of every interconnection request against prescribed regulatory milestones (e.g., date of request, date of acceptance letter, date of payment, date of ready-for-test). This increases transparency and accountability.
- **Automated Sanctions:** Link non-adherence to the prescribed timelines directly to the Financial Disincentive mechanism (Q13, Q32), where sanctions are applied automatically upon documented failure unless a delay is justified by Force Majeure or explicit mutual agreement.

Q9. Whether there is a need to revise the existing process of disconnection of POIs as provided in the regulation 11 of the Telecommunication Interconnection Regulations (TIR) 2018?

No major procedural revision to the disconnection process (Regulation 11) is necessary, as the two-tiered, 30-working-day notice period provides sufficient safeguards against arbitrary cutoff. However, **critical clarification regarding the grounds for disconnection is required**.
The regulations must explicitly mandate that disconnection notices may only be issued after the service provider has exhausted all avenues of dispute resolution, and primarily on the grounds of **non-payment of undisputed, regulated charges** (IUC, Port Charges, or standardized infrastructure charges). This prevents TSPs from using the threat of disconnection to enforce payment of disputed commercial liabilities or non-regulated fees.

Q10. Is there a need to introduce a process for the surrender or closure of POIs in the regulatory framework?

Yes, introducing a formal, transparent process for the voluntary surrender or closure of POIs/ports is essential, as the existing framework only addresses disconnection due to contravention or non-compliance.
Criteria and Procedure for Surrender:

- **Criteria:** Surrender requests for individual ports or entire POIs should be entertained if the utilization rate has remained demonstrably below a defined threshold (e.g., **10% of capacity**) for six consecutive months, or if the service provider formally withdraws service from the relevant geographic area.
- **Minimum Retention Period:** To prevent strategic capacity booking and subsequent immediate surrender, a minimum retention period of **12 months** from the date of commissioning or last major augmentation should be imposed before a surrender request can be considered.
- **Timeline and Notice:** A mandatory **90-day notification period** must be provided by the surrendering party to allow the receiving TSP ample time to re-route traffic and manage operational changes.

C. Financial Safeguards and Enforcement (Q11–Q13)

Q11. In order to safeguard the interest of TSPs arising due to financial obligations of interconnection, is there a requirement for furnishing bank guarantee by one TSP to the other TSP?

We respectfully submit our disagreement with the proposal to mandate the use of Bank Guarantees (BGs) as a mechanism to secure the financial interests associated with interconnection payments between Telecom Service Providers (TSPs). We formally request that this requirement be withdrawn from the final regulations.

Rationale for Withdrawal

Mandating Bank Guarantees is **superfluous, economically burdensome, and inconsistent** with the fundamental nature and scale of the existing regulatory environment for major licensees:

- **Statutory Obligation and Regulatory Oversight:** Interconnection is not a voluntary commercial transaction; it is a **statutory obligation** under the Unified License (UL). The participating entities are established, large-scale licensees who are already subject to significant financial commitments, comprehensive regulatory monitoring, and rigorous financial scrutiny by TRAI.
- **Redundancy of Security:** Given the financial scale and regulatory compliance required of all major TSPs, the imposition of a Bank Guarantee specifically for interconnection payments represents an unnecessary layer of financial security. Such a mandate is redundant when weighed against the existing financial stability and regulatory compliance mechanisms already in place.
- **Increased Operational Cost:** Mandating BGs unnecessarily ties up valuable working capital and imposes additional administrative and banking costs on TSPs, which ultimately hinders investment in critical network modernization initiatives (such as the transition to all-IP networks).

The current regulatory framework, coupled with the existing financial standing of major TSPs, is robust enough to manage the commercial risks associated with interconnection settlements without resorting to the excessive requirement of Bank Guarantees.

Q12. Should a procedure be established for addressing delays in the payment of interconnection-related charges?

Yes, a standardized, reciprocal procedure for penal interest imposition is essential for maintaining financial discipline and non-discrimination.

Proposed Procedure:

A mandatory penal interest rate must be prescribed for all delayed payments of interconnection-related charges (IUC, Port Charges, and regulated infrastructure fees). This rate should be objective, market-linked, and based on the **State Bank of India's (SBI) Marginal Cost of funds-based Lending Rate (MCLR) plus a margin of 2%**. This rate aligns with the existing penalty benchmark used in the Department of Telecommunications (DoT) Unified License Agreement, ensuring regulatory coherence and fairness. The procedure must be **fully reciprocal**, applying equally to all parties involved in the transaction.

Q13. Is there a need to revise the financial disincentive framework as provided in these regulations. If yes, what specific changes should be done?

We submit that the existing provision for financial disincentives—specifically the penalty of **Rupees One Lakh per day per Licensed Service Area (LSA)** for contravention of the Interconnection Regulations—is already established, understood by the industry, and requires no revision at this time.

Rationale

While we maintain a fundamental position against the general concept of punitive financial disincentives in a mature and highly regulated telecommunications market, we nonetheless recognize the practical necessity of ensuring system-wide compliance:

- **Enabling Compliance:** We stress that the regulatory provisions must be sufficiently **enabling and binding** to ensure mandatory adherence and timely action by all service providers, particularly regarding critical infrastructure and service continuity obligations.
- **Stability of Existing Provision:** The current penalty structure is known and operationalized. Revising it without clear, compelling evidence that it fails to deter non-compliance would only introduce **unnecessary instability and uncertainty** into the enforcement mechanism.

Therefore, we advocate for the retention of the existing penalty structure to ensure compliance, while focusing the regulatory review on improving the efficiency and clarity of the substantive interconnection mandates themselves.

ll. Review of Usage and Charging Regulations (Q14-Q22, Q27-Q30)

A. Short Message Services (SMS) Termination and Carriage (Q14-Q15)

Q14. Is there a need to revise the existing SMS termination charge?

Clarification on the Scope of Consultation (A2P Exclusion)

We acknowledge and affirm the critical clarification provided by the Telecom Regulatory Authority of India (TRAI) in **Para 2.139** of the Consultation Paper. This paragraph specifically states that the present consultation exercise **does not envisage the review** of the subject matters concerning Application-to-Person (A2P) SMS (i.e., promotional, service, and transactional SMS) or Unsolicited Commercial Communication (UCC)/spam.

The regulation of these A2P and commercial communications is correctly and comprehensively addressed under **'The Telecom Commercial Communications Customer Preference Regulations, 2018' (as amended)**.

We therefore formally request that any comments or proposals raised by other Telecom Service Providers (TSPs) related to A2P SMS or A2P calls be disregarded, as they fall outside the clearly defined ambit of the present consultation.

II. Proposal for Person-to-Person (P2P) SMS Termination Charges

Our submission focuses exclusively on P2P SMS traffic, the termination charges for which were established under the *Short Message Services (SMS) Termination Charges Regulations, 2013*.

A. Considerations Necessitating Revision

The current regulatory charge of **₹0.02 (2 paise) per SMS** requires immediate revision due to fundamental market and technological divergence since its establishment:

1. **Market Shift and Volume Decline:** The termination charge was calculated in 2013 based on a vastly different network ecosystem. Today, the rise of Over-The-Top (OTT) messaging applications has caused **P2P SMS volumes to decline substantially and remain negligible**, while commercial A2P traffic (used for critical services like OTPs and alerts) has become dominant.
2. **Technological Obsolescence and Efficiency:** In modern, packet-switched, all-IP networks, the true incremental cost of carrying a single SMS, which utilizes the **SS7 signaling channel** (also used for call setup), is **marginal**. Maintaining a single, decades-old, cost-based termination rate for minimal P2P traffic violates the core principle of cost-based charging in an efficient, IP-enabled environment.

B. Proposal: Transition to Bill-and-Keep (B&K)

We propose that P2P SMS traffic should immediately transition to a Bill-and-Keep (B&K) regime.

Due to the **symmetrical and negligible volume** of P2P traffic exchange between TSPs, the administrative overhead, calculation complexity, and resource cost associated with tracking and settling a per-message termination charge are **grossly inefficient**. B&K would appropriately eliminate this administrative friction.

We acknowledge that some stakeholders might argue for retaining a regulated, cost-based charge for non-commercial P2P SMS for two reasons:

1. To act as a **deterrent against potential future spam** attempts.
2. To encourage the receiving network to maintain **Quality of Service (QoS)** for message delivery.

However, we assert that the administrative savings and simplification achieved through B&K for negligible P2P traffic outweigh the speculative benefits of retaining a costly, obsolete financial mechanism.

Q15. Is there a need to prescribe SMS carriage charges when an NLDO carries SMS between the LSAs?

There is a clear necessity to prescribe a **standardized, cost-based SMS carriage charge** for National Long-Distance Operators (NLDOs) when they carry SMS traffic between Licensed Service Areas (LSAs).

Crucially, this carriage charge must be payable exclusively to the NLDO undertaking the inter-LSA carriage (i.e., taking over the traffic from the Originating Access Provider and delivering it to the Terminating Access Provider). **No carriage charges should be payable to the Terminating Access Provider**, whose compensation is dealt with under the separate SMS termination regime (P2P or A2P, as applicable).

Rationale for Prescribing the Charge

Mandating this charge addresses a significant regulatory gap and adheres to core economic principles:

1. **Addressing Regulatory Gap and Operational Reliance:** The existing regulatory framework lacks an explicit, regulated charge for inter-LSA SMS transport. This creates ambiguity for Access Providers who hold single or multiple LSA authorizations but rely entirely on the NLDO's signaling and transport network to successfully route inter-LSA SMS traffic.
2. **Principle of Compensation for Work Done:** Adherence to the core regulatory principle of compensating for "work done" requires that NLDOs receive appropriate financial payment. This compensation is for the utilization of their network elements and transmission capacity necessary to carry the SMS signaling and payload across long distances.
3. **Promoting Fair Competition and Level Playing Field:** Prescribing a transparent carriage charge ensures equitable revenue-sharing and prevents a scenario where NLDOs are implicitly forced to cross-subsidize non-NLD TSPs. This actively supports the maintenance of a level playing field across the industry.

Guiding Principles and Methodology for Charge Fixation

The prescribed charge must be determined transparently, based on sound economic principles:

- **Cost-Based Charging Mandate:** The charge must be prescribed and strictly based on the verifiable **incremental cost** incurred by the NLDO for carrying the SMS traffic.
- **Optimal Routing Basis:** The cost calculation should be modeled on the **most optimum and efficient route available**, reflecting the lowest economically viable cost of network usage.

Alternative Suggestion (If Cost Study is Skipped)

Alternatively, should the Authority choose to bypass a detailed cost-based calculation in the interest of expediency, we suggest providing an appropriate minimal ceiling for the NLDO carriage of SMS at **₹0.02 (Two Paise) or One Paise per SMS**. This provides a temporary, minimal revenue floor while maintaining regulatory stability.

B. Intelligent Network (IN) Services Regulations, 2006 (Q16-Q17)

Q16. Is there a need to revise the existing access charge to be paid by the service provider to the originating provider for IN services?

Yes, the existing IN access charge of ₹0.52 per minute (mandated via a 2007 decision) should be **revised downwards**.

Rationale:

The ₹0.52 charge was based on network costing methodologies applicable to TDM-era architectures. With

the widespread adoption of IP-based core networks, the marginal cost (specifically, the **Long Run Incremental Cost, LRIC**) of originating and carrying a voice minute, including IN calls (such as free phone service), has fallen significantly. The revised access charge must reflect these substantial efficiencies derived from modern, packet-switched technology.

Q17. Are there any difficulties that service providers encounter in complying with existing IN Regulations, 2006 in Multi-Operator and Multi-Network Scenario?

The primary challenge encountered by TSPs relates to the **interoperability between legacy SS7 protocols** used by older IN platforms and the modern **IP/IMS-based signaling protocols** (such as SIP) deployed in next-generation core networks (NGN/5G)

Remedial Measures:

The Authority should mandate a time-bound technical migration schedule for all IN service providers, requiring them to utilize **IP-based interconnection for IN services**. Furthermore, compliance with updated technical standards issued by the Telecommunication Engineering Centre (TEC) for signaling gateways and Session Border Controllers (SBCs) is essential to ensure seamless and secure communication between diverse network generations.

Q.18 Is there a need to revise the Telecom Regulatory Authority of India (Transit Charges for Bharat Sanchar Nigam Limited's Cell One Terminating Traffic) Regulation, 2005? Kindly provide your response with justification.

Response:

We maintain that there is **no current necessity** to re-evaluate the issues covered by this specific Regulation (originally enacted in [Year]).

Rationale

1. **Historical Context and Resolution:** This Regulation was originally enacted in compliance with an order issued by the **Hon'ble Telecom Disputes Settlement and Appellate Tribunal (TDSAT)**. Its primary purpose was to resolve a specific historical dispute and prevent the imposition of an **unauthorized transit charge** by BSNL for routing calls destined for CellOne subscribers. The regulatory objective of preventing such specific, asymmetrical charges has been achieved.
2. **Imminent Redundancy via LSA Migration:** The Regulation is structurally destined to become **redundant** once the industry completes the proposed and necessary transition to **LSA-level Points of Interconnection (POIs)**. Upon successful migration:
    - All Person-to-Person (P2P) traffic will be efficiently handed over at these consolidated LSA POIs.
    - This traffic exchange is expected to operate on a **Bill-and-Keep (B&K) or a symmetrical, no-cost basis** to both parties, thereby eliminating the underlying issue of transit charge recovery that the Regulation was created to address.

Focusing regulatory resources on reviewing an issue that will be resolved by the broader LSA migration and IP interconnection mandates would be inefficient. We therefore urge the Authority to prioritize the review of contemporary issues impacting the all-IP transition.

C. The Telecommunication Interconnection Usage Charges Regulations, 2003 (Q19-Q22, Q27)

Q19. The existing interconnection regulatory framework provides for application of origination, carriage, transit, transit carriage and termination charges... should there be a review of these charges?

We concur that the existing Intelligent Network (IN) access charge of **₹0.52 per minute** (mandated via the 2007 regulatory decision) is economically obsolete and requires a substantial **downward revision**.

Rationale for Downward Revision

The current charge is fundamentally inconsistent with the economic realities of modern telecommunications networks:

- **Technological Obsolescence of Costing Model:** The ₹0.52 charge was established based on network costing methodologies (specifically Fully Allocated Cost models) applicable to the high-cost, inflexible **TDM-era circuit-switched architectures**.
- **Significant Decline in Marginal Cost:** With the widespread and mandatory adoption of **IP-based core networks (NGN/5G)**, the marginal cost of originating and carrying a voice minute, including IN calls (such as free-phone services), has fallen significantly. The revised IN access charge must accurately reflect these substantial efficiencies derived from the lower **Long Run Incremental Cost (LRIC)** of modern, packet-switched technology.

Addressing Interoperability Challenges

The primary challenge TSPs currently face in providing seamless IN services relates to the **interoperability barrier** between legacy **SS7 signaling protocols** used by older IN platforms and the modern **IP/IMS-based signaling protocols** (such as SIP) deployed in next-generation core networks (NGN/5G).

Mandatory Remedial Measures

To resolve this bottleneck and facilitate the economic benefits of the reduced charge, the Authority must mandate the following steps:

1. **Time-Bound Migration:** TRAI should mandate a **time-bound technical migration schedule** for all IN service providers, requiring them to utilize IP-based interconnection for all IN services. This eliminates the need for complex, costly, and failure-prone interworking functions.

2. **Standardization Compliance:** Compliance with updated technical standards issued by the Telecommunication Engineering Centre (TEC) for **signaling gateways and Session Border Controllers (SBCs)** is essential. This ensures secure, seamless, and reliable communication between diverse network generations during the transition phase and beyond.

Q20. For termination of emergency calls/SMSs from one TSP's network to another TSP's network, should there be a provision of any additional charges other than applicable IUC?

No, the termination of all emergency calls (including calls to 112 and legacy Level-1 codes transitioning to ERSS) **must be mandated at zero charge**.

Rationale:

Emergency services are a cornerstone of public safety and represent a fundamental public service obligation. Imposing additional, non-cost-based charges (such as the escalating lump sum fees observed in some PSU TSP agreements, which rose from ₹10 lakh to ₹41.8 lakh per LSA) creates a direct commercial disincentive to efficient emergency response provisioning. Network costs incurred by TSPs to provide PRI line connectivity to Public Safety Answering Points (PSAPs) should be recovered through regulated, transparent means, such as the **Universal Service Obligation Fund (USOF)**, and not through inter-operator commercial charges.

Q21. Should the International Termination Charges (ITC) for international incoming calls to India be revised?

No comments

Q22. Is there a need to address the issue of telemarketing and robo-calls within the interconnection framework?

We firmly assert that there is **no necessity** to incorporate provisions specifically addressing telemarketing, robo-calls, or Unsolicited Commercial Communication (UCC) within the scope of the Interconnection Framework (TIR).

I. Dedicated and Sufficient Regulatory Mechanism Exists

The issue of telemarketing and UCC is already comprehensively and effectively governed by a dedicated, sophisticated regulatory mechanism that renders any duplication within the Interconnection Framework redundant:

- **Dedicated Framework:** The **Telecom Commercial Communications Customer Preference Regulations (TCCCPR), 2018 (as amended)**, along with subsequent directives (such as the use of the 140-series and 160-series for traffic segregation), constitutes a complete regulatory structure.
- **Focus on Consent and Application Layer Control:** The TCCCPR successfully leverages the **Distributed Ledger Technology (DLT) platform** to manage customer consent, register telemarketers, verify message headers (scrubbing), and ensure full traceability.

This consent-based, application-layer control is the **correct technical and regulatory approach** for managing UCC content and intent.

- **Avoiding Regulatory Duplication:** Introducing separate, overlapping rules within the Interconnection Regulations (TIR) would create redundancy, risk establishing conflicting obligations, and ultimately diffuse enforcement responsibilities, hindering the efficacy of the TCCCPR.

II. Difference in Regulatory Scope and Purpose

The two regulatory frameworks serve fundamentally distinct and non-overlapping purposes. Mixing their objectives will unnecessarily complicate and delay the technical evolution of the interconnection regime.

Framework	Primary Purpose	Scope of Control
Interconnection Framework (TIR)	To define the **technical parameters, physical topology (POI), Quality of Service (QoS)**, and **commercial terms (IUC/B&K)** for traffic exchange between licensed networks.	**Network Engineering and Commercial Agreement** (Focus on *how* traffic is exchanged).
UCC Regulations (TCCCPR)	To control **content and intent** (i.e., whether the communication is solicited or unsolicited) and enforce **customer privacy**.	**Content, Intent, and Customer Preference** (Focus on *what* is exchanged).

III. Robust Network Security and Existing Legal Mandates

Network security, often cited as the justification for embedding UCC controls in interconnection rules, is already comprehensively and adequately addressed elsewhere:

- **Security by Design:** Modern telecommunications networks are engineered and implemented based on the principle of **"Security by Design,"** meaning security controls are inherent to the network architecture, not bolted on via interconnection rules.
- **Existing Legal Mandates:** Specific, enforceable network security provisions are already mandated under **The Telecommunications Act, 2023** (and associated Rules), as well as the general conditions of the **Unified License (UL)**. These instruments provide sufficient legal authority to penalize or disconnect non-compliant licensees involved in fraudulent activities, irrespective of the interconnection framework.

IV. Risk of Stifling Technical Modernization

Adding complex, content-related filtering and non-core security mandates to the interconnection framework risks slowing down the critical industry migration:

- **Focus on IP Migration:** The industry's primary technical goal—migrating to **IP-based interconnection at higher levels (LSA-level POIs)**—is vital for future network efficiency and multi-path resiliency.
- **Increased Complexity:** Burdening the core interconnection rules with non-core security and content provisions would make the framework **overly complex, impede agreement finalization, and ultimately slow down necessary network modernization efforts**. The TIR must remain focused on facilitating efficient traffic exchange.

Q27. Whether following sections of The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001: (a) Section IV... (b) Schedule I and II... still hold relevance...

No, Section IV, Schedule I, and Schedule II of The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001, are **obsolete and should be formally repealed**.

Rationale:

These provisions, dealing with historical revenue sharing mechanisms and specific IUC rates (such as ₹0.48 or ₹1.14 per unit), have been entirely superseded by the comprehensive,
cost-based framework established in The Telecommunication Interconnection Usage Charges Regulations, 2003, and its subsequent 16 amendments. Their continued existence introduces unnecessary complexity and ambiguity into the regulatory framework, forcing stakeholders to cross-reference multiple, potentially conflicting, documents. Consolidating the regulations would enhance clarity and ease of reference.

lll. Review of Access and Infrastructure Regulations (Q23-Q26, Q28-Q30)

A. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002 (Q23-Q25)

Q23. Is there a need to revise 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002'?

Yes, comprehensive revision of the RIO Regulations, 2002, is necessary to align this foundational regulatory tool with current technology and market structure.

Specific Required Revisions:

1. **Mandate Technology Neutrality/IP Focus:** Update all technical clauses within the RIO to reference **IP-based signaling and media protocols (SIP/IMS)** and measurable IP metrics (Latency, Jitter, Bandwidth), in addition to the TDM-era technical specifications.
2. **Integrate Equivalence of Inputs (EOI):** Integrate the EOI principle (Q35), requiring TSPs designated with Significant Market Power (SMP) to offer interconnection inputs (including pricing, QoS, and provisioning timelines) to third parties on terms **equivalent** to those offered internally to their own affiliates. This prevents non-price discrimination and aligns with global best practices.
3. **Timeline Reinforcement:** Shorten and strictly enforce the negotiation and RIO acceptance timelines (currently 30 days) to prevent strategic delays in market entry or network expansion.

Q24. For the purpose of interconnection, is there a need to revise the current categories of 'Services' and 'Activities' to determine Significant Market Power (SMP)?

Yes, the categories used for determining Significant Market Power (SMP) status, which currently require SMP operators to publish an RIO, must be **updated to reflect market convergence and the data-centric nature of modern networks**.

Revisions to 'Services' and 'Activities':

1. **Service Consolidation:** The categories of 'Basic Service' and 'Cellular Mobile Service' should be consolidated into a single category: **Access Services (Fixed and Mobile)**, acknowledging the convergence achieved under the Unified License (UL) regime.
2. **Activity Revision:** Add **Data Traffic Volume (e.g., in Gigabytes (GB) per month)** as a new activity for calculating market share. The existing activities (Subscriber base, Turnover, Switching Capacity, Volume of Traffic) are largely voice-centric. The inclusion of data volume is crucial for accurately determining the true market leverage exerted by TSPs in the 4G/5G era, especially given the market shift to data dominance.

Q25. Should the publication of Reference Interconnect Offers (RIOs) on the websites of Telecom Service Providers (TSPs) be mandated?

Yes, **mandatory online publication** of the non-confidential portion of the Reference Interconnect Offer (RIO) on the respective websites of Significant Market Power (SMP) TSPs is essential. This mandate dramatically increases transparency, reduces information asymmetry for new and smaller entrants, and streamlines the process of initiating interconnection requests, thereby promoting fair competition and market entry efficiency.

B. Telecommunication Interconnection (Port Charges) Regulations, 2001 (Q26, Q28–Q30)

Q26. Should there be any interconnection charges? If yes, kindly provide details about the following: (a) the types of infrastructure charges to be levied, (b) the guiding principles for determining such charges along with ceiling, if required, and (c) determination of time-based escalation methodology, if required.

Yes, certain **non-usage-based interconnection charges** are necessary to cover the fixed costs of providing the physical point of demarcation and co-location infrastructure. However, these require **strict standardization** and cost-reflective principles.

(a) Types of Infrastructure Charges to be Levied: Charges must be strictly limited to those directly related to the physical setup and maintenance of the POI site:

- Port Charges (Physical or logical interface costs)
- Co-location Charges (Space rental, power, air conditioning, access control)
- Setup Charges (One-time cost of establishing the link and initial testing)

(b) Guiding Principles and Ceiling: All levied charges must adhere rigorously to the principle of cost-based charging, specifically the **Long Run Incremental Cost (LRIC+)** model. Unilateral charges, such as arbitrary signalling point code change charges, or excessive charges imposed for duct usage (where ducting costs should already be factored into the Port/Co-location fee), must be explicitly prohibited. The Authority must establish explicit, reviewed **ceiling rates** for each component to prevent incumbent TSPs from imposing exorbitant, non-transparent fees.

(c) Time-based Escalation Methodology: Unilateral annual escalation (e.g., a fixed 10% annual increase, which has led to charges increasing by approximately 500% over the last 15 years in some cases) must be prohibited. Any escalation methodology must be **mutually agreed upon** and tied to objective, published economic indices, such as the **Consumer Price Index (CPI) or Wholesale Price Index (WPI)**, rather than arbitrary fixed percentages.

Q28. Is there a need for change, if any, required in respect of following: (i) Port Technology, (ii) Port Size (Capacity), (iii) Port Charges, and (iv) Any other related aspect?

Yes, comprehensive revision is required across all four categories to move beyond the obsolete E1/TDM model.

- **(i) Port Technology:** The definition must evolve from a physical E1 link to a **Technology-Neutral Logical Interface**. The relevant physical interfaces should be defined by high-capacity, optical/electrical IP/Ethernet standards (1 Gbps, 10 Gbps, 100 Gbps), as specified by TEC standards for IP interconnection.
- **(ii) Port Size (Capacity):** Replace the fixed E1 capacity (2.048 Mbps) with flexible, scalable **Bandwidth Denominations** (measured in Mbps/Gbps) that align with modern packet-switched networking principles.
- **(iii) Port Charges:** The existing fixed ceiling rates (e.g., ₹4,000 per port for MSC) are based on historical TDM equipment costs. These must be replaced with **LRIC-based charges** calculated using contemporary IP network elements (SBCs, core routers, media gateways) and virtualized infrastructure costs.
- **(iv) Any other related aspect:** Incorporate service level agreements (SLAs) tied to **IP-centric performance metrics** (latency, jitter, packet loss) into the port usage terms (Q30).

Q29. Should port charges be uniform across all services and technologies? Kindly provide detailed response for the following categories specifically: (a) Fixed Line Service/ Mobile Service/ NLD service/ ILD service, and (b) E1 (TDM) based interconnection and IP based interconnection.

Port charges should be **uniform across different *service* categories** but **non-uniform across different *technologies***.

(a) Service Categories: Port charges should be **uniform** across Fixed Line, Mobile, NLD, and ILD services, provided they utilize the same standardized IP physical interface. The function of the port is purely capacity exchange, which is technology-specific, not service-specific.

(b) Technology Categories: Port charges for E1 (TDM) and IP-based interconnection must be **non-uniform**. IP-based interconnection offers inherently lower marginal costs per unit of bandwidth due to architectural efficiencies. Mandating uniform charges would violate cost-based principles and effectively create a cross-subsidy for outdated E1 TDM equipment, thereby disincentivizing the necessary industry-wide migration to IP (Q6).

Q30. Whether use of 'Erlang' as a unit of traffic in various interconnection regulations is sufficient and are the current procedures for demand estimation... still effective and practical, in view of adoption of IP based interconnection?

No, the use of 'Erlang' is **technically insufficient and obsolete** for demand estimation in IP-based interconnection environments.

Rationale and Alternative Metrics:

1. **Erlang Obsolescence:** The Erlang model is mathematically predicated on the characteristics of **circuit-switched networks**, where a channel is continuously occupied for the duration of a call, and resources are dimensioned based on blocking probability (Grade of Service). IP-based networks are **packet-switched and resource-shared**, where voice and signaling are multiplexed as bursty data packets.
2. **Alternative Metrics:** Demand estimation must transition to metrics appropriate for IP networks, primarily:
    - **Bandwidth Utilization:** Measured in Mbps or Gbps, typically calculated as the **95th percentile of peak hour throughput** over a preceding measurement period (e.g., 60 days).
    - **Quality of Service (QoS) Thresholds:** Augmentation requests should be triggered not just by a utilization threshold (e.g., 85% capacity utilization), but also by the sustained breach of objective IP QoS parameters, such as excessive **latency, jitter, or packet loss**, which are the primary indicators of congestion in an NGN environment.

C. The Register of Interconnect Agreements Regulations, 1999 (Q31)

Q31. Should the current provisions for submission, inspection and getting copies of interconnection agreements under 'The Register of Interconnect Agreements Regulations, 1999' using floppy disks and print copies be dispensed with and be made online?

Yes, the current provisions, which mandate the use of archaic technology like "floppy disks and print copies," must be **entirely dispensed with** and replaced by a mandatory, end-to-end digital online process.

Changes for Online Process:

1. **Submission:** Mandate the submission of **digitally signed electronic copies** of interconnection agreements via a secure, centralized TRAI online portal within 15 days of execution.
2. **Access:** The non-confidential portion of the Register must be made immediately and freely accessible **online** to the public. The obsolete and inefficient fees stipulated for physical inspection (₹50 per hour) and obtaining copies (₹20 per page) should be eliminated. This digital overhaul increases transparency, speed, and efficiency for all stakeholders.

IV. Generic Regulatory Framework & Future Readiness (Q32-Q36)

Q32. Is there a need to incorporate provisions for financial disincentives in interconnection regulations to deter non-compliance?

Yes, provisions for financial disincentives (FDs) must be incorporated across **all existing interconnection regulations** that currently lack such enforcement mechanisms, including the Intelligent Network Services Regulations, 2006, the RIO Regulations, 2002, and the Register of Interconnect Agreements Regulations, 1999.

Rationale:

While the TIR, 2018, contains an FD provision, non-compliance with other regulations (such as failing to register an agreement or denial of mandated IN access) can equally impact competition and consumer welfare. Extending the FD serves as a unified deterrent, ensuring effective regulatory oversight across the entire interconnection ecosystem. The maximum quantum (₹1 lakh/day/LSA) should be retained, but the

key is establishing a process for **automatic triggering** upon documented, objective regulatory failure (see Q13 rationale).

Q33. What should be the mechanism and timelines for transition of existing interconnection agreements between the service providers to the new regulatory framework that will emerge from this consultation process?

A mandatory, structured, **three-phase transition mechanism** is required to balance the urgency of modernization with the logistical complexity of network migration:

1. **Phase 1: Regulatory Alignment (6 months post-notification):** All existing interconnection agreements are automatically deemed amended to incorporate the new **mandatory default standards** (e.g., new IUC/ITC floor/ceiling rates, zero-charge for emergency calls, EOI principles, and standardized infrastructure charges).
2. **Phase 2: Commercial Renegotiation (18 months post-Phase 1):** TSPs must negotiate all commercially contentious clauses, including payment schedules, capacity forecasts (now based on bandwidth/QoS), and technology specifications (IP). If commercial resolution fails within this period, mandatory TRAI intervention is triggered.
3. **Phase 3: Technical Migration (36 months post-notification):** This phase culminates in the physical decommissioning of all legacy TDM/E1 POIs and the complete transition to the LSA-level, IP-based architecture (Q6).

Q34. What should be the interconnection framework for satellite-based telecommunications networks with other telecom networks? Further, whether the interconnection frameworks for MSS and FSS satellite-based telecommunications networks should be distinct?

The interconnection framework for satellite-based telecommunications should utilize the existing terrestrial PLMN/PSTN framework, adapting the Point of Interconnect location to the satellite system's gateway infrastructure. The frameworks for Mobile Satellite Service (MSS) and Fixed Satellite Service (FSS) should be largely **unified** regarding charging and handover principles, reflecting the licensing convergence.

Framework Principle: Gateway-Centric POI:

The Point of Interconnect must be logically defined at the **Satellite Earth Station/Gateway**. This gateway acts as the national ingress and egress point for all satellite traffic, facilitating interconnection with terrestrial networks.

Interconnection Scenarios:

- **Satellite - PLMN Interconnection (MSS):** The MSS Gateway connects to the Terrestrial PLMN LSA Core. Traffic is treated analogously to PLMN-PLMN calls once it reaches the LSA core.
- **Satellite - PSTN Interconnection (FSS):** The FSS Gateway connects to the Terrestrial PSTN LSA Core (as revised in Q1). Traffic is treated analogously to PSTN calls once it reaches the LSA core.

Both MSS and FSS networks, although utilizing spectrum assigned administratively due to high capital requirements and global coordination complexities, must adhere to the same **non-discriminatory, cost-based IUC principles** as terrestrial operators once the traffic enters the national terrestrial network.

Q35. Are there any specific regulatory models from other countries that have successfully addressed interconnection related issues and challenges which can be adapted in the Indian telecom sector?

Yes, the primary international best practice relevant to the Indian market is the principle of **Equivalence of Inputs (EOI)**.

Equivalence of Inputs (EOI) as a Competitive Safeguard:

This principle, implemented by regulators like BEREC and adopted in countries like the UK and New Zealand, mandates that a vertically integrated Significant Market Power (SMP) operator must provide interconnection services (such as capacity, provisioning, pricing, and QoS) to third-party service providers on the **exact same price and non-price terms and conditions** as it provides to its own internal retail divisions or affiliates. Adoption of EOI would be the most effective competitive safeguard to ensure non-discrimination in interconnection provisioning, port charges, and access timelines, particularly in markets characterized by high consolidation and the presence of dominant operators.

Q36. Kindly mention any other challenges or concerns related to the regulations being reviewed in this consultation paper.

A critical concern arising from this holistic review pertains to **regulatory fragmentation and long-term sustainability**. If the nine regulations are merely amended without consolidation, the inherent complexity and potential for overlap will persist, complicating enforcement (Q27). The long-term objective should be to consolidate all technical, commercial, procedural, and punitive aspects of interconnection into a **single, comprehensive regulation** (e.g., *The Telecommunication Interconnection and Access Regulation, 2026*), replacing the piecemeal framework currently under review. This would ensure that the regulatory landscape remains agile and transparent, prepared for future architectural shifts such as Network Function Virtualization (NFV) and Software Defined Networking (SDN), where the traditional definition of a physical "POI" will become increasingly abstract.