VIL/P&O/TRAI/AK/2025/132
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Advisor (Networks, Spectrum and Licensing-I)
Telecom Regulatory Authority of India,
4th, 5th, 6th & 7th Floor, Tower-F,
World Trade Centre, Nauroji Nagar,
New Delhi – 110029

Kind Attn: Shri Sameer Gupta

Subject: Comments on the TRAI's Consultation Paper on "Review of existing TRAI Regulations on Interconnection matters" issued on 10.11.2025.

Dear Sir,

This is in reference to the TRAI's consultation Paper on "Review of existing TRAI Regulations on Interconnection matters" issued on 10.11.2025.

In this regard, kindly find enclosed herewith comments from Vodafone Idea Limited on the abovesaid consultation paper.

We hope our comments will merit your kind consideration please.

Thanking you,
Yours sincerely,

For **Vodafone Idea Limited**

Ambika Khurana
Chief Regulatory and Corporate Affairs Officer

Enclosed: As stated above

VIL comments on "TRAI Consultation on Review of existing TRAI Regulations on Interconnection matters"

At the outset, we are thankful to the Authority for giving us this opportunity to provide our comments to the TRAI Consultation Paper on "Review of existing TRAI Regulations on Interconnection matters" dated 10.11.2025.

In this regard, we would like to submit our comments for Authority's kind consideration, as given below:

EXECUTIVE SUMMARY

1. Advancement in technology has made many older interconnection regulations increasingly outdated. This technological transformation demands a modernised regulatory approach that is flexible, digital, secure and aligned with the current industry practices, as legacy rules often create insufficiencies and operational constraints that no longer reflect how contemporary telecom networks function. **A modernised, technology-aligned interconnection framework is therefore essential to ensure efficiency, ease of doing business, and seamless connectivity for consumers.**

2. As the technology has advanced, the present interconnection system has struggled to keep up with how the evolving networks and services now operate. The technological advancements have outpaced the existing interconnection framework.

3. **LSA level interconnection:**

    a. These rapid technological advancements have exposed the structural gaps in the existing interconnection framework, especially in the context of the long-standing issues between PSU and TSPs. Further, the limitations of SDCA/LDCA based interconnection have added to complexities in this existing framework. **Hence, to cater these issues, in the new interconnection framework, the LSA based interconnection should be mandated without any additional charges for calls carried or transited within the network of a licensed service provider. It should be agnostic to PSTN to PSTN, PLMN to PSTN as well as PSTN to PLMN calls. The SDCA and LDCA based interconnection are outdated and highly inefficient.**

b. Once the LSA level interconnection is mandated by TRAI, a **time bound migration to LSA level POI** should also be parallelly mandated by TRAI.

4. **Migration path for mandatory LSA level POIs:**

   a. 50% traffic to be migrated to LSA level POI within 1 year of issuance of Regulation

   b. Balance 50% traffic to be migrated to LSA level POI within 2 years of issuance of Regulation

5. **IP based interconnection:**

   a. The existing TDM architecture is old and outdated, with its equipment and infrastructure being end of life, minimal vendor support, reduced hardware availability and diminishing skilled workforce. With the advancement in technology and modern networks, it is necessary that the interconnection moves to mandatory IP based interconnection at the earliest possible.

   b. **We propose that TRAI mandates phase-wise migration to IP-based interconnection and centralized POIs at the LSA level for fixed-line traffic between TSPs including PSUs** with NIL charges applicable for carriage/transit within the intra-LSA network of a TSP, ensuring the immediate migration of existing Fixed Line POIs.

6. **Migration path for mandatory IP based interconnection**

   a. **Phase 1 - Immediate (Within 6 & 12 months of issuance of Regulation) and ongoing thereafter:** New Capacity augmentation of new POI or in existing POI, should be only on IP interconnection after 6 months of issuance of Regulation and Within 1 year, 10% traffic to be migrated to IP interconnection.

   b. **Phase 2 - Short-Term (Within 18-24 months of issuance of Regulation):** Require operators to have a significant percentage (i.e. 50%) of their total interconnection capacity migrated to IP.

   c. **Phase 3 - Final Sunset (Within 3 years of issuance of Regulation):** Mandate migration of entire traffic to IP based interconnection and complete discontinuation of all TDM E1 interconnections. In this phase, all remaining TDM links must be migrated to IP.

7. **Coordination committee**: To facilitate smooth coordination and timely implementation of large-scale project like migration to mandatory LSA level POI as well as for migration to

mandatory IP based interconnection, it is imperative that Authority **should form a coordination committee which is chaired by a senior official of TRAI supported by few other officials and also, has representations of senior officials from TSPs.**

8. **Reciprocity Principle by default in Financial Conditions:** The reciprocity principle in financial conditions is necessary to ensure that each operator pays its fair share. Interconnection is fundamentally a two-way exchange of traffic hence, the principle of reciprocity becomes all the more beneficial for both the operators. Reciprocity is also required to encourage timely augmentation and better QoS, hence this should be mandated by TRAI for all the below financial conditions between operators.

9. **Time-bound return of Existing Bank Guarantees:** The TIR 2018 does not provide a guarantee that the original BG once submitted by a TSP will be returned after a fixed time, unless both the interconnecting parties agree to no BG requirement. Hence TRAI should define a timeline for return of the existing BGs.

10. **Financial Disincentive for obligations impacting inter-TSP rights:** Financial disincentive should be made in a graded manner to enforce inter operator rights and obligations. It should not be imposed in case of any administrative reporting towards TRAI.

11. **Time-bound Disconnection and Surrender of Ports/POIs:** To ensure that the process for disconnection and surrender of POIs is simplified and completed in a time-bound manner, we strongly urge TRAI to Regulate the process with a specified timeline in the TIR.

12. **Review of existing Port, Infrastructure and allied Charges:** It is extremely important that the port charges are reviewed as per present network costs, **reduced substantially as well as made uniform** irrespective of technology of interconnection (TDM / IP) or type of services (fixed line / mobile / NLD / ILD). It should be derived basis the present costs of an efficient IP based interconnection. Also, the port charges, infrastructure charges as well as all other allied charges should be clearly prescribed within the regulatory framework.

13. **Mandate multi-path resiliency and redundancy in the Point of Interconnection (POI) framework:** We submit that multi-path resiliency and redundancy in the Point of Interconnection framework has already been implemented in between private service providers, we recommend that this should be part of Regulation.

14. **Financial Obligations of Interconnection:** The Interconnect agreement between TSPs provide for imposing interest on delayed payments provides adequate deterrent, ensures timely payments and is working fine for decades now. Hence the Authority should

prescribe mandate of no BG to be demanded by Interconnection provider from Interconnection seeker for any charges related to interconnection after two years of initial interconnection, and also **prescribe a reciprocal interest on the delay in payment beyond 15 days of receipt of invoice**.

15. **The Short Message Services (SMS) Termination Charges Regulations, 2013**: There is no review required for SMS termination charges. However, **we strongly recommend the Authority to revise and increase the existing Rs. 0.05 SMS commercial communication charge to Rs. 0.10 per SMS.** This along with the existing Rs 0.02 per SMS termination charges, will making it to Rs 0.12 per SMS uniform commercial communication charge for A2P SMS.

16. **Access charges for IN services (toll free)**: There is a need to revise the existing access charge to be paid by the service provider to the originating provider for IN services (toll-free) and should be brought substantially lower than presently agreed charged between TSPs.

17. **SMS carriage charges:** SMS carriage charge is prescribed so that an effective and competitive market mechanism is built, for new service providers to enter the market with even single/few LSA authorisation.

18. **Intra-Network charges**: There is no place of having such inefficiency and obsolete requirements of carriage/transit carriage charge to be taken by a TSP from other TSP, for carrying a call within their network. Hence, **all intra-network charges for carrying a call to be terminated within a TSP's network, should be abolished.**

19. **Provision/Charges for termination of emergency calls/SMSs:** Post implementation of PSAP, the emergency calls are being routed directly to the control room of the PSAP center established by State under the project run by MHA. This has reduced the number of calls to almost Nil and the very objective of having annual LSA based price, has become redundant. With these changes, the inter-operator charges for emergency calls should be made free. If it doesn't find merit then, it should be defined based on the number of calls.

20. **International Termination charges**: The current ITC, capped between ₹0.35 and ₹0.65 per minute, creates a lucrative avenue for spammers who leverage the lower cost of international call termination to target Indian consumers. **Therefore, to effectively address the spam issue and protect Indian consumers, we strongly urge TRAI to revise the ITC rate upwards to align more closely with global standards.**

21. **Telemarketing and Robo calls:** The interconnection arrangement cannot identify these calls, and hence should not deal with the same. **Therefore, no provisions should be brought in the interconnection domain for the telemarketing and robo-calls.**

22. **RIO (Reference Interconnect Offer) to be revised:** The Model RIO needs to be updated to reflect the new authorisation framework that is likely to be introduced in terms of definitions, references to Acts/Rules, changes that have occurred in the last two decades including but not limited to technological changes, regulatory/licensing changes, digitalization related correspondence/procedural changes etc. However, there is no need of publishing RIO on the websites of TSPs as the agreements are reported to the Authority

23. **The Telecommunication Interconnection (Charges and Revenue Sharing):** Interconnection charges should be there for one-time Setup charges, Port charges, Colocation/ Interconnect facility rental, Backhaul/Leased line charges, International voice termination, SMS termination and SMS carriage, Emergency charges and Signalling link charges.

24. **Register of Interconnect Agreement:** 'The Register of Interconnect Agreements Regulations, 1999' should be repealed and current process for submission, inspection and getting copies of interconnection agreements under 'The Register of Interconnect Agreements Regulations, 1999' using floppy disks and print copies should be dispensed with.

PREFACE

1. **Advancement in Technology**

   a. With the rapid advancement of telecom technology, it has fundamentally altered the way networks operate. Earlier frameworks were built around TDM based, voice centric, and physically intensive interconnection models which were suited to an ecosystem with many operators and limited automation. However, today the networks are IP based, data driven, virtualised and increasingly automated, with technologies such as 4G/5G, OTT communication, and AI-based network management, which redefines connectivity.

   b. Hence, this advancement in technology has made many older interconnection arrangements and their regulations increasingly outdated. This technological transformation demands a modernised regulatory approach that is aligned with the current industry practices, as legacy rules often create insufficiencies and operational constraints that no longer reflect how contemporary telecom networks function.

   c. A modernised, technology-aligned interconnection framework is therefore essential to ensure efficiency, ease of doing business, and seamless connectivity for consumers.

2. **Present Inefficiencies / Market Failure:**

   a. The existing interconnection framework is increasingly not able to address the growing market inefficiencies and competitive distortions, particularly where the PSU operator is not operating at par with other TSPs and continues to derive asymmetric regulatory advantages. The legacy rules framed for a multi- operator, voice centric and TDM switching era does not account for the operational realities of today's unified, IP based and highly automated telecom environment. As a result, private TSPs face avoidable compliance burdens, delays and costs, while the PSU leverages outdated provisions to delay provisioning, imposes one-sided charges, interests and maintain non-uniform practices. Besides, the SDCA level interconnection and intra-network carriage/transit charges within a LSA, are more than two-decade old phenomena, which is highly inefficient and obsolete but, is being forced upon only by the PSU operator. This continued imbalance, not adopting advance technologies coupled by not moving towards LSA level and IP based interconnection effectively amounts to a market failure.

   b. A new, modern framework is therefore essential, which ensures uniform and reciprocal obligations, technologically relevant requirements, and equal

accountability across all TSPs to safeguard healthy competition and protect consumer interest.

3. **Need of Mandatory LSA level POIs:**

   a. Owing to many critical factors, it is imperative that the interconnection is moved to mandatory LSA level POIs, which should be uniform for both wireless and wireless traffic and not separate.

   b. As compared to early 2000, the networks have become all IP and distinction between wireless and wireline within the core network is no more applicable. This convergence of core network means there is no need of having any separate treatment for wireline and wireless traffic from interconnection perspective.

   c. Licensing framework for wireline and wireless services/networks have also converged into a single access authorisation.

   d. There is NIL IUC for wireless and wireline traffic.

   e. Through its recommendations dated 06.02.2025, TRAI has also recommended that fixed line numbering should also move to 10-digit closed numbering series and has recommended that it would require moving to LSA level POIs.

   f. Moving to 10-digit series and LSA level POIs will enable fixed number portability in future and benefit consumers.

   g. SDCA/LDCA level POIs is barrier for launch of services by new entrants.

   h. SDCA/LDCA level interconnection or separate interconnection for wireline traffic, is outdated and highly inefficient. It seeks to impose costs on efficient and modern networks of private TSPs, due to outdated framework and nodes being followed by the PSU TSP.

   i. LSA level unified POIs will help reduce costs, lead to faster interconnections, align with global practices, will push for faster migration to all IP interconnection which will further lead to better quality of voice calls for consumers and better experience.

4. **Need of Mandatory IP based Interconnection**

   a. The existing TDM architecture is old and outdated, with its equipment and infrastructure being end of life, minimal vendor support, reduced hardware availability and diminishing skilled workforce.

b. With the advancement in technology and modern networks, it is necessary that the interconnection moves to IP based interconnection at the earliest possible.

c. Continued enforcement of TDM interconnection requires operators to maintain parallel legacy switching and signalling infrastructure, imposing unnecessary operational expenditure and technical risk.

d. Therefore, it is important that the movement to IP based interconnection is mandated through Regulation, and made the only way of interconnection.

e. To avoid disruption in traffic or immediate need of capex for deploying IP interconnection related equipment, a phase-wise migration to all IP interconnection is crucial.

f. The IP based interconnection will bring in efficiencies, faster augmentation of capacities, reduce costs for TSPs and also enrich consumer experience as well.

5. Clear Provisions for surrender of Ports/POIs

Migration to LSA-level interconnection and IP based interconnection, would require surrender of capacity as well as disconnection of POIs, which has to move along with the migration process. Therefore, it is crucial that clear process with faster timelines are prescribed for executing surrender of Ports and disconnection of POIs. The migration should lead to efficiency and saving of costs, it should not lead to keeping of both TDM and IP architecture and also, should not lead to paying huge costs to PSUs even after submitting applications for surrender of ports and/or disconnection of POI.

6. Coordination committee for migration to LSA level and IP based Interconnection

a. Historically, the interconnection has faced maximum delays from coordination with the licensees which are PSUs, with separate corporate and circle level coordination appearing to be one of the major reasons causing delay in any effective and timely implementations. In between Private TSPs, largely the interconnection has remained smooth and the coordination happens only at the corporate level thus, removing the need of intra-organisation communications.

b. LSA level POIs and IP level interconnection, both are important and large-scale projects and will require effective and smooth coordination, especially at Corporate level, to ensure no delays and miscommunications are induced due to coordination

of TSPs at circle units. This will require a structured approach under the aegis of the TRAI.

c. Therefore, implementation of such an important and large-scale project, will necessitate a structured governance mechanism for transition, for the regulator to have oversight on the execution of a large, long-duration, multi-operator project.

d. To ensure efficiency, accountability, and regulatory alignment, formation of a Coordination Committee under the authority of the TRAI would be crucial.

e. The Coordination Committee should consist of few TRAI officials (as Chairperson as well as for Secretariat function) as well as senior officials from such Telecom Service Providers who are most required for the implementation of LSA level interconnection and mandatory IP based interconnection.

7. **Principle of Reciprocity and Each Party pays for its Outgoing Traffic**

a. Also, for successful implementation of LSA level interconnection and IP based interconnection, it is crucial that principle of reciprocity is mandated in all operational and financial aspects of the interconnection.

b. The clauses introduced through amendment to TIR, for exempting the ports acquired before 01.02.2018 from ports bifurcation and thus from the principle of each party pays for its outgoing traffic, has kept inefficiencies and high costs intact in the interconnection. It has continued to lead to compensating the outdated and inefficient architecture of PSU TSP at the cost of private TSPs.

c. Thus, the principle of Each Party pays for its outgoing traffic including for Ports, infrastructure as well as for transmission media, should apply to all Ports/POIs irrespective of the period when they were taken, except for the first two years of initial interconnection.

In furtherance to the above, kindly find below our question- wise comments:

QUESTION--WISE COMMENTS

A.1. The Telecommunication Interconnection Regulations, 2018

Q.1 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? Kindly justify your response.

VIL Comments to Q. No.1

Yes, the interconnection level should be specified at LSA level and it should be agnostic to PSTN to PSTN, PLMN to PSTN as well as PSTN to PLMN calls. Please find below justification in detail:

1. **Convergence of Wireline and Wireless Core networks:** As compared to early 2000, in last 2 decades the wireline and wireless networks have converged into all IP networks and the distinction between wireline and wireless Core network has diminished. Thus, in present times, unified core networks are able to provision, process and define routing for both wireline and wireless services. Thus, there is no separate treatment which is needed for wireline or wireless calls in the core networks.

2. **BSO and Cellular licensing framework converged into Access Networks:** The licensing frameworks used to be separate for basic (BSO) and cellular services (CMTS) initially. Thereafter, in 2003 a converged access license was formulated (UASL) under which licensee was able to provide both basic and cellular services. Further, in 2013, Unified License was put in place, again under which, licensee with Access authorisation was able to provide both basic and cellular services. Under the present the Telecommunications Act 2023 and draft Rules issued for Main Service authorisation, the licensing framework has been proposed to be further converged, with satellite medium based access services, also coming under the Access Authorisation. With so much simplification and convergence, the networks are becoming more and more unified, efficient and feature enriched thus, distinction and separation in one downstream network layer i.e. interconnection being separate for wireless and wireline, is highly undesirable, inefficient and outdated.

3. **No IUC for Wireless and for Wireline:** As per TRAI IUC regulations also, there is no distinction of IUC between wireless and wireline and both are at zero IUC (or Bill and keep). It indicates the level of maturity in Indian telecom market. Thus, from IUC perspective also, there is no need of having any distinction of interconnection i.e. no separate interconnect is required for PLMN to PLMN, PLMN to PSTN, PSTN to PLMN and PSTN to PSTN and all can converge through common and unified point of interconnections (PoI).

4. **Separate Numbering Plan:** As per National Numbering plan, the wireless and fixed-line services operate through separate numbering series and dialling mechanism. Through its recommendations dated 06.02.2025 on Revision of National Numbering Plan, the Authority has recommended migration to LSA based 10-digit closed numbering scheme for fixed-line services. Thus, even if some separate treatment will be needed for fixed-line and/or wireless services, the core networks can very well identify and distinguish between fixed-line and wireless resources, through the numbering series.

5. **TRAI recommendations - Migrating to LSA level numbering series for Wireline:**

a. Through its recommendations dated 06.02.2025 on Revision of National Numbering Plan, the Authority has recommended migrating to an LSA-based 10-digit closed numbering scheme for fixed-line services. The extract of the recommendations is given below:

> *"3.3 To effectively mitigate TI resource constraints in the long run for fixed-line services with minimal disruption, the Authority recommends the following: -*
> *(i) Migration from the existing SDCA-based numbering scheme to an LSA-based 10-digit closed numbering scheme for fixed-line services. ....."*

b. Moving to an LSA-based 10-digit closed numbering scheme is dependent upon LSA level POI. Presently, the SDCA unit of fixed-line calls can be identified through the SDCA code which is prefixed to the fixed line number. This SDCA code is allocated during activation stage basis the connection installation address. So, if a wireless/wireline consumer of TSP-A is dialling the fixed-line consumer of TSP-B, the TSP-A is aware of the related SDCA of TSP-B and applicable interconnection point. However, once the fixed-line Numbering series moves to LSA based, the 10-digit number can be allocated across the LSA as such, if the wireless/wireline consumer of TSP-A is calling the fixed-line consumer of TSP-B, the TSP-A would have no knowledge of SDCA or LDCA of the consumer of TSP-B. Considering this, the TSP-A would have to route all calls of fixed-line users of TSP-B, to a LSA level POI only.

c. Considering this, the Authority has also opined through its above-referred Recommendations dated 06.02.2025 that the Inter-TSP POIs would have to be shifted to LSA level only. Extract of the TRAI Recommendations is given as follows:

> *2.30 10-digit closed numbering scheme may require establishing the Point of Interconnection (PoI) between TSPs for fixed-line services at the Licensed Service Area (LSA) level. The shifting of the inter-TSP PoIs at LSA level, fixed-line would require substantial changes to the network routing design across all network nodes in India. Consequently, the Authority opines that the extant Telecommunication Interconnection Regulations (Second Amendment) 2020 (TIRs) governing PoIs need to be reviewed for shifting inter-TSP PoIs at the LSA level instead of the LDCA level to facilitate a smooth transition.*

d. **Therefore, moving to LSA level POI is necessary and immediate need before moving to 10-digit LSA-level fixed line numbering scheme, as recommended by the Authority to DoT.**

6. **Fixed to Mobile and Mobile to Fixed Portability in future**

a. The Mobile Number portability for mobile connections was implemented in 2010. Over a period of time, it has helped consumers to choose TSP of their choice and has eventually brought in competition amongst TSPs to keep on improving quality of services and enriching consumer's experience.

b. However, the fixed line consumers have not been able to shift their service provider due to absence of number portability and consequently, have been denied the right of choosing better service provider. Also, given the convergence of services and networks, the subscribers should also have right to choose porting of their numbers from fixed to mobile or vice-versa.

c. Thus, it is important to introduce number portability for fixed line numbers as well. This is dependent on moving to LSA level fixed line numbering scheme and consequently, dependent upon migrating to LSA level POIs.

d. The Authority has also noted this in its above-referred recommendations dated 06.02.2025, extracts of which is given as follows:

> *"2.32 Mitigation measures recommended under para 2.25 should be able to address TI requirements in the foreseeable future. However, if the need arises due to unprecedented growth in fixed-lines, Fixed-line Location Routing numbers (FLRN) may be introduced over the LSA-based 10-digit closed numbering scheme akin to Mobile LRN. In this scenario, each operating TSP within each LSA will be assigned a unique 4-digit FLRN code. All assigned fixed-line numbers will be associated with the FLRN code. Routing decisions for all fixed-line calls will be based on the FLRN code associated with each subscriber number. Migration from LSA-based 10-digit numbering scheme to an FLRN-based 10-digit fixed-line numbering framework will result in nationwide unrestricted availability of LSA-based TI resources.* ***Furthermore, the FLRN code-based fixed-line numbering scheme incidentally lays the foundation for fixed-line number portability similar to Mobile Number Portability (MNP). However, LSA-level POI is a prerequisite for the FLRN-based numbering scheme."***
>
> *"3.4 The Authority recommends that a 10-digit fixed-line numbering scheme using a Fixed-line Location Routing Number (FLRN) code should be adopted, after the successful implementation of the LSA-based 10-digit closed numbering scheme, at the earliest preferably within a maximum period of five years."*

e. **Therefore, migration of fixed line interconnection level to LSA level POIs has never been so crucial, as it would define the way forward for advanced technologies to have free market play, for providing enriched services and choices to the Indian consumers.**

7. **SDCA/LDCA based interconnection is an entry barrier for launch of fixed-line services in new towns:**

   a. Due to SDCA based interconnection being forced by the PSU operator (or LDCA level interconnection as per TIR 2020), if traffic is handed over at any other level, additional charges are levied by PSU operator.

   b. If a TSP has to launch services in a new town/SDCA, it becomes commercially very challenging as compared to existing fixed line service provider in the said town/SDCA, owing to the cost of establishing SDCA/LDCA level POI with the PSU operator or additional carriage charges for termination at any other POI level of PSU operator.

   c. This entry barrier in terms of sub-LSA level interconnection, discouraged business plans to increase reach of fixed line services in new towns and hence, is impacting availability of competitive services in majority of the SDCAs/LDCAs across the country. Besides, this entry barrier will also discourage any new player to enter the fixed-line market.

8. **PSTN (Wireline) interconnection at SDCA/LDCA level is highly inefficient:**

   a. The SDCA and LDCA based interconnection are outdated and highly inefficient. Given the advanced technologies and IP based network nodes being rolled-out by service providers, it is imperative that interconnection regime moves to a mandatory LSA (Licensed Service Area) level interconnection, without any additional charges for calls carried or transited within the network of a licensed service provider.

   b. With LSA level POIs, the implementation and upgradations become easier and simpler. It allows centralised POIs at key locations of each state, which leads to faster rollout, easier expansions, fewer delays in augmentations of POIs.

   c. The fewer the points of interconnection, it becomes simpler, uniform, and easier-to-manage interconnection planning, and hence it reduces operational complexity for both the Telecom Service Providers, be it seeker or a provider of interconnection.

   d. As the country has hundreds of SDCAs, 322 LDCAs, but only 22 LSAs, the SDCA/LDCA-based interconnection requires hundreds of physical POIs across districts/towns thus,

increasing the complexities of rollout as well as delaying the process of augmentation of POIs.

9. **Advantages of LSA based Unified POIs for PSTN and PLMN:**

   a. As explained above, it also becomes important to move to a mandatory LSA based interconnection to bring in efficiencies and remove avoidable costs. Some more rationale for supporting LSA based interconnection is as mentioned below:

   b. **Lower Cost for TSPs:** The lesser number of POIs would mean lower cost on transmission links, ports, co-location, manpower and maintenance costs. This reduces the capex and opex for all TSPs.

   a. **Efficient Use of Network Resources:** The SDCA/LDCA-based POIs create fragmented traffic pools, leading to underutilized trunks, whereas, the LSA based POIs create large traffic pools thus improving traffic predictability, demand forecasting, trunk utilization and routing efficiency. This ensures less wastage and better network quality.

   b. **Better for IP-based / All-IP Networks:** The modern networks are packet-switched, centralised, virtualised and Service-area POIs align with 4G/5G/VoLTE architecture, however, the SDCA/LDCA is a legacy PSTN-era concept making LSA based interconnection future-ready being aligned with modern telecom standards.

   c. **Faster Interconnection Between TSPs:** Fewer POIs leads to fewer points of failure, moreover it is easier to monitor and troubleshoot these fewer POIs. Further, quicker fault resolution means improved call completion rates.

   d. **Reduction in inter operator disputes and Regulatory Burden:** The existing SDCA/LDCA-level interconnection has resulted in many disputes on POI creation, bearing of augmentation cost, whereas the LSA based interconnection simplifies all TSPs obligations and compliances, leading to a more predictable system for regulators, operators, and consumers.

   e. **Aligns to Global Practice**: Globally, interconnection has moved to either State/circle level or National-level based interconnection, and do not operate at small geography based POIs (like SDCA/LDCA based in India). Adopting the LSA based approach will modernize Indian interconnection to global norms. For e.g. Europe has a National or large regional interconnection, USA has LATA (Local Access and Transport Areas). Each LATA is a regional boundary for interconnection, a functionality similar to LSAs. The FCC policy encourages simplifying POI structure with a philosophy of one region = one interconnection framework.

f. **Better Customer Experience:** Besides above, most important advantage of LSA-based Unified POIs will accrue to the consumer is following ways

i. Faster call set-up times
ii. Reduction in traffic congestion as POIs are quickly augmented at the LSA level.
iii. Better Voice Quality (especially VoLTE/5G voice) with less echo or distortion.
iv. Faster expansion of interconnection capacity ensures no overload of networks during peak hours.
v. More stable VoLTE/VoNR calls
vi. Faster deployment of new services leads to faster launch of services from existing service providers as well as new service providers, due to no dependency on POIs at SDCA/LDCA level.
vii. Identifying the fault and its repair becomes faster with a simpler POI architecture in case of any network outage.

10. **Thus, we again state that the LSA based interconnection reduces complexity, cost, disputes, and inefficiency as compared to the existing outdated SDCA/LDCA model, hence, we strongly recommend the Authority for implementation of mandatory LSA level Unified interconnection for both PSTN and PLMN calls.**

Q.2 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? Kindly justify your response.

VIL Comments to Q. No.2

1. Kindly refer to our comments made to question number 1 above.

2. We submit recommend that the regulatory mandate should be kept simpler and only LSA level POI should be prescribed.

3. We do not foresee any use case of having any sub-LSA level POIs.

4. Any option to keep interconnection at a level other than LSA level based on mutual agreement, will bring up subjectivity and will thus be prone to being interpreted to its own advantage by certain players. Allowing sub-LSA level POIs based on mutual agreement has the potential to defeat the very objective of mandating and migrating to LSA based POIs.

5. **Therefore, no interconnection should be allowed at a level other than LSA level.**

Q.3 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 Interconnection Offer) Regulations, 2002? Kindly justify your response.**

VIL Comments to Q. No.3

The following aspects would have to be suitably covered in the regulatory mandate under the above-stated Telecommunication Interconnection Regulations (TIR), 2018 and the Telecommunication Interconnection (Reference Interconnection Offer) Regulations, 2002 (RIO); to ensure that all the service providers can move to LSA level Unified POIs in a time-bound manner, with reciprocity, removing avoidable costs being its main pillars.

1. **Mandating Time-bound Migration to LSA level POIs:** Once the LSA level interconnection is mandated by TRAI, a time bound migration to LSA level POI should also be parallelly mandated by TRAI. Without any mandate from TRAI, the below issues may occur, and Interconnection will remain fragmented and inefficient due to inadequacy of regulatory mandates:

    a. The legacy SDCA/LDCA level interconnection will continue indefinitely.

    b. The operators will be forced to add POIs at SDCA/LDCA level, in the garb of one-sided conditions of existing interconnect agreement.

    c. In absence of a mandatory timeline for migration, the operators will migrate as per their own convenience and hence there would be no alignment between operators.

2. **Formation of Coordination Committee with Corporate SPOCs:** The Telecom Regulatory Authority of India Act, 1997 (TRAI Act) provides clear statutory function of the TRAI over interconnection. As per section 11 (b) of the TRAI Act, the Authority is empowered to formulate and hence should form a coordination committee to ensure effective and time-bound interconnection between different service providers as well as to facilitate deployment of new technologies to ensure technical compatibility.

3. **Publishing TSP-wise Migration status and its dependencies on TRAI's Portal:** Once the timelines are specified for the migration of POIs, milestones based periodic updates should be published TSP-wise on the TRAI portal. This will ensure transparency, reciprocity and alignment of all operators on timelines given by TRAI.

4. **Strict Provisions for facilitating Discontinuation and Surrender of POIs/capacity:** As of now there are no clear conditions related to the exit point of interconnection i.e. for surrendering of all/partial ports or the POI. It is desirable that strict and clear regulatory provisions related to ports/POI discontinuation as well as for surrender in terms of process, timelines and costs, are reviewed and prescribed.

5. **Mandating no downstream carriage/Transit charges at LSA level POIs**: There is no reasoning of having an inefficient and obsolete requirement of carriage/transit carriage charge to be taken by a TSP from other TSP, for carrying a call within their network in an LSA. Hence, all intra-network charges for carrying a call within a TSP's network, should be abolished by making it NIL, in an LSA level POI framework.

6. **POIs/Ports to be taken by a TSP's own Outgoing Traffic:** An unambiguous duty should be cast upon a TSP for its outgoing traffic, after the first 2 years of initial interconnection on its own transmission media. This ensures reciprocity/parity in interconnection arrangement and responsibility of each TSP for its own traffic.

7. **Traffic Routing Tables:** The traffic routing tables (Tables 1.1, 1.2, 2.1, and 2.2) as per the RIO require a comprehensive revision. These tables are built on the legacy hierarchy of SDCA, LDCA, and TAX levels. They should be updated to reflect LSA-level interconnection as the standard handover point. The scenarios for local, intra-circle, and inter-circle calls must be redefined around the LSA as the primary anchor, simplifying the routing logic to reflect centralized IP-based core networks.

8. **Reciprocity Principle by default in Financial Conditions-** The reciprocity principle in financial conditions is necessary to ensure that each operator pays and bears its fair share. Interconnection is fundamentally a two-way exchange of traffic, hence the principle of reciprocity becomes all the more beneficial for both the operators. Reciprocity is also required to encourage timely augmentation of new and efficient interconnection arrangements which can also yield better QoS, hence this should be mandated by TRAI for all the below financial conditions between operators.

9. **Financial Conditions**

    a. **Interest on delayed payments of charges regulated under Interconnection:** The regulation should prescribe a reciprocal interest on delayed payment of charges under interconnection.

    b. **Bank Guarantee only on Net payment basis**: The TIR should continue to prescribe that the BG requirement should be strictly limited to the net payable amount arising from interconnection.

c. **Time-bound return of Existing Bank Guarantees:** The TIR 2018 does not provide any enabling provision for the return of the original BG after a fixed time. There is no explicit clause in the Regulation which states that after what time the BG must be returned. The requirement remains contingent on ongoing interconnection usage and payment obligations. Hence TRAI should define a timeline for return of the existing BGs.

10. **Financial Disincentive for obligations impacting inter-TSP rights:** If the Authority has to implement large scale project of national importance i.e. LSA level interconnection as well as IP based interconnection, there would certainly be a need of having provisions of putting financial deterrent to ensure compliance of milestones and its timelines. Therefore, Financial disincentive should be there to enforce inter operator rights and obligations. It should not be imposed in case of any administrative reporting towards TRAI.

Q.4 Is there a need to mandate multi-path resiliency and redundancy in the Point of Interconnection (POI) framework to mitigate link failure at the primary POI in the case of:

c. **PSTN-PSTN interconnection,**
d. **PLMN-PLMN interconnection, and**
e. **PLMN-PSTN interconnection?**

If yes, kindly provide an appropriate architectural framework with diagram. Kindly justify your response.

VIL Comments to Q. No.4

1. We reiterate our above comments to question no. 1 to 3, that the interconnection should move to LSA level Unified POIs, dealing with both PSTN and PLMN traffic.

2. With this background, we further submit that multi-path resiliency and redundancy in the Point of Interconnection framework has already been implemented in between private service providers, with exception of certain new service providers who have may not have much traffic. With the PSU, redundancy is also available at L1 Tax POIs in case of failure at primary POI.

3. Multi-path resiliency and redundancy is highly recommended and it is already been followed in the industry. While moving to LSA level POIs for fixed line services with PSU service provider, it would need to be set-up by both the parties. However, same has to be set-up on a reciprocal basis so that no single party is put to disadvantage, both in financial and non-financial terms.

4. Thus, suitable provisions containing the principle can be incorporated, without making it overly prescriptive.

Q.5 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. Kindly justify your response.

VIL Comments to Q. No.5

1. The TSPs in India are well-established players with decades of operational experience and robust internal capabilities, enabling them to effectively anticipate, manage and mitigate a wide range of security and cybersecurity threats.

2. Further, the TSPs manage network security risks, including cybersecurity risks (including the network nodes involved in interconnection), in compliance with the DoT's licensing/ authorization requirements and the law of land, thereby ensuring a secure and resilient national telecom infrastructure. Any additional security norms from the TRAI may overlap with the DoT's licensing norms / Rules / provisions of Act and create complications as such, it should be avoided.

3. **Therefore, there is no need to incorporate any additional security provisions in the interconnection framework to ensure network security.**

Q.6. (a) Should IP-based interconnection be mandated for new interconnections in the regulatory framework? Kindly justify your response.
(b) Should TSPs be mandated to migrate existing TDM based E1 interconnection to IP-based interconnection within a specified period? If yes, suggest timelines. Kindly justify your response.

VIL Comments to Q. No.6

1. **We strongly urge the TRAI to mandate IP interconnection for new interconnections as well as prescribe a phase-wise migration of existing TDM interconnections to IP based interconnection.**

2. **Technical Drivers for Migrating to IP Interconnection**

a. **Advancement of Technology:** Establishment of modern telecom networks are necessitating service providers move to an IP based interconnection from TDM based interconnection, as the better and advanced quality codecs on IP based interconnection will improve consumer experience and also bring in network efficiency.

b. IP-based interconnection aligns with ongoing upgrades across access and core networks, including 4G/5G, fibre, IMS, VoLTE/VoNR and IP Multimedia Core evolution.

c. Under IP interconnection, voice becomes a service layer transported over a unified packet platform, enabling integration with multimedia communication, IoT and cloud-based enterprise platforms.

d. In case of IP based packet switched core networks, a single soft switch along with the required number of Access/Line Media Gateway ("LMG") and Trunk Media Gateway ("TMG") can replace large number of standalone TDM based switches. In fact, one soft switch may be sufficient to cater to the requirement of one or more than one LSAs. As many LMGs and TMGs can be parented to a single Soft Switch, the requirement of a large number of standalone TDM switches can be done away with.

e. **Obsolescence of TDM and Network Sustainability:** TDM/PSTN infrastructure is approaching end-of-life, with declining vendor support, reduced hardware availability, and diminishing skilled workforce retention.

f. **Network Modernization:** TDM equipment is reaching its end-of-life cycle globally, and vendor support is diminishing. A mandate with glide-path forces a timely upgrade, improving service quality parameters (e.g., MOS, lower latency, jitter).

g. Continued enforcement of TDM interconnection requires operators to maintain parallel legacy switching and signalling infrastructure, imposing unnecessary operational expenditure and technical risk.

3. **Economic Drivers for Migrating to IP Interconnection**

a. Migration to IP-based interconnection eliminates duplication of transmission layers, reducing CAPEX and OPEX for both incumbents and competitive service providers.

b. Continued coexistence of TDM and IP architectures increases power, space, switching, signalling and support costs, which may eventually burden consumer pricing.

c. Establishing a centralized LSA based POI uniformly for both PLMN and PSTN traffic will help address delays in commissioning and ensure compliance with TRAI regulations by making interconnection more streamlined.

4. **Competition enablement and Market Considerations**

a. All TSPs except one of PSU have centralized LSA based unified POIs for both fixed-line and mobile traffic. Even the PSU manages mobile traffic centrally at LSA level. Given the minimal volume of fixed-line traffic, it can be efficiently handled through a centralized and unified interconnection at LSA level, dealing with both PSTN and PLMN traffic.

b. With the transition to IP networks, even the PSU service provider has replaced its traditional TDM-based circuit-switched networks with IP-based packet-switched NGN core networks. Additionally, it has also deployed a single IP TAX Trunk Media Gateway (TMG) in each LDCA cluster across all circles.

c. The shift towards IP-based interconnection is steadily progressing. As all private service providers continue upgrading to IP networks, a phased migration to IP interconnection is inevitable.

5. **Cost Efficiency**

a. IP networks offer significant operational and capital expenditure (OpEx/CapEx) savings. The TDM technology involves Media Gateways, which consumes more Carbon foot print than IP based nodes i.e. SBC e.g. MGW of 50K sometimes may occupy 2 racks spaces and huge power consumption when compared with SBC which occupies a 2U space or some SBCs uses only 1U rack space and relatively less power than MGW.

b. All the OEMs have stopped development of the legacy TDM nodes and these nodes have reached their end of life. Most of the OEMS have declared End of Support for many equipment nodes and are supporting on Best effort basis without any hardware support. Many a times, the hardware from a dismantled stock is preserved and reused.

c. Mandating IP interconnection avoids the need for expensive media gateways for TDM-IP conversion at interconnection points, thereby reducing costs.

6. **Consumer Experience**

a. IP interconnection will improve consumer experience, as it can deliver equal or better reliability and Quality of Service (QoS) than TDM due to prioritisation, redundancy and routing flexibility.

b. As, the end to end network i.e. the originating and terminating networks are IP, there is no requirement of transcoding and hence a better and superior quality of voice.

c. Moreover, with the inception of new HD codecs like EVS, we will be able to deliver end to end VoLTE HD quality calls between the operators. But, in a TDM framework, there are CODEC translations and possibility of degradation in voice quality cannot be ruled out.

7. **Global precedence:**

a. Multiple international jurisdictions including the United States, United Kingdom, members of the European Union, Australia, Brazil, South Africa, China and Canada have already initiated or completed migration toward IP-native interconnection frameworks.

b. Countries such as the United Kingdom (PSTN Switch-Off Programme 2027) and the United States (FCC Technology Transition Initiatives) formally recognise TDM as no longer sustainable for long-term nationwide interconnection.

c. Australia (NBN all-IP wholesale model), Canada (CRTC IP interconnect mandates) and the European Union (BEREC NGN Framework) have adopted all-IP interconnection as a long-term standard.

d. In Singapore, SingTel has proposed/mentioned in its RIO that it shall cease offering new SS7-based Interconnection arrangements from 28.02.2027 and that existing licensees' SS7 based interconnections need to be migrated to IP based interconnection by 31.05.2027.

8. **Dependencies for Smooth transition to IP Interconnection:**

For smooth transition from TDM to IP Interconnection, following areas would have to be addressed through Regulatory mandate:

a. **Mandate with Timelines:** Leaving migration solely to the operators' decision will lead to delay as the operators with legacy infrastructure may be reluctant to bear the costs of conversion (e.g. deploying SBCs). A regulatory mandate ensures the entire sector moves forward cohesively and no operator is disadvantaged due to early purchase of network equipment. A clear, mandated timeline ensures that no operator can use the continued presence of an obsolete technology, to impose the inefficiencies of legacy networks.

b. **Coordination Committee:**

i. LSA level POIs and IP level interconnection, both are important as well as are large-scale projects. They will require effective and smooth coordination between TSPs, especially at their respective Corporate/Headquarters level, to ensure no delays and miscommunications are induced due to coordination of TSPs at circle units. This will require a structured approach under the aegis of the TRAI.

ii. Therefore, implementation of such an important, large-scale, long-duration project, will necessitate a structured governance mechanism for transition with controlled oversight of Regulator.

iii. Hence, to ensure efficiency, accountability, transparency and regulatory alignment, formation of a Coordination Committee under the authority of the TRAI would be crucial.

c. **Time-bound Disconnection and Surrender of Ports/POIs:**

i. Under TIR 2018, TRAI has regulated the timeline for various sub-processes for entering into interconnection and setting up of POI. However, there are no provisions related to timelines and cost for exiting or surrender of a POI/ports due to which a TSP has to go through one-sided and often ambiguous process of surrender under the interconnection arrangement with the PSU TSP.

ii. The IP interconnection will require assurance of smooth withdrawal/surrender of Ports/POIs, without any additional costs on TSPs, so that the TSPs do not end up maintaining the legacy POIs as well as new LSA level / IP POIs.

iii. Therefore, the process for disconnection and surrender of POIs including the timelines has to be tightly regulated and clear provisions should be prescribed in the TIR regulation.

d. **Time-bound Augmentation of POIs/Ports:** With IP interconnection, the implementation and upgradations become easier and simpler. It allows centralised POIs at key locations of each LSA which leads to faster rollout, easier expansions, fewer delays in augmentations of POIs.

e. The fewer the points of interconnection, it becomes simpler, uniform, and easier-to-manage interconnection planning, and hence it reduces operational complexity for both the Telecom Service Providers, be it seeker or a provider of interconnection.

With the simpler process in place, it is important to have specific regulated timelines for augmentation of Ports/POIs.

f. **Financial Reciprocity:** The reciprocity principle in financial conditions is necessary to ensure that each operator pays its fair share. Interconnection is fundamentally a two-way exchange of traffic. Hence, the principle of reciprocity becomes all the more beneficial for both the operators and brings certainty and predictability in the relationship. Reciprocity is also required to encourage timely augmentation and better QoS, hence this should be mandated by TRAI for all the below-mentioned financial conditions between operators.

g. **Seeker-Provider Principle only for new Interconnection agreements (new service provider):** The seeker provider principle was introduced to ensure that the new service providers are able to obtain timely and efficient interconnection while entering the market. In line with this original intent, the applicability of this principle should be limited to only new interconnection agreements sought by new service providers. The existing TSPs already have established interconnection arrangements, predictable traffic patterns, and mutually defined operational processes, hence allowing the seeker provider principle to continue beyond first 2 years, offers no additional regulatory value but will create unnecessary procedural complexities as well as both cost and process inefficiencies.

h. **Bifurcation of traffic and Each Party bears cost for its Outgoing traffic:** A clear bifurcation of interconnection traffic, with each TSP bearing the cost of carrying its own outgoing traffic on its own transmission media for interconnectivity to the other operator's network, ensures a fair, transparent, and efficient interconnection regime. This approach promotes reciprocity in interconnection arrangement, accountability in network planning, prevents cost-shifting, and reduces disputes related to capacity augmentation or provisioning delays. This framework therefore contributes to greater operational clarity, ease of doing business, and improved service quality for consumers.

i. **Port, Infrastructure and allied Charges to be prescribed**- To ensure transparency, predictability and uniformity in interconnection arrangements, it is important that the port charges, infrastructure charges as well as all other allied charges are clearly prescribed within the regulatory framework. Prescribing a standardised structure for interconnection related charges- covering port creation, maintenance, co-location, and other associated infrastructure elements will provide clarity to all service providers and help avoid unilateral or non-uniform practices.

j. **Interest on Delayed Payments:** While the provisions of interest on delayed payments are applicable for both sides in interconnection agreements between

private TSPs however, the PSU operator imposes one-sided interest provisions. It is important that reciprocal principle is adopted and the TRAI prescribes rate of interest on delayed payments, which the TSPs should be free to charge from each other in case of delayed payments after the due date.

k. **No need of execution of an additional Interconnection agreement:** The implementation of regulatory provisions is often delayed by citing need of execution of addendum to the existing Interconnect Agreement. Many a times, provisions are included in the draft being proposed which are not aligned with the TRAI's regulatory provisions and hence, delays the implementation of regulatory norms. Therefore, it is important that the TRAI Regulation should explicitly clarify that there is no need of executing an interconnect agreement, for implementation of the Regulation.

l. **The Regulation should also allow TSPs to set-up POIs catering to multiple LSAs, based on mutual agreement but, without any intra-network cost being passed upon by one TSP to another.**

9. **Proposed Regulatory approach for Migration**

a. **Phase-wise Migration**

i. A phased migration roadmap may be issued, allowing coexistence of TDM and IP interconnection during a defined transitional period. While a mandatory migration is necessary to fully realize the benefits of all-IP ecosystem across the entire industry, the transition must be managed carefully to account for existing investments and operational realities during the migration.

ii. Given that certain network elements in the network support TDM based interconnection at present, there should be a progressive shift to mandatory implementation of the IP based interconnection, with phase-wise targets for all service providers. The phase-wise approach will help avoid immediate discarding of equipment as well as avoiding high capex costs in purchasing new equipment at one-point in time.

iii. Since all TSPs including PSU opearator is already having centralized switching in most cases, the centralized POIs for fixed-line traffic at the LSA level on IP interconnection, can be prescribed, leading to operational efficiency and cost reduction.

iv. Therefore, we propose that TRAI mandates phase-wise migration to IP-based interconnection and centralized POIs at the LSA level for fixed-line traffic

between TSPs including PSUs with NIL charges applicable for carriage/transit within the intra-LSA network of a TSP, ensuring the immediate migration of existing Fixed Line POIs.

b. **Following migration path can be adopted**

i. We strongly recommend following "glide path" approach with clear milestones set by the regulator to facilitate a smooth and structured transition.

ii. **Phase 1 - Immediate (Within 6 & 12 months of issuance of Regulation) and ongoing thereafter:** New Capacity augmentation of new POI or in existing POI, should be only on IP interconnection after 6 months of issuance of Regulation and Within 1 year, 10% traffic to be migrated to IP interconnection.

iii. **Phase 2 - Short-Term (Within 18-24 months of issuance of Regulation):** Require operators to have a significant percentage (i.e. 50%) of their total interconnection capacity migrated to IP.

iv. **Phase 3 - Final Sunset (Within 3 years of issuance of Regulation):** Mandate migration of entire traffic to IP based interconnection and complete discontinuation of all TDM E1 interconnections. In this phase, all remaining TDM links must be migrated to IP.

v. This glide path allows operators to plan their capital expenditures, depreciate existing TDM assets, write off the nodes, and manage the technical complexities without service disruption.

10. **CONCLUSION:**

a. **Therefore, a phase-wise migration from TDM to IP interconnection is essential to ensure long-term sustainability, efficiency and competitiveness of national telecommunications networks. The shift aligns with global regulatory evolution and delivers significant technological, economic, operational and consumer-experience benefits.**

b. **For this phase-wise migration, a clear and all-encompassing regulatory mandate and push is essential to align the entire telecom sector with the all-IP future, maximizing efficiency and aligning with the advanced technologies, enriching the consumer experience.**

c. **Further, the Regulation should also permit setting up of POIs catering to multiple LSAs, based on mutual consent of TSPs.**

Q.7. Should the existing processes of 'provisioning and augmentation of ports at POIs' under Chapter IV of the TIR 2018 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?

Kindly provide your response with justification.

and

Q.8. Should the existing framework for Interconnection process and timelines, as provided in the existing TRAI regulations including, The Telecommunication Interconnection Regulations (TIR) 2018, The Telecommunication Interconnection (RIO) Regulations, 2002, and The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation 2001 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. Kindly provide your response with detailed justifications.

VIL Comments to Q. No.7 & 8

1. The Interconnection related regulations have been prescribed by the Authority over more than two decades. Some of these Regulations have not been reviewed for over a decade and two as well. The last Interconnection related regulation was prescribed in 2018 and amended in 2020.

2. In past decade, the telecom industry has deployed next generation networks thereby providing digital state of the art telecom services to consumers. As an innovative telecom player, VIL keeps deploying advanced network nodes and technical solutions, to bring in efficiency into its operations as well as for providing quality services to its customers.

3. In contrast to above, interconnection is between two service providers and the efficiency can only be achieved if both the service providers work towards a common goal. Given the role-play of different service providers, there is a need of Authority to pitch in and regulate the sector through interconnection regulations thereby, bringing in efficiencies in the operations of service providers as well as also leading to better quality of services to consumers.

4. The present interconnection arrangements are posing various challenges and continue to ride on various traditional and outdated inefficiencies thereby, loading avoidable costs on the sector as well as not supporting high quality services to consumers. The next generation networks and services requires an evolved and flexible interconnection regulatory norm, which are based on transparent, reciprocal, cost-based arrangements and do not lead to perpetual cross-subsidization of inefficiencies in the interconnection layers by an interconnection seeker.

5. The perpetual cross-subsidization of inefficiencies in interconnection layers also pose a significant entry barrier for a new service provider as well as for existing service provider intending to launch services in new cities as it requires mandatory interconnection.

6. In this regard, kindly find below our detailed Regulation-wise comments:

A. The Telecommunication Interconnection Regulation, 2018 (TIR 2018)

7. **Challenges being faced:** Telecom Service Providers (TSPs) currently face several challenges in implementing the existing TDM-centric framework, details of which are given in table below:

Challenge	Detail	Example Scenario
IP Interconnection Ambiguity	The regulations primarily refer to TDM links (E1s). While IP interconnection is mentioned in TIR 2018, the *specific* technical implementation standards and mandatory timelines are not explicit.	Operator A wants to provision a new IP interconnect link with Operator B, but B insists on a TDM link because the regulations are vague on mandatory IP standards.
Slow Provisioning Timelines	The existing 30-day timeline in TIR 2018 is often challenging to meet for complex new peering points, especially when commercial negotiations or physical infrastructure delays occur.	A new entrant requests interconnection; the incumbent operator uses the full 30 days for every single E1 group requested sequentially, rather than provisioning bulk IP capacity efficiently.
Dispute Resolution Delays	The process for resolving disputes over interconnection points (e.g., location,	An operator claims capacity is exhausted at a specific location,

	capacity, quality parameters) can be slow, leading to service disruption and anti-competitive behavior.	delaying interconnection, and the dispute mechanism takes months to resolve the technical and commercial issue.
Port charges Cost Discrepancy	The Port charges are largely designed around the cost structure of TDM networks. IP interconnection has a different cost profile.	An operator with an efficient all-IP network will still end up paying port charges based on a legacy TDM cost model, cross-subsidizing less efficient operators.

8. **Justification for Revision and Proposed Remedies:** A revised framework is necessary to provide clarity, efficiency, and fairness for all operators

   a. **Update Technical Standards to Mandate IP Interconnection:**

      i. **Justification:** The existing RIO and TIR 2018 must be updated to make IP-based interconnection the default and mandatory standard for all new interconnections. This aligns with global trends and TRAI's push for NGN migration.

      ii. **Remedy:** Clearly define technical specifications for IP interconnection (e.g., use of SBCs, EVS codec as primary) within the regulation.

   b. **Streamline and Accelerate Timelines for IP Provisioning:**

      i. Introduce a "deemed approval" clause if the interconnection request is not acted upon within a shorter, fixed timeline (e.g., 15 days for a simple capacity augment).

      ii. Mandate a clear process for bulk IP capacity agreements rather than incremental TDM E1 provisioning.

   c. **Port charges for IP Networks:** The current Port charges framework (as per the 2001 regulations) needs re-evaluation based on actual IP network costs. Continuing with TDM-based port charges may not suit the latest IP based architecture.

   d. In summary, even though transparency and fair access in the existing regulations are sound, but the *technical details, timelines, and financial models* must be revised to

reflect the technological reality of modern IP-based telecom networks. This will ensure a smooth transition to a fully digital India.

9. **Conditions for Exit from Interconnection points/POIs:** At present, the TIR prescribes conditions related to the entry point of interconnection i.e. for seeking of new and additional ports, its process, timelines, costs etc. However, there are no clear conditions related to the exit point of interconnection i.e. for surrendering of all/partial ports or the POI. It is desirable that clear regulatory norms related to ports/POI surrender in terms of process, timelines and costs, are also reviewed and prescribed thereafter.

10. **Ports prior to 01.02.2018:**

    a. The TIR 2018 prescribed for division of ports on the basis of outgoing traffic and each service provider to seek ports to meet the requirement of its outgoing traffic after 2 years from establishment of initial interconnection. However, although paras 32 and 34 of the explanatory memorandum to TIR 2018 noted the view of certain stakeholders that such division of ports should be based on each party bearing the cost of interlinking media (i.e. underlying transmission media for POI connectivity), para 39 delineating the Authority's decision did not give any rationale for non-consideration of this aspect without which the division of ports envisaged under TIR 2018 is rendered futile.

    b. Further, the TIR 2018 through first amendment, allowed port and infrastructure charges for all ports provided before 01.02.2018 to continue to be payable as per the terms and conditions which were applicable to them before 01.02.2018. This creates a further disincentive on division of ports under TIR 2018 and creates a more non-equitable interconnection framework.

    c. It may be noted that both the above are contradictory to each other and adequate efficiencies cannot be achieved if the interconnection arrangements continue to follow terms and conditions that are more than 20 years old in some cases.

    d. As a period of more than 7 years have passed whereby cost of ports and infrastructure charges have been further paid as per outdated terms and conditions existing before 01.02.2018, it is high time that port and infrastructure charges should apply on the basis of outgoing traffic of each party, (incl. cost of interlinking/underlying media), irrespective of the date when the ports/POI were provisioned. This provision also creates a discrimination between the older operators and the newer players as the former continue to be saddled with legacy costs.

11. **Other Interconnection charges**

a. The interconnection arrangements are also fraught with various allied charges which are forced on the service providers in the name of seeker-provider relationship and bring in lot of inefficiencies and avoidable costs into play.

b. Some of these charges are being imposed in the name of infrastructure charges, emergency service charges, set-up charges, surrender of POIs and/links, Active link charges, Passive link charges, shifting of POIs, one-side interest on delayed payments etc.

c. As interconnection is mandatory, we strongly urge the Authority to deal with all the interconnection related charges, in whatever form/name, and regulate the same.

The Telecommunication Interconnection (port charges) Regulation,2001

12. **Review of existing port charges:** The present applicable port charges for providing port in MSC and in Tandem/Tax switch was fixed as Rs 4,000 and Rs 10,000 respectively in 2012. However, the same has not been reviewed for more than a decade now. It is extremely important that the port charges are reviewed as per present network costs, reduced substantially as well as made uniform for both MSC and Tandem/Tax switch. **To encourage faster adoption and transition to IP based interconnection, the port charges for TDM ports should be revised and aligned based on cost from IP based network elements.**

13. **Prescribing port charges under IP interconnection:** In new interconnection arrangements, IP interconnection is being provided however, there is no reference available for port charges under IP interconnection in the TRAI Regulation. For moving into a mandatory IP interconnection, as explained above, it would be a pre-requisite to prescribe port charges for IP interconnection as well.

Additional Points:

14. As can be seen from the pre-consultation paper, there are 9 regulations related to Interconnection, most of which have been issued more than 2 decades ago.

15. For ease of doing business and having simpler interconnection framework, certain Regulations should be merged like Register of Interconnect regulation can be merged with the TIR 2018.

Q.9. 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? If yes, what specific changes should be done in the disconnection procedure? Kindly justify your response.

VIL Comments to Q. No.9

1. As stated above, we reiterate that once the IP based interconnection is fully adopted by all TSPs in India, many provisions of the TIR 2018 and other interconnection regulations designed for a previous era will become redundant. Thus, the interconnection Regulations for telecom will require a comprehensive review to create a new, efficient framework for managing IP-based interconnections.

2. As per the existing TIR 2018, a TSP intending to disconnect a POI must first issue a show-cause notice of fifteen working days to the other party, clearly stating the reasons for the proposed disconnection. If the response is unsatisfactory or absent, the initiating TSP is then required to provide a subsequent fifteen working days' notice specifying the date of disconnection. This two-tiered notice system aims to ensure transparency and provide adequate time for dispute resolution, thereby safeguarding the interests. While these provisions were reasonable and sufficient for TDM based interconnection and legacy networks, there are areas which would require realignment to ensure smooth adoption of IP based interconnection, details of which are given as follows:

3. **Yes, we believe that there is a strong need to revise the existing process for the disconnection of Points of Interconnection (POIs) as provided in Regulation 11 of the Telecommunication Interconnection Regulations (TIR) 2018.**

4. **Challenges with the Current Process:**

    a. The current process, which essentially involves a 15-day show cause notice followed by another 15-day disconnection notice (a 30-day total process), is functional for standard commercial disputes but is inadequate for addressing critical issues like immediate security threats, fraud or for sunset of TDM networks. TRAI should review the existing interconnection regulations, including the POI disconnection process, to better manage the transition to IP and resolve existing challenges.

    b. **Legacy Technology Retirement:** When migrating to all-IP networks (as discussed previously), the current regulation provides an easy out for operators to delay the closure of obsolete TDM POIs. The regulation states that TDM POIs can remain operational until "the interconnected service providers mutually decide to close such POIs," which often leads to stagnation if one party is unwilling to migrate.

5. **Specific Changes to the Disconnection Procedure:** To address these challenges, we propose the following specific changes:

   a. **Mandate a Time-Bound Closure of TDM POIs:**

      i. Change: Revise the "mutual consent" clause for closing legacy POIs. Instead, incorporate the previously suggested "glide path" timeline for mandatory migration to IP interconnection.

      ii. Procedure: Once a service provider has completed its IP migration journey as per the national mandate, the TDM POIs must be decommissioned within a specified notice period (e.g., 60 days) regardless of mutual consent, provided alternative IP connectivity is available.

      iii. Justification: This eliminates the use of legacy technology as a negotiation leverage point and facilitates industry-wide NGN transition.

   b. **Clarify the "Cause for Reason" Clause and Financial Disincentives:**

      i. Change: Clearly define what constitutes a valid "cause or reason" for disconnection (e.g., persistent non-payment of IUC dues, consistent failure to augment capacity) and link it directly to the financial disincentive framework.

      ii. Procedure: If a disconnection is found to be unjustified by TRAI, the penalty/financial disincentive should be clearly and swiftly applicable.

      iii. Justification: This prevents arbitrary use of the disconnection threat as a negotiation tactic by dominant operators and ensures that the power to disconnect is used only for legitimate reasons.

   c. **Other cases of disconnection** like w.r.t. any charges, dispute etc, following process can be followed thereby ensuring no arbitrage or unilateral threats or disconnections.

      i. Notice to be served with a 15 days timeline to respond.

      ii. Joint meeting between the TSPs and documentation of all MOMs within 15 days of first notice: It should be the responsibility of the TSP who has issued the disconnection notice to call a meeting and document the MOMs (in agreement with partner TSP). Notice will become null and Void in case no meeting is called upon within 15 days of the notice.

iii. In case of non-compliance to point-2, TSP cannot issue another notice for the period of next 6 months in any circumstances. In case TSP whom the notice is issued, failed to attend the meeting, a second notice will be issued within the time frame of 15 days.

iv. In case TSP whom the notice is issued does not respond, a final notice will be issued with the time frame of 15 days and clear date and time of disconnection of POI which is in dispute.

v. In case both TSPs fail to reach an agreement in the joint meeting, matter can be escalated to the second level (both TSP's Regulatory Head or their authorized representative with a power of taking decision) within one month of Joint meeting. Till the decision is not taken at this level, POI can't be disconnected / blocked by either of the TSPs.

vi. In case of disagreement at second level, TSPs should take legal recourse and approach Hon'ble TDSAT within one month of decision. Till the decision by TDSAT, POI can't be disconnected / blocked by either of the TSP.

d. **The entire notification process for disconnection and augmentation should be digitized and made automated.**

Q.10. Is there a need to introduce a process for the surrender or closure of POIs in the regulatory framework? If yes, what should be the criteria, procedure, charges, and timelines, including the minimum retention period for POIs before a surrender or closure request can be made? Kindly justify your response.

VIL Comments to Q. No.10

1. Yes, we believe there is a definite need to introduce a formalized, explicit process for the surrender or permanent closure of Points of Interconnection (POIs) within the regulatory framework.

2. At present, the TIR prescribes conditions related to the entry point of interconnection i.e. for seeking of new and additional ports, its process, timelines, costs etc. However, there are no clear conditions related to the exit point of interconnection i.e. for surrendering of all/partial ports or the POI.

3. While Regulation 11 of the TIR 2018 addresses disconnection for specific causes (like non-payment), it doesn't clearly outline the procedure for a mutual, planned surrender or closure of POIs that are no longer commercially or technologically viable (e.g., closing TDM links after IP migration or rationalizing locations due to traffic consolidation).

4. The private TSPs follow reciprocal rights for surrender of POI and/or POI capacity which may generally be required for optimisation or low traffic or for restructuring of POIs etc. But this is not there when TSPs surrender POI/Port with PSUs. TSPs encounters difficulties when attempting to surrender POIs, Port/POI infrastructure with PSUs. The right to surrender POIs or ports should be reciprocal.

5. There should be a provision to surrender either specific capacity at a POI or the entire POI, without going into the rationale of such surrender. This right should be available to both parties, and any surrender request initiated by one party should be processed and approved by the other within four weeks of receipt.

6. In reality, most of the time surrender requests are not addressed or responded to by one PSU within the stipulated timeline and TSPs are left chasing them for the whole year at times with no success.

7. This gives financial advantage to the PSU, who continues to then bill annual charges to TSPs even for the pending surrender ports and unfairly compels them to make payment for the underutilized, non-operational ports, even though they have been put up for surrender.

8. Under TIR 2018, TRAI has regulated the timeline for various sub-processes for entering into interconnection and setting up of POI. Similarly, it is important that TRAI also regulates the timelines and cost for exiting or surrender of a POI/ports.

9. **Summary Justification for a Formal Port/POI Closure Process:**

   a. **Network Rationalization:** Operators need a clear, non-dispute mechanism to optimize their network footprint. Maintaining redundant or obsolete POIs (especially physical TDM links) is inefficient and costly.

   b. **Clarity and Transparency:** A formal process removes ambiguity and prevents one operator from indefinitely forcing another to maintain an obsolete or unnecessary POI due to the current "mutual consent" ambiguity.

   c. **Regulatory Oversight:** A formalized process ensures TRAI/DoT maintains an accurate record of the active interconnection, which is crucial for monitoring network coverage, capacity, and quality of service nationally.

10. **Proposed Criteria, Procedure, Charges, and Timelines:** The new regulatory framework should incorporate the following elements for the surrender or closure of POIs:

    a. **Criteria for Surrender/Closure:** A TSP should be allowed to initiate a request for POI surrender/closure based on clear criteria:

        i. Technological Obsolescence: The POI uses a legacy technology (e.g., TDM E1) for which an IP alternative has been successfully provisioned.

        ii. Low Traffic: The POI consistently handles traffic volumes below a defined minimum threshold (e.g., less than 1 E1 equivalent for 6 consecutive months), making it inefficient to maintain.

        iii. Network Consolidation: The operator is rationalizing its network architecture, and traffic is being efficiently rerouted through other existing POIs, provided Quality of Service (QoS) metrics are maintained.

        iv. Mutual Agreement: Both operators involved agree that the POI is no longer needed.

    b. **Minimum Retention Period**

        i. Timeline: A minimum retention period of 12 months from the date of initial commissioning should be mandated before a surrender or closure request can be initiated.

        ii. Justification: This prevents operators from commissioning and decommissioning POIs arbitrarily for short-term gain, ensuring stable network planning and investment recovery time for the infrastructure deployed.

    c. **Procedure for Surrender/Closure:** The procedure should prioritize transparency and a phased approach as below:

        i. **Step 1 - Formal Notice (90 Day's advance notice):** The initiating operator submits a formal request to the peering partner and simultaneously notifies TRAI/DoT. The notice must include the justification based on the defined criteria and a traffic impact analysis.

        ii. **Step 2 - Traffic Rerouting Plan (Day 15-60 from the Formal Notice date):** The operators mutually agree on a plan and timeline for traffic migration to alternative POIs to ensure zero service disruption for end-users.

iii. **Step 3 - Verification (Day 60-90 from the Formal Notice date):** The notice receiving operator verifies that traffic has been successfully migrated and that no QoS degradation has occurred.

iv. **Step 4 - Final Closure and Decommissioning (Day 90+ from the formal Notice date):** The physical or logical POI is decommissioned, and both operators formally update the Authority that the closure is complete.

d. By introducing this structured process, the regulatory framework supports network modernization and efficient business practices while safeguarding end-user interests and ensuring overall network stability.

11. **Therefore, to ensure that the process for surrender of Ports/POIs is simplified and completed in a time-bound manner, we strongly urge TRAI to:**

a. **Regulate the process, formats, timeline and costs of surrender of Ports/POIs in line with points mentioned at point no. 10 above, through suitable provisions incorporated in the TIR.**

b. **If the notice receiving TSP do not respond in a defined period, then there should be no charges applicable for the said POI/ports and the POI/Port surrendering TSP should be free to remove its related equipment.**

c. **There should not be any rejection/delay in surrender of POIs/ports, based on reason for such surrender.**

d. **NO charges related to the said Ports/POIs after the date of surrender/disconnection of ports/POI.**

Q.11. 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? If yes, please provide the process and methodology for determining the initial bank guarantee amount and any subsequent bank guarantee amount, if required. Kindly justify your response.

And

Q.12. Should a procedure be established for addressing delays in the payment of interconnection-related charges? If yes, what should be the procedure to address such delays? Kindly provide your response with justification.

VIL Comments to Q. No.11 and 12

1. In today's scenario the TSPs are well-established, firmly regulated and there is no substantial risk perception which exists. Besides, the IUC pay-out has gone down significantly, after voice IUC was made zero thus, the cost and effort of Bank Guarantee (BG) is much bigger than the actual risk coverage. Besides, other interconnection related charges like Port charges etc are to be paid in advance thus, obviating the need of any financial security.

2. Such practices of taking BGs are obsolete and do not find any precedence amongst the established private TSPs.

3. Also, BGs were initially thought as a way of guaranteeing dues towards the state. However, in interest of Ease of Doing Business, DoT has also reduced the performance and Financial BG requirement for TSPs by 80% and also provided waiver of BGs for existing spectrum.

4. Providing and maintaining the BGs blocks the working capital, increases the costs for TSPs (commission, renewal charges, margin money) and also tilt the negotiation power with the BG holder as they can invoke the BG encashment even for a legitimate dispute being raised by other TSPs, without going into the rationale of the dispute.

5. One such example are the Global markets which are mature markets and do not require bilateral BGs between operators for interconnection. India too is moving toward simpler, digital, trust-based interconnection models. Removing BGs aligns with the modern practice.

6. Hence, for a free market play between competitive players, it is crucial that the Regulation should mandate that interconnection provider should not demand any BG from interconnection seeker for any charges related to interconnection, after two years of initial interconnection.

7. The Interconnect agreement between TSPs provide for imposing interest on delayed payments. This provision provides adequate deterrent, ensures timely payments and is working fine for decades now. As such, no additional mechanism is required over and above provision for interest on delayed payment.

8. **In view of the above, we request the Authority to prescribe in the regulation:**

a. **Mandate of no BG to be demanded by Interconnection provider from Interconnection seeker for any charges related to interconnection, after two years of initial interconnection.**

b. **Prescribing a reciprocal interest on the delay in payment beyond 15 days of receipt of invoice.**

Q.13. Is there a need to revise the financial disincentive framework as provided in these regulations? If yes, what specific changes should be done? Kindly justify your response.

VIL Comments to Q. No.13

1. Considering the inter-operator rights and obligations involved in interconnection framework, there is a clear merit in putting in place a deterrent to ensure compliance of conditions, which can otherwise provide disproportionate advantage to certain TSP or create some arbitrage stifling free play of market forces.

2. If the Authority has to implement large scale project of national importance i.e. LSA level interconnection as well as IP based interconnection, there would certainly be a need of having provisions of putting financial deterrent to ensure compliance of milestones and its timelines.

3. Therefore, we recommend that Financial disincentive should be there to enforce inter operator rights and obligations. It should not be imposed in case of any administrative reporting towards TRAI.

4. Further, the financial disincentives should be made graded, to ensure that TSPs are not imposed of huge financial disincentives for shorter period of delay in complying with the provisions of the Regulations and timelines mentioned thereto.

A.2.The Short Message Services (SMS) Termination Charges Regulations, 2013

Q.14. Is there a need to revise the existing SMS termination charge? If yes, what are the considerations necessitating such a revision? If not, kindly provide justification.

VIL Comments to Q. No.14

1. The current Regulation prescribes for Rs 0.02/SMS domestic termination charges, to be paid by an originating access provider to terminating access provider. We are fine with continuation of this charge.

2. On one hand, it seeks to compensate the terminating service provider and on the other hand, it serves two purposes of firstly discouraging spam through unregistered telemarketer route and secondly by removing free ride by the TSPs who do not have any (or substantial) retail subscribers but, deal with sending large volumes of bulk A2P SMS and thus, have asymmetric traffic.

3. **Therefore, the Rs 0.02/SMS domestic termination charges should continue and there is no need to revise the existing SMS termination charge.**

4. However, there is a need to relook and increase the commercial communication charge for A2P SMS.

5. The present charge of Rs. 0.05 per SMS was introduced by TRAI through a Regulation in the year 2011.

6. Over the past many years especially due to TCCCP Regulation, 2018 and ensuing DLT based ecosystem, there have been mammoth changes required in the infrastructure setup, security protocols, compliance with regulations, ongoing maintenance as well as change in field processes, to handle the commercial communications and also to put in place measures to protect the consumers from unsolicited commercial communications.

7. It is pertinent to mention that such mammoth changes based on regulatory mandates have led to multi-fold increase in cost for TSPs including the increase due to inflationary trends. However, Rs. 0.05 charge has not undergone revision for past more than a decade and does not reflect true market conditions.

8. **Considering all above, we strongly urge the Authority to revise and increase the existing Rs. 0.05 SMS commercial communication charge to Rs. 0.10 per SMS. This along with Rs 0.02 per SMS termination charges, will making it to Rs 0.12 per SMS uniform commercial communication charge for A2P SMS.**

Q.15. Is there a need to prescribe SMS carriage charges when an NLDO carries SMS between the LSAs? If yes, what principles and methodology should apply? If not, kindly provide justification.

VIL Comments to Q. No.15

1. Yes, there is a need to prescribe the SMS carriage charges, in case NLD operator carries the SMS over NLDO's signalling network from originating access provider and hands over to the terminating access provider in a different LSA.

2. Unavailability of a reference price/ceiling for SMS carriage charge poses challenges for service providers providing voice interconnect to single/multiple LSA licensee (not having their own NLD networks), who in turn use the signalling path to send SMS also without paying any carriage charge.

3. **Therefore, a regulated SMS carriage charge will provide an effective and competitive market mechanism, for new service providers to enter the market with even single/few LSA authorisation. We recommend a SMS carriage charge of Rs 0.01/sms should be prescribed, which can be levied by TSPs on mutual agreement basis.**

A.3.Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006

Q.16. Is there a need to revise the existing access charge to be paid by the service provider to the originating provider for IN services? If yes, kindly provide detailed explanation; if not, kindly provide justification.

And

Q. 17. Are there any difficulties that service providers encounter in complying with existing IN Regulations, 2006 in Multi-Operator and Multi-Network Scenario? Kindly describe these challenges in detail and suggest possible regulatory remedial measures to overcome these challenges.

VIL Comments to Q. No. 16 and 17

1. Yes, there is a need to revise the existing access charge to be paid by the service provider to the originating provider for IN services.

2. The inter-operator charges for IN services were agreed between TSPs almost two decades back. The IUC for voice has fallen and became zero in between TSPs. However, the IN charges has seen no revision or reduction for a long time.

3. Voice market is very much dynamic and looking at current trends it is relevant to bring competitiveness in the market but, same is hindered by age old very high charges of Rs

0.52/min for tollfree IN calls. Reducing these charges will also help give more competitive offerings to the enterprise consumers, and also expand the market of tollfree IN services.

4. The inter-operator charges for IN service becomes more about revenue to an originating TSP i.e. more the mobile subscriber share, more the revenue without any corresponding effort in expanding the market. It becomes disproportionately lucrative to TSPs with large subscriber share though there is no extra work done at Originating TSP's end. If inter-operator charges for tollfree IN services are regulated and substantially reduced, it will present a fair market opportunity for all service providers dealing in providing tollfree IN service numbers to the enterprise consumers.

5. Therefore, it is important that access charges for IN services are prescribed and reduced considerably, considering the present times.

6. Except the charges as mentioned above, the current framework is working fine and without any challenges in agreement execution, routing or completion of calls. As such, there is no need of any other regulatory remedial measures to be taken.

A.4. TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005

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

VIL Comments to Q. No.18

1. There is no place of having such inefficiency and obsolete requirements of carriage/transit carriage charge to be taken by a TSP from other TSP, for carrying a call within their network.

2. While moving to LSA based interconnection may take certain time in terms of augmentations of new POIs, as an immediate measure, the carriage/Transit charges should be reviewed and made NIL (Zero), for carrying the call within the network of a TSP. This will also encourage TSPs to move to LSA based interconnection at the earliest possible.

3. **Hence, all intra-network charges for carrying a call within a TSP's network, should be abolished.**

A.5. The Telecommunication Interconnection Usage Charges Regulations, 2003

Q.19. The existing interconnection regulatory framework provides for application of origination, carriage, transit, transit carriage and termination charges for various levels of interconnections for PSTN-PSTN, PLMN-PLMN, PLMN-PSTN. Based on the interconnection regulatory framework suggested in your response in Questions 1, 2 and 3 above, should there be a review of these charges? Kindly justify your response.

VIL Comments to Q. No. 19

1. **Origination, Carriage and Termination Charges:** There is no need for review of origination, carriage and termination charges for various levels of interconnections for PSTN-PSTN, PLMN-PLMN, PLMN-PSTN. The market is matured enough and there is no need of bringing in any charges which can create arbitrage or unnecessary costs for TSPs.

2. **Transit and Transit Carriage Charge:** There is an arbitrage in between certain TSPs in the name of transit or transit carriage, which is impacting free play of market forces and enriches one TSP that too for its own network inefficiencies, at the cost of another TSP. There is a need to abolish the intra-network transit or transit carriage charges. We request TRAI to kindly abolish these charges by making them NIL.

Q.20. 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? If so, what should be the charges and the basis thereof?

VIL Comments to Q. No. 20

1. The present arrangement on Emergency calls is obsolete and inefficient. It seeks to compensate one TSP at the cost of another TSP, without going into any rationale of volume of traffic.

2. Under the present one-sided arrangement, the PSU operator charges very heavy annual payment on per LSA basis, with a 10% annual increment. The charges which started at Rs 10 lakhs per annum per LSA has reached Rs 49 lakhs per annum per LSA for the financial year 2025-26.

3. At the same time, after implementation of PSAP, the emergency calls are being routed directly to the control room of the PSAP center established by State under the project run by MHA. It has been asked to route the overflow calls through the network of PSU operator. Due to this the volume of calls declined from ~111 mn mins in FY 2024-25 to

46.97 mn mins in FY 2025-26 (till Oct'25). With rapid PSAP implementation and migration of traffic, the volume of traffic through PSU operator will reduce to few thousand mins of calls only in FY 2026-27 itself.

4. Thus, with volume of calls to emergency numbers through PSU operator become next to NIL, the dependency on PSU operator as well as the very objective of having annual LSA based lumpsum price, has become redundant.

5. With these change in circumstances, the charges for emergency calls have to be made NIL, even if inter-operator route is to be used as a secondary mechanism.

6. **Global precedence:** Globally the NRAs have implemented no inter-operator charge for emergency calls e.g.

   a. All 27 EU member states plus EEA countries Iceland, Liechtenstein, and Norway prohibit inter-operator charges for emergency calls under the European Electronic Communications Code (EECC) Article 109 and prior directives like 2002/22/EC.

   b. ACMA (Australia) mandates free 000 calls without interconnect fees.

   c. Therefore, global norms also support making the inter-operator charges as zero.

Q.21. Should the International Termination Charges (ITC) for international incoming calls to India be revised? If yes, what are the considerations necessitating such a revision. Kindly provide your response with justification.

VIL Comments to Q. No.21

1. Spam calls and messages have become a significant nuisance for Indian consumers, with fraudsters increasingly exploiting vulnerabilities in the telecom ecosystem. The TSPs have taken various measures to combat this menace, including the implementation of caller ID authentication, AI-based spam detection, international country name display and centralized databases such as the Centralized International Out-roamer database (CIOR). CNAP is also in the implementation phase. These steps have notably reduced CLI spoofing using Indian numbers. However, the problem persists considering the illegitimate financial benefit drawn by the scamsters, particularly with calls originating from international routes where lenient regulatory norms apply, making it imperative to address this growing concern effectively.

2. Recognizing the severity of the issue, both the DoT and TRAI have undertaken multiple initiatives to curb spam and fraudulent calls. Notable measures include stringent DLT based regulatory framework on SMS and voice calls, Know Your Customer (KYC) norms, as well as proactive measures from TSPs like enhanced AI/ML-based spam detection frameworks. Despite these efforts, international spam calls and phishing attempts continue to rise, exploiting gaps in the regulatory framework, particularly in relation to low levels of International Termination Charges (ITC) in India as compared to ITC in other countries.

3. While DoT and TRAI have been proactive in taking measures against spam, the existing ITC rates remain a major concern. The current ITC, prescribed between ₹0.35 and ₹0.65 per minute, creates a lucrative avenue for spammers who leverage the lower cost of international call termination to target Indian consumers.

4. A comparative analysis of ITC rates across various countries highlights India's significantly lower charges:

Countries/Region	ITC (INR)	ITC in India as a %age of ITC in Other countries
India	0.65	
Myanmar	22	3.0 %
Philippines	13	5.0 %
Dubai	13	5.0 %
Vietnam	5.5	11.8 %
Cambodia	5.5	11.8 %
Laos	6	10.8 %
Brazil	2	32.5 %
China	5	13.0 %
Russia	15	4.3 %
US continent (Non US/Canada)	19	3.4 %
Europe (Average)	17	3.8 %
Middle East (Average)	12	5.4 %
SAARC (Average)	14	4.6 %
Maldives	56	1.2 %
Cuba	48	1.4 %
Seychelles	48	1.4 %
Tanzania	20	3.3 %
Belgium	17	3.8 %
Kenya	15	4.3 %

Nepal	11	5.9 %
Sri Lanka	10	6.5 %
Nigeria	9	7.2 %
Saudi Arabia	9	7.2 %
Egypt	8	8.1 %
France	7	9.3 %
Mauritius	3	21.7 %
Pakistan	3	21.7 %
Indonesia	3	21.7 %
Japan	1	65.0 %

Sources: BEREC, TRAI, BRTI

5. The data above clearly indicates that ITC in India are among the lowest in the world, making it financially viable for fraudsters to exploit these routes for originating spam and phishing attempts from outside India, for terminating on Indian consumers. The prevailing low ITC rate of ₹0.65 facilitates fraudulent activities, leading to increased spam, phishing attempts, and financial scams. In contrast, other countries have higher termination rates, which also act as a deterrent against such misuse.

6. For instance, several recent cases have highlighted the severity of the issue. Indian banks and financial institutions have reported rising instances of fraudulent calls from international numbers impersonating officials from the Income Tax Department, RBI, and law enforcement agencies. Victims are tricked into revealing sensitive information, leading to financial losses.

7. The implications of India's low ITC rate extend beyond consumer inconvenience and fraud. It negatively impacts Indian TSPs, reduces revenue for the Government Exchequer, and creates an unfair economic scenario compared to global peers. Raising ITC rates would serve as an effective countermeasure, increasing the cost of entry for fraudsters and reducing the volume of spam and fraudulent calls.

8. **Therefore, in light of the above, to effectively address the spam issue and protect Indian consumers, we strongly urge TRAI to revise the ITC rate to align more closely with global standards. A higher ITC rate will:**

   a. **Create an entry barrier for fraudsters exploiting international call termination.**

   b. **Reduce the number of international spam/phishing attempts.**

   c. **Ensure fair revenue realization for Indian TSPs and the Government Exchequer.**

d. **Bring India's ITC rates in line with international benchmarks.**

Q.22. Is there a need to address the issue of telemarketing and robo-calls within the interconnection framework? If yes, kindly provide your inputs on the possible approaches. Kindly justify your response.

VIL Comments to Q. No.22

1. There is a no need to address the issue of telemarketing and robo-calls within the interconnection framework, as there is no feature within the call to identify whether it is originated by the telemarketer or a robo call.

2. The interconnection arrangement cannot identify these calls, and hence should not deal with the same.

3. Also, the interconnection usage charges have been cost-based. The charges (if any) for the commercial communications, were defined under the scope of the Telecom Commercial Communications Customer Preference Regulations 2018 (TCCCPR), which includes the charges for A2P SMS.

4. In past few quarters, some of the stakeholders have sought prescribing charges on voice calls related to commercial communications as a measure to curb spam, during the industry discussions in TRAI on TCCCPR related topics.

5. In this regard, it may be noted that adoption of a separate series for service and transactional calls is in early stage (1600xx for BFSI sector) and will require identification and roll-out for many other sectors. Prescribing any charge at this stage, would lead to increase in costs for migration to these series and thus, impact the noble objective of making consumer aware through a separate and easily identifiable series.

6. Therefore, no provisions should be brought in the interconnection domain for the telemarketing and robo-calls.

A.6. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002

Q.23. Is there a need to revise 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002'? If yes, kindly provide the specific revisions. Kindly provide your response with justification.

VIL Comments to Q. No.23

1. Yes, 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002' needs to be revised, for it to serve the present and future requirements.

2. RIO Regulation of 12.07.2002 should define and mandate that 'Interconnection Seeker' and 'Interconnection Provider' for a fixed/limited duration of 2 years (i.e initial 2 years of establishment of interconnection), post which there be no concept of seeker or provider and both operators should be treated at par and there should be reciprocity in all aspects of interconnection including augmentation, infrastructure, costs for own outgoing traffic, surrender, disconnection, financial conditions, interests etc.

3. The Model RIO needs to be updated to reflect the new authorisation framework that is likely to be introduced in terms of definitions, references to Acts/Rules, changes that have occurred in the last two decades including but not limited to technological changes, regulatory/licensing changes, digitalization related correspondence/procedural changes etc.

4. The model RIO should also capture LSA-level interconnection as the only way of interconnection, and accordingly, there should be NIL intra-network charge in an LSA, in any name like transit or transit carriage charge etc.

5. Further, the Model RIO should also capture glide path for IP based interconnection at LSA level, to ensure consistent voice quality, free from the drawbacks of protocol conversions between TDM & IP, and also include relevant IP protocols (SIP/SIGTRAN).

6. The RIO should also mandate that after completion of 2 years of initial interconnection, each Party shall be required to split the total E1s on a POI for its outgoing traffic on each Party's respective transmission media and to augment E1s for its outgoing traffic thereafter on its own transmission media. There should be no exemption to Ports taken before 2018 or for any other such period.

7. Model RIO should allow flexibility w.r.t establishment of interconnection basis leased lines instead of active/passive transmission links-based interconnection involving payment of infrastructure charges comprising of building, power, space, duct charges.

8. RIO of 2002 – does not have a provision w.r.t disconnection/surrender of interconnection ports/POI and hence, should be included in line with the points explained in our detailed comments above to question no. 9 and 10.

9. Concept of near-end and far-end handover (mentioned in RIO guidelines) will not be relevant in LSA based interconnection and may be dispensed with.

Q.24. For the purpose of interconnection, is there a need to revise the current categories of 'Services' and 'Activities' to determine Significant Market Power (SMP)? Kindly provide your response with justification.

VIL Comments to Q. No.24

In our view, the current categories of 'services' and 'activities' can be continued.

Q.25. Should the publication of Reference Interconnect Offers (RIOs) on the websites of Telecom Service Providers (TSPs) be mandated? Kindly justify your response.

VIL Comments to Q. No.25

There is no need of publishing RIO on the websites of TSPs as the agreements are reported to the Authority and any TSP can seek a copy of Interconnect agreement executed between any set of TSPs from TRAI. This will act as a measure of transparency for new TSPs seeking interconnection from existing TSP(s).

A.7. The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001

Q.26. 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. Kindly provide your response with justification.**

VIL Comments to Q. No.26

Yes, interconnection charges should be there for

1) Setup charges – this should be one time charges.

2) Port charges – Regulated (fixed) rates (one-time/recurring) – need for reduction of existing port charges determined in 2012 and regulated rate should be based on IP ports.

3) Colocation/ Interconnect facility rental - Space/power/building/duct/modem at POI sites – Cost based/Reasonable with a mandatory principle of reciprocity.

4) Backhaul/Leased line charges – It should be Capacity based.

5) International voice termination – It should continue to be regulated and revised upwards significantly.

6) SMS termination – It should continue to be regulated (presently, only SMS termination is regulated).

7) Emergency charges – should be regulated and set to Nil

8) Signalling link charges – SS7/Sigtran setup

Q.27. Whether following sections of The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001:

a. Section IV which contains 'Revenue Sharing Arrangements' i.e. interconnection usage charges.

b. Schedule I and II which contains rates of interconnection usage charges.

still hold relevance, in view of the subsequent issuance of the Regulation 4 under Section IV which specifies rates of 'Interconnection Usage Charges (IUC) under 'The Telecommunication Interconnection Usage Charges Regulations, 2003'.

Additionally, is there an alternative way to organize these two regulations to enhance clarity and ease of understanding? Kindly provide your response with justification.

VIL Comments to Q. No.27

1. TIR 2001 - Section IV can be continued as it lays down principles/over-arching framework w.r.t interconnection. Schedules I & II can be deleted as these are no longer relevant.

2. IUC Regulation 2003 - Regulation 4 under Section IV – Only Schedule II and Schedule VI are relevant (ie. II – w.r.t Domestic carriage charges, VI – International termination rates).

A.8. Telecommunication Interconnection (Port Charges) Regulations, 2001 and Its Amendments

Q.28. Is there a need for change, if any, required in respect of following:

a. **Port Technology**
b. **Port Size (Capacity)**
c. **Port Charges**
d. **Any other related aspect**

Kindly provide a detailed response with justification.

and

Q.29. 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.**

In case non-uniform charges are suggested, what methodology should be followed for calculation of port charges for above mentioned categories of services and technologies. Kindly provide a detailed response with justification.

VIL Comments to Q. No. 28 and 29

1. **Yes, the Port charges should be made uniform irrespective of technology of interconnection (TDM / IP) or type of services (fixed line / mobile / NLD / ILD).**

2. In an all IP advanced networks, it is imperative that all inefficiencies are removed. The TDM Port charges separately for fixed line ports and MSC ports, were defined at a time, when there were separate network architectures for these services. Presently, the networks are based on a unified IP equipment and the distinction of fixed or mobile calls is not available.

3. Further, the TDM network equipment are obsolete, end of life and end of support therefore, no new equipment has been purchased for past many years. Thus, there would not be any benchmarking available for present costs to arrive at separate port charges for TDM based ports. The earlier charges were fixed on the basis of costs taken from an approx. year ~2011 and would not be relevant for any cost-based port charge determination after few years, leave aside in 2025-26.

4. Thus, the Port charges should be uniformly determined on the basis of efficient network architecture in present times i.e. IP based interconnection, irrespective of services.

5. **For encouraging TSPs to move to IP based interconnection, we strongly recommend TRAI to mandate following:**

    a. **Option-1:** Remove the TDM port charges for both fixed line and MSC ports i.e. make them as NIL. Prescribe Port charges only for IP based ports, which will encourage TSPs to move towards IP based interconnection in a time-bound manner.

    b. **Option-2:** If the Authority's doesn't find merit in above option, then there should be uniform Port charges for TDM and IP ports, which should be derived basis the costs of IP network elements.

6. Besides above, the Port charges should be determined and prescribe while keeping in view **reciprocity** and **forward-looking IP-centric costs i.e.**:

    a. **Cost-Based, Not Historical Cost:** Charges should be based on a forward-looking economic model for modern IP networks, not PSU's historical, fully depreciated TDM costs. This prevents private operators from subsidizing PSU's legacy inefficiencies.

    b. **Symmetrical Obligations:** Any charges, conditions, or bank guarantees must be reciprocal e.g. set-up and/or shifting of POIs etc.

    c. **Capacity-Based and Scalable:** Port charges should be clearly defined per unit of capacity (e.g., per Gbps of an IP port) to allow for clear planning and transparent billing.

7. In conclusion, a "wise and good regulatory mandate" should acknowledge present market realities and be based on efficient and advanced technologies and not on the basis of obsolete technologies or historical costs. In this way, the regulatory framework will be able to drive the industry forward efficiently and fairly.

Q.30. Whether use of 'Erlang' as a unit of traffic in various interconnection regulations is sufficient and are the current procedures for demand estimation as provided in the Telecommunication Interconnection (Port Charges) Regulation 2001 and the TIR 2018 still effective and practical, in view of adoption of IP based interconnection?

a. If yes, kindly provide justification in support of your response.

b. **If no, kindly provide alternate metrics and demand estimation methods for IP-based interconnection along with detailed explanation.**

In either case, kindly provide suitable diagrammatic representation.

VIL Comments to Q. No. 30

1. As a key stake holder involved in the ongoing IP migration, we submit that the use of Erlang as the sole unit of traffic is no longer relevant for modern IP interconnection, and the current demand estimation procedures in the 2001 and 2018 regulations are outdated and impractical for an all-IP environment. The current framework, while functional for TDM, needs revision to align with packet-switched technology.

2. **Rationale for Revision – Key Limitations of Erlang/TDM procedures in IP context**

   a. Erlang is a unit of measurement for *traffic intensity* in circuit-switched TDM networks, where a dedicated circuit is held for the duration of a call. This concept does not directly translate to IP networks, where voice is broken into packets and sent efficiently alongside data traffic over shared bandwidth.

   b. **TDM vs. IP Efficiency:** An Erlang calculation assumes dedicated physical lines. IP uses bandwidth far more efficiently via techniques like statistical multiplexing, where bandwidth is only used when a person is speaking.

   c. **Capacity vs. Bandwidth:** TDM is about *capacity* (how many simultaneous calls). IP is about *bandwidth* (how much data is moving).

   d. **Traffic Heterogeneity:** IP links carry not just voice but often converged services (data, video). Erlang cannot measure data traffic.

3. **Alternate Metrics and Demand Estimation Methods for IP-Based Interconnection:**

   a. We need to shift from Erlang (traffic intensity) to Bandwidth/Throughput (data volume over time).

   b. **Alternate Metric: Gigabits per Second (Gbps):** The primary metric for IP interconnection should be Gigabits per Second (Gbps) or Megabits per Second (Mbps) of throughput. This measures the actual rate of data transfer across the peering link, which aligns with how modern IP routers and SBCs manage and bill capacity.

4. **New Demand Estimation Method: Peak Concurrent Session Analysis**

a. The current TDM method in the regulations involves manual E1 counting and utilization reports (e.g., monitoring blockage levels P.01 or P.02). The IP method should involve concurrent sessions:

b. **Procedure:** TSPs should monitor actual *peak hour concurrent usage* over a period of several weeks.

c. **Forecasting:** Demand estimation should be based on projected subscriber growth and expected *average session bandwidth* (e.g., an EVS call uses about 20-30 kbps depending on the mode) which is arrived from Concurrent session.

d. This provides a far more accurate and efficient way to dimension an IP interconnection link than trying to convert Erlangs to approximate bandwidth needs in a packet-switched world.

5. In conclusion, the existing framework's reliance on Erlang is a relic of the TDM era. To create a modern, effective regulatory framework that supports efficient IP interconnection, TRAI must revise the regulations to adopt contemporary metrics like Gbps and concurrent sessions and demand estimation based on peak bandwidth (As per the CODEC mutually agreed) analysis.

A.9. The Register of Interconnect Agreements Regulations, 1999

Q.31. 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?

a. If yes, what changes do you suggest for the online process, timelines, related charges and any other aspect?

b. If not, kindly provide justification.

VIL Comments to Q. No.31

1. The Telecom Regulatory Authority of India (TRAI) Register of Interconnect Agreement Regulations, 1999 were introduced to ensure transparency and non-discrimination in interconnection arrangements between telecom service providers (TSPs).

2. This Regulation mandate that all interconnection agreements (for voice, data, and other telecom services) be registered with TRAI to prevent anti-competitive practices and promote fair access to networks.

3. The Regulation prescribes submission of copies of Interconnect agreements in both print form as well as soft copy, by the service providers. The related extract of the Regulation is given as follows:

> *"6. All service providers shall furnish to the Authority two copies each of the Interconnect Agreements along with modification(s), if any, thereto in print form, duly authenticated, along with a soft copy of it in a floppy/diskette of 3.5" size in Microsoft word software and also in such other form as may be prescribed from time to time."*

4. In this regard, there are two changes required i.e. merging this regulation with the TIR 2018 Regulation as well as prescribing end to end digital process for submission of Interconnect agreements as well as accessing the Register of Interconnect agreement and taking its copies. Details of these two changes are given as follows:

5. **Merging this regulation with the TIR 2018 Regulation:**

   a. The request for new Interconnect agreement and its execution is regulated through the TIR 2018. As such, it would be appropriate that submission of Interconnect agreements should also be done under the same very Regulation i.e. TIR 2018.

   b. **Therefore, we strongly urge that relevant provisions for submission of Interconnect Agreement as well as accessing the Register of Interconnect agreement and taking its copies, maintaining confidentiality/non-access of the sensitive parts of the interconnect agreement, should be introduced in the TIR 2018 regulation and the existing Regulation i.e. 'The Register of Interconnect Agreements Regulations, 1999' should be repealed.**

6. **End to end Digital process for submission and accessing Interconnect Agreement:**

   a. We submit that seeking print copies as well as soft copies in floppy/diskette, is a traditional and outdated form of submission. In today's digital era, the print-copies and submission in floppy/diskette should be replaced with an end to end digital process.

   b. Further, the access to the Register of Interconnect agreement or copy of pages of any Interconnect agreements, should also be made available to TSPs through an end-to-end digitized process and digital payment submission. Accordingly, their respective fees should also be reviewed and realigned.

c. The digitization of the submission of the interconnect agreement copies will significantly streamline the regulatory compliance and enhance the efficiency of all stakeholders. The digital submission of agreements will further enable automated acknowledgements, audit trails, and real time tracking, allowing both the operators and the Authority to monitor the compliance seamlessly.

d. **Therefore, we request that the current process for submission, inspection and getting copies of interconnection agreements under 'The Register of Interconnect Agreements Regulations, 1999' using floppy disks and print copies should be dispensed with, and be replaced with an end to end digital process.**

B. Generic Questions pertaining to all existing interconnection regulations

Q.32. Is there a need to incorporate provisions for financial disincentives in interconnection regulations to deter non-compliance? If yes, kindly provide specific scenarios and mention the concerned regulations, where financial disincentives would be applicable, along with their quantification. Kindly justify your response.

VIL Comments to Q. No.32

1. Considering the inter-operator rights and obligations involved in interconnection framework, there is a clear merit in putting in place a deterrent to ensure compliance of conditions, which can otherwise provide disproportionate advantage to certain TSP or create some arbitrage stifling free play of market forces.

2. If the Authority has to implement large scale project of national importance i.e. LSA level interconnection as well as IP based interconnection, there would certainly be a need of having provisions of putting financial deterrent to ensure compliance of milestones and its timelines.

3. Therefore, we recommend that Financial disincentive should be there to enforce inter operator rights and obligations. It should not be imposed in case of any administrative reporting towards TRAI.

Q.33. 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? Kindly provide detailed response with justification.

VIL Comments to Q. No. 33

1. **Coordination committee for migration to LSA level and IP based Interconnection**

   a. Historically, the interconnection has faced maximum delays from coordination with the licensees which are PSUs, with separate corporate and circle level coordination appearing to be one of the major reasons causing delay in any effective and timely implementations. In between Private TSPs, largely the interconnection has remained smooth and the coordination happens only at the corporate level thus, removing the need of intra-organisation communications.

   b. LSA level POIs and IP level interconnection, both are important and large-scale projects and will require effective and smooth coordination, especially at Corporate level, to ensure no delays and miscommunications are induced due to coordination of TSPs at circle units. This will require a structured approach under the aegis of the TRAI.

   c. **Therefore, implementation of such an important and large-scale project, will necessitate a structured governance mechanism for transition, for the regulator to have oversight on the execution of a large, long-duration, multi-operator project.**

   d. To ensure efficiency, accountability, and regulatory alignment, formation of a Coordination Committee under the authority of the TRAI would be crucial.

   e. **The Coordination Committee should consist of couple of TRAI officials (as Chairperson as well as for Secretariat function) as well as officials from such Telecom Service Providers who are most required for the implementation of LSA level interconnection and mandatory IP based interconnection.**

2. **Regulatory Justification for Creation of a Coordination Committee**

   a. **Interconnection is a Statutory function of TRAI:**

      i. The Telecom Regulatory Authority of India Act, 1997 (TRAI Act) provides clear statutory function of the TRAI over interconnection. Section 11 (b) of the TRAI Act provides:

      "…..
      (b) discharge the following functions, namely: —

      (i) ensure compliance of terms and conditions of licence;

(ii) notwithstanding anything contained in the terms and conditions of the licence granted before the commencement of the Telecom Regulatory Authority of India (Amendment) Act, 2000 (2 of 2000), fix the terms and conditions of inter-connectivity between the service providers;
(iii) ensure technical compatibility and effective inter-connection between different service providers;"

ii. Under the above statutory functions, the Authority is empowered to formulate a coordination committee to ensure effective interconnection between different service providers as well as to facilitate deployment of new technologies to ensure technical compatibility.

iii. It is clear that the formation of a Coordination Committee aligns with these statutory functions of the TRAI under the TRAI Act.

b. **Need for Centralised Decision-Making & Oversight:** A large, multi-stakeholder project like LSA level interconnection or IP interconnection involving calls between crores of subscribers, calls on emergency numbers etc, requires uniform rollout timelines, Inter-operator infrastructure alignment, harmonisation of communications. Fragmented decision-making could cause delays, interoperability issues and inconsistent service quality. A Coordination Committee would provide a single-point mechanism for resolving inter-operator communication, ensuring phase-wise and time-bound migration, giving oversight to milestones, intervening before deadlines etc.

c. **Ensuring Regulatory Compliance and Fair Market Conduct:** When multiple operators are required to collaborate in such a large-scale project involving revolutionary migration to advanced technologies as well as improving service quality for crores of subscribers, risks may arise in areas such as non-reciprocal terms, anti-competitive behaviour, discriminatory network access or pricing, unequal infrastructure sharing etc. A regulator-led committee enables continuous monitoring, transparent governance, and equitable treatment of all operators, mitigating competition-related conflicts through structured supervision and intervening in case of missing timelines.

d. **Faster Decision Cycles & Regulatory Enablement:** Each service provider follow their independent approval cycles, different layers of decision making, as well as their internal priority to different LSAs / traffic / network nodes etc., which will cause delay to the execution and migration. The Coordination committee under the aegis of Regulator can bring all service providers on same page and priority and thus, oversee phased implementation milestones and also ensure public reporting of the same.

e. **Accountability and Transparency:** The constitution of the committee will also ensure Milestone-based tracking and reporting to the regulator without any delay. It will bring in stakeholder inclusivity with neutral chairmanship. Further, it will provide Regulator complete and real-time picture of the implementation, allowing it to intervene quickly, as and when need arises.

2. Approach for Migration to IP based Interconnection

a. Phase-wise Migration

i. A phased migration roadmap may be issued, allowing coexistence of TDM and IP interconnection during a defined transitional period. While a mandatory migration is necessary to fully realize the benefits of all-IP ecosystem across the entire industry, the transition must be managed carefully to account for existing investments and operational realities during the migration.

ii. Given that certain network elements in the network support TDM based interconnection at present, there should be a progressive shift to mandatory implementation of the IP based interconnection, with phase-wise targets for all service providers. The phase-wise approach will help avoid immediate discarding of equipment as well as avoiding high capex costs in purchasing new equipment at one-point in time.

iii. Since all TSPs including PSU operator is already having centralized switching in most cases, the centralized POIs for fixed-line traffic at the LSA level on IP interconnection, can be prescribed, leading to operational efficiency and cost reduction.

iv. Therefore, we propose that TRAI mandates phase-wise migration to IP-based interconnection and centralized POIs at the LSA level for fixed-line traffic between TSPs including PSUs with NIL charges applicable for carriage/transit within the intra-LSA network of a TSP, ensuring the immediate migration of existing Fixed Line POIs.

b. Following migration path can be adopted

i. We strongly recommend following "glide path" approach with clear milestones set by the regulator to facilitate a smooth and structured transition.

ii. **Phase 1 - Immediate (Within 6 & 12 months of issuance of Regulation) and ongoing thereafter:** New Capacity augmentation of new POI or in existing POI,

should be only on IP interconnection after 6 months of issuance of Regulation and Within 1 year, 10% traffic to be migrated to IP interconnection

iii. **Phase 2 - Short-Term (Within 18-24 months of issuance of Regulation):** Require operators to have a significant percentage (i.e. 50%) of their total interconnection capacity migrated to IP.

iv. **Phase 3 - Final Sunset (Within 3 years of issuance of Regulation):** Mandate migration of entire traffic to IP based interconnection and complete discontinuation of all TDM E1 interconnections. In this phase, all remaining TDM links must be migrated to IP.

v. This glide path allows operators to plan their capital expenditures, depreciate existing TDM assets, write off the nodes, and manage the technical complexities without service disruption.

c. **CONCLUSION:**

i. **Therefore, a phase-wise migration from TDM to IP interconnection is essential to ensure long-term sustainability, efficiency and competitiveness of national telecommunications networks. The shift aligns with global regulatory evolution and delivers significant technological, economic, operational and consumer-experience benefits.**

ii. **For this phase-wise migration, a clear and all-encompassing regulatory mandate and push is essential to align the entire telecom sector with the all-IP future, maximizing efficiency and aligning with the advanced technologies, enriching the consumer experience.**

iii. **Further, the Regulation should also permit setting up of POIs catering to multiple LSAs, based on mutual consent of TSPs.**

3. **For migration to LSA level POIs:** While above process of migration should be followed for transitioning to mandatory LSA level POIs, the phase-wise milestones should be as follows:

a. 50% traffic to be migrated to LSA level POI within 1 year of issuance of Regulation

b. Balance 50% traffic to be migrated to LSA level POI within 2 years of issuance of Regulation

4. Our comments given above to question no. 1 to 3 and 6 may also be read as part of response to this question.

Q.34. 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? Please provide your response along with end-to-end diagrammatic representation and justification in respect of the following:

a. **Satellite - Satellite network interconnection**
b. **Satellite - PLMN interconnection**
c. **Satellite - PSTN interconnection**

VIL Comments to Q. No.34

1. In our view, the interconnection framework for satellite-based telecommunications networks should be similar to the access networks. In the draft Rules on Main service authorisation, satellite has been envisaged only as a medium and the services has been recognized as access services thus, the proposed authorisation framework as per draft rules has kept satellite under the Access service authorisation only.

2. Keeping above in view, the interconnection framework for satellite services should also be IP based and on the basis of mutual agreement between the parties.

3. Unlike access network, the gateway in satellite network can serve multiple LSAs and thus, it should be possible to connect one Gateway to Multiple LSAs – this will help serve D2D cases as well.

4. In other cases of satellite-based services, one satellite gateway station can deliver the service to multiple LSAs and can carry this traffic on its long-distance network and delivery locally at the LSA to the TSP.

Q.35. 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? If yes, kindly provide details of such international best practices.

VIL Comments to Q. No.35

Some of the relevant global examples are given below:

1. FCC has also proposed and is consulting through Notice of Proposed Rulemaking[1] thereby seeking comment on ways the Commission can facilitate a successful transition to all-Internet Protocol (IP) interconnection for voice services to improve access to public safety, consumer protection, and competition. The FCC has proposed not to enforce by December 31, 2028, certain interconnection obligations which require covered voice service providers to maintain legacy time-division-multiplexing (TDM) technology.

2. Multiple international jurisdictions including the United States, United Kingdom, members of the European Union, Australia, Brazil, South Africa, China and Canada have already initiated or completed migration toward IP-native interconnection frameworks.

3. Countries such as the United Kingdom (PSTN Switch-Off Programme 2027) and the United States (FCC Technology Transition Initiatives) formally recognise TDM as no longer sustainable for long-term nationwide interconnection.

4. Australia (NBN all-IP wholesale model), Canada (CRTC IP interconnect mandates) and the European Union (BEREC NGN Framework) have adopted all-IP interconnection as a long-term standard.

5. In Singapore, SingTel has proposed/mentioned in its RIO that it shall cease offering new SS7-based Interconnection arrangements from 28.02.2027 and that existing licensees' SS7 based interconnections need to be migrated to IP based interconnection by 31.05.2027.

Q.36. Kindly mention any other challenges or concerns related to the regulations being reviewed in this consultation paper.

VIL Comments to Q. No.36

No comments.

xx ---------- End of Document ---------- xx

[1] https://www.fcc.gov/consumer-governmental-affairs/fcc-extends-dates-comments-transitioning-voice-telephone-services-all-internet-protocol