



भारतीय दूरसंचार विनियामक प्राधिकरण
Telecom Regulatory Authority of India



Consultation Paper
on
**Review of existing TRAI Regulations on
Interconnection matters**

New Delhi, India

10th November 2025

Tower F, NBCC World Trade Centre, Nauroji Nagar
New Delhi - 110029

“प्रभावी विनियम – सुगम संचार”
“Effective Regulation - Ease of Communication”

Written comments on the Consultation Paper are invited from stakeholders by 8th December 2025 and counter-comments by 22nd December 2025. The comments and counter-comments may be sent, preferably in electronic form, to Shri Sameer Gupta, Advisor (Networks, Spectrum and Licensing-I), TRAI on the email ID adv-ns11@traigov.in with a copy to ja2-ns12@traigov.in. Comments and counter-comments received from stakeholders will be posted on the TRAI's website (www.traigov.in).

For any clarification/ information, Shri Sameer Gupta, Advisor (Networks, Spectrum and Licensing - I), TRAI, may be contacted at Telephone No. +91-11-20907752.

CONTENTS

1	Chapter 1 – Introduction	1
A.	Overview of Interconnection as an enabler of digital connectivity.....	1
B.	Regulatory Framework for Interconnection in India.....	5
C.	Learnings from Global Best Practices	17
D.	Need for Review of the Regulatory Framework for Interconnection.....	18
E.	Structure of this Consultation Paper	24
2	Chapter 2 – Examination of the Issues.....	25
A.	The Evolving Landscape of Telecommunications	25
B.	Regulations-Specific issues	25
B.1	The Telecommunication Interconnection Regulations, 2018.....	25
B.2	Short Message Services (SMS) Termination Charges Regulations, 2013	62
B.3	Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006	73
B.4	The Telecom Regulatory Authority of India (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005	78
B.5	The Telecommunication Interconnection Usage Charges Regulations, 2003	79
B.6	The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002.....	97
B.7	The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001	106
B.8	The Telecommunication Interconnection (Port Charges) Regulations, 2001	112
B.9	The Register of Interconnect Agreements Regulations, 1999	124
C.	Generic Questions pertaining to all existing interconnection regulations	128
3	Chapter 3 – Issues for Consultation	134
4	Annexure-I.....	142
5	Annexure-II	151
6	Annexure-III	153
7	Annexure-IV.....	159
8	Annexure-V.....	161
9	Annexure-VI.....	174

10 Annexure-VII	217
11 Annexure-VIII	227
12 Annexure-IX	234
13 Annexure-X.....	238
14 Annexure-XI	244
15 List of Acronyms	254

LIST OF FIGURES

Figure 1.1: Comparative trend of number of wireless subscribers in the world and India from year 2014 to 2024.....	1
Figure 1.2: Comparative trend of number of wireline subscribers of the world and India from year 2014 to 2024.....	3
Figure 1.3: Timelines of existing Interconnection Regulations	6
Figure 1.4: Timeline of the Register of Interconnect Agreements Regulations, 1999	8
Figure 1.5: Timeline of the Telecommunication Interconnection (Port Charges) Regulations, 2001	9
Figure 1.6: Timeline of the Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001	10
Figure 1.7: Timeline of the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002	11
Figure 1.8: Timeline of the Telecommunication Interconnection Usage Charges Regulations, 2003	12
Figure 1.9: Timeline of the TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005	13
Figure 1.10: Timeline of the Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006	15
Figure 1.11: Timeline of the Short Message Services (SMS) Termination Charges Regulations, 2013	15
Figure 1.12: Timeline of the Telecommunication Interconnection Regulations, 2018	16
Figure 2.1: Interconnection between TDM-based network operator and IP-based network operator.....	43
Figure 2.2: Technology preference in Inter-LSA & Intra-TSP Communication.....	46
Figure 2.3: Technology Preference for Inter-LSA, Inter-TSP Communication	47
Figure 2.4: A2P Originating SMS per subscriber per month.	66
Figure 2.5: P2P Originating SMS per Subscriber per Month	67
Figure 2.6: A2P SMS Traffic	68

Figure 2.7: P2P SMS Traffic	69
Figure 2.8: Route flow of International Outgoing Calls	88
Figure 2.9: Route flow of International Incoming Calls	89
Figure 2.10: Yearly ILD Traffic Trend	90
Figure 2.11: Decreasing rate of ILD Incoming Traffic in percentage.....	92

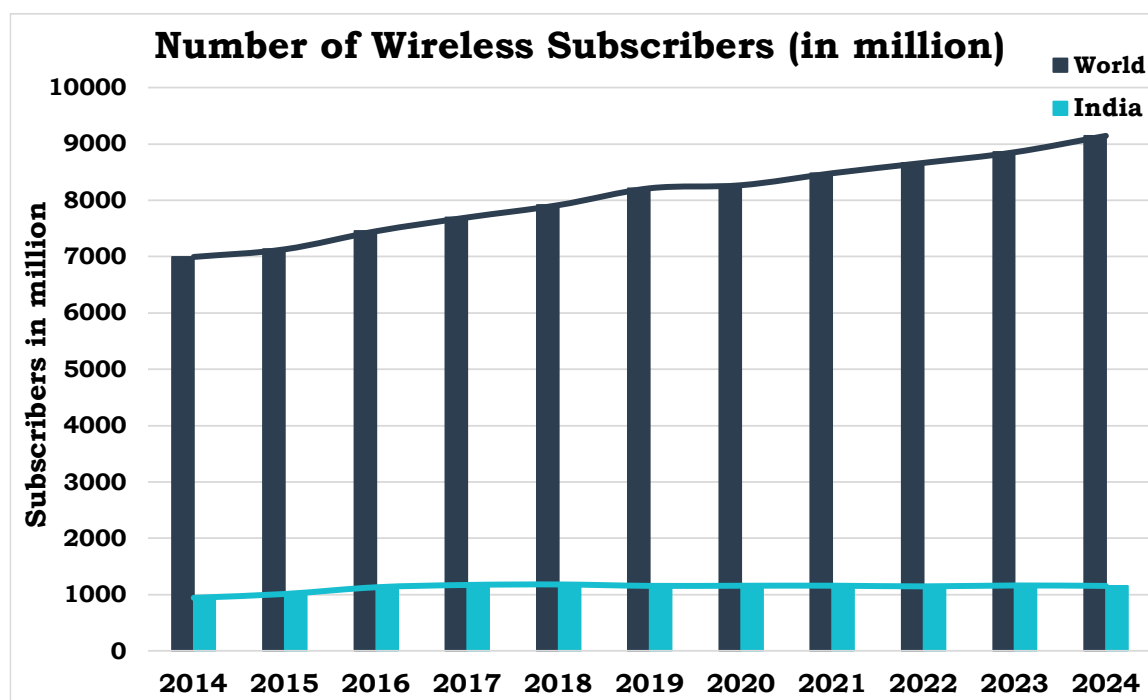
LIST OF TABLES

Table A: Port Charges notified in ‘The Telecommunication Interconnection (Port Charges) Regulation, 2001’	113
Table B: Port Charges notified in ‘The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007’	114
Table C: Proposed Revised Ceiling of Annual Port Charges for MSC and Tandem/TAX Exchanges	115

Chapter 1 – Introduction

A. Overview of Interconnection as an enabler of digital connectivity

- 1.1. In today's globalised world, the ability to connect and communicate with anyone, anywhere, is something we often take for granted. One of the essential building blocks of the worldwide telecommunication networks is interconnection. Interconnection is the process that links different telecommunication networks, thereby enabling seamless communication between the users. It might not be an exaggeration to say that interconnection serves as the backbone of telecommunications networks. It involves commercial and technical arrangements under which network providers connect their networks and services to



Source: TRAI's Telecom Subscription Reports^[1] & ITU's development statistics^[2]

Figure 1.1: Comparative trend of number of wireless subscribers in the world and India from year 2014 to 2024.

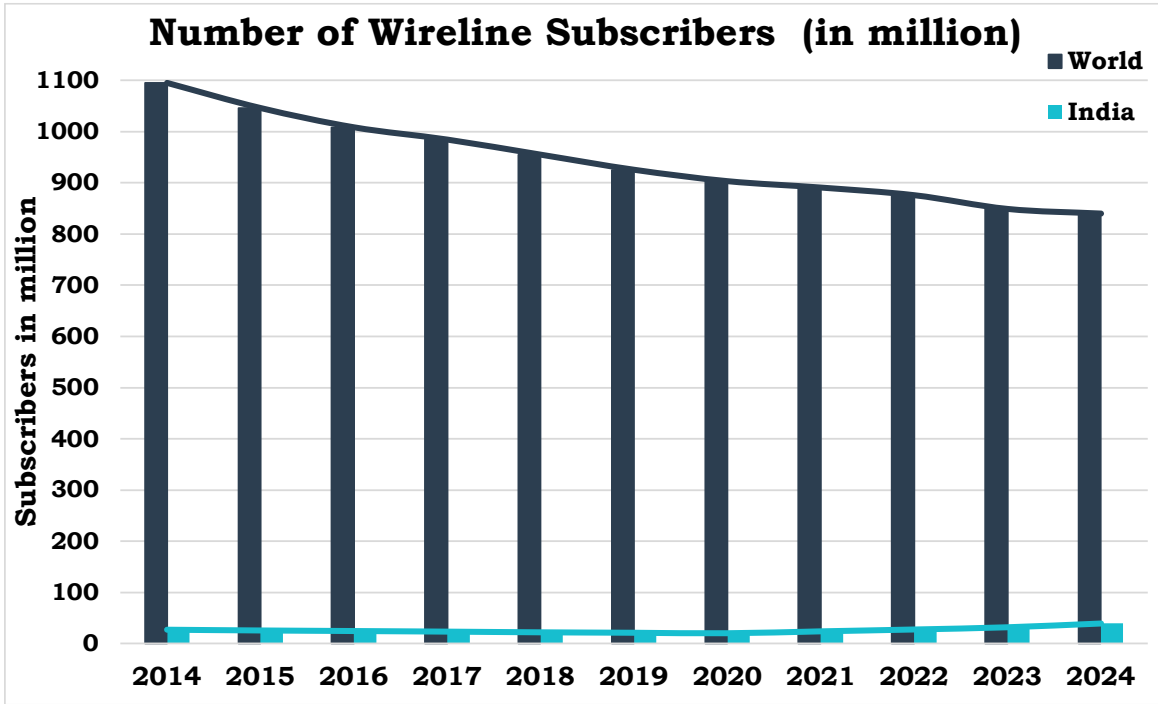
^[1] <https://tra.gov.in/release-publication/reports/telecom-subscriptions-reports>

^[2] <https://www.itu.int/en/ITU-D/Statistics/pages/stat/default.aspx>

enable their customers to have access to the customers and services of other network providers. In summary, interconnection between two public telecommunication networks allow customers of one network provider to communicate with customers of the other network provider.

- 1.2. The graph at Figure 1.1 illustrates the year-wise trend in the number of wireless subscribers in India compared to the global total from 2014 to 2024. This graph provides insights into India's contribution to global wireless connectivity.
- 1.3. The global wireless subscriber base grew steadily from around 7 billion in 2014 to approximately 9.5 billion in 2024, showing a consistent year-on-year rise. This shows global mobile growth, driven by faster broadband access and affordability. Technology advancements like 4G, 5G, and IoT have also fuelled the expanding mobile ecosystem.
- 1.4. India's wireless subscriber base also shows an upward trend, growing from around 900 million in 2014 to over 1.1 billion in 2024. This growth aligns with key policy and market developments in the country. By 2017, India's wireless subscriber counts surged, contributing to over 12% of the global wireless base, a position it has largely retained through 2024. While this reflects sizeable progress, the number of unique wireless subscribers is lower than the total population, suggesting that the penetration among the entire population remains a potential growth area.
- 1.5. The graph at Figure 1.2 illustrates the year-by-year trend of the number of wireline subscribers in India compared to the global total from 2014 to 2024, highlighting long term changes in user preferences and the evolving role of fixed line infrastructure in the digital communication landscape.
- 1.6. The global decline in wireline subscribers from 1.1 billion in 2014 to 850 million in 2024 is driven by a general shift to wireless communication from wireline communication. In contrast, India's wireline trend initially mirrored this global decline, falling from 27 million in 2014 to below 20 million by 2020 due to mobile substitution. However, post-2020, India saw a resurgence in wireline subscriptions, rising to over 39 million by 2024.

This reversal was fuelled by increased broadband demand during the COVID-19 pandemic, expansion of FTTH (Fiber to the Home) services, and bundled service offerings, i.e., combining high-speed internet, IPTV, and landline voice, especially in urban and enterprise domain.



Source: TRAI's Telecom Subscription Reports^[3] & ITU's development statistics^[4].

Figure 1.2: Comparative trend of number of wireline subscribers of the world and India from year 2014 to 2024

- 1.7. Seamless interconnection among Indian TSPs have enabled efficient traffic handling across telecom networks. Policies such as elimination of domestic voice termination charges (Interconnection Usage Charges^[5]) and mobile number portability (in wireless networks), has played an important role in eliminating barriers and providing support to the telecom operators to collaborate and expand.

^[3] <https://traigov.in/release-publication/reports/telecom-subscriptions-reports>

^[4] <https://www.itu.int/en/ITU-D/Statistics/pages/stat/default.aspx>

^[5] **Interconnection Usage Charge (IUC):** The charge payable by one service provider to another for the actual usage of network elements involved in the origination, transit, or termination of calls. These charges cover the operational cost of utilizing network resources to carry telecommunication traffic between different service providers.

The importance of interconnection

- 1.8. Telecommunications users cannot communicate with each other unless necessary interconnection arrangements are in place^[6]. Without robust interconnection mechanisms, the individual networks would function in isolation, resembling self-contained “discrete islands” rather than an integrated system. Such a scenario would undermine the fundamental objective of establishing a unified telecommunications infrastructure. Consequently, the lack of effective interconnection would not only impede market development but also hinder the broader socio-economic progress facilitated by a fully integrated telecommunications sector.
- 1.9. Interconnection agreements under ‘The Telecommunication Interconnection Regulations (TIR), 2018’, aim to enable cross-network communication for the 1.21 billion telecom subscribers^[7], but challenges, if any, faced among telecom service providers in finalizing interconnection agreements timely, may limit its true potential. Despite a mandate requiring interconnection agreements to be finalized within 30 days^[8], delays do occur and have the potential to affect not only the service rollout timelines but also deprive consumers of the likely benefits arising out of service innovation and competitiveness.
- 1.10. In order to ensure that interconnection arrangements are finalized in a timely manner, it is imperative that telecommunications service providers (TSPs) reach consensus, keeping in view the prescribed regulations and directions. The Authority is conscious of the fact that the regulatory framework which fails to evolve, presents risks of constraining not only market development but also technological advancement.
- 1.11. In essence, Interconnection regulations may require a review in order to continue playing a role in maintaining level playing field among the service

^[6] https://www.itu.int/ITU-D/treg/Documentation/Infodev_handbook/3_Interconnection.pdf

^[7] https://traf.gov.in/sites/default/files/2025-09/QPIR_03092025.pdf

^[8] https://traf.gov.in/sites/default/files/2024-09/CR_01012018.pdf

providers, ensuring quality of service and expanding accessibility to the users.

B. Regulatory Framework for Interconnection in India

1.12. Some of the regulations, covering interconnection matters in respect of voice and SMS carried over PSTN-PSTN, PSTN-PLMN and PLMN-PLMN, issued by the Authority are outlined below:

- i. The Telecommunication Interconnection Regulations, 2018 **(Annexure-I)**
- ii. The Short Message Services (SMS) Termination Charges Regulations, 2013 **(Annexure-II)**
- iii. Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006 **(Annexure-III)**
- iv. TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005 **(Annexure-IV)**
- v. The Telecommunication Interconnection Usage Charges Regulations, 2003 **(Annexure-V)**
- vi. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002 **(Annexure-VI)**
- vii. The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001 **(Annexure-VII)**
- viii. The Telecommunication Interconnection (Port Charges) Regulations, 2001 **(Annexure-VIII)**
- ix. The Register of Interconnect Agreements Regulations, 1999 **(Annexure-IX)**

Interconnection regulations listed above are the principal regulations. Subsequently, their amendments have been issued from time to time. The regulations provided in Annexure-I to IX are the consolidated regulations which include the respective principal regulations and their amendments.

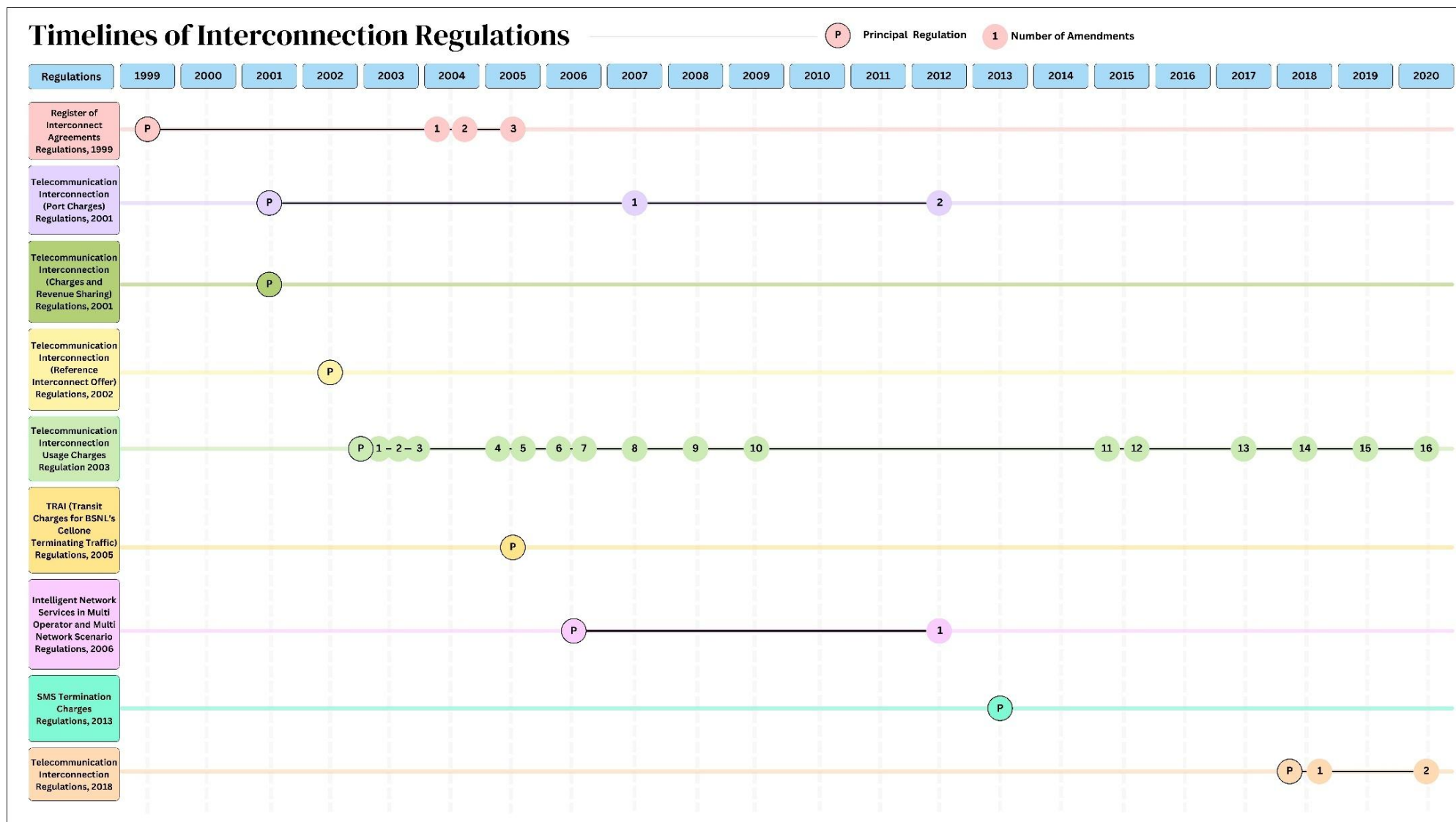


Figure 1.3: Timelines of existing Interconnection Regulations

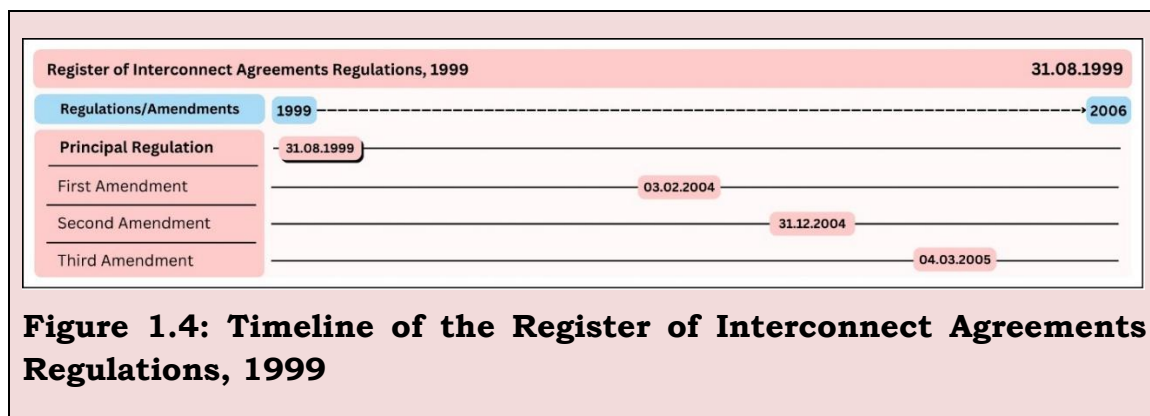
- 1.13. For ease of understanding, Figure 1.3 illustrates the chronological progression of all major TRAI regulations pertaining to interconnection since the Authority's establishment in 1997. This timeline highlights important regulatory milestones, including the introduction of the Reference Interconnect Offer (RIO) regulation in 2002, which standardized agreements between operators. Over the years, the Authority has periodically updated and strengthened the interconnection framework to address evolving industry needs, such as mandating timelines for entering into interconnection agreements, introducing financial disincentives for non-compliance, and specifying procedures for provisioning and augmentation of Points of Interconnect (POIs). The figure also includes Telecommunication Interconnection Regulations of 2018, which provided for 30 days of timeline for signing interconnection agreements and set clear guidelines for port provisioning, disconnection, and financial disincentives for violations.

C.1. The Register of Interconnect Agreements Regulations, 1999^[9]

- 1.14. The Authority, on 31st August 1999, notified 'The Register of Interconnect Agreements Regulations 1999' and established the framework for maintaining a comprehensive register of interconnect agreements between telecommunication service providers across India. These regulations were amended on 3rd February 2004, 31st December 2004, and 4th March 2005. These regulations mandate that all TSPs furnish the information pertaining to details of their interconnection agreements to TRAI, covering agreements entered both before and after the date of the regulations' coming into force on 1st September 1999.

A brief timeline of the Register of Interconnect Agreements Regulations, 1999, along with its three subsequent amendments, is presented below.

^[9] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7091>



C.2. The Telecommunication Interconnection (Port Charges) Regulations, 2001^[10]

- 1.15. Telecom Regulatory Authority of India on 28th December 2001 notified The Telecommunication Interconnection (Port Charges) Regulations 2001. These regulations were amended on 2nd February 2007 and 18th September 2012. The objective of these regulations was to specify the port charges payable by the interconnection seeker to the interconnection provider for terminating interconnection links on the network interface. Further, these regulations also regulate arrangements for sharing revenue derived from providing telecommunication services.
- 1.16. The port charges were initially determined by the Authority in 1999 by the Telecommunication Interconnection (Charges and Revenue Sharing) Regulations 1999 dated 28th May 1999^[11] and later modified with the issuance of 'The Telecommunication Interconnection (Port Charges) Regulations 2001' on 28th December 2001. The bandwidth of the port was specified as 2.048 Megabits per second, i.e., one E1 link^[12]. These regulations introduced a slab-based ceiling rate system (e.g., ₹55,000 per port for 1–16 PCMs).

^[10] www.trai.gov.in/release-publication/regulations/amendments-page/7113

^[11] www.trai.gov.in/sites/default/files/2024-09/Consolidated_Regulation_28051999.pdf

^[12] **E1 link** is a standard digital transmission link used in India, other Asian countries and Europe. It operates at a data rate of 2.048 Mbps and carries data or voice over 32 channels, each at 64 Kbps. Of these 32 channels, 30 are used for voice or data communication, while 2 are used for signalling purposes. It uses time-division multiplexing (TDM) to interleave these 32 channels, combining into a single E1 transmission stream.

- 1.17. The first amendment, effective from 1st April 2007, introduced and replaced the original slabs with a revised rate structure in Schedule II, reducing port charges (e.g., ₹39,000 per port for 1–16 PCMs). Interconnection seekers were required to project traffic for six months in Erlangs^[13] to determine port demand, and billing scenarios were also clarified in these regulations.

A brief timeline of the Telecommunication Interconnection (Port Charges) Regulations, 2001, along with its two subsequent amendments, is presented below.

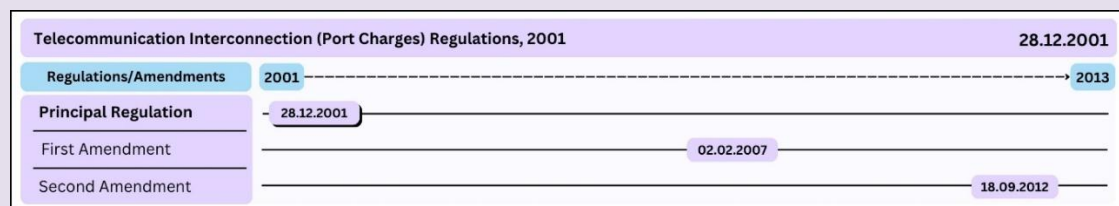


Figure 1.5: Timeline of the Telecommunication Interconnection (Port Charges) Regulations, 2001

- 1.18. The second amendment, effective from 1st October 2012, further simplified the structure by introducing Regulation 2B and Schedule III, replacing slabs with flat ceiling rates of ₹4,000 per port/year for MSCs and ₹10,000 per port/year for Tandem/TAX switches. Updated CAPEX data was used, assuming 10 years of equipment life, and confirmed that media and transmission costs remain part of IUC, not port charges.

C.3. The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001^[14]

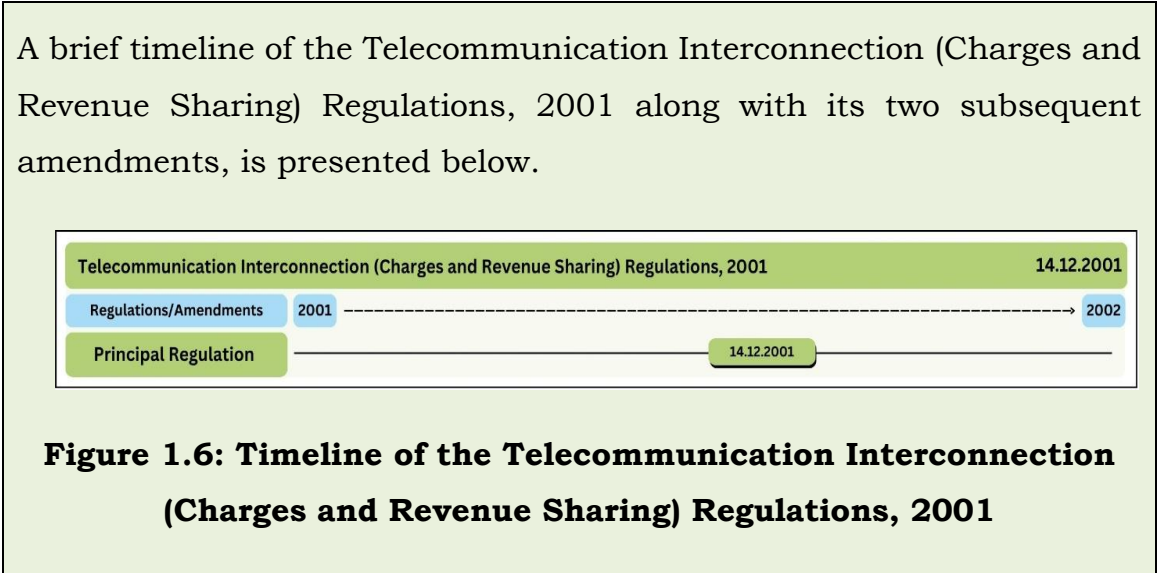
- 1.19. Initially, the revenue share regime was put in place vide 'The Telecommunication Interconnection (Charges and Revenue Sharing)

^[13] An **Erlang** is a unit of telecommunications traffic measurement, representing the continuous use of one voice path (or circuit) for one hour. If a single phone line is in use for 60 minutes, it carries 1 Erlang of traffic.

^[14] <https://www.trai.gov.in/sites/default/files/2024-09/201112090239141733750intwll0-15.pdf>

Regulations 1999^[15]. These Regulations came into force with effect from 1st May 1999. Revenue sharing for basic services, i.e., ‘calls originating in a basic service provider’s network and transmitted through or terminated in another basic service provider’s network’ and revenue sharing for cellular mobile services, i.e., ‘calls originating in a cellular mobile service provider’s network and transmitted through or terminated in another service provider’s network’ were separately specified in these regulations. Two schedules under these principal regulations were substituted by the First Amendment Regulations, 1999 (w.e.f. 17.09.1999). Further, the first amendment regulations of 1999 and Regulation 8 of ‘The Telecommunication Interconnection (Charges and Revenue sharing) Regulations, 1999’ had been quashed by the Hon’ble High Court of Delhi vide judgement dated 17.01.2000 in Writ Petition (C) No. 6543 of 1999 and CW No. 6483 of 1999.

- 1.20. Subsequently, on 14th December 2001, the Authority issued ‘The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001 (5 of 2001)’.



[15] https://www.trai.gov.in/sites/default/files/2024-09/Consolidated_Regulation_28051999.pdf

C.4. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002^[16]

- 1.21. The Authority introduced the Telecommunication Interconnection (Reference Interconnect Offer) Regulations in 2002 to ensure effective and timely interconnection between the telecom service providers. TSPs having Significant Market Power (SMP) status in accordance with ‘The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002’, are mandated to publish a RIO, which outlines the technical and commercial terms for interconnection based on the model RIO provided in the regulations. The RIO serves as the foundational framework for all interconnection agreements involving the issuer TSP of the RIO. This enables interconnection seekers to either fully accept the RIO terms and directly enter into an agreement with the service provider or use it as a basis for negotiation to finalize an interconnection agreement.

A brief timeline of the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002, is presented below.

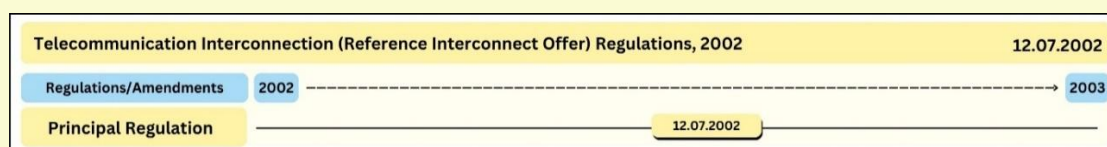


Figure 1.7: Timeline of the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002

C.5. The Telecommunication Interconnection Usage Charges Regulations, 2003^[17]

- 1.22. The Authority established a regulatory framework for Interconnection Usage Charges through ‘The Telecommunication Interconnection Usage Charges (IUC) Regulations, 2003 (1 of 2003)’ dated 24th January 2003. The Authority issued ‘The Telecommunication Interconnection Usage Charges

^[16] www.trai.gov.in/release-publication/regulations/amendments-page/7206

^[17] www.trai.gov.in/release-publication/regulations/amendments-page/7233

Regulations, 2003 (4 of 2003)' dated 29th October 2003, which superseded the earlier IUC Regulations dated 24th January 2003. There have been 16 (sixteen) amendments^[18] to these regulations since their inception, with the latest one being released on 17th April 2020.

A brief timeline of the Telecommunication Interconnection Usage Charges Regulations, 2003, along with its sixteen subsequent amendments, is presented below.

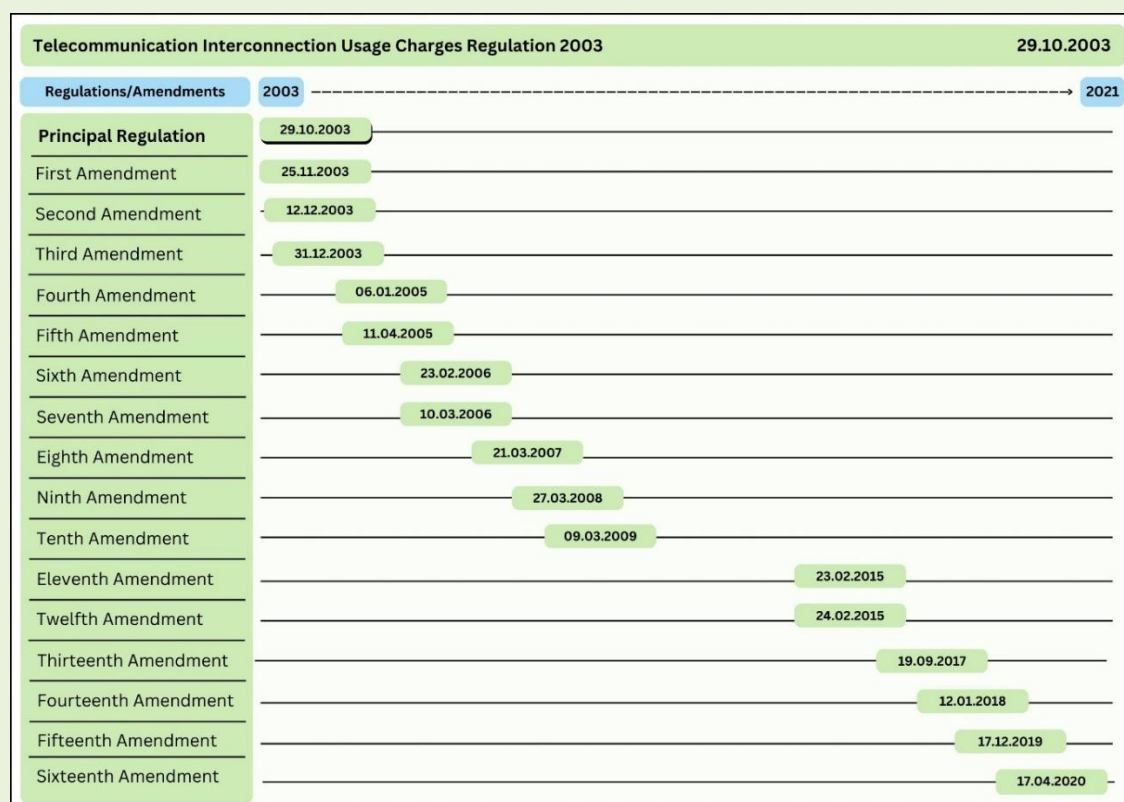


Figure 1.8: Timeline of the Telecommunication Interconnection Usage Charges Regulations, 2003

- 1.23. These regulations were established to create a framework for various telecom service providers to financially compensate for the use of their respective networks under interconnection arrangement with each other.
- 1.24. 'The Telecommunication Interconnection Usage Charges (IUC) Regulations, 2003' established a regime based on charges for originating,

^[18] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7233>

transiting, and terminating calls. These charges are specified in detailed schedules attached to the regulations.

- 1.25. Since 2003, the Authority has periodically reviewed and amended these regulations. Consequently, the rates of different types of interconnection usage charges have changed over the period.

C.6. TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005^[19]

- 1.26. These Regulations came into force with effect from 3rd May 2005, consequent to the Hon'ble TDSAT's order dated 3rd May 2005, in Petition No. 20/2004 (Cellular Operators Association of India and others Vs Bharat Sanchar Nigam Limited & others.)

A brief timeline of the TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005, is presented below.



Figure 1.9: Timeline of the TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005

- 1.27. These regulations provide for transit charges for accessing BSNL's CellOne subscribers as follows:

“...No transit charge shall be levied by BSNL (Bharat Sanchar Nigam Limited) on Cellular Operators for accessing BSNL's CellOne subscribers, wherever the MSCs of both BSNL's CellOne and Private CMSOs' are connected to the same BSNL switch...”

^[19] www.trai.gov.in/release-publication/regulations/amendments-page/7265

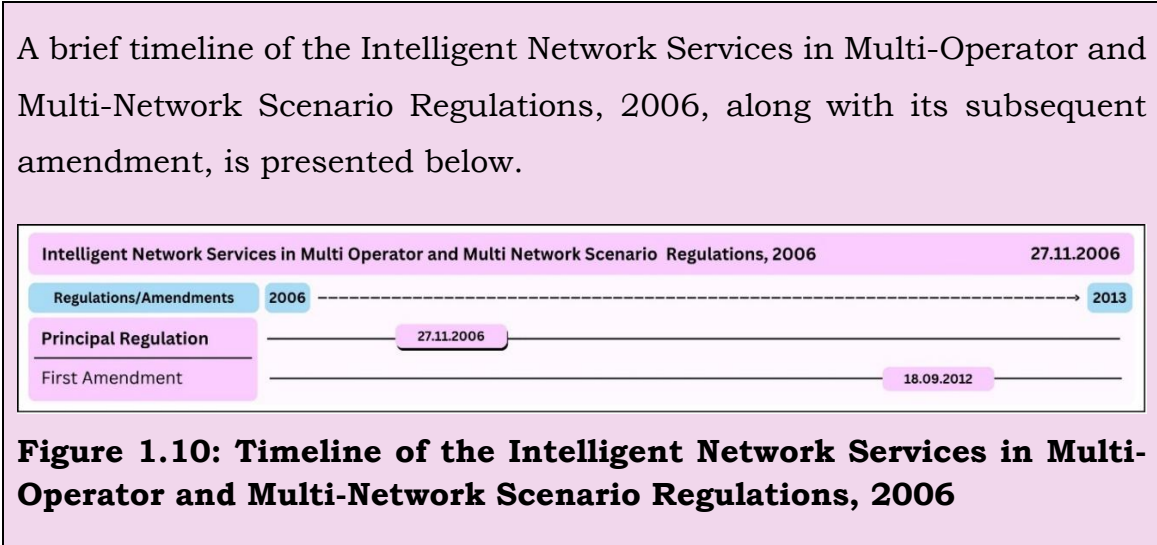
C.7. Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006^[20]

- 1.28. Intelligent Network (IN) services refer to value-added telecommunication services that are offered by separating service function/ service logic from the underlying call processing switching system (i.e. switching infrastructure) within a multi-operator and multi-network environment. IN services enable subscribers to access enhanced functionalities (such as free phone service, virtual card calling, televoting, premium rate service etc.) that are portable across networks of different service providers. This ensures that services hosted on one service provider's network can be accessed by customers of another service provider. In National numbering plan (2003)^[21], 180 series was allocated for IN Services.
- 1.29. To provide a regulatory framework for Intelligent Network Services, the Authority issued the 'Intelligent Network Services in Multi Operator Multi Service Scenario Regulations, 2006 (13 of 2006)' on 27th November 2006.
- 1.30. These regulations mandated that all telecom service providers offering IN services must establish interconnection agreements with other access providers to ensure that subscribers can access IN services across different networks. The regulations also stipulated that such interconnection agreements be submitted to TRAI within 15 days of signing.
- 1.31. Subsequently, 'The Intelligent Network Services in Multi Operator and Multi Network Scenario (Amendment) Regulations, 2012' (17 of 2012), dated 18th September 2012, were introduced. This amendment reinforced the requirement for service providers to enter into arrangements with other service provider within 90 days from the date of commencement of these regulations for providing intelligent network services to subscribers of other telecom service providers and these arrangements or agreements to

^[20] https://www.trai.gov.in/sites/default/files/2024-09/CR_27112006.pdf

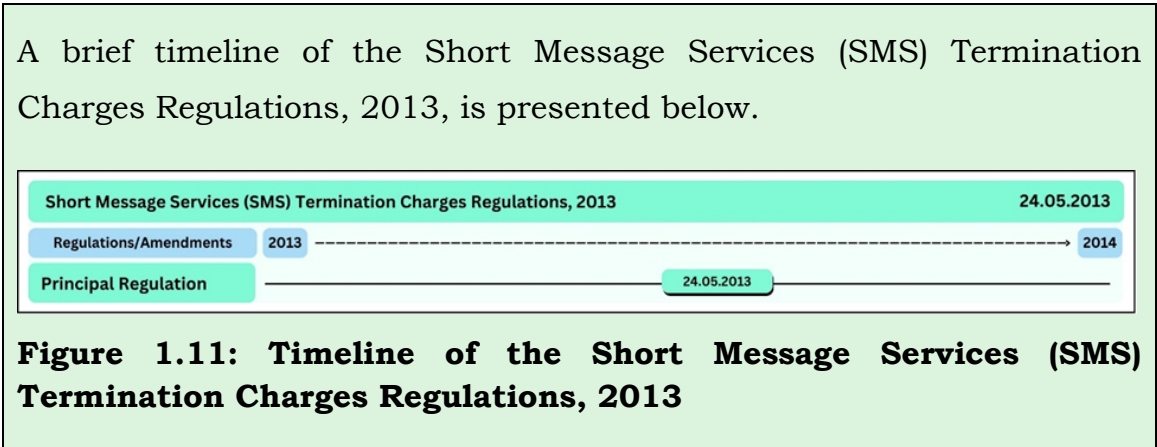
^[21] https://dot.gov.in/sites/default/files/nnp2003_0_0.pdf?download=1

come into force within 30 days from the date of entering into such arrangements or agreements.



C.8. The Short Message Services (SMS) Termination Charges Regulations, 2013^[22]

- 1.32. SMS termination charges are the charges that are payable by the originating access provider to the terminating access provider for each SMS terminated by it on the network of the terminating access provider. ‘The Short Message Services (SMS) Termination Charges Regulations, 2013’, which were issued on 24th May 2013, came into force with effect from 1st June 2013. These regulations prescribed SMS termination charge of ₹0.02 (2 paise only) per SMS.



^[22] https://www.trai.gov.in/sites/default/files/2024-09/CR_24052013.pdf

C.9. The Telecommunication Interconnection Regulations, 2018^[23]

- 1.33. 'The Telecommunication Interconnection Regulations, 2018' issued on 1st January, 2018, covered some of the important aspects of interconnection, e.g., interconnection agreement, provisioning of initial interconnection and augmentation of Points of Interconnection (POIs), interconnection charges^[24], disconnection of POIs, and financial disincentive on interconnection matters. These regulations came into effect from 1st February, 2018.
- 1.34. Since the issuance of the 'The Telecommunication Interconnection Regulations, 2018', two amendments have been issued. The first amendment, dated 5th July 2018, stipulated, *inter-alia*, that port charges for POIs established prior to February 2018 shall remain unchanged and mandated traffic forecasting on every six months basis in lieu of the previous 30 days requirement. The second amendment, dated 10th July 2020, prescribed the levels of interconnection for PSTN-to-PSTN connectivity, the location of POIs, and also prescribed carriage charges applicable to calls between LDCC and SDCC.

A brief timeline of the Telecommunication Interconnection Regulations, 2018 along with its two subsequent amendments, is presented below.

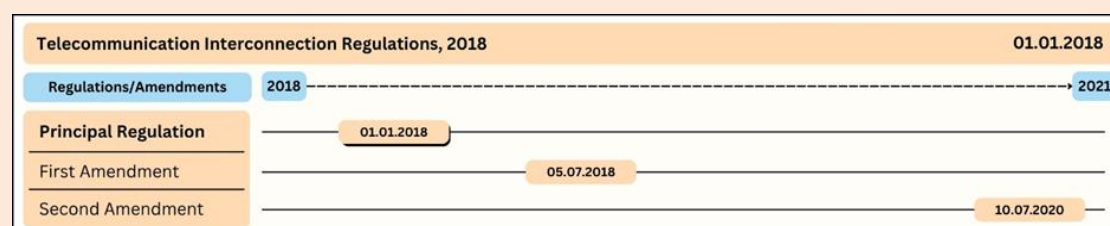


Figure 1.12: Timeline of the Telecommunication Interconnection Regulations, 2018

^[23] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7352>

^[24] **Interconnection Charge:** These charges are levied by an interconnection provider to an interconnection seeker for establishing the physical linkage between their telecommunications networks, covering infrastructure and connectivity costs.

C. Learnings from Global Best Practices

- 1.35. International best practices across the globe emphasize the need for harmonized regulations, greater regulatory predictability through the reduction of uncertainty, and access to fair and just mechanisms for all the stakeholders, i.e., the telecom industry and customers.
- 1.36. Countries promote cooperation in telecom interconnections by adopting common standards and regulatory frameworks, *inter-alia*, by adopting global best practices either from other parts of world or from international organizations like International Telecommunication Union (ITU) as outlined in the World Bank document ‘Telecommunication Regulation Handbook’^[25] containing guidance on technical domain, development domain and policy domain as under:

*"...**policy domain:** to promote, at the international level, the adoption of a broader approach to the issues of telecommunications in the global information economy and society..."*

C.1. Equivalence of Inputs

- 1.37. During the pre-consultation phase, one of the stakeholders highlighted the principle of Equivalence of Inputs (EOI). They noted that, in several countries, EOI is implemented to ensure that vertically integrated operators provide the same terms and conditions to third-party service providers as they do to their own affiliates. The stakeholder further recommended that EOI principles should be adopted in India, particularly with regard to interconnection provisioning, port charges, and access timelines especially in markets where a dominant operator is present^[26]. In the context of telecom interconnections, Equivalence of inputs is an extension of the non-discriminatory principle, which requires one service

^[25] https://www.itu.int/ITU-D/treg/Documentation/Infodev_handbook/3_Interconnection.pdf

^[26] <https://www.trai.gov.in/sites/default/files/2025-04/BIF%20Comments.pdf>

provider to provide another service provider with the same price and non-price inputs as it provides to its own divisions, subsidiaries, or partners. This is an important concept, as it helps to promote competition, prevents anti-competitive practices, encourages innovation, and ensures fair interconnections.

- 1.38. The Body of European Regulators for Electronic Communications (BEREC) is the body in which the regulators of the telecommunications markets in the European Union work together. BEREC considers the EoI principle as the surest way to achieve effective protection from discrimination^[27]. This approach is already applicable within the telecommunication markets in New Zealand^[28] and United Kingdom^[29].

D. Need for Review of the Regulatory Framework for Interconnection

- 1.39. Over the preceding two decades, interconnection regulatory framework has been progressively shaped through a series of regulatory measures and interventions, commencing with the regulations 'The Register of Interconnect Agreements Regulations, 1999' and continuing with the more recent 'The Telecommunication Interconnection Regulations, 2018.' Further, these two regulations, along with various other interconnection regulations, have gone through many amendments, with the latest amendment being 'The Telecommunication Interconnection (Second Amendment) Regulations, 2020,' notified on 10th July 2020. This framework has been playing an important role in establishing principles of fair competition, non-discrimination, reciprocity, cost-based pricing, etc.

^[27] <https://eur-lex.europa.eu/eli/reco/2013/466/oj/eng>

^[28] https://comcom.govt.nz/_data/assets/pdf_file/0027/225972/Equivalence-and-non-discrimination-guidance-30-September-2020.pdf

^[29] https://www.ofcom.org.uk/siteassets/resources/documents/phones-telecoms-and-internet/information-for-industry/bt/consolidated_undertakings24.pdf?v=332693

- 1.40. However, the telecommunications landscape in India has undergone a period of evolution. This transformation has been influenced by a convergence of factors, including technological advancements (e.g., transition from TDM or E1-based network to IP-based network architecture), changes in market structures (e.g., the consolidation of telecom operators), and evolving statutory (The Telecommunications Act, 2023 ^[30]) and regulatory frameworks.

D.1. Regulatory and Statutory Developments:

- 1.41. The regulatory landscape itself has been subject to continuous refinement, with new policies and guidelines introduced over time to adapt to changing market realities and technological developments. A statutory development in this regard is the enactment of 'The Telecommunications Act, 2023' on the 24th of December 2023 and is being implemented in a phased manner. The Central Government notified vide the Gazette notification dated 21st June 2024 that the provisions of sections 1, 2, 10 to 30, 42 to 44, 46, 47, 50 to 58, 61, and 62 of the said Act shall come into force on 26th June 2024^[31]. This Act repeals and replaces 'The Indian Telegraph Act, 1885'^[32] and 'The Indian Wireless Telegraphy Act, 1933'^[33]. Among other things, the Act envisages to introduce an authorisation based regime for telecommunication services.

D.2. Market Dynamics:

- 1.42. The Indian telecommunications market has experienced structural changes, characterized by periods of competition, consolidation among major operators, and the emergence of new players and business models. These changes could influence market positioning as well as competitive

^[30] <https://egazette.gov.in/WriteReadData/2023/250880.pdf>

^[31] [https://egazette.gov.in/\(S\(4ceiurycjxxgxq03vdtzigei\)\)/ViewPDF.aspx](https://egazette.gov.in/(S(4ceiurycjxxgxq03vdtzigei))/ViewPDF.aspx)

^[32] dot.gov.in/sites/default/files/the_indian_telegraph_act_1985_pdf.pdf?ref=static.internetfreedom.in

^[33] indiacode.nic.in/bitstream/123456789/15410/1/the_indian_wireless_telegraphy_act%2C_1933.pdf

positioning among service providers, potentially affecting the commercial and technical terms of interconnection agreements in the future.

D.3. Technological Advancements:

- 1.43. The fundamental architecture of telecommunication networks appears to be undergoing a change, moving away from legacy systems towards IP-centric infrastructures. At the time when the interconnection regulations were framed, E1-based network elements like TDM ports, their technologies, and respective traffic considerations were prevalent. Now, IP-based connectivity introduces different technical considerations for signalling, routing, capacity management, service guarantees, billing, etc.
- 1.44. Modern telecom networks are mostly designed to operate on IP-based connectivity. This brings us to a question that whether the current framework adequately covers technology like IP-based infrastructure and whether it fully addresses the technical and commercial aspects of interconnection due to co-existence of E1-based networks and IP-based networks.
- 1.45. Therefore, it may be beneficial to assess how existing interconnection regulations could evolve to facilitate a smooth and efficient transition to future-ready IP-based networks, with the aim of ensuring long-term growth and sustainability for the sector. Furthermore, the advent of current technologies such as Network Function Virtualization (NFV)^[34],

^[34] **Network Function Virtualization (NFV)** in telecom is a network architecture concept that replaces traditional, dedicated hardware appliances such as routers, firewalls, and load balancers with software-based network functions running on standard, commodity servers or cloud infrastructure. These software-based functions can be deployed, managed, and scaled more flexibly and cost-effectively than physical devices. NFV allows telecom operators to quickly roll out new services, respond to changing network demands, and reduce both capital and operational expenses by eliminating the need for specialized hardware. This approach supports the growing needs of modern telecommunications, especially with the rise of 5G, IoT, and increasing data traffic.

Software Defined Networking (SDN)^[35], the Internet of Things (IoT)^[36], and Machine-to-Machine (M2M) communications (M2M being a foundational technology for the IoT) presents both potential opportunities and challenges for the existing interconnection paradigm. NFV and SDN, by virtualizing network functions and abstracting network control, could potentially alter the traditional understanding of network boundaries and interconnection points. These changes might impact the provisioning, management, and cost of interconnection. Similarly, the scale and diverse traffic characteristics associated with IoT and M2M communications may necessitate examination of traditional approaches to interconnection, considering their varied QoS requirements, low-bandwidth applications, and the potential for numerous connected devices. The existing regulations may or may not adequately address the unique technical and commercial aspects of interconnecting these new technology driven networks and services. Therefore, a review may be required to address above mentioned aspects.

1.46. To summarize, a few of the key developments are given below:

- a) Enactment of the Telecommunications Act, 2023, and the notification of several rules on various constituents of the Act.
- b) Increasing prominence of IP-based interconnections among telecom service providers, virtual and software-defined network architectures.
- c) Subscriber shift to data-based 4G, 5G wireless services, emergence of 6G wireless services and wireline broadband services.

^[35] **Software Defined Networking (SDN)** is a modern approach to network management that separates the network's control plane (which decides how data moves) from the data plane (which actually moves the data). In SDN, a centralized software controller manages and configures the entire network, allowing administrators to dynamically adjust traffic flows, automate tasks, and respond quickly to changing requirements without needing to manually configure individual devices. This architecture makes networks more flexible, scalable, and easier to manage, offering greater visibility and centralized control compared to traditional hardware-based networks.

^[36] **IoT** refers to the network of billions of physical devices such as sensors, appliances, vehicles, and machines, connected to the internet, allowing them to collect, share, and analyze data. In telecommunications, IoT is transforming the industry by enabling seamless communication between these devices. Telecom companies can play a crucial role by providing the connectivity platforms that manage IoT devices. With the rise of 5G, IoT adoption in telecom is accelerating fast.

- d) Prominence of wireless telephony as the primary mode of communication.
- e) Rise in traffic volume of Application-to-Person (A2P) SMS as compared to Person-to-Person (P2P) SMS.

1.47. In view of the above, the Authority issued a Pre-consultation Paper (PCP) on ‘Review of existing TRAI Regulations on Interconnection matters’ on 3rd April 2025^[37]. Stakeholders were initially invited to submit their comments by 16th April 2025^[38], with the deadline subsequently extended to 23rd April 2025^[39], to gather feedback on the following issues:

- I. *“The proposed review will require a thorough analysis and careful consideration of key objectives, including fostering interconnection, enhancing competition, promoting non-discriminatory practices, ensuring long-term sustainability and viability of the telecom sector. Completing this exercise can only be achieved through close cooperation among all stakeholders. Therefore, to facilitate this review, the Authority invites all stakeholders to participate in the pre-consultation process by submitting the issues, concerns and suggestions pertaining to the existing interconnection regulations to develop a futuristic and robust regulatory framework for interconnection.*
- II. *While submitting inputs, stakeholders may consider review of relevant interconnection-related regulations, including, but not limited to the following regulations:*
 - a. *The Telecommunication Interconnection Regulations, 2018*

^[37] https://www.trai.gov.in/sites/default/files/2025-04/CP_03042025.pdf

^[38] <https://www.trai.gov.in/pre-consultation-paper-review-existing-trai-regulations-interconnection-matters>

^[39] https://www.trai.gov.in/sites/default/files/2025-04/PR_No.24of2025_0.pdf

- b. *The Short Message Services (SMS) Termination Charges Regulations, 2013*
- c. *Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006*
- d. *TRAI (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005*
- e. *The Telecommunication Interconnection Usage Charges Regulations, 2003*
- f. *The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002*
- g. *The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001*
- h. *The Telecommunication Interconnection (Port Charges) Regulations, 2001*
- i. *The Register of Interconnect Agreements Regulations, 1999*

III. *The Authority encourages all stakeholders to focus on, but not limited to the following aspects:*

- a. *Efficacy of existing interconnection frameworks in the current telecom ecosystem.*
- b. *Challenges faced by service providers in implementing interconnection.*
- c. *Impact of emerging technologies on interconnection requirements.*
- d. *Best practices from global interconnection frameworks for possible adoption in India.*
- e. *Role of interconnection in improving consumer experience and network efficiency.”*

- 1.48. Based on the comments received from the TSPs and other stakeholders^[40] on the pre-consultation paper dated 3rd April 2025^[41], the Authority noted that there is a *prima facie* case for review of the regulatory framework for telecom interconnection.

E. Structure of this Consultation Paper

- 1.49. Through the present Consultation Paper (CP), the Authority is undertaking a review of the existing regulatory framework for interconnection with the ultimate objective of facilitating fair, effective, and non-discriminatory interconnection between telecom service providers in a consultative manner. This consultation paper has been structured into three chapters.
- A. **Chapter I** provides an introduction, outlining the background, objectives, and context for the present consultation.
- B. **Chapter II** offers a comprehensive analysis of the principal regulatory issues pertaining to interconnection, with a view to facilitating a detailed examination and inviting informed comments from stakeholders.
- C. **Chapter III** enumerates the specific questions and issues identified for consultation, thereby seeking the views, suggestions, and feedback of all stakeholders to enable transparent regulatory decision-making process.

^[40] <https://www.trai.gov.in/pre-consultation-paper-review-existing-trai-regulations-interconnection-matters>

^[41] https://www.trai.gov.in/sites/default/files/2025-04/CP_03042025.pdf

Chapter 2 – Examination of the Issues

A. The Evolving Landscape of Telecommunications

- 2.1. Interconnection, in the present context refers to the connecting of two networks to allow subscribers on one network to communicate with those on other through voice or text messages. This is a fundamental pillar for the smooth and efficient functioning of any multi-operator telecommunications environment. The present consultation aims to review the existing interconnection regulatory framework established to deal with the exchange of voice and text messages between the service providers.
- 2.2. Over time, regulatory frameworks may develop gaps, overlaps, or inconsistencies that could possibly affect equitable access and operational efficiency for all service providers, regardless of their size or market share. Addressing these challenges also requires simplifying technical and operational regulations to reduce complexity. Efficient and streamlined interconnection procedures can help reduce costs and delays in service rollout. Therefore, it is important to undertake the current exercise to review the existing interconnection regulatory framework.
- 2.3. Given these considerations and background, stakeholders are requested to submit their response and perspectives on the questions asked in the subsequent sections.

B. Regulations-Specific issues

B.1 The Telecommunication Interconnection Regulations, 2018

- 2.4. The Telecommunication Interconnection Regulations, 2018^[42] (TIR 2018) provide a comprehensive framework for how telecom service providers interconnect their networks. These regulations define the concept and management of Points of Interconnection (POIs), which are important

^[42] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7352>

demarcation points where traffic is exchanged between telecom service providers.

- 2.5. 'The Telecommunication Interconnection Regulations, 2018' sets out timelines for entering into interconnection agreements, methodology for determination of bank guarantee amount, mandates fair and non-discriminatory provisioning of POIs, and establishes procedures for port allocation, augmentation, and disconnection. The regulations also cover aspects such as principles of interconnection charges, augmentation of POIs based on traffic forecasting, and dispute resolution.
- 2.6. There is a provision in these regulations which mandates that every service provider must, within thirty days of receiving a request from another service provider, enter into an interconnection agreement on a non-discriminatory basis. The process for entering into such an agreement is laid out in these regulations like the requesting service provider must submit a request along with a copy of its license agreement, specify the services for which interconnection is sought, indicate the proposed POI locations, and state the technology to be used at each POI. The service provider receiving the request is then required to provide a draft interconnection agreement within five working days. This ensures a time-bound and transparent process for establishing interconnection agreements, which is important for seamless network interoperability and consumer benefit.
- 2.7. The regulations also establish a detailed framework for provisioning and augmentation of ports at POIs. For the first two years following the establishment of initial interconnection, the requesting service provider is responsible for seeking ports to meet the demand for both incoming and outgoing traffic at POIs. After this period, or from 1st February, 2018 (whichever later), the total ports at a POI must be converted for carrying one way traffic in proportion to the outgoing traffic of each service provider, averaged over the preceding three months. Any further requests for ports must align with the outgoing traffic requirements of each provider.

Additionally, after the interconnection agreement is in place, the requesting provider may ask for a sufficient number of ports at POIs to meet traffic requirements for the next three months. For augmentation, every provider is required to furnish, at six-month intervals, a forecast of busy hour^[43] outgoing traffic for the succeeding six months at each POI. The first such forecast must be provided within sixty days of the establishment of interconnection.

- 2.8. The regulations further specify the conditions and procedures for disconnection of POIs, ensuring that such actions are not arbitrary and laid down procedure is followed. To enforce compliance, the regulations introduced provision of financial disincentives for violations related to interconnection, such as delays or failures in provisioning POIs or entering into interconnection agreements within the stipulated timelines.
- 2.9. Since the notification of the principal regulations, there have been two amendments. The first amendment, issued on 5th July 2018, clarified that port charges for POIs established before February 2018 would remain unchanged and revised the requirements for traffic forecasting to be conducted every six months instead of 30 days. It also adjusted the timelines for port augmentation requests, providing more flexibility to the telecom service providers.
- 2.10. The second amendment, notified on 10th July 2020, introduced provisions for level of interconnection for PSTN-to-PSTN connectivity, the location of POI, and it also prescribed carriage charge for carriage of calls from LDCC to SDCC and vice versa.

a) Legal Matters related to the Telecommunication Interconnection Regulations, 2018

- 2.11. There is a litigation matter presently going on before the Hon'ble High Court of Delhi involving a TSP and TRAI vide Writ Petition (civil) 4758 of 2019.

^[43] **Busy hour** refers to the continuous 60-minute period of the day during which a telecommunications network experiences the highest traffic.

The petitioner TSP had challenged the validity of the *Telecommunication Interconnection Regulations, 2018* dated 1st January 2018, and the *Telecommunication Interconnection (Amendment) Regulations, 2018* dated 5th July 2018 and sought a stay on the operation of these regulations, asserting that they are *ultra vires*. The petitioner prayed that,

“(a) Issue a writ of certiorari or in the nature thereof or any other writ, order or direction setting aside/quashing the Telecommunication Interconnection Regulations, 2018 dated 01.01.2018 made by the Telecom Regulatory Authority of India; (b) This Hon’ble Court may additionally set aside the Telecommunication Interconnection (Amendment) Regulations, 2018 (4 of 2018) dated 5th July 2018. (c) pass any other or further order(s) as this Hon’ble Court may deem fit and proper in the facts and circumstances of the present case.”^[44]

- 2.12. The primary contention revolved around the Regulation 12, which, according to the petitioner TSP, unlawfully granted adjudicatory powers to TRAI, which, under Section 14 of the TRAI Act, 1997, fall exclusively within the jurisdiction of Hon’ble TDSAT. The petitioner TSP had further argued that the Financial Disincentive (FD) up to ₹1 lakh per day per licensed service area amounted to a penalty, which TRAI lacked the authority to impose.
- 2.13. The petitioner TSP also argues in respect of ‘The Telecommunications Interconnection Regulations, 2018’ that:

“Because the impugned regulation is arbitrary as it effectively does away with the concept of “seeker” and “provider” of interconnection. By only limiting the “seeker” status for two years the TRAI has created artificial classes with no intelligible differentia. The concept of “seeker” and “provider” of interconnection has always been that the existing TSP, which has

^[44] Extract from the petition filed by M/s MTNL before the Hon’ble High Court of Delhi

established telephone exchanges and other infrastructure at various places and has facilitated other new TSPs in their rollout of services without the new TSP having the need to make such huge investment for establishing exchange and infra at all such places is the provider and the new TSP is the seeker.”

- 2.14. The petitioner TSP had also challenged the regulations’ approach to Points of Interconnection (POIs). It contended that TRAI had attempted to shift the ownership of POIs from the interconnection provider to the interconnection seeker by mandating a change in the functionality of ports from bidirectional (handling both incoming and outgoing traffic) to unidirectional (handling only outgoing traffic).
- 2.15. The petitioner TSP emphasized that it had invested heavily in infrastructure such as exchanges within its licensed service areas in full compliance with the regulatory and licensing framework in force at the time. It further argued that the impugned regulations unfairly benefitted other TSPs, imposed undue financial burden, and caused losses.
- 2.16. Finally, the petitioner asserted that the impugned regulations had been framed without adequate deliberation or due regard to the operational and financial implications for public sector entities.
- 2.17. The matter is currently pending before the Hon’ble High Court of Delhi.

b) Key issues pertaining to these Regulations

- 2.18. Following issues have been highlighted by stakeholders in their comments to the pre-consultation paper issued on 3rd April 2025^[45], indicating a need for a review of these Regulations:

i. Examination of existing Levels of Interconnection

- 2.19. POIs for fixed-line services have been provisioned at the Long-Distance Charging Area (LDCA) and Short Distance Charging Area (SDCA) level, and

^[45] https://www.trai.gov.in/sites/default/files/2025-04/CP_03042025.pdf

this aligns with the National Numbering Plan (NNP)^[46] and the idea of ‘Local call’ in telecom network. Local call as defined in the Unified Licence (UL) Agreement^[47] of the Department of Telecommunications for telecom service authorisations, is a call originating and terminating within the same local area and is charged at local call rates. It is important to note here that, as per UL, for Basic Service, the SDCA is the local area, and for mobile network, the service area (i.e., LSA) is the local area.

- 2.20. The SDCA/LDCA-based interconnection regime was designed when the telecom landscape was dominated by E1 or TDM-based PSTN networks ^[48], with multiple hierarchical switching levels (such as Level-I TAX, Level-II TAX, and Tandem exchanges) facilitating call routing across Short Distance Charging Areas (SDCAs) and LDCAs within each License Service Area (LSA).
- 2.21. However, the telecom sector has undergone technological transformation. The introduction of the Unified License regime, the technological development of IP-based packet-switched core networks, and the convergence of services have fairly changed traffic patterns and network architectures. Today, a single IP core can efficiently handle traffic for an entire LSA, requiring reassessment of the traditional LDCA-based POI structure.
- 2.22. Interconnection for wireless services is already being done at the Licensed Service Area (LSA) level. Therefore, it needs to be examined whether aligning fixed wireline interconnection to this same level is technologically justified, reflecting a consistent regulatory framework and current technological capabilities. It is to be kept in view that the modern network

^[46] <https://dot.gov.in/sites/default/files/nnp2003.pdf>

^[47] <https://eservices.dot.gov.in/sites/default/files/user-mannual/Compendium-UL-AGREEMENTupdatedupto31032024.pdf>

^[48] **PSTN** stands for **Public Switched Telephone Network**. It is the traditional, circuit-switched telephone system used globally for voice communication, often referred to as landlines. While much of its core infrastructure has become digital, PSTN remains essential for fixed-line telephony and global voice connectivity.

architectures allow centralized traffic-handling models at the LSA level, potentially making the LDCA-based POI structure for fixed networks less aligned with current technological developments.

- 2.23. The concept of local call for both mobile and fixed wireline calls in India is defined by regulatory and licensing frameworks that specify how calls within certain geographic areas are treated for tariff and network purposes. As stated earlier, for mobile services, any call made within the same Licensed Service Area (LSA), whether to another mobile or a landline number is treated as a local call. Fixed wireline services defined local calls as those made within a Short Distance Charging Area (SDCA). The fixed wireline service providers are required to provide connectivity at the SDCA level to ensure local and intra-circle communications.
- 2.24. Additionally, TRAI's recent recommendations on the 'Revision of National Numbering Plan'^[49] mention the need and importance to consider change of inter-operator POIs from the LDCA to the LSA level to facilitate smoother transitions to modern network architectures as follows:

“...with the advent of modern technology, most TSPs have transitioned their fixed wireline service switching capabilities from the SDCA level to the LSA level. Both technological advancements and the evolving regulatory framework envision the management of PSTN traffic at a more centralised level...”

- 2.25. Stakeholders have expressed varied perspectives on the matter of level of interconnection. For instance, one of the stakeholders (who happens to be a wireline operator) highlighted that transitioning to IP-based interconnection at the LSA level is to be mandated, as it is now becoming challenging for wireline operators to invest in TDM-based network, as well as difficulties in sourcing TDM equipment because their Original Equipment Manufacturers (OEMs) are no longer supplying TDM equipment. It further mentioned that while one of the TSP is consolidating

^[49] https://trai.gov.in/sites/default/files/2025-02/Recommendation_06022025.pdf

its network to IP-TAX, at the same time it is not initiating IP interconnections with the stakeholder.

- 2.26. Similarly, one of the stakeholders in their comments expressed need to move towards the LSA-based interconnection citing Next Generation Network^[50] (NGN) deployment by TSPs, *inter alia*, stating that:

“...TSPs are implementing advanced technologies such as IMS (IP Multimedia Subsystems), 4G and 5G to deliver world-class telecom services. Enabling IP-based interconnection will ensure seamless connectivity, enhanced Quality of Service (QoS) and facilitate the adoption of advanced 4G codecs for improved voice quality...”

- 2.27. The stakeholder further mentioned that with the transition to IP networks, even one of the incumbent TSPs has replaced its traditional TDM-based circuit-switched networks with IP-based packet-switched NGN core networks and has deployed a single IP TAX Trunk Media Gateway (TMG) in each LDCA cluster across all circles. However, the interconnection with other TSPs is still on TDM based circuits.

“...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...”

- 2.28. The stakeholder also submitted that the TSPs are accelerating their 4G/5G rollout requiring IP-based interconnection to enhance service quality, particularly for VoLTE-to-VoLTE calls. It further submitted that some of the TSPs are aligned to migrate on IP based interconnection and similarly other TSPs should be mandated to adopt a phased approach toward IP interconnection. All other operators barring a few TSPs have centralized

^[50] **NGN** stands for **Next Generation Network**. It refers to a modern, all-IP (Internet Protocol) based telecommunications network that can carry voice, data, and multimedia services over a single network infrastructure, replacing traditional circuit-switched networks. NGNs are designed to be more flexible, efficient, and capable of supporting a wide range of services and applications.

POIs for both fixed-line and mobile traffic, even such TSPs manage mobile traffic centrally. Given the minimal volume of fixed-line traffic, it can be efficiently handled through a centralized interconnection. Therefore, from both technological and regulatory perspective, the potential benefits and challenges associated with alternative interconnection levels need to be thoroughly assessed.

- 2.29. This prompts a reconsideration that whether any level other than the LSA (Licensed Service Area) is practical in the modern telecom landscape. A careful evaluation is required to ensure that interconnection strategies align with current technological advancements and regulatory frameworks.
- 2.30. It is pertinent to note that the matter of level of interconnection and point of traffic handover has been dealt in multiple regulations and accordingly the aspect that need to be addressed is what changes are required to be done in the level of interconnection and point of traffic handover as provided in the Telecommunication Interconnection Regulations (TIR), 2018 and the Guidelines annexed to the Telecommunication Interconnection (Reference Interconnection Offer) Regulations, 2002.
- 2.31. The Second Amendment dated 10.07.2020 of the Telecommunication Interconnection Regulations, 2018 provides for the following:

“9A. [Level of interconnection for PSTN-to-PSTN connectivity:

(1) Within a service area, the location of POI, for calls between PSTN and PSTN or between PSTN and NLD network, shall be at such place as may be mutually agreed between the interconnection provider and the interconnection seeker.

(2) In case the interconnection provider and the interconnection seeker fail to agree under sub regulation (1), the location of POI, for calls between PSTN and PSTN or between PSTN and NLD network, shall be at LDCC:

Provided that carriage charge for carriage of calls from LDCC to SDCC and vice versa, as applicable, shall be paid by the interconnection seeker to the interconnection provider:

Provided further that the existing POIs at the SDCC level, for calls between PSTN and PSTN or between PSTN and NLD network, shall remain in operation for a period of at least five years or till such time the interconnected service providers mutually decide to close such POIs, whichever is earlier:

Provided also that the existing POI at the SDCC level, for calls between PSTN and PSTN or between PSTN and NLD network, can be closed if the services of either of the interconnected service providers are discontinued in that SDCA.”

- 2.32. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002^[51] prescribes the levels of interconnection between different networks in the para 4.4 and 4.5 of Annex - C titled ‘Reference Interconnect Offer Guidelines dated 12.07.2002’, which may be seen at **Annexure-XI**. These scenarios are discussed in following paras.
- 2.33. **Table 1.1 - PSTN to PSTN (Out-going Traffic)** - The table specifies the designated Points of Interconnection (POIs) for local, intra-circle, inter-circle, and international PSTN-PSTN outgoing traffic. It further specifies POI arrangements for traffic routing between Basic Service Operators (BSOs), National Long-Distance Operators (NLDOs), and International Long-Distance Operators (ILDOs).
- 2.34. **Table 1.2 - PSTN to PSTN (In-coming Traffic)** - The table specifies the POI designations in handling incoming PSTN to PSTN traffic. It further specifies the interconnection level between BSOs and other operators for different calling scenarios.

^[51] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7206>

- 2.35. **Table 2.1 - Traffic from PLMN to PSTN** - The table specifies the arrangement of POIs for mobile-originated traffic to PSTN in terms of local, intra-circle, inter-circle, and international calls. It further specifies the traffic handover between Mobile Service Providers and BSOs, NLDOs, and ILDOs.
- 2.36. **Table 2.2 - Traffic From PSTN to PLMN** - The table specifies the POI arrangements for PSTN-originated traffic destined for mobile networks, across local, intra-circle, inter-circle, and international calls. It further specifies mechanisms for routing including lower hierarchy routing options (below TAX level).
- 2.37. The arrangements for outgoing and incoming traffic routing, as outlined in Tables 1.1 and 1.2 for PSTN to PSTN communications, alongside Tables 2.1 and 2.2 which govern PLMN to PSTN and vice versa, merit close examination not only for their operational efficiency but also for their adaptability to emerging market dynamics and technologies. With questions now arising on mechanisms for handling traffic when traditional POIs are absent, opportunities to enhance network utilization through segregation or consolidation of traffic flows, and the evolving coordination between fixed wireline and mobile operators, stakeholders are invited to reflect the changes required in these POI frameworks, if any, so that the matter can be further examined.
- 2.38. One of the TSPs, however, supported connectivity at SDCA/LDCA levels and opposed the migration of connectivity to a single point in their comments and, *inter alia*, stated that:

“...it has established exchanges at all LDCA/SDCA levels to meet the extant Licensing/Regulatory dispensation - by incurring huge expenditure in CAPEX (Construction of exchange buildings/ installation of Local/ TAX exchange/ laying of copper local cables) and OPEX (including recruitment of manpower at all levels). While its resources (money as well as man-power) were engaged largely in arranging and providing for interconnection,

incurring huge expenditure, the private TSPs employed their resources in mobile network expansion and customer acquisition. The private TSPs have over the years only used the establishment/ network of PSU for their growth. While it spent most of its expenditure on establishments whereas private TSPs made the similar expenses towards customer acquisition and network expansion. As a result, private TSPs have huge customer base while it is still struggling with maintaining its establishments and manpower. A level playing field may be ensured to protect huge investments made by the PSU.

It has made huge expenditure in setting up of establishments at SDCA/ LDCA levels and migration of connectivity to a single point will make such establishments unproductive...”

- 2.39. As per stakeholders' comments that the telecom sector is undergoing a transition from legacy circuit switched to IP-based networks and given the rising complexity of inter-operator traffic flows, the provisions across these two regulations i.e. 'The Telecommunication Interconnection Regulations (TIR), 2018' and 'The Telecommunication Interconnection (Reference Interconnection Offer) Regulations, 2002' require re-assessment. In particular, the determination of the point of traffic handover has become important due to technological evolution, increasing traffic volumes, and the need to minimize disputes.
- 2.40. Against this backdrop, stakeholders are invited to provide their views on the changes required in the level of interconnection and point of traffic handover as envisaged in 'The Telecommunications Interconnection Regulations, 2018' and the 'Reference Interconnect Offer Guidelines' of 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002', if any, for further examination, and therefore, stakeholders' comments are solicited on the following questions:

- Q1. For PSTN to PSTN, PLMN to PSTN and PSTN to PLMN, should the interconnection level be specified at LSA level? If yes, should the existing POIs at the LDCA/SDCA level also be migrated to the LSA level? Kindly justify your response.**
- Q2. For PSTN to PSTN, PLMN to PSTN, PSTN to PLMN and PLMN to PLMN, should interconnection be allowed at a level other than the LSA level, based on mutual agreement? Kindly justify your response.**
- Q3. Based on your response to Question 1 and 2 above, what changes, if any, are required in the level of interconnection / point of traffic handover as provided in the following:**
- a) Telecommunication Interconnection Regulations (TIR), 2018, and**
 - b) Guidelines annexed to the Telecommunication Interconnection (Reference Interconnection Offer) Regulations, 2002?**
- Kindly justify your response.**

ii. Multi-path resiliency and redundancy in POI framework

- 2.41. During the consultation process, one of the stakeholders pointed out that the current Point of Interconnection (POI) architecture continues to follow a point-to-point implementation model for both legacy TDM-based and IP-based POIs. It further indicated that this approach, while functionally adequate, is perceived to lack resilience and redundancy. This requires a network architecture comprising of a primary POI and secondary POI(s), wherein the primary POI will carry traffic in default scenario, and the traffic would shift to secondary or alternate POI(s) as a backup connectivity. In case of link failure at the primary POI, the absence of alternate POI or multi-path connectivity can result in service disruptions, thereby causing potential loss of traffic as well as affecting quality of service and customer experience.

- 2.42. Given the many comments from stakeholders proposing for fewer and aggregated POIs for voice and SMS traffic, the robustness of POI connectivity design assumes importance. With the evolution of IP networks, the possibility of incorporating advanced architectural frameworks that enable redundancy, load sharing, and dynamic rerouting of traffic is now technically feasible. Therefore, the Authority has considered it pertinent to examine whether the regulatory framework should mandate multi-path resiliency and redundancy at the POI level to enhance network reliability.
- 2.43. The Authority considers that interconnection between service providers is an important element in ensuring ubiquitous and uninterrupted communications across networks. A failure at the POI level without any redundancy can potentially affect large volumes of traffic, leading to congestion, and degraded service experience. The continuation of point-to-point architecture for IP interconnections exposes networks to a single point of failure. In contrast, resilient and redundant architectures may be designed to provide alternate paths for traffic flow, thereby mitigating the risk of disruptions.
- 2.44. Such frameworks not only enhance reliability but keeps telecom network ready for any unforeseen situation. In the Indian context, where subscriber bases are large and traffic volumes are high, reliance on a single-path POI implementation may not be suitable in the long run. The Authority is therefore of the view that introduction of resilience and redundancy in the POI framework merits further examination.
- 2.45. The Authority also recognizes that mandating multi-path redundancy may involve additional investment in infrastructure, including transmission capacity, routing equipment, and interconnection links. Smaller service providers, in particular, may find the associated costs considerable. At the same time, the long-term benefits of improved service reliability, customer satisfaction, and reduced service disruptions may outweigh the initial costs. The Authority is therefore seeking a balanced approach that

safeguards consumer interest without imposing disproportionate burdens on service providers.

- 2.46. Further, it is important to explore whether the required resiliency can be achieved through regulatory mandates or whether it may be better addressed through technical standards and bilateral agreements among operators. The Authority is of the view that stakeholder feedback on feasible architectural models, including illustrative diagrams, will provide valuable insights. Such inputs will help determine whether a regulatory mandate for multi-path resiliency and redundancy in the POI framework is necessary in the telecom network.

iii. Security in telecom network interconnections

- 2.47. Telecommunications networks are essential for many aspects of day-to-day life, from national defence to public safety to economic growth. This is a sector that, *inter-alia*, supports healthcare, manufacturing, energy, transportation and more. As technology evolves, so do the capabilities of attackers, requiring continuous adaptation and revision of underlying regulatory frameworks for ensuring network security.
- 2.48. Interconnection point carries a potential security vulnerability and increases the attack surface which can be exploited by malicious actors for abusing interconnect privileges to locate individuals, intercept messaging, and eavesdrop on calls^[52] etc. Before the adoption of IP-based interconnections, Telecommunication Networks based on E1 interconnection had sufficient barriers to entry due to trusted peers on the either ends of the telecom network. Securing the network against threats was simpler. Today, the telecom sector has moved to IP infrastructure, IP networks potentially allow much easier access from anywhere in the world, thereby lowering the barriers to security breach attempts.

^[52] <https://www.oracle.com/a/ocom/docs/industries/communications/state-telecom-security-wp.pdf>

- 2.49. The IP network including the interconnect interfaces use open protocols which are universally accessible^[53]. So, the networks are susceptible to various attacks like denial-of-service (DoS), IP spoofing, interception, session hijacking, packet sniffing, compromised key attacks, Domain Name System (DNS) spoofing, network scanning, signalling and routing exploits, etc. Hence the challenge is in protecting the telecom networks, especially interconnection points, gateways and control systems from intruders, by addressing this issue through a regulatory framework.
- 2.50. For instance, a recent cyberattack in United States named ‘Salt Typhoon’^[54] breached nine domestic telecommunications and internet service providers, exposing vulnerabilities in critical infrastructure across the US. It compromised devices like routers and switches by exploiting old equipment, facilities that had not been updated, and network components that lacked basic cybersecurity protocols in the United States and in more than a dozen other countries. The issue of cybersecurity at the point of interconnection has also been highlighted in the following:

“...The recently reported cyberattacks by “Salt Typhoon” on key telecom providers in US, showcases the ability of attackers to go after information of senior government officials. In this attack, the intruders were also able to get access to sensitive information that is normally accessible to Lawful Interception teams (information used for surveillance). This attack highlighted the challenge that despite following global security standards (such as 3GPP, ITU-T) it is difficult to maintain a complex network environment specifically in a highly interconnected environment being secure at all the times...”^[55]

^[53] https://ntiprit.gov.in/pdf/ngn/Interconnection_issues_IP_Networks_Study_paper-TEC.pdf

^[54] <https://docs.fcc.gov/public/attachments/FCC-25-9A1.pdf>

^[55] <https://kpmg.com/in/en/blogs/2025/02/telecom-sector-cyber-risk.html>

- 2.51. In response to ‘Salt Typhoon’, the Federal Communications Commission (FCC), the U.S. telecom regulator, issued a Declaratory Ruling^[56] and Notice of Proposed Rulemaking (NPRM) in January 2025 that clarify and expand the obligations of telecommunications carriers. The ruling affirms that these carriers must secure not only the physical equipment in their networks but also how they manage the network as a whole, including implementing safeguards against unlawful access or interception of communications. The NPRM proposes that communications service providers be required to develop, update, and maintain comprehensive cybersecurity and supply chain risk management plans, with an annual certification to the FCC that these plans are in place and have been implemented.
- 2.52. In December 2022, the UK introduced its Telecommunications Security Code of Practice^[57]. This established strong legal security duties and specific security measures for public telecom providers to identify, prevent, and mitigate security risks. The framework included a tiered compliance system based on provider size, with Ofcom, the UK telecom regulator, responsible for regulatory oversight and enforcement.
- 2.53. These regulatory measures, *inter-alia*, highlight that Points of Interconnection (POIs) must also be secured against cyber threats, as unpatched or poorly protected gateways, routers, switches especially at the points of interconnection can be a potential security vulnerability. A compromised network element can lead to widespread disruptions, thereby requiring the implementation of security controls at this layer, which is an important part of the interconnection regulatory framework. This matter needs further examination from the regulatory perspective.

^[56] <https://docs.fcc.gov/public/attachments/FCC-25-9A1.pdf>

^[57] [https://assets.publishing.service.gov.uk/media/6384d09ed3bf7f7eba1f286c/E02781980 Telecommunications Security CoP Accessible.pdf](https://assets.publishing.service.gov.uk/media/6384d09ed3bf7f7eba1f286c/E02781980_Telecommunications_Security_CoP_Accessible.pdf)

- 2.54. Accordingly, in light of the stakeholder's concerns on multi-path resiliency, redundancy as well as the concerns flagged by global entities on security aspects of interconnections, the Authority seeks comments to examine the need to mandate multi-path resiliency, redundancy and security provisions in the POI framework for fixed wireline and wireless services, and if so, the appropriate architectural framework that may be adopted.
- 2.55. In this background, stakeholder's comments are solicited on the following question:

Q4. 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:

- i. PSTN-PSTN interconnection,**
- ii. PLMN-PLMN interconnection, and**
- iii. PLMN-PSTN interconnection?**

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

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

iv. Assessment of need for migration to IP-based Interconnection for all TSPs

- 2.56. The Indian telecom sector, due to technological development, is transitioning from legacy circuit-switched networks towards modern, IP-based (Internet Protocol) interconnection frameworks. This change is driven by the need to support an increasingly diverse range of communication services that go beyond traditional voice calls, including Voice over IP (VoIP), video conferencing, rich communication services (RCS), and other data-intensive applications. Stakeholders have indicated that IP-based interconnection offers numerous advantages over traditional

Time Division Multiplexing (TDM) and circuit-switched technologies. These benefits include higher network efficiency due to packet switching, greater scalability to accommodate growing traffic volumes, enhanced flexibility for integrating multiple service types, and improved quality of service (QoS) through advanced traffic management capabilities. Additionally, IP-based networks are capable of faster deployment of new services and innovations, which is important in an era of digital transformation and increasing consumer expectations.

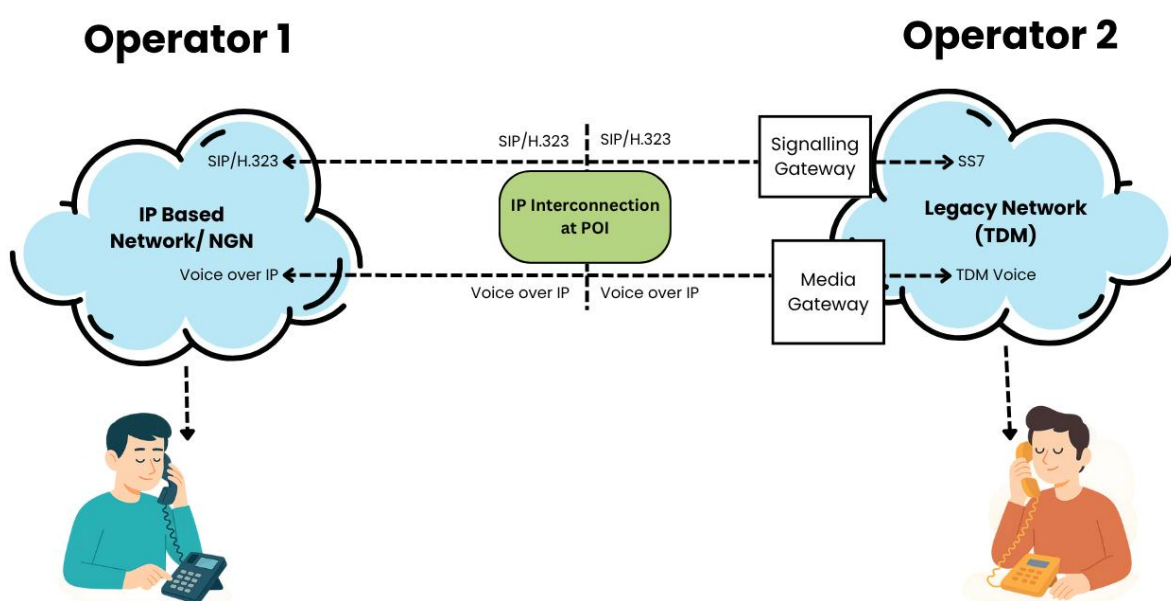


Figure 2.1: Interconnection between TDM-based network operator and IP-based network operator.

- 2.57. Building upon this technological evolution, the accompanying diagram in the Figure 2.1 visually represents a common scenario of interconnection between an IP-based network and a legacy TDM network, highlighting the crucial elements that enable seamless communication during this transitional phase. In this architecture, Operator 1 utilizes an IP-based Next Generation Network (NGN) that transports voice and signalling using protocols such as SIP and H.323, effectively supporting advanced applications and services. Operator 2, however, continues to operate a legacy network based on E1 or TDM, where signalling relies on SS7 and

voice is transmitted as traditional TDM streams. The interface between these two domains is facilitated at a dedicated Point of Interconnect (POI), where both signalling and media gateways play pivotal roles. The signalling gateway mediates between SIP/H.323 and SS7, translating messages and ensuring seamless call setup and management across both network types. Simultaneously, the media gateway converts voice traffic between VoIP packets and TDM streams, enabling real-time communication despite differing underlying technologies.

- 2.58. Globally, many advanced economies have either completed or are well underway with the migration to IP-based interconnection. Regulators across several countries, such as the Canada^[58] have acknowledged the evolutionary shift towards IP technology, which enables greater network efficiencies, opportunities for network optimization, and service offerings than legacy circuit-switched technologies. The Body of European Regulators for Electronic Communications (BEREC), which is the body in which the regulators of the telecommunications markets in the European Union (EU) work together, has also recommended in its ‘Final Report on IP interconnection’^[59] that telecom regulators in EU member states devise an appropriate interconnection regime for an all-IP world and to focus on the migration towards IP based Next Generation Networks (NGNs). IP-based interconnection not only reduces operational costs for service providers but also enhances interoperability and facilitates the rollout of next-generation communication services.
- 2.59. In India, however, the existing interconnection arrangements remain predominantly rooted in E1 or TDM based circuit-switched technologies. While these legacy systems have served well in the past, they are now increasingly seen by stakeholders as inefficient and inadequate for supporting the converged, multi-service networks that modern consumers

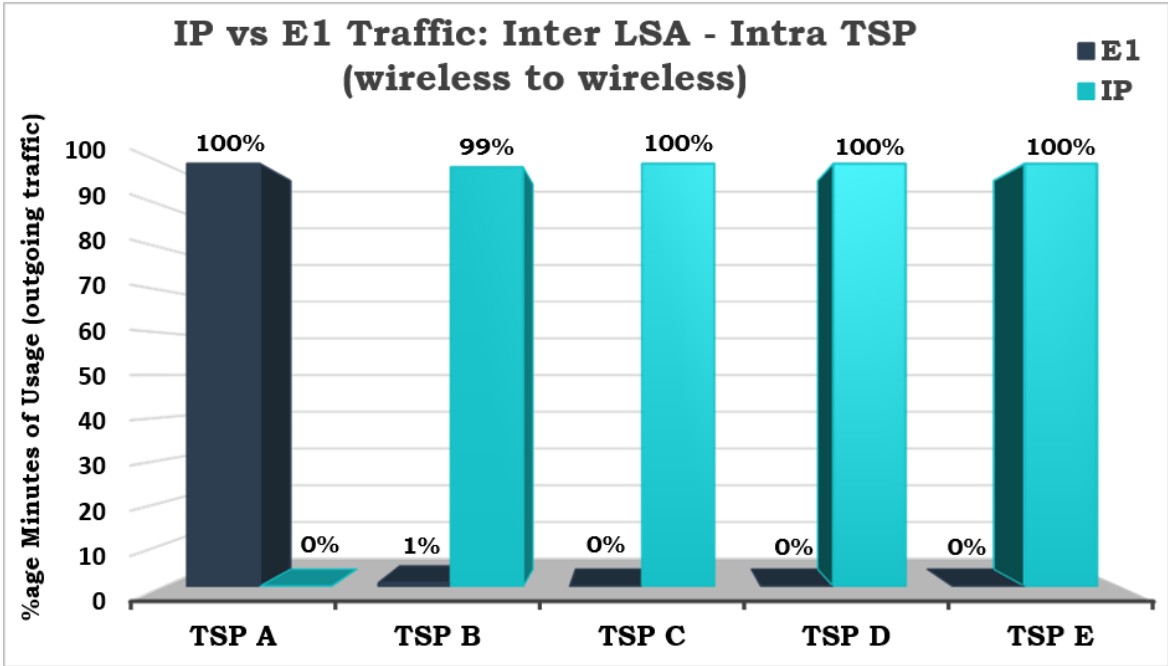
^[58] <https://crtc.gc.ca/eng/archive/2012/2012-24.pdf>

^[59] https://www.berec.europa.eu/sites/default/files/files/documents/erg_07_09_rept_on_ip_interconn.pdf

and enterprises demand. Circuit-switched interconnection is inherently limited by its fixed bandwidth allocation per channel and lack of flexibility, making it less suitable for handling the dynamic and bursty nature of IP traffic. Moreover, running both legacy and IP-based systems in parallel makes telecommunications operations more complex and expensive for service providers, which can slow down innovation and reduce the quality of communication services and seamless communication experiences. IP-based telecom networks enable faster call setup times, more flexible and scalable networks, and lower costs compared to E1-based networks. They efficiently handle multiple types of traffic over a single infrastructure and simplify management. As the telecom ecosystem moves towards 5G and beyond, there is a need to assess the matter of migrating to the IP-based interconnection.

- 2.60. Majority of the stakeholders in their submissions, during pre-consultation, have supported the subject of migration from E1-based interconnection to the IP-based interconnection. Out of 15 stakeholders who have submitted their views, 12 stakeholders have supported the IP-based interconnection over existing E1 or TDM based interconnection. Views of many stakeholders on IP interconnection have already been collated in the above section under the heading “**Examination of existing Levels of Interconnection**”. Stakeholders have cited the long-term benefits of efficiency, cost savings, and service innovation. They emphasize the need for clear timelines along with a regulatory framework to facilitate the transition. However, there might be some concerns about the upfront capital expenditure required for upgrading infrastructure, clarity on port charges for IP interconnection, technical challenges involved in migration, and the risk of service disruptions during the transition period.
- 2.61. The graph at Figure 2.2 illustrates the percentage distribution of IP and E1 outgoing traffic for Inter-LSA & Intra-TSP wireless-to-wireless voice communication across five of India’s telecom service providers (TSP A to TSP E), based on data for the month of March 2025. This reflects the degree

of modernization in the internal interconnection architecture across LSAs within each operator’s network.

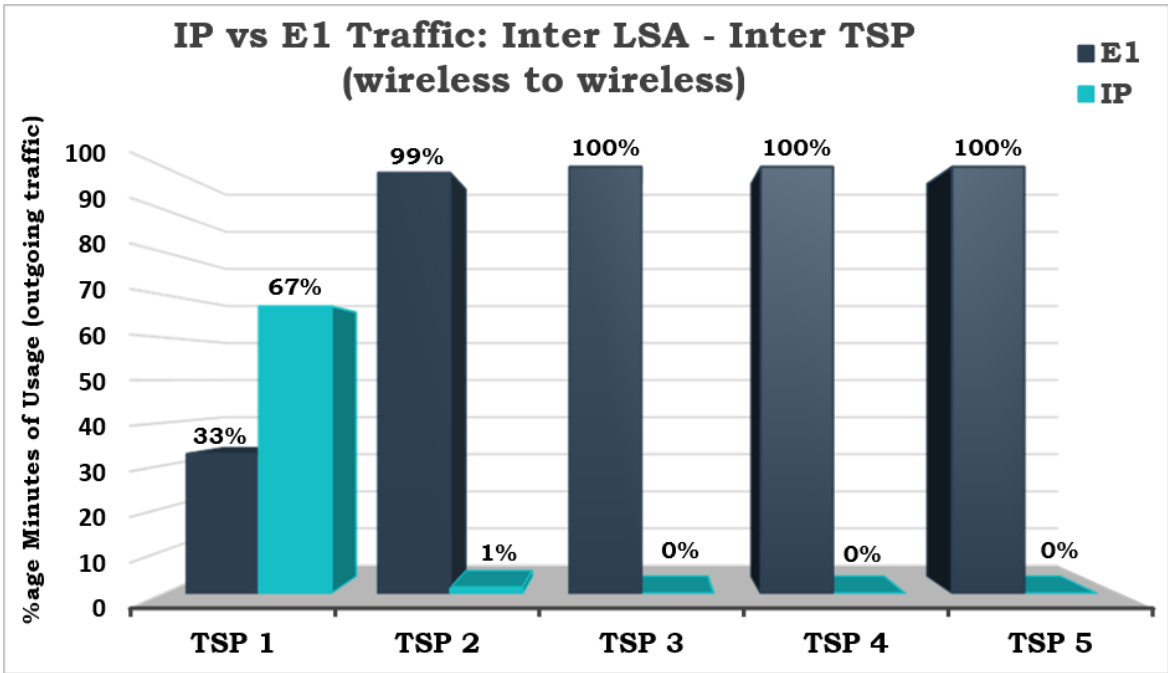


Source: Minutes of Usage data provided by TSPs for March 2025

Figure 2.2: Technology preference in Inter-LSA & Intra-TSP Communication

- 2.62. This variation reflects internal preference for majority of operators for IP connectivity in comparison to E1 connectivity. Since intra-TSP inter-LSA communication is fully within the control of each provider, they may potentially face fewer coordination hurdles, facilitating faster upgrades.
- 2.63. The graph at Figure 2.3 illustrates the percentage share of IP and E1 outgoing traffic for inter-LSA inter-TSP wireless-to-wireless voice communication across five Indian telecom service providers (TSP1 to TSP5) for the month of March 2025.
- 2.64. As depicted in Figure 2.3, TSP1 carries 67% of its inter-LSA outgoing wireless traffic with other TSPs over IP networks, indicating a notable transition towards next-generation interconnection. TSP2 rely heavily on E1 connectivity, with 99% of its inter-operator traffic across LSAs routed through traditional circuit-switched infrastructure. Similarly, TSP3, TSP4,

and TSP5 show 100% dependence on E1-based systems, reflecting no migration toward IP-based interconnection for this category of traffic.



Source: Minutes of Usage data provided by TSPs for March 2025

Figure 2.3: Technology Preference for Inter-LSA, Inter-TSP Communication

- 2.65. This pattern reflects that while most operators remain tied to E1 due to existing legacy systems, TSP1’s adoption of IP could point to efforts in cost optimization, scalability, and better integration with digital ecosystem. The disparity suggests varying levels of technological adaptation among operators and needs further examination.
- 2.66. The comparative analysis of the two graphs presented in Figure 2.2 and Figure 2.3 underscores a clear dichotomy in technology adoption based on the nature of interconnection. While intra-operator (within the same TSP) inter-LSA traffic has largely transitioned to IP-based interconnection, inter-operator (between different TSPs) inter-LSA traffic continues to rely heavily on traditional E1 circuits. This divergence highlights the need for further regulatory and industry-driven efforts to promote IP-based interconnection

between operators, which would harmonize network efficiencies, improve quality of service, and support the sector's ongoing digital transformation.

- 2.67. For interconnection over IP, fixed wireline and wireless networks are interconnected for voice and SMS traffic by adopting both electrical and optical connectivity, with standards issued by the Telecommunication Engineering Centre (TEC) titled 'IP Based Interconnection between Service Providers Networks'^[60]. Interconnection between networks uses devices such as dedicated edge routers, session border controllers, and media gateways, which perform protocol conversion and support a variety of physical interfaces.
- 2.68. One of the stakeholders, while recommending IP interconnection and time-bound migration to IP-based interconnection across all networks, *inter alia*, stated that:

"...telecom industry is undergoing a structural shift toward all-IP networks to enable high-quality services such as VoLTE, video calls, and other real-time applications. With the advent of IP networks, the TDM based circuit switched networks are being replaced with IP based packet switched core networks.

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 a large number of 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.

All major private operators have already migrated a substantial portion of their POIs to IP. Even the PSU operator has deployed IP-TAX Trunk Media Gateways and NGN infrastructure but continues

^[60] <https://tec.gov.in/pdf/IRs/TEC-SD-IT-IPI-001-01-NOV-15.pdf>

to maintain legacy TDM-based interconnection arrangements with private operators.

This dual structure leads to interoperability issues, degraded call quality (especially for VoLTE-to-VoLTE or video calls across networks), inefficient capacity utilization, and increased operational costs. Additionally, the PSU operator's fragmented POI provisioning for fixed-line services, despite its own centralized switching architecture, continues to result in delays and network planning challenges..."

- 2.69. In this background and to examine these matters, stakeholders' comments are solicited on the following questions:

Q6. (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.

v. Provisioning and augmentation of ports at POIs

- 2.70. The process for provisioning and augmentation of ports at Points of Interconnection (POIs) is one of the elements of 'The Telecommunication Interconnection Regulations, 2018'. Chapter IV of the regulations provide regulatory framework for interconnection seeker and interconnection provider^[61] and lays out a detailed mechanism for seeking and augmenting ports, including the initial two-year period where the requesting service provider is responsible for seeking ports to meet both incoming and

^[61] In accordance with the TIR, 2018, the term "interconnection seeker" refers to the service provider that initiates a request for interconnection to another service provider, referred to as the "interconnection provider." The interconnection seeker is responsible for submitting a formal request for connectivity; the interconnection provider, upon receipt of such a request, is obligated to take this forward, provision the requisite ports, and establish the necessary connectivity for interconnection.

outgoing traffic. After this period, or from 1st February 2018 (whichever was later), the total ports at a POI were to be converted for one-way traffic in proportion to the outgoing traffic of each service provider, averaged over the preceding three months. Subsequently, each service provider is required to seek ports only to meet the requirements of its outgoing traffic. This framework was designed to ensure transparency, fairness, and efficiency in the allocation of network resources and to prevent disputes over capacity at interconnection points.

- 2.71. Some stakeholders pointed out that the principle of reciprocity in terms and conditions for interconnection is not being uniformly followed by a TSP. It was highlighted that in many cases, such TSP continues to treat other service providers as "seekers" of interconnection long after the initial arrangements have been established.
- 2.72. It was further submitted by stakeholders that no service provider should be treated as a perpetual "seeker" for interconnection beyond a reasonable period, for instance two years, as this practice results in non-uniform application of cost-sharing obligations. Stakeholders suggested that the classification of some operators as "seekers" indefinitely should be discontinued and that interconnection charges and cost-sharing responsibilities should be applied on a reciprocal and non-discriminatory basis across all operators.
- 2.73. On the other hand, a TSP has submitted other TSPs are insisting to enter into interconnection agreements on terms dictated by them, and in case of non-agreement, refrain from signing the interconnection agreements altogether.
- 2.74. The aforesaid TSP further pointed out that other TSPs had approached the Authority with a request that it may be directed to implement all relevant provisions of the interconnection regulations even without execution of a formal agreement. It further stated that such practices undermine the principle of mutual agreement and reciprocity envisaged in the interconnection framework.

- 2.75. The Authority observes divergent views expressed by TSPs on the implementation of the seeker - provider concept and reciprocal cost-sharing obligations. The existing regulations prescribe clear procedures and timelines for provisioning of interconnection as well as the “seeker” classifications based on the requirement to seek ports to meet outgoing traffic. The litigation on this issue has already been discussed the earlier sections.
- 2.76. The Authority recognizes that reciprocity in interconnection arrangements is essential for ensuring non-discriminatory treatment and promoting a level playing field among all service providers. The concern of some of the TSPs that perpetual “seeker” classification may lead to inequitable cost burdens is also worth examining. At the same time, the Authority notes a TSP’s submission for implementation of interconnection provisions exactly as provided in the regulations.
- 2.77. In view of the above, the Authority is of the opinion that there may be a need to further examine the seeker-provider framework to ensure clarity, reciprocity, and time-bound obligations while safeguarding the commercial fairness of interconnection agreements. The matter requires examination in this consultation paper to ascertain if any modifications or clarifications are required in the existing regulatory framework to address this issue.
- 2.78. In light of the concerns raised, the Authority considers it important to examine whether the current process for port provisioning and augmentation remains effective in addressing the operational realities of the sector. The changing market dynamics including rising volumes of telecom traffic, migration to IP-based networks, and increasing reliance on interconnection for converged services require a more agile and responsive framework. The Authority accordingly seeks stakeholder views on whether the present timelines and compliance mechanisms are sufficient or whether modifications are warranted to enhance efficiency, strengthen accountability, reduce operational bottlenecks, and foster a more resilient and future-ready interconnection regime.

- 2.79. The Authority seeks to understand whether the existing provisions adequately address the dynamic needs of the industry and consumers. It needs to be examined whether the modifications are required to enhance efficiency, reduce operational complexities, and promote a more responsive interconnection regime.
- 2.80. In this background, stakeholders' comments are solicited on the following questions:

Q7. 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:

- a. Seeking of ports at POIs,**
- b. Request for initial provisioning of ports, and**
- c. Request for augmentation of POIs?**

Kindly provide your response with justification.

vi. Review of existing Interconnection timelines

- 2.81. Adherence of timelines by TSPs play an important role in initial commissioning and subsequent modifications of POIs. Adhering to timelines in telecom interconnection are essential to ensure seamless connectivity, minimize network congestion, and safeguard consumer interests by prompt linking of networks across different service providers. With the growing subscriber base, timely provision and augmentation of interconnection points prevent call failures and maintain service quality. Regulatory mandates for defined timelines help foster fair competition among operators and create a level playing field for technological and market growth.
- 2.82. In pre-consultation comments, some of the telecom service providers have raised the issue of delays in the provisioning of Points of Interconnection (POIs) by the incumbent TSPs across several licensed service areas. Despite

the clear timelines prescribed under 'The Telecommunication Interconnection Regulations, 2018', stakeholders stated that in many cases POIs are not commissioned within the mandated 42 days period from the receipt of a complete request. Such delays, according to these stakeholders, disrupt the timely rollout of telecom services, hamper network expansion plans, and adversely affect the quality of service delivered to customers.

- 2.83. Stakeholders emphasized that interconnection with the specific TSP remains an important and obligatory requirement in the Indian telecom ecosystem, owing to its extensive network coverage and legacy connectivity base. Consequently, any delay in POI provisioning imposes a disproportionate impact on other operators, who remain unable to commence or expand services without such interconnection in place. This was viewed as creating an artificial bottleneck in service rollout and eroding the overall efficiency of the sector.
- 2.84. To address these concerns, some stakeholders proposed that establishing a POI with the specific TSP should not be treated as a mandatory precondition for launching or expanding voice services, particularly in cases where delay is attributable to the specific TSP. They further argued that stricter accountability measures need to be instituted to ensure adherence to the 42 days' timeline, including the introduction of monitoring and deterrent mechanisms to deal with non-compliance.
- 2.85. Some of the stakeholders emphasized the need for defining clear timelines in order to avoid delay or denial of interconnection requests. It was suggested that a strengthened dispute resolution mechanism and adoption of international best practices would help in ensuring a fair and efficient interconnection framework.
- 2.86. A view was expressed that strict adherence to prescribed POI (Point of Interconnection) commissioning timelines must be enforced uniformly across all operators. Stakeholders pointed out that the existing regulatory framework may not be sufficient to prevent anti-competitive practices, such as dominant operators imposing high charges or deliberately delaying

interconnection agreements. It was suggested that these provisions may require review to enable streamlined dispute resolution processes and a level playing field for all service providers.

- 2.87. It was further highlighted that certain operators have faced delays in service rollout on account of non-adherence to prescribed interconnection timelines by other TSPs. To address this, some stakeholders proposed that the Authority may establish a reporting system to monitor the status of all interconnection requests, publish compliance reports of TSPs periodically, and impose deterrent measures in cases of unjustified delay.
- 2.88. It was also pointed out that while the Telecommunication Interconnection Regulations, 2018 prescribe timelines for establishing POIs, multiple acceptance test procedures are required for different types of traffic and for capacity augmentation. Stakeholders observed that in some cases, such as with incumbent TSPs, the process takes much longer time, sometimes extending to several months, due to legacy procedures being followed. It was suggested that the Authority may examine methods to streamline these processes and reduce avoidable delays.
- 2.89. As per the existing interconnection framework, the Authority has, from time to time, notified several regulations that collectively prescribe the detailed procedures and corresponding timelines to be followed by service providers in matters relating to interconnection. These regulatory measures are aimed at ensuring transparency, fairness, and uniformity in the establishment and augmentation of Points of Interconnection (POIs), execution of interconnection agreements, settlement of charges, and provisioning and augmentation of capacity.
- 2.90. Regulations among these are 'The Telecommunication Interconnection Regulations, 2018', which, *inter-alia*, lay down the timelines and processes for provisioning and augmentation of POIs; the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002, which, *inter-alia*, mandate the preparation and publication of Reference Interconnect Offers along with various times lines by service providers with

‘significant market power’ status; and the Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001, which provide the framework for determination of interconnection charges and revenue sharing arrangements. Collectively, the above said regulations provide an interconnection framework prescribing detailed timelines for different procedural and commercial operations with the intent of minimizing disputes, curbing delays, and promoting a level playing field across service providers. The prescribed procedures and corresponding timelines under these regulations are given in detail in the **Annexure-X**.

2.91. The Authority has observed that delays in interconnection provisioning undermine the intended objectives of the interconnection regulations, which were designed to bring about transparency, predictability, and uniformity in interconnection processes. Timely establishment of POIs is central to ensuring network readiness, avoiding congestion, safeguarding consumer interest, and promoting fair competition. Repeated breaches of prescribed timelines risk creating inefficiencies and disputes, which, if left unaddressed, may have far-reaching effects on service quality and sectoral growth.

2.92. In this background, and to further examine this matter, stakeholders’ comments are solicited on the following question:

Q8. 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.

vii. Review of existing procedure of disconnection and surrender of POIs

- 2.93. 'The Telecommunication Interconnection Regulations, 2018'^[62] established a structured framework for the disconnection of Points of Interconnection (POIs) between telecom service providers. Under these regulations, 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 of the parties involved by minimizing service disruptions. It may be noted that the disconnection is initiated by a TSP in case of contravention of the provisions of the regulations or agreement by other TSP which, *inter-alia*, includes non-payment of dues.
- 2.94. Despite the provisions for disconnection of Points of Interconnection (POIs) in 'The Telecommunication Interconnection Regulations, 2018', several stakeholders have raised concerns about issues related to the surrender process for POI. Many stakeholders have specifically pointed out the absence of a clearly defined regulatory framework for the surrender of all or partial ports or the POI itself. Stakeholders emphasize that a formal exit or surrender process should be clearly articulated within the regulatory framework. The Authority understands that in certain situations such as reduction in traffic between the operators, withdrawal of services from certain areas by an operator, re-routing of traffic, etc. there may be a requirement for surrendering a part or whole of the POIs and this is distinct in nature from the disconnection of POI due to contravention of regulations and non-compliance of agreement, as mentioned in para above.

^[62] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7352>

- 2.95. Given the dynamic nature of the telecom sector including the introduction of new technologies and evolving service requirements it is prudent to reassess the existing provisions.
- 2.96. In their response to the pre-consultation paper, stakeholders suggested for the introduction of surrender procedures, outlining clear criteria, processes, charges, and timelines for the voluntary surrender of POIs. Additionally, stipulating a minimum retention period prior to allowing a surrender request would support stable service continuity while ensuring operational flexibility.
- 2.97. In view of this, it will be appropriate to get stakeholders' comments to reassess and revise, the existing disconnection procedure and to introduce surrender procedure for POI, if required.
- 2.98. In this background, stakeholders' comments are solicited on the following questions:

Q9. Whether there is a need to revise the existing process of disconnection of POIs as provided in the regulation 11 of the Telecommunication Interconnection Regulations (TIR) 2018? If yes, what specific changes should be done in the disconnection procedure?

Kindly justify your response.

Q10. 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.

viii. Provision of Bank Guarantee

- 2.99. Regulation 5 of the Telecommunication Interconnection Regulations, 2018^[63], addresses the requirement for furnishing a bank guarantee^[64] by one telecom service provider (TSP) to another as a security measure during the establishment of interconnection. These bank guarantees are generally intended to safeguard the interests of the interconnection provider against potential financial defaults such as non-payment of interconnection usage charges (IUC) or other commercial liabilities that may arise under the interconnection arrangement.
- 2.100. As per the sub-regulation (1) of regulation 5 of TIR-2018, the bank guarantee is to be furnished for a period of six months from the date of initial interconnection, covering the total number of ports sought during this period, if demanded by the provider. Bank guarantee is also to be furnished for the interconnection usage charges payable by a service provider. For interconnection usage charges, the process to determine the liability of the service provider to furnish bank guarantee has been provided in the sub-regulation (2) of regulation 5 of TIR-2018. At the end of every six-month period, the net payable IUC for the previous two months is calculated, and the service provider with a net payment liability furnishes a bank guarantee equivalent to that amount for the ensuing six months. This rolling mechanism ensures that the bank guarantee amount dynamically reflects the actual interconnection traffic and financial exposure, thereby aligning risk coverage to current operating liabilities.
- 2.101. The ceiling on the bank guarantee per E1 link at a Point of Interconnection is specified as ₹ 8,00,000 multiplied by the applicable IUC per minute for the traffic carried on that E1 link. This formula introduces greater transparency and uniformity in determining the amount of bank guarantee and thereby ensuring financial security required for interconnection between TSPs.

^[63] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7352>

^[64] A **bank guarantee** is a formal assurance provided by a bank on behalf of its customer, promising to cover financial or contractual obligations if the customer fails to fulfil them. In essence, if the customer defaults, the bank will pay the beneficiary, providing a safety net for the third party involved.

2.102. While the practice of furnishing bank guarantees is a long-standing commercial safeguard in inter-operator agreements, there has been variation in the quantum and applicability of such guarantees across different TSPs. These changes have brought to the fore questions regarding the adequacy and relevance of the existing provisions on bank guarantees and the need to further examine this matter.

2.103. One of the TSPs, during pre-consultation, in its comments raised the issue related to bank guarantee. The concerned TSP, *inter-alia*, stated that:

“...before TIR 2018, BSNL was not required to submit Bank Guarantees to other TSPs and BSNL sought Bank Guarantees from other TSPs suitably to protect its receivables. From the BSNL perspective, the issue of Bank Guarantee needs immediate attention. And not only IUC, the Bank Guarantee should also include other interconnection charges and outstanding...”

2.104. Another TSPs also gave its comments during pre-consultation stage on the issue of bank guarantee. The concerned TSP, *inter-alia*, stated that:

“...One of the most important aspects of IP interconnections would be to revise the existing charges as well as to prescribe a ceiling on all types of interconnection charges and other financial conditions including set up costs, port charges, NPLC charges and Bank Guarantees. The charges / financial conditions must have a direct and clear linkage to actual usage. We recommend that any prescribed formulae to arrive at the charges and / or Bank Guarantees must be clear and concise with no room for any misinterpretations leading to a higher amount than intended by the Authority...”

2.105. In the above context, stakeholders’ comments are solicited on the following question:

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

ix. Standardizing procedures for delayed IUC payments

- 2.106. Interconnection Usage Charges (IUC) payments are made by one telecom service provider (TSP) to another for the use of its network to originate, carry, or terminate voice calls and SMSs. Timely settlement of these charges is essential for maintaining financial discipline, ensuring smooth inter-operator relationships, and supporting the overall stability of the telecom sector. However, delays in IUC payments and other interconnection-related payments could possibly lead to disputes, affect cash flow issues, and operational inefficiencies among the TSPs.
- 2.107. Presently, interconnect agreements between TSPs may include provisions for penal interest in case of delayed payments, but these terms are not uniform.
- 2.108. This absence of a standardized framework leads to inconsistent enforcement, inter-operator disputes, and an uneven playing field. Some of the TSPs have called for equitable, transparent, and reciprocal settlement mechanisms.
- 2.109. Some of the stakeholders submitted that the applicable interest rate for delayed payments should be reviewed and benchmarked. Benchmarking is usually done to a widely recognized financial indicator, such as the State

Bank of India's (SBI) Marginal Cost of fund-based Lending Rate (MCLR)^[65] plus a reasonable margin (e.g., 2%), to ensure that the rate is fair, market-linked, and adjusts with prevailing economic conditions. License agreement of Department of Telecommunications for unified license^[66] also provides for interest on delayed payment at a rate which is 2 % above the MCLR of State Bank of India.

2.110. Some other stakeholders also submitted that linking the penal interest rate to a transparent, external benchmark discourages delays, compensates the affected party adequately, and maintains regulatory consistency.

2.111. In this background, stakeholders' comments are solicited on the following question:

Q12. 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.

x. Financial Disincentive Framework

2.112. Financial disincentive (FD) is a monetary amount imposed on service providers by TRAI for non-compliance of TRAI regulations. The financial disincentive framework provided in the Telecommunication Interconnection Regulations, 2018^[67], was designed to ensure timely and fair compliance by service providers with interconnection requirements. This framework relied on financial disincentive to address failures such as not entering into interconnection agreements within the stipulated

^[65] **Marginal Cost of Funds-based Lending Rate (MCLR)** is the minimum interest rate below which a bank is not permitted to lend loans.

^[66] <https://dot.gov.in/sites/default/files/Compendium-UL-AGREEMENT%20updated%20up%20to%2031032024.pdf?download=1>

^[67] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7352>

timelines, delays in providing initial Points of Interconnection (POIs), failure to augment POIs as required, and other violations of regulatory clauses.

2.113. These regulations provides that if any service provider contravenes the provisions of these regulations, it shall be liable to pay an amount, by way of financial disincentive not exceeding rupees one lakh per day per licensed service area, as the Authority may direct.

2.114. During the pre-consultation, stakeholders have not directly expressed views on the quantum and nature of financial disincentive, but many stakeholders have highlighted the need for incorporating effective and efficient mechanisms for dispute resolution in the matters of interconnections.

2.115. In this background, stakeholders' comments are solicited on the following question:

Q13. 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.

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

2.116. SMS termination charges are the charges that are payable by the originating access provider to the terminating access provider for each SMS delivered.

2.117. Initially termination charges for SMS were kept under forbearance and were governed by 'The Telecommunication Interconnection Usage Charges Regulation, 2003'. Subsequently, 'The Telecommunication Interconnection Usage Charges (Tenth Amendment) Regulations, 2009' contained a schedule specifically mentioning that SMS termination charges would be kept under forbearance. The afore-mentioned schedule was as follows:

*“Interconnect Usage Charge (IUC) for Short Message Service (SMS)
- Interconnect Usage Charge (IUC) for Short Message Service (SMS)
shall be under forbearance:*

*Provided that such charges shall be transparent, reciprocal and
non-discriminatory”*

2.118. The issue of IUC for SMS was raised in the consultation paper dated 27th April 2011, inviting detailed inputs from stakeholders. Following this, stakeholders submitted their comments and counter-comments, providing diverse perspectives on the matter. In a continued effort to gather comprehensive data, the Authority, vide its letter dated 13th December 2012, again specifically asked all service providers about international practices concerning SMS termination charges, the specific network elements utilized for providing SMS termination, relevant cost data, and the costing methodology employed for estimating SMS termination charges. Many of the service providers reiterated their prior stand of "Bill and Keep" for SMS termination charges, a system where each operator bears its own costs for terminating messages. In support of their "Bill and Keep" suggestion, they also submitted various international practices illustrating its implementation. These service providers submitted that if it is decided to prescribe an SMS termination charge, it should be strictly based on cost, and according to their calculations, it should be less than 1 paisa per SMS. On the other hand, some of the TSPs were of the view that the termination charge for all types of SMS should be prescribed at a level that allowed the terminating operator not only to recover their costs but also to successfully address the pervasive concerns of SPAM and pesky SMSs.

2.119. The policy of forbearance on SMS termination charge had worked satisfactorily in the past when the use of SMS by the subscriber was limited. In the changed circumstances, there had been an exponential increase in the number of commercial SMSs, a large imbalance in SMS traffic between the networks of interconnecting service providers, unilateral imposition of SMS termination charge and in case of non-agreement,

disconnection by some dominant service providers and growing litigations amongst the service providers. This imbalance, coupled with the imposition of SMS termination charges and, in cases of non-agreement, disconnection by some of the service providers, led to growing litigations amongst the service providers. Recognizing these challenges, the policy of forbearance in SMS termination charges was reviewed and a cost-based SMS termination charge was prescribed to bring stability and fairness to the market.

2.120. Subsequently, 'The Short Message Services (SMS) Termination Charges Regulations, 2013^[68],' issued on 24th May, 2013 came into force on 1st June, 2013. These regulations prescribe a cost-based SMS Termination Charge as 2 paise per SMS (for domestic SMS) to be paid by originating Access Provider to the terminating Access Provider. The regulations further provide that termination charges for international incoming SMS shall be under forbearance.

2.121. In addition to the above termination charge of ₹0.02 (2 paise) per SMS, 'The Telecom Commercial Communications Customer Preference Regulations, 2018' dated 19th July 2018 (as amended from time to time) provides for the following:

"Terminating Access Provider (TAP) may charge Originating Access Provider (OAP) for Commercial communication messages as following:

- (1) Upto ₹ 0.05 (five paise only) for each promotional SMS;*
- (2) Upto ₹ 0.05 (five paise only) for each service SMS;*
- (3) Upto ₹ 0.05 (five paise only) for each Transactional SMS;.*

Provided that there shall be no Service SMS charge on:

- (i) any message transmitted by or on the directions of the Central Government or State Government;*

^[68] https://www.trai.gov.in/sites/default/files/2024-09/201305240356215478392English_SMS_Regulation_24.05.pdf

- (ii) *any message transmitted by or on the directions of bodies established under the Constitution;*
- (iii) *any message transmitted by or on the directions of the Authority;*
- (iv) *any message transmitted by any agency authorized by the Authority from time to time;”*

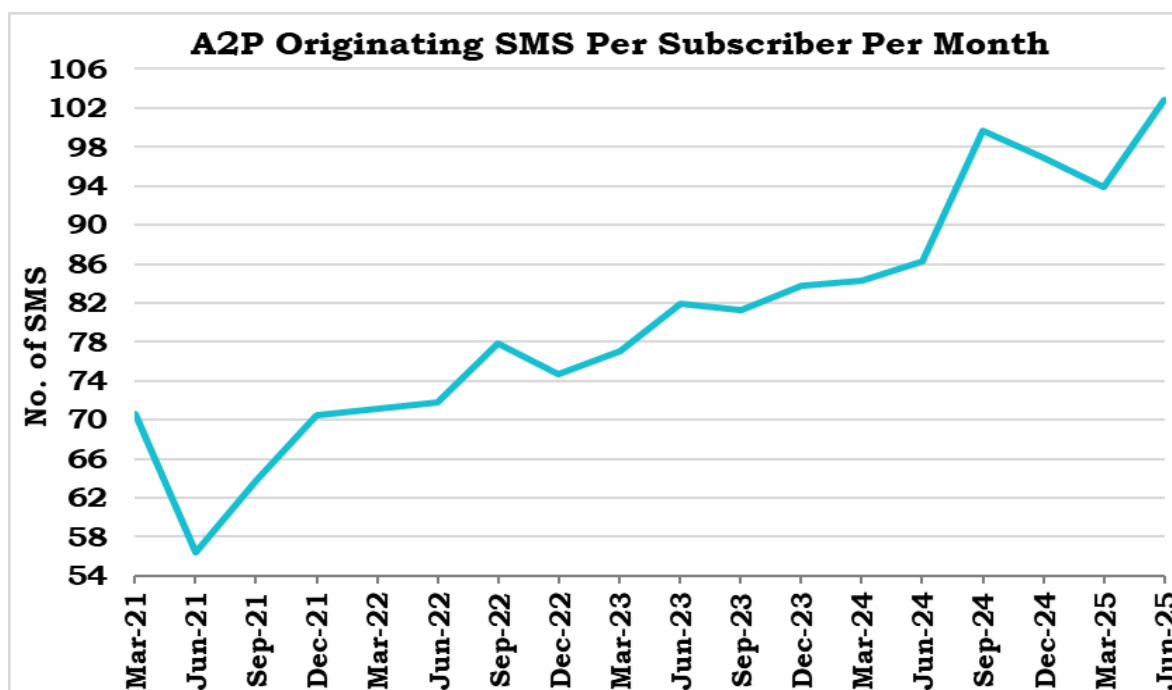
2.122. According to para 13 of the explanatory memorandum to The Short Message Services (SMS) Termination Charges Regulations, 2013:

“...some of the large Telecom Service Providers (TSP) submitted that the smaller operators are selling bulk SMSs to the telemarketers at comparatively cheap price. Their contention is that the revenue earned by such service providers through the sale of bulk SMS is primarily because they are able to send large number of A2P SMS to their subscribers. As their subscriber base is large compared to the subscriber base of such service providers, there is a substantial traffic imbalance between the two networks. These service providers further contended that as such service providers are earning revenue because of the investment done by them for acquiring customers and building the networks, in their opinion they should also be given a part of such revenue. To take care of such externalities and to ensure that the service providers continue to invest in building up the networks, the Authority had earlier prescribed a promotional SMS charge of Re.0.05 on promotional SMS sent by registered telemarketer in the Telecom Commercial Communications Customer Preference Regulations, 2010 (6 of 2010). While doing this exercise, the Authority has observed that apart from promotional SMSs, there is a large traffic imbalance between different networks on account of transactional SMSs also. Hence, with these amendments, the Authority has also simultaneously amended the Telecom Commercial Communications Customer Preference Regulations, 2010 (6 of

2010) to prescribe a transactional SMS charge of Re.0.05 per transactional SMS...”.

Emergence of over-the-top (OTT) application-based messaging

2.123. As stated above, the existing 2 paise per SMS charge was established in 2013, a period different from today's digital environment. Back then, SMS remained a primary mode of short-form communication, and the regulatory focus was on ensuring cost recovery and preventing market from operator-imposed charges.



Source: SMS reports submitted by TSPs

Figure 2.4: A2P Originating SMS per subscriber per month.

2.124. The graph at Figure 2.4 illustrates the quarterly trend in the average number of A2P (Application-to-Person) originating SMS per subscriber per month from March 2021 to June 2025.

2.125. The graph at Figure 2.4 shows A2P SMS per user per month rising from around 71 in March 2021 to a peak of nearly 103 by June 2025, indicating strong growth, especially in the second half of the year. This surge aligns with increased reliance on SMS for digital services, financial transactions,

and e-commerce, driven by OTPs, alerts, and two factor authentication. A2P SMS remains preferred for its wide reach, device agnosticism, and reliability, especially in areas with low smartphone penetration or limited internet access.

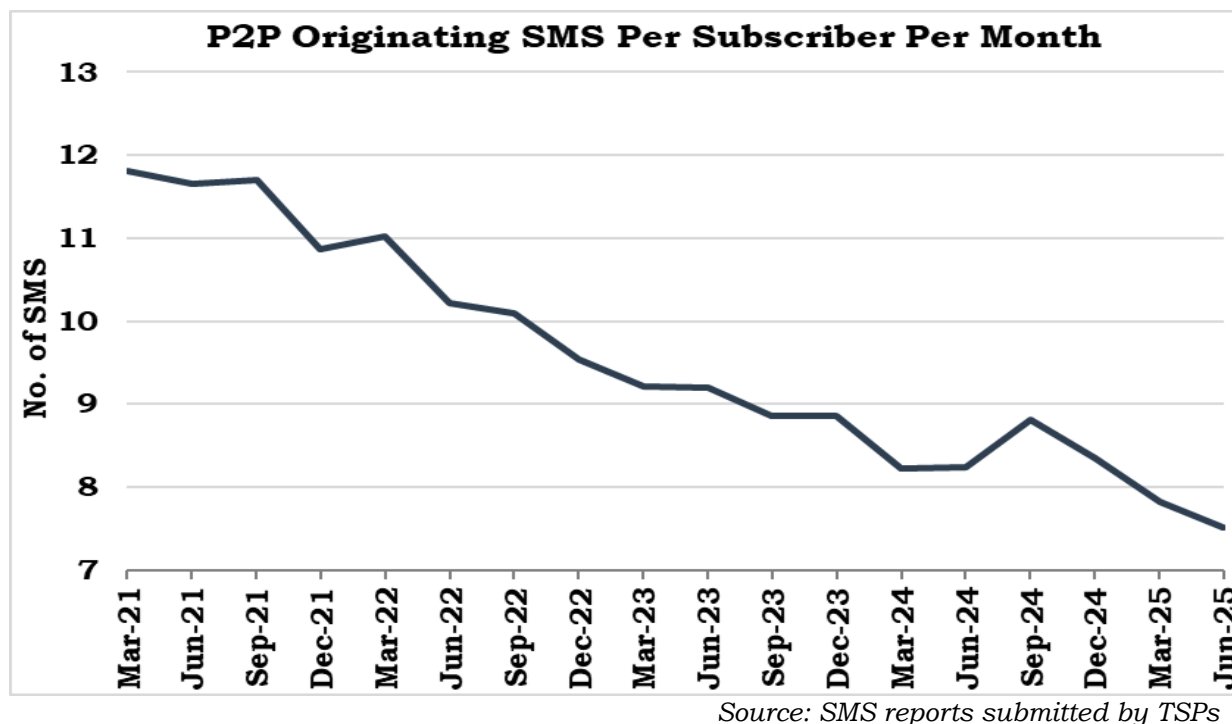
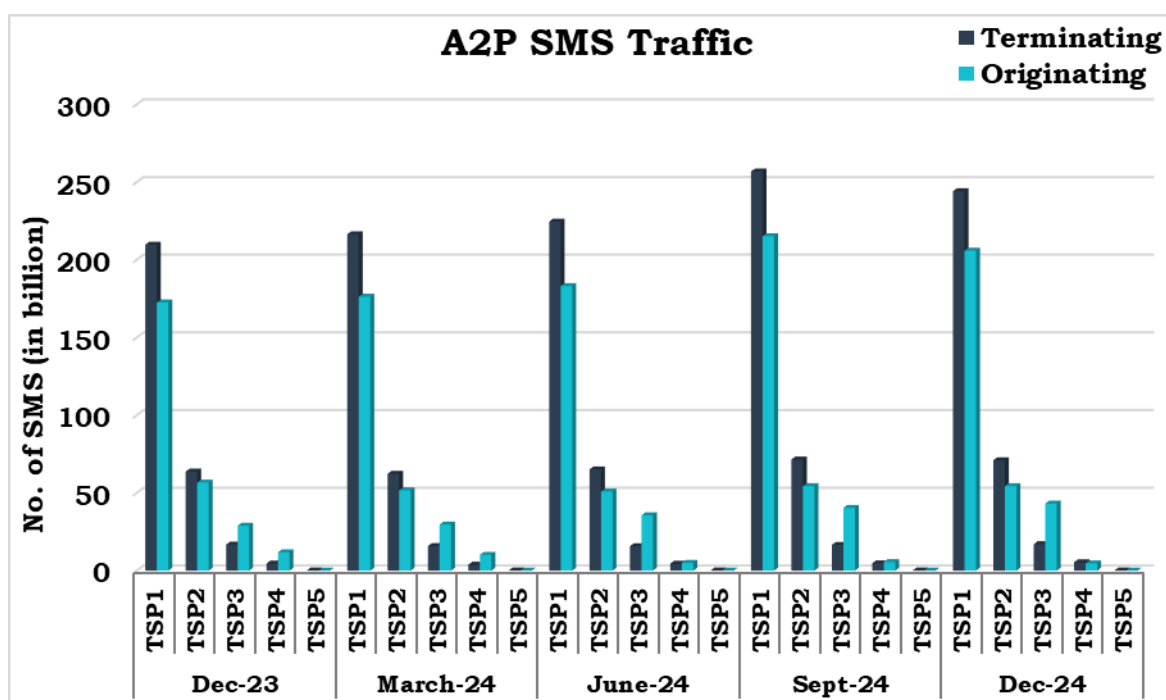


Figure 2.5: P2P Originating SMS per Subscriber per Month

2.126. The graph at Figure 2.5 illustrates the quarterly trend in the average number of P2P (Person-to-Person) originating SMS per subscriber per month from March 2021 to June 2025.

2.127. The graph at Figure 2.5 reaffirms that P2P SMS usage in India remains minimal and flat, with monthly volumes ranging between 8 and 12 messages per user throughout March 2021 to June 2025. A slight spike in September in 2021 and 2024 could be driven by major cultural and social events like Raksha Bandhan, Ganesh Chaturthi, Onam, the start of academic sessions, and the onset of the wedding season all prompting personal greetings and logistical coordination via SMS. Overall, the graph displays a fall in number of SMS per subscriber per month. With the rise of OTT application-based messaging services, there has been a shift from

traditional SMS to these platforms, as users may be preferring options like WhatsApp and Telegram for feature-rich, real-time communication. While P2P SMS continue to find usage in the legacy devices comprising of keypad type mobile phones and feature phones, allowing users to send SMS, OTT application-based messaging services are becoming increasingly popular among smart phone users. Overall, user behaviour is moving toward more interactive and versatile platforms.



Source: SMS reports submitted by major TSPs

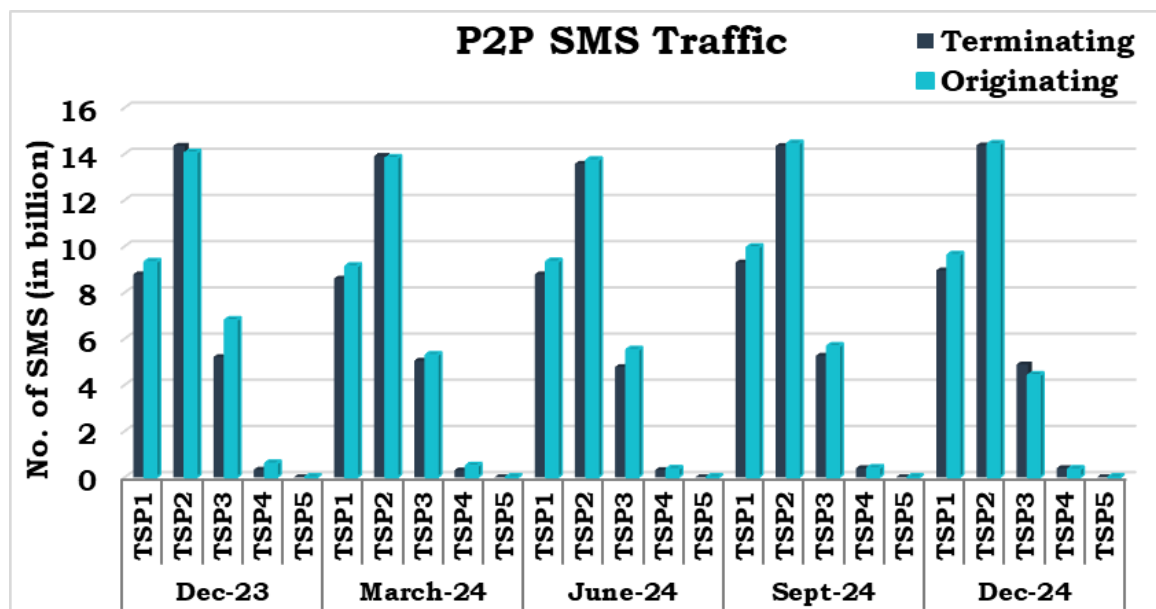
Figure 2.6: A2P SMS Traffic

2.128. The graph at Figure 2.6 illustrates the quarterly trend of Application-to-Person (A2P) originating and terminating SMS traffic across five telecom service providers (TSP1 to TSP5) from December 2023 to December 2024. TSP1 consistently handles the largest share of A2P traffic, with terminating traffic reaching around 260 billion and originating traffic around 220 billion in September 2024. The asymmetry between originating and terminating SMS traffic handled by various TSPs is also visible in the Figure 2.6.

2.129. Some of the TSPs show relatively higher originating volumes of A2P SMS traffic than terminating ones whereas other TSPs show reverse of it i.e.

higher terminating A2P SMS traffic volumes than the originating A2P SMS traffic volumes. The overall upward trend of A2P SMS traffic, especially the spike in September 2024, aligns with seasonal demands as explained above. It is evident that A2P messaging continues to grow due to its important utility in services like OTPs, alerts, two factor authentication, and commercial communication.

2.130. It is pertinent to mention that there are certain other wireline TSPs primarily catering to the enterprise segment. These service providers provide bulk SMS facilities to their enterprise customers including telemarketers.



Source: SMS reports submitted by major TSPs

Figure 2.7: P2P SMS Traffic

2.131. The graph at Figure 2.7 illustrates the quarterly trend of Person-to-Person (P2P) SMS traffic, both originating and terminating, across five telecom service providers (TSP1 to TSP5) for the period from December 2023 to December 2024. As can be seen from Figure 2.7, the volume of originating P2P SMS traffic is comparable to the terminating P2P SMS traffic for majority of TSPs, reflecting the two-way symmetrical nature of P2P SMS communication.

2.132. The graph at Figure 2.7 illustrates that the TSP3 and TSP4 maintain moderate traffic as compared to the TSP 1 and TSP2, while TSP5 carries the least traffic in this space. However, compared to A2P SMS volumes, the P2P SMS volumes are significantly lower. Nonetheless, P2P traffic has shown relative stability over the year, with minor quarter-to-quarter fluctuations.

i. Review of SMS termination charges

2.133. The Short Message Service (SMS) continues to serve as an important mode of communication, particularly for critical functions such as one-time passwords, banking and transaction alerts, e-commerce order and delivery notifications, and governments' citizen-centric services notifications even as data-based application messaging platforms have gained widespread popularity. In this context, the current SMS termination charge of 2 paise per SMS has remained unchanged for a quite some time. The interconnection framework is designed to ensure fair compensation to service providers for delivering messages that originate from other networks, while also fostering efficiency, competition, and protection of consumer interests. However, with the telecom industry undergoing technological transformation, marked by a change from legacy 2G and 3G networks to modern IP-based 4G and 5G infrastructures, the cost dynamics associated with SMS termination might have changed.

2.134. Furthermore, the increasing reliance on SMS traffic, especially by enterprises and public service providers, has led to a surge in bulk SMS usage. This raises important questions about need to examine whether the current termination charge remain reasonable and equitable, both in terms of recovering actual costs and ensuring a level playing field for market participants. There is also a need to examine if the existing charge structure creates any unintended disincentives for innovation and service quality.

- 2.135. In order to protect the interests of the consumers and also acknowledging the submission of some service providers that, SMS Termination Charges should be cost-based and adhere to the "work done" principle, the Authority had prescribed a cost-based SMS termination charge of ₹ 0.02 (Paise 2 only) per SMS. This decision aimed to standardize the termination charge and reduce disputes.
- 2.136. Despite these regulatory efforts, several stakeholders have raised issues highlighting the concerns regarding efficacy and continued relevance of the existing SMS termination charge regime.
- 2.137. With the per-SMS termination charge of 2 paise, the volume of SMS traffic across different networks could lead to administrative overheads for billing, reconciliation, and dispute resolution between service providers. These concerns indicate a need to assess and further review the existing regulatory framework, if required.
- 2.138. Various stakeholders have commented for SMS termination charges to be cost based. They have also commented for SMS termination charges to be a tool for deterrence of spam and unsolicited commercial communication. One of the stakeholders has commented that a TSP who has essentially established only SMSC may not be compared with the TSPs who have established BTS/ BSC/ MSC and huge mobile network and such TSPs should be liable to pay proportionately more termination charges to mobile/GMSC TSPs.
- 2.139. As discussed above in para 2.121, the subject matters of A2P promotional, service and transactional SMSs along with those related with unsolicited commercial communication such as spam SMSs are dealt under 'The Telecom Commercial Communications Customer Preference Regulations, 2018' (as amended from time to time), present consultation does not envisage the review of these regulations.
- 2.140. In view of these evolving market and technological conditions, stakeholders' comments are solicited on the following question to examine the SMS

termination charges prescribed by 'The Short Message Services (SMS) Termination Charges Regulations, 2013':

Q14. 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.

ii. SMS Carriage charges when NLDO carries SMS between LSAs

2.141. The SMS Termination Charges Regulations, 2013, were primarily framed in an era when SMS was a widely used mode of person-to-person (P2P) communication. At that time, the Authority regulated termination charges for SMSs to prevent any anti-competitive practices among telecom service providers (TSPs). However, the regulatory framework did not explicitly prescribe charges for SMS carriage by National Long-Distance Operators (NLDOs), particularly in cases where messages are relayed across different Licensed Service Areas (LSAs). With changing traffic patterns and volume of SMS traffic, it requires an examination of this subject from regulatory perspective.

2.142. One of the stakeholders in its comments during pre-consultation submitted following:

"...Regulation doesn't provide for SMS carriage charges, in case NLO 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. This poses challenges for service providers intending to take single/multiple LSA authorisation to serve niche use cases but, without intending to build a pan-India interconnected NLD network..."

2.143. Moreover, as the Authority continues its broader review of interconnection frameworks in light of technological advancements and convergence of services, it becomes pertinent to assess whether SMS carriage (akin to voice

carriage handled by NLDOs) requires a cost-based charging mechanism. Any such consideration must be carefully evaluated in terms of recovery of cost involved, market competitiveness, and the long-term sustainability of SMS. Establishing clarity on whether and how SMS carriage charges should be determined will not only reduce inter-operator disputes but also contribute to fair revenue-sharing arrangements.

2.144. Accordingly, stakeholders' views are being solicited to examine whether there is a need to prescribe SMS carriage charges for NLDOs carrying messages between LSAs. For terminating SMS to the subscriber, both the services of the TSP serving the subscriber and the involvement of the NLD operator are essential, as this SMS traffic can only be carried by the NLD operator. If such charges are indeed needed, the Authority seeks to examine this issue in greater depth and understand the appropriate cost-based methodology or market benchmarks that should guide determination of charges. Conversely, if stakeholders believe that no such charges are necessary, their justification will assist in largely reinforcing the current regulatory position.

2.145. In view of this background, stakeholders' comments are solicited on the following question:

Q15. 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.

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

2.146. The Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006, along with its amendment issued in 2012, laid down the framework for the provision and interconnection of telecom services that go beyond basic voice and data. A decision dated 5th December 2007 was issued, specifying that for all IN based free phone calls from any network, free phone service provider shall pay ₹ 0.52 to the originating

service provider. These regulations were important at a time when services like Freephone (toll-free numbers), Universal Access Number, and Premium Rate Services (PRS) were gaining traction, requiring seamless interaction between different network operators to ensure end-to-end connectivity and service delivery. The primary objective was to facilitate the widespread availability of IN services, promote fair competition, and safeguard consumer interests in a burgeoning multi-operator environment. These regulations addressed aspects like points of interconnection, technical standards, and commercial principles to ensure that subscribers of one service provider could access IN services provided by another service provider.

2.147. However, the telecommunications landscape has undergone transformation since 2006 and even since the 2012 amendment. The advent of high-speed data networks (4G/5G), the adoption of Over-the-Top (OTT) communication services, and the move towards cloud-native architectures have reshaped how telecom services are designed, delivered, and consumed. These technological advancements and market dynamics may necessitate a comprehensive review of the existing IN regulations to assess their continued relevance, effectiveness, and ability to accommodate future innovations while ensuring continued consumer access and fair competition. In this regard, issues to be discussed are as follows:

i. Access charges

2.148. The Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006, were established to enable seamless provision of intelligent network (IN) services such as free phone (toll-free) and universal access number etc. across multiple operators and networks in India. One of the aspects of these regulations is the facilitation of interconnection agreements and the specification of access charges to ensure fair compensation for network usage by all parties involved. Specifically, the Authority's decision dated 5th December 2007 in respect of these regulations, *inter-alia*, mandated that the free phone service provider

pay an access charge of ₹ 0.52 per minute to the originating service provider for every IN-based free phone call, as given below:

- (i) “For all IN based free phone call from any network, free phone service provider shall pay ₹ 0.52 to the originating service provider. It also includes calls originating from national/international roaming subscribers. This access charge will be applicable to those service providers who have not entered into agreement till date. It will not affect in any manner the charges already mutually negotiated between the service providers.*
- (ii) Originating service provider shall handover free phone call to free phone service provider at existing point of interconnection.*
- (iii) All the service providers who have not entered into agreement for IN based free phone services till date are directed to enter into agreement in the framework of above decision or mutual agreement within 15 days of this decision i.e. before 20.12.2007 and submit agreement to the Authority for registration within 15 days from the date of entering into such agreement.*
- (iv) All the service providers who have already entered into agreement on or before 15.11.2007, they are directed to send compliance of implementation to the Authority on or before 15.12.2007. Compliance of implementation of agreement signed after 15.11.2007 shall also reach to the Authority within 30 days from the date of entering into such agreement.”*

2.149. During pre-consultation process, few stakeholders gave comments on the IN regulations. One of the stakeholders suggested to revise the current IUC of ₹ 0.52.

2.150. There have been changes in network technologies, cost structures, and traffic volumes, including the proliferation of IP-based networks and the declining relative importance of traditional voice and IN-based services since 2006 when these regulations first came into effect. These developments may have altered the cost dynamics underlying the original

₹ 0.52 access charge. Furthermore, the current regulatory framework allows for mutual negotiation of charges, but in cases where such agreements are not reached, the prescribed access charge serves as the default. This raises the question of whether the existing benchmark remains appropriate or requires revision to better reflect present-day realities.

2.151. Given these factors, it is necessary to examine whether the ₹ 0.52 access charge continues to serve its intended purpose of fair compensation and efficient network utilization, or if a revision is required.

ii. Challenges in IN Interconnection

2.152. The 2006 IN Regulations, along with the 2012 amendment, prescribed technical guidelines and operational procedures for interconnecting Intelligent Network platforms between different service providers. These regulations provided that:

“...network equipment (including circuit or packet switches) to conform to the International Telecommunication Union and Telecommunication Engineering Centre standards and Standards of the industry. - All Eligible Service Providers providing the Intelligent Network Services in Multi-Operator Multi-Network scenario shall use such type of network equipment (including circuit or packet switches) which conform to the International Telecommunication Union and Telecommunication Engineering Centre standards and standards of the industry:

Provided that in the case of new technologies where no standards have been determined, all Eligible Service Providers shall deploy type of network equipment (including circuit or packet switches) approved by the Central Government and the Licensor...”

- 2.153. These guidelines were intended to facilitate the smooth exchange of signalling information and service logic necessary for routing and billing IN calls. Such procedures often involve establishing physical links, configuring signalling points (e.g., Signalling Transfer Points - STPs), and agreeing on technical parameters for message exchange, often relying on legacy SS7 (Signalling System No. 7) protocols.
- 2.154. However, as the networks and technologies transition to IP-based and virtualized infrastructures (e.g., IMS^[69], NFV^[70]), the implementation of these interconnection arrangements may present various technical and operational challenges for service providers. These might stem from the complexity of integrating diverse legacy IN platforms, managing different versions of signalling protocols, troubleshooting call flows across multiple network domains, or dealing with issues related to fraud detection and prevention in a multi-operator environment.
- 2.155. Therefore, in order to examine this matter further needs identification of technical and operational issues experienced by operators and gather their suggestions for practical improvements, potentially involving updated technical standards, streamlined processes, or greater flexibility in implementation, stakeholders' comments are solicited on the following questions:

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

^[69] **IMS** stands for **IP Multimedia Subsystem**. It is a standardized architectural framework designed to deliver multimedia communication services such as voice, video, and text messaging over IP (Internet Protocol) networks. IMS was originally specified by the 3rd Generation Partnership Project (3GPP) for use in next-generation mobile networks but is now used in both mobile and fixed-line networks.

^[70] **Network Function Virtualization (NFV)** in telecom is a network architecture concept that replaces traditional, dedicated hardware appliances such as routers, firewalls, and load balancers with software-based network functions running on standard, commodity servers or cloud infrastructure. These software-based functions can be deployed, managed, and scaled more flexibly and cost-effectively than physical devices. NFV allows telecom operators to quickly roll out new services, respond to changing network demands, and reduce both capital and operational expenses by eliminating the need for specialized hardware. This approach supports the growing needs of modern telecommunications, especially with the rise of 5G, IoT, and increasing data traffic.

kindly provide detailed explanation; if not, kindly provide justification.

Q17. 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.

B.4 The Telecom Regulatory Authority of India (Transit Charges for BSNL's Cell One Terminating Traffic) Regulations, 2005

- 2.156. The Telecom Regulatory Authority of India (Transit Charges for BSNL's CellOne Terminating Traffic) Regulations 2005, issued on 8th June 2005, emerged from dispute between M/s BSNL and private cellular operators over transit charges levied by M/s BSNL for terminating calls on its CellOne network.
- 2.157. Prior to 2005, M/s BSNL imposed a transit charge of 19 paise per minute on cellular operators for routing calls through its PSTN switches to reach CellOne subscribers. This practice was challenged by the Cellular Operators Association of India (COAI) in Petition No. 20/2004, arguing that the charges were discriminatory and violated principles of fair interconnectivity.
- 2.158. Hon'ble TDSAT, in its order dated 3rd May 2005, ruled that M/s BSNL could not levy transit charges under such circumstances, emphasizing the need for a level playing field and directing to formalize this decision into regulations. After examining the issue, these regulations were issued, explicitly prohibiting transit charges for calls where the MSCs of BSNL's CellOne and private operators were interconnected through the same BSNL switch.
- 2.159. These regulations were made effective from retrospective date i.e. date of Hon'ble TDSAT's order dated 3rd May 2005.

2.160. During the pre-consultation phase of this consultation process, none of the stakeholders have given comments concerning these regulations.

2.161. In this background, stakeholders' comments are solicited on the following question:

Q18. 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.

B.5 The Telecommunication Interconnection Usage Charges Regulations, 2003

2.162. The Authority established a regulatory framework for Interconnection Usage Charges through 'The Telecommunication Interconnection Usage Charges (IUC) Regulations, 2003 (1 of 2003)^[71] dated 24th January 2003. The main objective of these regulations was to prescribe a framework for sharing of revenues between originating, transit, and terminating networks.

2.163. Recognizing the need for enhanced clarity and operational ease, 'The Telecommunication Interconnection Usage Charges Regulations, 2003 (4 of 2003),^[72] were issued on 29th October 2003, which superseded the earlier regulations and became the principal regulatory instrument governing IUC in India.

2.164. Since their implementation, these regulations have been amended sixteen times, the latest being notified on 17th April 2020^[73], transitioned international termination charges into a sort of forbearance regime ranging between ₹ 0.35 and ₹ 0.65 per minute, while mandating non-discriminatory access across standalone and integrated operators. Earlier amendments,

^[71] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7220>

^[72] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7233>

^[73] https://www.trai.gov.in/sites/default/files/2024-09/Regulations_17042020.pdf

including the eleventh and twelfth in 2015, addressed termination, carriage charges and evolving traffic profile. As highlighted in consultation paper on 'Review of Interconnection Usage Charges'^[74] dated 5th August 2016, the IUC regime is an integral part of the regulatory framework for the telecom sector, intended to ensure that inter-operator payments are cost-based, promote competition, and ultimately benefit consumers by enabling affordable and efficient access to telecommunication services.

2.165. The Telecommunication Interconnection Usage Charges (IUC) Regulations, 2003 introduced an element-based charging methodology, wherein various charges were individually prescribed in detailed schedules attached to the regulations. Origination charges, transit charges, carriage charges, transit carriage charges, termination charges, and international termination charges have been explained below:

- i. **Origination Charges:** The calling party's access provider collects call charges from the calling party (i.e., the subscriber) as per the applicable tariff. From the amount so collected from the subscriber, the access provider has to pay termination charges to the called party's access provider and carriage charges (in case of an inter-circle call) to the NLDO. The access provider retains the balance amount to cover the cost of originating the call. The amount so retained by the calling party's access provider is called an origination charge. In essence, these are the charges incurred by the originating network (the network from which a call is initiated) for handling the initial segment of the call.
- ii. **Carriage Charge:** Carriage charge means the charges for carrying telecommunication traffic (voice and SMS) by a telecom service provider on its network for the other telecom service provider, from the point of handover to the point of termination or another handover, referring to long distance calls within India.

^[74] https://www.trai.gov.in/sites/default/files/2024-09/Consultation_Paper_05_August_2016.pdf

- iii. **Transit Charge:** Transit charge means the amount payable by a telecom service provider for routing telecommunication traffic (voice and SMS) through another telecom service provider's network, when connectivity to the terminating network is not established.
- iv. **Transit Carriage Charge:** Transit carriage charge refers to the charge for carriage of intra-circle traffic handed over from Cellular Mobile networks to Fixed network, from Level II Trunk Automatic Exchange (TAX) of LDCA in which the call is to be terminated, to SDCA.
- v. **Termination Charges:** Domestic termination charge (DTC) is the charge payable by an access provider, whose subscriber originates the call, to the access service provider (ASP) in whose network the call terminates. In a Calling-Party-Pay (CPP) regime, the calling subscriber pays for the call to his access provider, and the calling party's access provider usually pays the termination charge to the called party's access provider to cover the network usage cost. This compensates the terminating network for the resources utilized to deliver the call to the called party.
- vi. **International Termination Charges (ITC):** International termination charge (ITC) is the charge payable by an Indian International Long-Distance Operator (ILDO), who carries the call from outside the country, to the access provider in the country in whose network the call terminates.

2.166. These regulations also prescribed access deficit charge (ADC). ADC^[75] regime had been put in place to manage the sustainability of the operations of the fixed line operators in a competitive environment, the Authority phased out the Access Deficit Charges (ADC) on domestic calls with effect from 1st April 2008 and from international incoming calls with effect from

^[75] <https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=74840>

1st October 2008. ADC was started from 1st May, 2003 for giving sufficient time to fixed line operators for rebalancing the tariffs in the transition period. Regulatory objective was to create a balanced environment where both large and small service providers could recover costs fairly, facilitate seamless connectivity across licensed service areas, and foster healthy market competition.

2.167. There has been technological evolution from circuit-switched voice platforms to IP based, packet-switched networks and data-dominant services. In response, IUC charges have been periodically recalibrated to align with technological efficiencies, declining per-minute costs, and altered traffic patterns. However, with the telecom landscape now moving towards next-generation interconnection architectures, a comprehensive reassessment of the fundamental structure, methodology, and applicability of IUC, including contemporary principles like cost-based charges, granularity, and interoperability, is necessary to preserve the regulatory framework's relevance and efficacy in the digital age of IP based networks.

i. Examining carriage and transit charges

2.168. The Telecommunication Interconnection Usage Charges Regulations, 2003 established a comprehensive, cost-based framework for following charges, across all service providers in a multi-operator environment. This approach ensured that interconnection usage fees more accurately reflected network costs, promoting transparency and predictability in inter-operator settlements.

2.169. Summary of the termination charges, origination charges, and carriage charges as provided in Schedule I and Schedule II of the regulations are as follows:

a. Termination charges

i. Local and national long-distance calls:

A. Wireless to wireless: ₹ 0.06 per minute from 1st October 2017 to 31st December 2020; 0 (Zero) from 1st January 2021 onwards.

B. Wireless to wireline, wireline to wireline, wireline to wireless: 0 (Zero) per minute from 1st March, 2015.

ii. International incoming calls:

A. Calls to wireless and wireline: Not less than ₹ 0.35 and not more than ₹ 0.65 per minute (from 1st May 2020 onwards).

b. Origination charges

i. Authority has kept origination charges under forbearance. Origination charges are retained from the residual after payment of carriage and termination charges.

c. Carriage charges

i. Carriage charges for long distance calls within India:

A. As per mutual agreement between service providers, subject to a ceiling of ₹ 0.35 (thirty-five paise) per minute, irrespective of distance.

ii. Transit charges for intra-SDCA calls:

A. These charges are under forbearance, subject to condition that direct interconnection between access providers is mandatory. Para (b) of the Schedule II of the Regulations further specifies that:

“For exceptional cases of Intra-SDCA transit, operators may decide the charges through mutual negotiation. However this [shall be less than Re. 0.15 (Fifteen paise only) per minute].”

iii. TAX Transit Charges:

A. Trunk automatic exchange transit charge in all cases, other than transit charge for accessing the cellular mobile telephone service of BSNL by cellular operators which is governed by the TRAI (Transit charges for BSNL's Cell One Terminating Traffic) Regulation, 2005, shall be less than ₹ 0.15 (Fifteen paise only) per minute and, subject to the said limit, may be decided by the concerned service providers through mutual commercial arrangement.

iv. Transit Carriage Charge (Level II TAX to SDCA):

A. ₹ 0.15 (fifteen paise) per minute for intra-circle traffic handed over from cellular networks to fixed networks.

2.170. Furthermore, these regulations also stipulate the carriage charges payable between operators. The accompanying 'Notes to Schedule II,' including Table II, provide detailed provisions on the point of traffic handover, which determines how traffic is exchanged and where carriage charges become applicable for a particular level of interconnection, as given below:

Table II - Applicability of Carriage Charge

(F = Fixed or WLL(Fixed); W = WLL(M); C = Cellular Mobile)

Type of Traffic	Carriage Charge	Carrier (Handover at)
Within SDCA		
<i>F/W ↔ F/W</i>	<i>Nil for direct connectivity/ Applicable tandem usage as in Schedule II (b)</i>	<i>BSO1/BSO2 (Tandem)</i>
<i>F/W ↔ C</i>	<i>Nil (Tandem: Metro)/ TAX usage carriage Charge (Level II TAX)</i>	<i>BSO (Tandem: Metro)/ BSO (Level II TAX)</i>
<i>F/W/C ↔ ILD</i>	<i>As above since ILDO hand-over is at LDCC TAX</i>	<i>BSO (TAX)</i>
Intra Circle i.e. Inter (SDCA)		

$F \leftrightarrow F$	Carriage as per details in BSO1/ BSO2 Schedule II	BSO1/BSO2	Depending on Near end or Far end Handover
$F \leftrightarrow W$	Carriage as per details in BSO1/ BSO2 Schedule II	BSO1/BSO2	
$F/W \leftrightarrow C$	Same as Intra SDCA except TAX charge is “applicable” Charge since more than one TAX may be involved.	BSO (Level II/ I TAX)	
$C \leftrightarrow ILD$	No carriage/ tandem in case traffic is picked up or delivered at MSC	MSC (Direct connectivity cases)	
$F / W \leftrightarrow ILD$	Carriage as per Schedule II	BSO (TAX)	
Inter Circle			
$F/ W \leftrightarrow F/ W$	Carriage as per Schedule II	NLDO (TAX)	
$F \leftrightarrow C$	Carriage as per Schedule II	NLDO (TAX)	
$W \leftrightarrow C$	Carriage as per Schedule II	NLDO (TAX)	
$F/W/C \leftrightarrow$ ILD	Carriage as per Schedule II	NLDO (TAX)	

2.171. Many stakeholders have given comments on the need for review of the interconnection usage charges especially transit and carriage charges in their response to the pre-consultation paper.

2.172. On the other hand, one of the TSP has submitted that:

“...It may be noted that almost all interconnection Regulations are inter-related whether it is about Port charges, IUC or IN etc. Each amendment is closely related to the other e.g. while carriage charges were high, private TSPs were more interested in having PoI at the lowest level of switching area. However, subsequently when carriage charges were reduced, these TSPs are not interested in having connectivity at one point only....”

2.173. In this background, stakeholders' comments are solicited on the following questions to examine this issue:

Q19. 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.

ii. Interconnection Charges for Emergency Calls (112 and Legacy Level-1 Codes)

- 2.174. Emergency services are a cornerstone of public safety and a critical public utility. The provision of universal access to emergency services is a fundamental public interest obligation for all telecom service providers in the country. With the operationalization of the nationwide 112 Emergency Response Support System^[76] (ERSS), India has moved towards a unified emergency response platform, wherein PRI lines are to be provided by each TSP in each PSAP^[77] without any commercial implications (**Annexure-XII**).
- 2.175. However, in few places, legacy emergency short codes such as 100 (for police), 101 (for fire), and 102 (for ambulance) continue to be in use, and their integration with the ERSS is still underway in several states. Department of Telecommunications' letter conveying instructions to all access service providers tilted "Implementation of Single Number based

^[76] <https://112.gov.in/>

Emergency Response Support System (ERSS) is a Pan-India single number (112) based emergency response system for citizens in emergencies. Each State/ UT is required to designate a dedicated Emergency Response Centres (ERC) to handle emergency requests and assistance from Police, Fire & Rescue, Health and other services. These services can, inter-alia, be accessed by dialing 112 from phone, pressing power button on smart phone 3 times quickly to activate panic call etc.

^[77] **Public Safety Answering Point (PSAP):** It is an automated facility setup in the capital cities of all States and UTs, which handles emergency calls and provide assistance available to the people in distress within the best possible time with the help of Police, Fire & Rescue, Health services etc. (<https://112.gov.in/about>)

Emergency Response Support System” dated 24th August 2020 on this matter is placed at **Annexure-XII**.

- 2.176. Currently, the routing and termination of emergency calls often involve multiple networks, including those of private TSPs and public sector undertakings (PSUs). In many cases, private operators are required to route emergency calls through PSU networks, which may levy charges for this service, which includes applicable IUC as well as lump sum charges. Stakeholders, in their comments to the pre-consultation paper, have submitted that regulatory guidance on interconnection charges for emergency calls are required.
- 2.177. Many stakeholders in their response to the pre-consultation paper have expressed views to regulate and streamline the emergency service interconnection charges indicating that there exists a difference in the method of charging for emergency services among government PSU TSPs. It is stated by one of the stakeholders that while one of the government PSU TSP has adopted a methodology of charging for emergency services on a per call basis, other PSU TSP imposes excessive charges for these services, including a lump sum fee per LSA that increases by 10% annually, in addition to per-call charges. This lump sum charge has risen, from ₹10 lakh per LSA per year in 2010 to ₹41.8 lakh per LSA per year by 2025. Stakeholder requested to prescribe a cost based IUC for emergency services as well.
- 2.178. Furthermore, while the existing interconnection regulations and overarching framework have been primarily structured to address commercial voice traffic. The distinct characteristics associated with emergency services, such as priority routing, necessitate a reassessment to determine whether specific and tailored regulatory provisions are required to adequately address these services. There is a need to examine whether the existing regulations sufficiently ensure universal access to emergency services.

2.179. In the background of the above, stakeholders' comments are solicited on the following question to examine this issue:

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

iii. Examining International Termination Charges (ITC) Regime in context of IP-Based Networks

International Outgoing Calls:

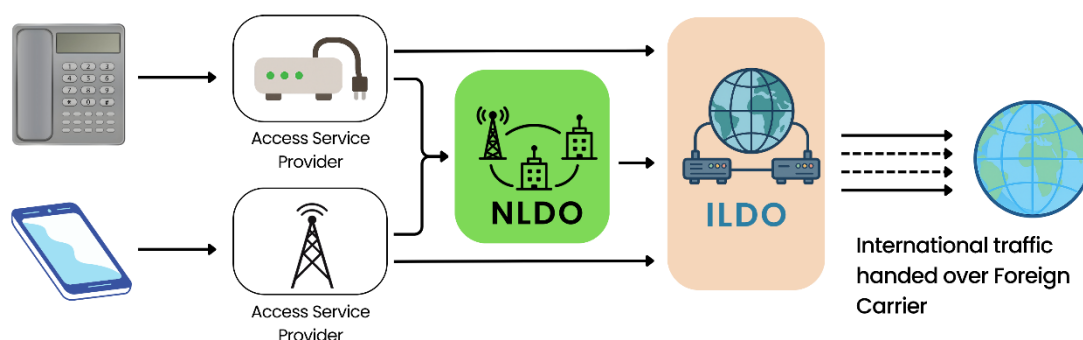


Figure 2.8: Route flow of International Outgoing Calls

2.180. Figure 2.8 illustrates the typical routing of international outgoing calls originating from Indian subscribers (shown on the left side of the figure), encompassing both fixed-line and mobile networks, traversing through access service providers' network to NLDOs' and ILDOs' network to foreign carriers and terminating into foreign countries' access service provider and finally connecting to the foreign subscriber. This is further detailed in subsequent paras.

2.181. **Call Origination:** International outgoing calls can originate from either a fixed-line telephone or a mobile handset. In both cases, the call is first routed through the respective Access Service Provider (ASP), either a Basic

Service Provider (for fixed lines) or a Cellular Mobile Service Provider (for mobile phones).

- 2.182. **National Long-Distance Operator (NLDO):** Once the call is received by the Access Service Provider, it is handed over to a National Long-Distance Operator (NLDO). The NLDO is responsible for carrying the call across different Licensed Service Areas (LSAs) within India, ensuring the call reaches the appropriate gateway for international termination.
- 2.183. **International Long-Distance Operator (ILDO):** At the international gateway, the call is transferred from the NLDO to an International Long-Distance Operator (ILDO). The ILDO is licensed to carry calls outside the national boundaries of India and is responsible for handing over the call to the appropriate foreign carrier.
- 2.184. **Handover to Foreign Carrier:** Finally, the ILDO hands over the international outgoing call to a foreign carrier, which then delivers the call to the intended recipient in the destination country.

International Incoming Calls:

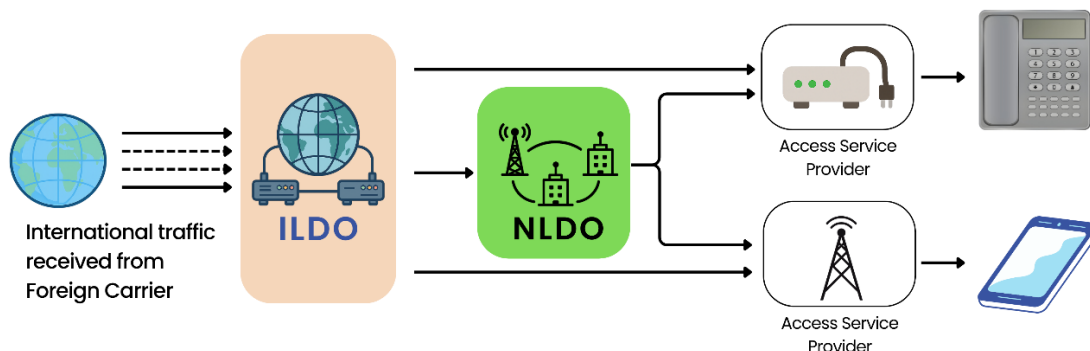


Figure 2.9: Route flow of International Incoming Calls

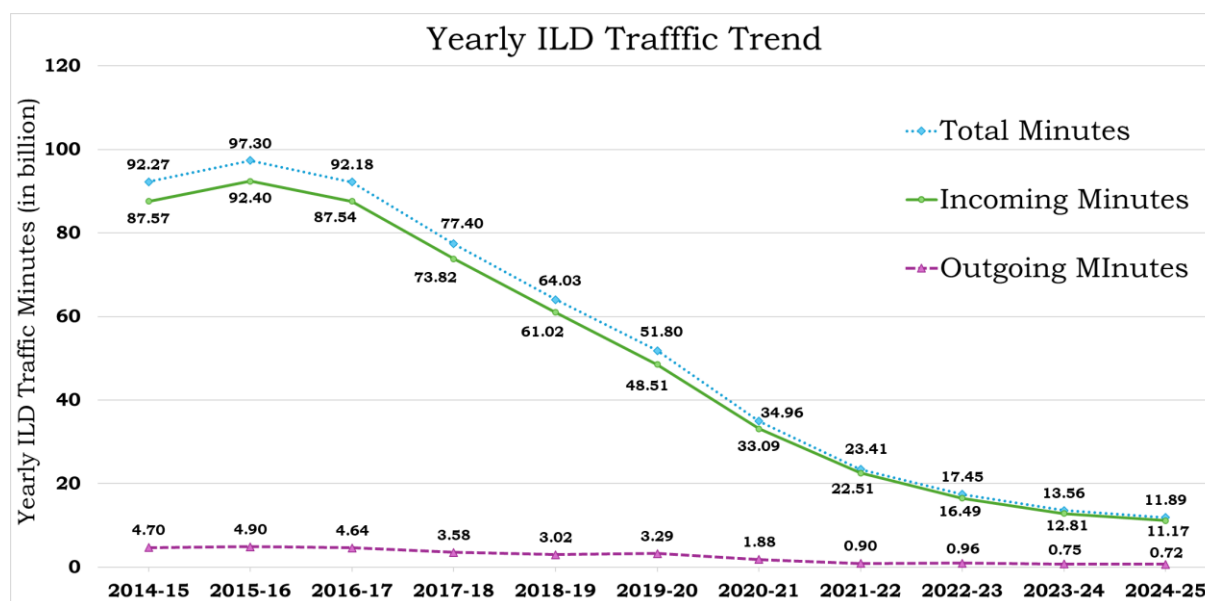
- 2.185. Figure 2.9 illustrates the typical routing of international incoming calls originating from foreign subscribers and finally terminating to Indian subscriber.
- 2.186. **International Traffic Reception:** International incoming calls originate from subscribers in foreign countries and are routed through a foreign carrier. These calls are handed over to the International Long-Distance

Operator (ILDO) licensed in India, which is responsible for receiving all international voice traffic entering the country.

2.187. **Role of ILDO:** The ILDO acts as the gateway for international calls, ensuring compliance with regulatory requirements and facilitating the secure and efficient transfer of international voice traffic into the Indian telecom network. Upon receipt, the ILDO hands over the call to a National Long-Distance Operator (NLDO).

2.188. **Role of NLDO:** The NLDO is responsible for carrying the call from the international gateway (managed by the ILDO) across different Licensed Service Areas (LSAs) within India. The NLDO ensures the call is routed to the appropriate Access Service Provider (ASP) based on the destination number, whether it is a fixed-line or a mobile subscriber.

2.189. **Access Service Provider (ASP):** The ASP, which may be a Basic Service Provider (for fixed-line phones) or a Cellular Mobile Service Provider (for mobile phones), receives the call from the NLDO and completes the final leg of the call delivery to the end subscriber. This ensures that international calls can seamlessly reach both landline and mobile users across the country.



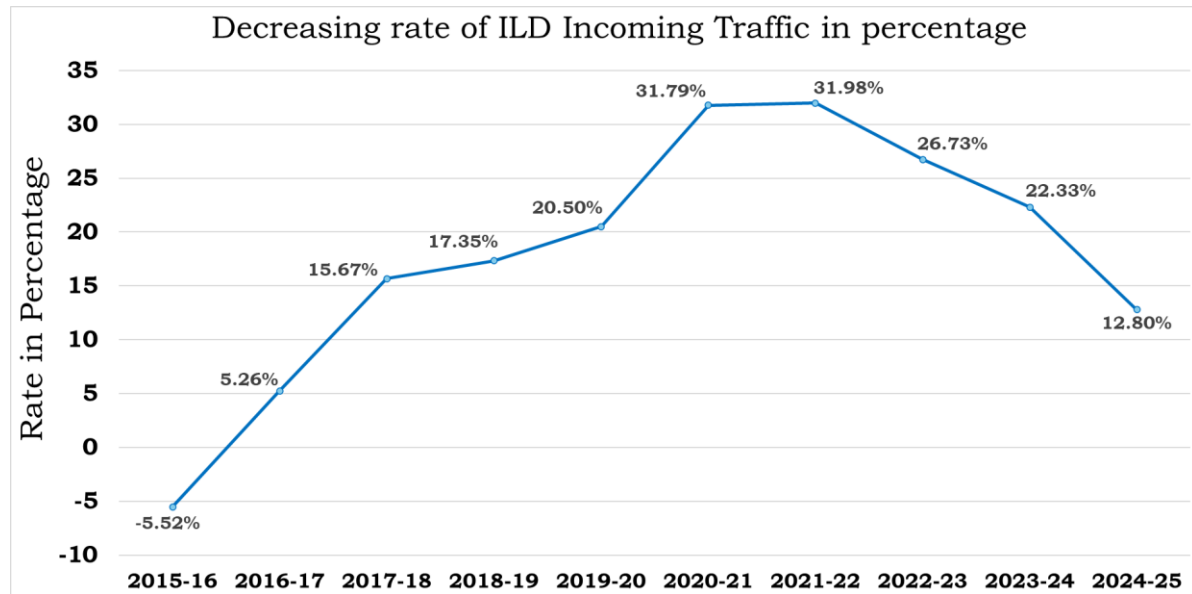
Source: Data submitted by ILDOs

Figure 2.10: Yearly ILD Traffic Trend

- 2.190. The graph at Figure 2.10 illustrates the annual trend of International Long Distance (ILD) traffic in India from 2014-15 to 2024-25, showing incoming, outgoing, and total minutes. ILD traffic peaked in 2015-16 with 97.30 billion total minutes, most of which was dominated by incoming calls (92.40 billion), while outgoing traffic remained consistently low throughout the period.
- 2.191. A sharp decline began from 2017-18 onwards, with total traffic dropping to just 11.89 billion minutes in 2024-25. This fall could be due to the growing adoption of OTT communication apps (like WhatsApp, Telegram etc.), which offer free global calling. The impact of COVID-19 further accelerated this shift by increasing reliance on data-driven services and reducing international mobility.
- 2.192. Many stakeholders have highlighted that high ILD termination charges levied by foreign countries for outbound traffic originating from India and terminating to other countries deterred the growth of outbound ILD traffic from India. It is pertinent to note that the interconnection regulations have been amended from time to time. Referring to the figure 2.10, it can be seen that the ILD traffic is declining continuously. The trend reflects a structural transition from traditional ILD voice services to internet-based communication^[78], highlighting the need for review of existing regulation to maintain balance in the ILD ecosystem.
- 2.193. The graph at Figure 2.11 illustrates the year-on-year rate of decrease in percentage terms, for ILD (International Long Distance) incoming traffic from 2015–16 to 2024–25, where the positive values indicate a decline and negative values reflect traffic growth as compared to previous year. The percentage rate of change in traffic for any year is calculated using the

^[78] [Technical report ITU-T DSTR-OTTBypass \(07/2024\) - OTT bypass](#)

previous year's traffic figure as a base^[79], wherein a larger positive value depicts a sharper reduction in the traffic volume.



Source: Data submitted by ILDOs

Figure 2.11: Decreasing rate of ILD Incoming Traffic in percentage.

2.194. In 2015–16, ILD incoming traffic had increased over previous year, as shown by a negative rate of -5.52%. However, this trend reversed from 2016–17 onwards, with a consistent rise in positive percentages indicating a growing year-on-year reduction in incoming traffic. The rate of decline accelerated from 5.26% in 2016–17 to a peak of 31.98% in 2021–22, reflecting a substantial drop in traditional ILD voice usage, which, as stated earlier, was largely influenced by the COVID-19 pandemic and a shift toward OTT platforms for international communication.

2.195. After 2021–22, while ILD traffic continued to decline, however, the rate of reduction slowed and dropped to 26.73% in 2022–23, 22.33% in 2023–24, and 12.80% in 2024–25. This suggests that although the steepest fall has passed, the overall trend remains downward. The sustained positive percentages, even post-pandemic years, point to a continued change in the

^[79] Following formula has been used for calculation of the decreasing rate of traffic in percentage $\frac{(\text{Previous Year Incoming Minutes} - \text{Next Year Incoming Minutes}) \times 100}{\text{Previous Year Incoming Minutes}}$, for example, for year 2015-16 to 2016-17, the incoming minutes decreased from 92.40 billion to 87.54 billion (Figure 2.10), therefore, for year 2016-17, Rate of decrease in percentage = $\frac{92.40 - 87.54}{92.40} \times 100 = 5.26\%$ (Figure 2.11).

users' behaviour, with indication of international voice traffic increasingly moving away from conventional ILD services to internet-based OTT calling solutions.

- 2.196. The decline in ILD traffic has continued even though ILD termination charges for calls terminating in India have been kept relatively low as compared to calls originating from India and terminating in other countries. However, these low charges in India help make calls affordable. Whereas, foreign telecom operators charge much higher termination charges for calls originating from India to other countries.
- 2.197. Another consideration is that the current IUC regime is based on voice minutes for cost assessment and revenue settlement. In an IP-based, all-data environment, where voice is one of many applications using the packet switched network, the existing model may not fully capture evolving usage patterns or cost structures. Additionally, the existing IUC framework needs review in view of evolving next-generation networks (NGN), IP Multimedia Subsystems (IMS), or Voice over LTE (VoLTE)^[80] services. As the sector transitions to newer technologies, there is a need to review and potentially update, if required, the IUC regime to better address emerging technologies, support investment in newer technological developments like IP-based infrastructure and align regulatory approaches with modern network architectures to make it future ready.
- 2.198. The volume of international voice traffic traditionally carried over Public Land Mobile Networks (PLMN) has migrated to internet-based communications platforms. These platforms often bypass^[81] traditional interconnection frameworks and compete with conventional international voice and text services.

^[80] **VoLTE** stands for **Voice over Long-Term Evolution**. It is a technology that allows voice calls to be made over a 4G LTE (Long-Term Evolution) data network, instead of the traditional 2G or 3G voice networks. VoLTE provides higher quality voice calls, faster call setup times, and allows users to use voice and data services simultaneously on their smartphones.

^[81] <https://www.itu.int/epublications/zh/publication/itu-t-dstr-ottbypass-2024-07-ott-bypass?utm>

- 2.199. The Telecommunication Interconnection Usage Charges (Sixteenth Amendment) Regulations 2020^[82] dated 17th April 2020, which came into force from 1st May 2020, mandates that International Termination Charges (ITC) for international incoming call to wireless and wireline should not be less than ₹ 0.35 (thirty-five paise only) per minute and not more than ₹ 0.65 (sixty-five paise only) per minute.
- 2.200. Many of the stakeholders, during pre-consultation, were of the view that current international termination charges for incoming calls to India are asymmetrical as compared to the termination charges levied by TSPs of other countries for the outgoing international call from India. Stakeholders further indicated that comparatively lower termination charges of incoming calls to India *vis-à-vis* termination charges of outgoing calls from India make routing of spam and scam calls terminating into India through other countries attractive for spammers and scamsters. To address this issue, they submitted that ITC should be gradually revised upwards from the current ₹ 0.65 per minute. In this context, it is proposed to examine the ITC regime to assess whether termination charges accurately reflect cost, support competitiveness, and prevent distortions in traffic flows.
- 2.201. Given these multi-dimensional issues, the Authority seeks to ascertain stakeholders' view on whether the existing IUC and ITC frameworks are sufficiently robust to accommodate technological advancement, changing user behaviour, and evolving international dynamics. Stakeholders' comments are solicited on the following questions to examine this issue:

**Q21. 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.**

^[82] https://www.trai.gov.in/sites/default/files/2024-09/Regulations_17042020.pdf

iv. Examining the issue of Telemarketing and Robo-Calls in Interconnection Framework

- 2.202. Some of the stakeholders in their comments in the pre-consultation have highlighted concerns regarding the increasing volume of traffic generated by telemarketing and robo-calls.
- 2.203. Telemarketing calls, in general, are outbound telephone calls made by an enterprise, business or a call centre to potential or existing customers for the purpose of promoting, advertising, or selling products and services, generating leads or conducting surveys. These calls are often initiated by the seller or marketing entity, not the customer, and aim to create new sales opportunities or gather market information.
- 2.204. While on the other hand, robo-calls are automated, pre-recorded voice calls delivered in bulk, often originating without direct human intervention at the point of call origination and many times irrespective of the consent of recipients. These calls are, usually bulk dialled to a wide audience, primarily generated by telemarketers, financial services, political campaigns, and unregistered marketers for commercial and promotional purposes.
- 2.205. Unlike telecom calls between two subscribers, which typically involve direct, conversational interaction and where calls can be initiated by either subscriber, telemarketing and robo-calls generally constitute outbound communication characterized by their commercial intent, large volume, one-way origination and promotional nature. For any originating operator, this practice enables increased call volumes and reach to subscribers across networks of all service providers.
- 2.206. A stakeholder in its pre-consultation comments has suggested that
- “....that A2P traffic be excluded from the mandatory interconnection regime and handled exclusively through commercial agreements between service providers and telemarketers...”*

- 2.207. It is pertinent to note that in view of the concerns regarding the proliferation of unsolicited telemarketing and robo-calls, the Authority has notified the Telecom Commercial Communications Customer Preference (Second Amendment) Regulations 2025^[83], to enhance the regulatory framework governing commercial communications. The amendment introduces specific provisions to address the use of automated calling systems, including robo-calls, and mandates prior disclosure by senders intending to use such systems. It further streamlines the complaint redressal mechanism by simplifying the process for lodging complaints and reducing the timeframes for resolution. The regulations also empower access providers to take timely action against entities found to be in violation, including disconnection. The 160 numbering series^[84] has been allocated exclusively for service and transactional voice calls made by government bodies, regulators, and principal financial entities. This enables citizens to easily recognize service and transactional calls. With the introduction of the 160-series for genuine service and transactional communications, the 140-series is reserved solely for promotional and telemarketing calls.
- 2.208. There may be a need for examination of this issue due to asymmetrical nature of robo-calls and telemarketing calls. In the background of the above, stakeholders' comments are solicited on the following question:

**Q22. 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.**

^[83] https://www.trai.gov.in/sites/default/files/2025-02/Regulation_12022025.pdf

^[84] <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2022249>

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

- 2.209. Interconnection, the bedrock of any multi-operator telecom environment, ensures that subscribers of one network can seamlessly communicate with those on another. Prior to comprehensive regulations, interconnection agreements were often subject to bilateral negotiations, which could lead to protracted disputes, non-transparent terms, and potentially anti-competitive practices, particularly for new entrants. A new entrant telecom service provider (TSP) typically begins with a smaller network and a limited subscriber base, necessitating interconnection with the networks of incumbent TSPs to deliver services to its subscribers. However, incumbent TSPs may resist such interconnection arrangements, as they perceive it as enabling new entrants to leverage their established networks and intensify competition. Incumbents may believe that the commercial benefits of interconnection favour the smaller telecom service providers, as their subscribers gain greater access to the larger subscriber bases of the incumbents. Consequently, incumbent TSPs may deliberately delay interconnection by imposing unilateral terms and conditions in agreements or demanding excessive charges.
- 2.210. Such practices could lead to prolonged and costly negotiations between competing TSPs, undermining the competition and potentially affecting the quality and efficiency of services provided to consumers. To address these challenges, many countries have introduced regulatory guidelines aimed at creating a conducive environment for facilitating fair and expeditious interconnection between TSPs. These countries^[85] have mandated publication of Reference Interconnect Offer (RIO) by operators having significant market power (SMP) status.
- 2.211. In India, the expansion and liberalization of the telecommunications sector in the early 2000s necessitated a robust framework to govern interconnection between competing service providers. To address this, 'The

^[85] <https://datahub.itu.int/data/?i=100046&s=5273>

Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002"^[86] (hereinafter referred to as "the RIO Regulations 2002") were issued on 12th July 2002.

2.212. One of the objectives of the RIO Regulations 2002 was to mandate 'significant market power' operators, a concept explained in detail in subsequent para, to publish a "Reference Interconnect Offer" (RIO). A RIO is a standard offer document detailing the terms and conditions under which a service provider would provide interconnection to other licensees. By requiring the publication of a RIO, the Authority sought to bring transparency and predictability to the interconnection process, reducing the negotiation burden on new operators and facilitating faster market entry. Reference interconnect offer finds its mention in the World Trade Organisation (WTO) reference paper on Basic Telecommunications agreed by the Negotiating Group on Basic Telecommunications^[87]. WTO reference paper on basic telecommunications embodies a negotiated set of pro-competitive regulatory principles. It is a set of common guidelines for a regulatory framework that countries should follow to support the transition of the telecommunications sector to a competitive marketplace and to guarantee effective market access. The reference paper deals with various regulatory principles including competitive safeguards, interconnection and creation of independent regulator among others^[88]. India also participated in the WTO Negotiating Group on Basic Telecommunications. In the reference paper published in the year 1996, it was agreed that,

"...a major supplier will make publicly available either its interconnection agreements or a reference interconnection offer."^[89]

^[86] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7206>

^[87] https://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm

^[88] https://www.wto.org/english/tratop_e/serv_e/telecom_e/workshop_dec04_e/gueremazi_referencepaper.doc

^[89] https://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm

- 2.213. The RIO covers aspects such as points of interconnection, technical standards, quality of service parameters, and the commercial terms, including charges, for various interconnection services. This approach was designed to minimize disputes and promote efficient network rollout across the country.
- 2.214. Furthermore, the RIO Regulations 2002 provided a clear framework for dispute resolution in cases where service providers could not mutually agree on interconnection terms. In such cases, the Authority may intervene to settle disputes, ensuring that interconnection is provided in a timely manner and on fair terms. These regulations also emphasized the principle of non-discrimination, ensuring that an interconnecting service provider received terms and conditions no less favourable than those offered to any other service provider. Over its two decades of existence, the RIO Regulations 2002 has played a pivotal role in enabling the growth of India's multi-operator telecom market, facilitating seamless communication, and fostering competition to the ultimate benefit of the consumers. Hence, as already explained above, the Reference Interconnect Offer is a concrete regulatory tool required under WTO commitments to promote open, fair, and transparent interconnection in telecommunications markets, embodying principles defined in the WTO Reference Paper for Basic Telecommunications.
- 2.215. A core concept underpinning these regulations is that of 'Significant Market Power' (SMP). SMP is a designation given to operators with substantial control over market conditions due to their market share of 30% or more. Under current regulations, a service provider shall be deemed to have significant market power if it holds a share of 30% of total 'Activity' in a licensed telecommunication service area. These services are:
- A. Basic Service,
 - B. Cellular Mobile Service,
 - C. National Long-Distance Service, and
 - D. International Long-Distance Service.

And an ‘Activity’ would mean and include any one or more of the following:

- i. Subscriber base
- ii. Turnover
- iii. Switching Capacity
- iv. Volume of Traffic

2.216. Operators identified as having SMP were required to publish Reference Interconnect Offers (RIOs), which were subject to regulatory scrutiny and approval.

a) Legal Matters related to the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002

2.217. ‘The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002,’ and a model Reference Interconnect Offer, formed the basis of the Reference Interconnect Offer (RIO) to be published by all telecom service providers with Significant Market Power (SMP). Market power refers to “*the degree to which price can profitably be elevated above a competition level.*”^[90] Firms with significant market power can set prices above or below (predatory pricing to reduce/eliminate competition) marginal cost^[91]. In India, on similar lines, a concept of dominant market power is prevalent. Section 4 of the Competition Act 2002, as amended by the Competition (Amendment) Act 2023, provides for the phrase ‘dominant position.’ The Act defines ‘dominant position’ in terms of:

“strength enjoyed by an enterprise, in the relevant market in India, which enables it to -

- (i) operate independently of the competitive forces prevailing in the relevant market;*

^[90] http://www.law.harvard.edu/programs/olin_center/papers/pdf/Kaplow_886.pdf

^[91] **Marginal Cost** can be defined as the difference in the overall cost of production caused by producing one additional unit of output.

(ii) affects its competitors or consumers or the relevant market in its favour.”^[92]

2.218. In India, as per the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002, a service provider shall be deemed to have significant market power if it holds a share of 30% of activities in the services mentioned above^[93]. Service providers are not required to obtain prior permission for entering into interconnect agreements. As per the “The Register of Interconnect Agreement Regulations 1999”, an agreement must be registered with the TRAI, after it has been signed.

2.219. Two TSPs challenged before Hon’ble TDSAT the decision of TRAI conveying its approval on their draft RIO with some alterations made therein and also challenged certain provisions of the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002 (Appeal No. 11 of 2002 and Appeal no. 12 of 2002). The main contention of TSP was that TRAI cannot override the terms and conditions of licenses and interconnections agreements and that the regulations are in breach of the provisions of the TRAI Act 1997. While allowing the appeal, Hon’ble TDSAT in its order dated 27.04.2005, *inter-alia*, held that the TRAI has powers to change the terms and conditions of interconnectivity of the license issued prior to 24th January 2000, only to the extent to bring the pre-2000 issued licenses into conformity with the licenses issued after 24th January 2000.

2.220. The power of TRAI to fix the terms and conditions of interconnectivity between service providers came up before the Hon’ble High Court of Delhi in the Writ Petition (Civil) 24105/2005. The Hon’ble High Court, vide its judgement^[94] dated 9th July, 2007, in para 48, *inter-alia*, held as under:

“48...The amending Act has bifurcated the functions of the Authority. It must now make recommendations under Section 11

^[92] <https://www.cci.gov.in/legal-framework/act>

^[93] www.trai.gov.in/release-publication/regulations/amendments-page/7206

^[94] https://delhihighcourt.nic.in/app/case_number_pdf/2007:DHC:733-DB/VJS09072007CW241052005.pdf

(1) (a) and by virtue of Section 11 (1) (b) must discharge several functions, including fixing the terms and conditions of interconnectivity between service providers, maintain interconnect agreements etc., as we have already adumbrated above...”

The Hon’ble High Court of Delhi in para 49 of the above mentioned judgement further held that:

“49... We cannot accept the argument that the law does not empower TRAI to fix terms of interconnection.”

The above mentioned judgement of the Hon’ble High Court of Delhi has obtained finality as the Special Leave to Appeal (Civil) No(s). 23612-23613/2007 filed against the said judgement of Hon’ble High Court of Delhi has been dismissed by the Hon’ble Supreme Court vide its order dated the 3rd January 2008^[95].

This judgement re-affirmed the power of TRAI to fix the terms and conditions of interconnectivity."

b) Key issues pertaining to these Regulations

2.221. As stated earlier, over the past two decades, the telecom sector has undergone transformational changes. The market structure has changed due to mergers, exits, and consolidation; technological transitions have moved networks from circuit-switched to all-IP and cloud-based architectures; and regulatory frameworks have been updated to reflect the realities of convergence, and digital services. As a result, there might be a case to examine the existing RIO framework to ensure that it fully addresses the present requirements. In this context, a review of the Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002, is relevant. In this regard, key issues to be discussed are as follows:

^[95] <https://api.sci.gov.in/jonew/bosir/orderpdf/535289.pdf>

i. Reference Interconnect Offer framework in a changing telecom landscape

- 2.222. Given the technological and market evolution since 2002, there is a rationale to revisit the regulatory mechanisms that ensure fair, reasonable, and non-discriminatory interconnection terms. Among the possible options, amending the existing RIO Regulations to incorporate changes in technology (such as IP-based interconnection, virtualization, and 5G), market structure (e.g., reduced number of operators), and licensing norms may help modernize the framework while retaining the familiarity and predictability of the RIO mechanism. On the other hand, prescribing a Standard Interconnection Agreement could bring more consistency and reduce prolonged negotiations, particularly in cases of dispute or delay. This approach may be especially useful in ensuring timely network interoperability in the public interest, but it must be carefully designed to maintain flexibility and account for varied business models and network architectures.
- 2.223. Alternatively, prescribing only broad guidelines based on fair, reasonable, and non-discriminatory principles and leaving the rest to bilateral negotiations could promote flexibility and reduce regulatory burden, especially in a matured and competitive market. However, this approach may not adequately safeguard smaller or new entrants in scenarios where bargaining power is uneven. Another option could be a hybrid approach incorporating mandatory RIO principles with fallback standard agreements in cases of negotiation failure. This approach appears to combine the benefits of all above mentioned approaches.
- 2.224. Another important consideration is the migration of existing interconnection agreements to any new regulatory framework that may emerge from this consultation. Given the importance of consistency, interoperability, and regulatory certainty, allowing voluntary migration to the new framework could benefit both operators and consumers. On the contrary, a rigid or mandatory migration may disrupt long-standing

agreements. So, it is important to strike a balance between regulatory modernization and operational continuity in consultation with all stakeholders.

2.225. Further, the current timelines and processes prescribed in the RIO Regulations 2002 for publishing, reviewing, and implementing RIOs may need to be revisited. In today's fast-paced, digital-first environment, where network changes and service launches occur rapidly, delays in finalizing interconnection terms can hinder service rollouts and consumer access. The timeline for responding to interconnection requests, submitting revised RIOs to the Authority, and dispute resolution mechanisms may require streamlining and digital enablement to enhance efficiency and predictability. Revisiting these procedural aspects will help make the interconnection framework more responsive, time-bound, and aligned with the needs of both operators and consumers.

2.226. In conclusion, stakeholders' comments are solicited on the following question to examine this matter further:

**Q23. 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.**

ii. Role of Significant Market Power (SMP) and RIO Disclosure Obligations

2.227. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002, was introduced with the objective of ensuring transparency, fairness, and non-discrimination in the interconnection process among telecom service providers (TSPs).

2.228. As discussed earlier, the RIO framework has certain categories of 'Services' i.e. Basic Service, Cellular Mobile Service, National Long-Distance Service, and International Long-Distance Service, and certain 'Activities' namely

Subscriber base, Turnover, Switching Capacity, Volume of Traffic in a licensed telecommunication service area for determination of SMP. This framework was designed to prevent dominant players from dictating interconnection terms unilaterally, thereby protecting competition and enabling new entrant and smaller players to negotiate on equal footing.

2.229. With the passage of time, the Indian telecom sector has undergone structural and technological changes. The market has moved from being highly fragmented to more consolidated, and technologically advanced IP-based networks are replacing the traditional circuit-switched systems. This required re-examination of the matter pertaining to SMP.

2.230. In light of these changes, to assess whether the current framework of SMP designation and selective RIO publication still serves its original intent or whether it needs to be updated to reflect contemporary market dynamics, stakeholders' comments are solicited on the following question:

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

2.231. 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002' aims to ensure fair and transparent interconnection arrangements among telecom service providers (TSPs). As described in earlier sections, under these regulations, TSPs with Significant Market Power (SMP), defined as those holding a 30% market share in a licensed service area are mandated to publish a Reference Interconnect Offer (RIO). The RIO outlines the technical and commercial terms for interconnection and serves as a standardized framework to facilitate efficient negotiations and agreements between operators. This approach minimizes repetitive negotiations and promotes a level playing field in the telecom sector.

- 2.232. Regarding the existing interconnection framework, the current model distinguishes between interconnection seekers and providers, delineating roles where one-party requests interconnection and the others facilitate it. This structure has been effective in clarifying responsibilities and streamlining interconnection agreements. Further, in today's digital environment, it would be prudent to review the possibility of publication of RIO on the SMPs' websites to ensure better accessibility for entrant TSPs. The Authority is of the opinion to re-examine the matter and seek detailed views of the stakeholders.
- 2.233. In the background of the above, stakeholders' comments are solicited on the following question to examine this matter:

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

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

- 2.234. The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations^[96], 2001, issued on 14th December 2001, established the framework for how service providers interconnect, share revenues, and levy charges across telecommunication networks. They replaced 'The Telecommunication Interconnection (Charges and Revenue sharing) Regulations, 1999' and sought to address emerging challenges in a multi-operator landscape.
- 2.235. At its core, the Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001 (hereinafter also referred as "2001 Regulations") sought to create a level playing field by laying down the principles for determining interconnection charges and the sharing of

^[96] <https://www.trai.gov.in/sites/default/files/2024-09/201112090239141733750intwll0-15.pdf>

revenues arising from telecommunication services. Key tenets included following broad principles:

- a. The principle of cost-based charging;
- b. For determination of cost-based interconnection charges, the main basis shall be “incremental or additional” costs directly attributable to the provision of interconnection by the interconnection provider;
- c. No service provider shall discriminate between service providers in the matter of levying of charges for interconnection;
- d. No service provider shall be charged for any interconnection facility it does not seek or require;

2.236. By regulating these charges, the Authority aimed to foster healthy competition, encourage investment in network infrastructure, and protect consumer interests by enabling universal access to telecommunication services without artificial barriers or exorbitant costs stemming from interconnection disputes. The regulations addressed various facets of interconnection, including the principles of interconnection, process and broad timelines of interconnection, interconnection charge and revenue sharing for basic and cellular mobile services. Interconnection charges were largely forborne under these regulations, however, revenue sharing rates for per unit of traffic for local calls, domestic long distance calls, and international calls were specifically provided. Essentially these regulations provided a structured approach to how operators would compensate each other for the use of their networks to originate, transit, and terminate calls.

2.237. This framework was crucial in an era where fixed-line and mobile services were rapidly expanding, necessitating robust and equitable interconnection regimes to facilitate communication across different service providers and technologies, thereby ensuring that subscribers of one network could reliably connect with subscribers of another.

2.238. Over the past two decades, the Indian telecommunications landscape has undergone a transformation, characterized by rapid technological advancements, exponential growth in subscriber base, making available

high speed data services, and a transition from voice-centric to data-centric consumption. While the principles provided in the 2001 Regulations remain relevant, the dynamic nature of the sector necessitates a periodic review to ensure that the regulatory framework stays abreast of these changes. In this regard, key issues to be discussed are as follows:

i. Standardizing and Promoting Transparent, Cost-Based Infrastructure Charges

- 2.239. Interconnection between TSPs involves not only the exchange of traffic but also the sharing of physical and network infrastructure. Over time, incumbent operators have introduced a range of infrastructure-related charges such as tower rental, space rental, duct sharing, passive cabling, POI setup, power supply, air conditioning, technology-specific charges, escalation charges, signalling point code change charges, emergency charges, late payment fees, etc.
- 2.240. Stakeholders in their response to pre-consultation paper highlighted this issue and stated that miscellaneous infrastructure charges are often levied unilaterally, lack transparency, and are not always based on actual costs or usage. One of the stakeholders also commented that, there have been instances where a TSP has charged other operators for signalling point code changes but has refused to pay similar charges in case there is a requirement of change of Signalling Point Code at their end. They requested that these charges should be made reciprocal.
- 2.241. Stakeholders indicated that the escalation of infrastructure charges over time is often not mutually agreed upon, leading to further ambiguity and conflict. Some stakeholders submitted that incumbent TSPs unilaterally determine Infrastructure charges, setting them at exorbitant rates with an annual increase of 10%, whereas TIR 2018 provides for mutually negotiated, reasonable and transparent charges. Infrastructure charges have escalated by approximately 500% between 2010 and 2025 due to the yearly 10% increment.

- 2.242. Another stakeholder stated that incumbent TSPs impose separate charges for duct usage, even though these costs should already be included in the POI infrastructure charges. Therefore, it should be prohibited from levying additional duct charges, as these should be considered part of the port and POI infrastructure charge. These issues not only increase operational costs but also create uncertainty and hinder efficient network interconnection.
- 2.243. To address these concerns, there is a need to examine this issue and explore the possibility of bringing clarity and standardization by explicitly including all permissible infrastructure-related charges and their escalation rates in the consultation process. This would ensure that such charges become cost-based, usage-based, reciprocal, and non-discriminatory, thereby eliminating ambiguity and fostering a more predictable and fairer interconnection environment. Clear regulatory guidance would also help prevent disputes, promote investment in shared infrastructure, and support the overall growth and efficiency of the telecom sector.
- 2.244. In background of the above, stakeholders' comments are solicited on the following question:

Q26. Should there be any interconnection charges? If yes, kindly provide details about the following:

- a. the types of infrastructure charges to be levied,**
- b. the guiding principles for determining such charges along with ceiling, if required, and**
- c. determination of time-based escalation methodology, if required.**

Kindly provide your response with justification.

ii. Relevance of Section IV, Schedules I and II of the 2001 Regulations

- 2.245. The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations 2001 laid the broad principles for addressing interconnection

and revenue sharing arrangements. The dynamic nature of the telecom sector necessitated the introduction of a more comprehensive framework. Consequently, the Telecommunication Interconnection Usage Charges Regulations, 2003, (hereinafter also referred as “2003 Regulations”) together with the successive amendments issued thereunder from time to time, have emerged as the primary framework governing usage-based charges for interconnection. Though, certain aspects of the 2001 regulations have not been repealed. To bring better clarity and compliance, the above two regulations are analysed and discussed in detail in the following sections.

- 2.246. The Telecommunication Interconnection (Charges and Revenue Sharing) Regulations, 2001 were introduced to create an interconnection arrangements framework between service providers. The regulations contain key provisions related to broad principles governing interconnection charges, revenue sharing arrangements, reporting requirements, and rate prescriptions for basic and cellular mobile services.
- 2.247. Section III of 2001 regulations outlines the broad principles governing interconnection charges, emphasizing that such charges should be cost-based, non-discriminatory, and transparent, and provides the general methodology for their determination rather than prescribing fixed rates. Section IV of 2001 regulations sets out the broad framework for revenue sharing arrangements, particularly in the context of interconnection usage charges (IUC). In addition to these sections, Schedules I and II of 2001 regulations specify applicable IUC rates for various categories of calls viz. local, domestic long distance and international calls, forming the operative basis of interconnection tariffs at the time of issuance. Regulation 4 of Section IV of the IUC Regulations, 2003, comprehensively addresses the determination and settlement of IUC, making certain provisions of the 2001 regulations, particularly Section IV and Schedules I-II redundant, and it may no longer reflect current market realities or cost structures.

- 2.248. Subsequently introduced Telecommunication Interconnection Usage Charges Regulations, 2003 are comprehensive, cost-based framework for origination, carriage, and termination charges in a multi-operator environment. This approach ensured that interconnection usage fees more accurately reflected network costs, promoting transparency and predictability in inter-operator settlements.
- 2.249. The regulation 4 under section IV of the Telecommunication Interconnection Usage Charges Regulations, 2003 specifies Interconnect Usage Charges i.e. Termination Charges and Carriage Charges, and Interconnect Usage Charges (IUC) for Short Message Service (SMS).
- 2.250. Therefore, it requires consideration whether Section IV along with their Schedules I & II of the 2001 Regulations are relevant in light of the framework introduced in 2003 Regulations.
- 2.251. The regulation 3 under Section III of the Telecommunication Interconnection Usage Charges Regulations, 2003 mentions that:

“3. Interconnection Charges

Interconnection Charges shall continue to be governed by “The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation, 2001(5 of 2001)” and The Telecommunication Interconnection (Port Charges) Regulation 2001 (6 of 2001), except to the extent modified by this Regulation”

- 2.252. Regulation 3 under Section III of the 2003 Regulations indicated above refer to the provisions of the 2001 Regulations except to the extent modified. It links the new framework back to the old one, potentially requiring stakeholders to cross-reference two sets of regulations to determine the applicable charges and principles. Therefore, it needs to be assessed whether this cross-reference continues to serve the purpose, or whether clarity would be better achieved by retaining only Regulation 4 under

section IV of the 2003 Regulations, which prescribes the operative IUC rates.

2.253. An alternative approach could also be to either restructure the relevant provisions across both sets of regulations to enhance clarity and improve ease of reference for stakeholders.

2.254. In the background of the above, stakeholders' comments are solicited on the following question to examine this matter further:

Q27. 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.

B.8 The Telecommunication Interconnection (Port Charges) Regulations, 2001

2.255. 'The Telecommunication Interconnection (Port Charges) Regulations^[97], 2001' were issued on 28th December 2001 to establish a framework for charging port access between telecom networks. As defined in these regulations, a 'Port' is a place of termination on a switch or distribution frame that provides ingress and egress of traffic between two

^[97] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7113>

interconnecting networks. These regulations specified that the bandwidth of the 'Port' shall be 2.048 Megabits per second, which is essentially an E1 link in TDM based interconnection. In a multi-operator environment, these regulations aimed to address anomalies in earlier charge structures that encouraged excess port demands and discouraged efficient provisioning. These regulations, *inter-alia*, specified slab-based ceiling rates for port charges based on the number of PCMs (Pulse Code Modulation) links or E1 links demanded by an interconnection seeker from an interconnection provider for terminating interconnection links as per the table below:

Table A: Port Charges notified in 'The Telecommunication Interconnection (Port Charges) Regulation, 2001'

[Applicable from 28.12.2001 to 31.03.2007]

S. No.	No. of Ports	'Port' charges (Ceiling of ₹ per port)
1.	1 to 16 PCMs	$N * 55,000$
2.	17 to 32 PCMs	$8,80,000 + (N-16) * 30,000$
3.	33 to 64 PCMs	$13,60,000 + (N-32) * 20,000$
4.	65 to 128 PCMs	$20,00,000 + (N-64) * 15,000$
5.	129 to 256 PCMs	$29,60,000 + (N-128) * 14,000$

Where 'N' refers to the number of ports demanded by the interconnection seeker within the capacity ranges under the column 'No. of ports.'

2.256. These charges were based on Directly Attributable Incremental Costs (DAIC)^[98] and Annual Recurring Expenditure (ARE)^[99], with provisions for mandatory reporting, review, and Authority's intervention in case of any dispute.

^[98] **Directly Attributable Incremental Costs** are the specific, additional costs caused by providing a telecom service or interconnection. It is the costs that would not exist without that service and can be clearly assigned to it.

^[99] **Annual Recurring Expenditure (ARE)** refers to the total predictable, yearly expenses that a business or individual expects to incur on a regular basis.

2.257. The port charges were subsequently revised on 2nd February 2007. After following a consultation process, the Authority notified ‘The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007’^[100] on 2nd February 2007 to be effective from 1st March 2007, vide which the ceiling rates for existing port charges were reduced by about 26% to 29% for various slabs. The revised port charges were as follows:

Table B: Port Charges notified in ‘The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007’

[Applicable from 01.04.2007 to 30.09.2012]

S. No.	No. of Ports	'Port' charges (in ₹) per annum
1.	1 to 16 PCMs	$N * 39,000$
2.	17 to 32 PCMs	$6,24,000 + (N-16) * 22,500$
3.	33 to 64 PCMs	$9,84,000 + (N-32) * 14,500$
4.	65 to 128 PCMs	$14,48,000 + (N-64) * 11,500$
5.	129 to 256 PCMS	$21,84,000 + (N-128) * 10,500$

Where ‘N’ refers to the number of ‘ports’ within the capacity ranges under the column ‘No. of Ports.’

2.258. The Authority again revised the port charges by issuing ‘The Telecommunication Interconnection (Port Charges) (Second Amendment) Regulations, 2012’ on 18th September 2012. Keeping in view the CAPEX costs of an E1 port in GMSC and TAX exchanges at that time, these regulations revised the ceiling of annual port charges as per the following table in the Schedule III of these regulations:

^[100] https://www.trai.gov.in/sites/default/files/2024-09/First_Amendment_02_Feb_2007.pdf

Table C: Ceiling of Annual Port Charges for MSC and Tandem/TAX Exchanges

[Applicable from 01.10.2012 till present]

S. No.	Type of Switch	Port Charges (Ceiling of ₹ per Port)
1	MSC	4,000
2	Tandem/TAX Exchange	10,000

2.259. A way forward was provided for the review of port charges in these regulations in view of the migration to IP based interconnection that had already started by that time and noted following in the Explanatory Memorandum:

“...Now, migration to Next Generation Networks (NGN) has started and the major telecommunication operators in India have already implemented IP based core transport network for carrying voice and data traffic. In some cases IP/Ethernet elements have extended into access and aggregation networks. In the changed circumstances, instead of reviewing TDM switch based interconnect exchange concept, in view of the advancement in technology, extension of networks, entry of various new operators, TRAI is in process of studying that whether peer-to-peer interconnection, IP based interconnection exchange or a combination would be preferable. A comprehensive consultation paper in this regard would be issued, separately...”

“...the Authority will keep close watch and if requires, either suo motu or on the basis of requests received from the service providers, it may review the port charges...”

a) Legal Matters related to the Telecommunication Interconnection (Port Charges) Regulations, 2001

- 2.260. The Telecommunication Interconnection (Port Charges) Regulations, 2001 (hereinafter referred to as “the Regulations” in this section only) were introduced under Sections 11(1)(b) and 36 of the Telecom Regulatory Authority of India (TRAI) Act, 1997, to standardize port charges payable by one service provider (interconnection seeker) to another service provider (interconnection provider) for the use of interconnection ports, ensuring non-discriminatory access and fostering competition. These regulations primarily aim to establish a fair and transparent regime for charges levied by access providers for providing interconnection ports to other service providers.
- 2.261. Over time, the Authority has reviewed and amended these regulations in accordance with the evolving technological landscape and market dynamics. One such amendment was the “Telecommunication Interconnection (Port Charges) (Second Amendment) Regulations, 2012,” dated 18.09.2012. While the regulatory intent was to simplify the interconnection framework and enhance regulatory clarity, these changes were met with legal resistance from certain service providers.
- 2.262. Some telecom service providers contested the regulations on the grounds that they had overridden existing interconnection agreements and altered the financial and operational arrangements previously agreed upon with other telecom service providers.
- 2.263. There are litigation matters presently going on in the Hon’ble High Court of Delhi in respect of these regulations vide Writ Petition (civil) 1338 of 2014 and Writ Petition (civil) 2816 of 2014. The petitioner TSPs had challenged the validity of the “Telecommunication Interconnection (Port Charges) (Second Amendment) Regulations, 2012 dated 18th September 2012” on several legal and procedural grounds and had prayed for the following:

“(i) Quash and set aside the impugned Telecommunication Interconnection (Port Charges) (2nd Amendment) Regulations, 2012 dated 18.09.2012 issued by the Respondent No. 1/TRAI;

(ii) Direct the members of Respondent No. 2 and Respondent No. 3 to pay the port charges in terms of the rates agreed under the Interconnect Agreement.”

2.264. It had been stated by the petitioners that the impugned regulations were violative of the principles of natural justice, as no prior opportunity of hearing was afforded to the petitioner before the decision to alter port charges was made. According to the petitioner the revised charges were considerably below the actual costs incurred by them for provisioning interconnection ports to TSPs, leading to financial prejudice.

2.265. The petitioners further submitted that they were not put on specific notice regarding the abolition of the slab-based system of port charges, and thus, they were denied an opportunity to comment on this aspect of these regulations. It was also contended that TRAI had altered the methodology of cost apportionment, which disproportionately impacted providers based on the volume of ports demanded.

2.266. Whereas, TRAI asserted that due process was strictly adhered to while formulating the 2012 amendment. A comprehensive consultation process was conducted involving the issuance of a pre-consultation paper, a formal consultation paper, and the organisation of open house discussions to solicit views from all stakeholders. The Authority maintains that the regulations were framed following a transparent, fair, and consultative approach. This matter is currently pending before the Hon’ble High Court of Delhi.

i. Reviewing port technology, size, and charges for evolving networks

2.267. The Telecommunication Interconnection (Port Charges) Regulations, 2001, were conceptualized and implemented at a time when circuit-switched (E1 or TDM based) networks dominated the telecom infrastructure. The

concept of a "port" and its associated charges were intrinsically linked to the physical E1 interface and capacity planning methodologies of these traditional networks, primarily designed for voice traffic. However, the telecommunications industry worldwide has since witnessed a paradigm shift, characterized by a migration from legacy E1 based circuit switched networks working on TDM technology to advanced, packet-based Internet Protocol (IP) networks. This transition is not merely an incremental upgrade but a fundamental change in how voice and SMSs are transmitted, processed in the data packet form in the modern telecommunication networks.

- 2.268. Currently, fixed wireline and wireless networks are interconnected for voice and SMS traffic mostly using E1 based Time Division Multiplexing (TDM) links. A 'port' or an E1 link provides a bandwidth of 2.048 Mbps divided into 32 timeslots, with each timeslot consisting of 64 Kbps capacity, where 30 timeslots carry voice signal, and 2 timeslots are used for signalling. Typical interconnection sizes involve multiples of E1 links (such as 2, 4, 8, 16, and upwards) aggregated based on required capacity and traffic demands of the service providers.
- 2.269. The interface standards for E1 based TDM interconnection conform to ITU-T recommendations G.703 for the physical and electrical characteristics of the E1 interface and G.704 for framing and timeslot assignments.
- 2.270. Interconnection using E1 links is typically electrical, using balanced 120-ohm twisted pair copper cables over shorter distances. For longer distances or higher capacity requirements, E1 links are bundled and transmitted using higher capacity transmission equipment for which optical fiber is used along with electrical-to-optical conversion equipment, providing enhanced signal integrity and reduced attenuation. This E1/TDM based interconnection formed the backbone for circuit-switched services, efficiently carrying voice and SMS traffic between fixed wireline and wireless networks at that point of time.

- 2.271. This technological evolution coupled with reductions in the electronic and optical equipment costs and an exponential surge in data traffic (driven by broadband, 4G, and the advent of 5G technologies), necessitates a review of the existing regulations. The current definitions and assumptions regarding "port technology", "port size (capacity)", and consequently, "port charges", needs examination to assess whether it accurately reflect the underlying economic costs or the operational realities of modern IP-based networks. For instance, IP interconnection often involves different scaling mechanisms, bandwidth considerations, and network elements as compared to traditional E1/TDM ports. Therefore, it is crucial to understand what changes are required to ensure that interconnection arrangements remain efficient, contemporary, cost-reflective, and relevant, preventing any disincentives for technological upgrades or disproportionate cost burdens on service providers.
- 2.272. During pre-consultation process, many stakeholders had expressed their views requesting review of port charges due to technological and other reasons like need for examination to ascertain that they are fair, competitive and reflective of modern infrastructure and technology costs.
- 2.273. Telecommunication Engineering Centre (TEC) standards titled 'IP Based Interconnection between Service Providers Networks'^[101] defines various requirements to be met at the IP interconnection interface to enable the public telecom networks to interconnect over IP links. These interfaces include Dense Wavelength Division Multiplexing (DWDM) based links, optical or electrical Synchronous Digital Hierarchy (SDH) connections, and direct Ethernet links, supporting speeds like Fast Ethernet, Gigabit Ethernet, and 10 Gigabit Ethernet depending on the traffic load and network requirements. The optical interface provides varying link speeds like 1 Gbps, 10 Gbps, 100 Gbps and above as per the network requirements.

^[101] <https://tec.gov.in/pdf/IRs/TEC-SD-IT-IPI-001-01-NOV-15.pdf>

2.274. Connectivity is typically established using optical fiber for backbone and long-haul segments due to its high bandwidth and low latency, while electrical copper connections may be used in short-haul or legacy scenarios with comparatively lower bandwidth requirements. The interface standards for IP connectivity conform to Ethernet (IEEE 802.3), SDH, and above-mentioned TEC specified standard. Service providers are required to follow these standards when establishing their interconnections with each other to maintain service quality, ensure reliable traffic exchange, and guarantee interoperability at every point of interconnection between mobile-mobile and mobile-landline networks in India.

2.275. The above-mentioned TEC standard titled 'IP Based Interconnection between Service Providers Networks' also provides for quality of service (QoS) as well as it outlines parameters and measures to maintain end-to-end voice quality including latency^[102], jitter^[103], packet loss^[104], and overall network efficiency. Performance indicators such as round-trip delay^[105], mean opinion score (MOS)^[106], answer seizure ratio^[107], average length of

^[102] **Latency** in IP telecom network is how long it takes for data to travel across a network. Shorter latency means faster communication.

^[103] **Jitter** in an IP telecom network is the variation in delay between when data packets are sent and when they arrive. Instead of arriving at steady, regular times, packets may come faster or slower, causing uneven delivery. This can make voice or video calls sound broken or look disrupted.

^[104] **Packet loss** in an IP telecom network happens when some data packets sent from one device do not reach their destination. This loss can cause voice or video calls to sound broken, freeze, or drop.

^[105] **Round-trip delay** is the total time it takes for a signal or data packet to travel from the source to the destination and back again to the source, including the time for transmission, propagation, and acknowledgment processing. It is typically measured in milliseconds.

^[106] **Mean opinion score** is a subjective parameter defined in ITU-T Rec. P.10 about the performance of telephone transmission system used either for conversation or listening to spoken material.

^[107] **Answer Seizures Ratio** expresses the ratio of the number of calls effectively answered in a given period of time against the number of call session requests in that time.

conversation^[108] and post-gateway ringing delay^[109] are considered to maintain service quality.

2.276. With the proliferation of new and emerging technologies, such as IP-based voice (VoIP), IP Multimedia Subsystem (IMS), and 5G networks, there is a need to examine whether current interconnection framework adequately cover all facets of modern interconnection, therefore, stakeholders' comments are solicited on the following question:

Q28. Is there a need for change, if any, required in respect of following:

- i. Port Technology**
- ii. Port Size (Capacity)**
- iii. Port Charges**
- iv. Any other related aspect**

Kindly provide a detailed response with justification.

ii. Re-evaluating network elements and uniformity of port charges across services/technologies

2.277. The calculation of port charges, as stipulated in the Telecommunication Interconnection (Port Charges) Regulations, 2001, was based on a set of identifiable network elements and equipment prevalent in TDM-centric networks. However, the architectural transformation towards IP-based networks means that the composition and cost contribution of various network elements at the interconnection points may have changed. Modern IP interconnection involves elements such as routers, IP switches, session border controllers (SBCs), virtual routers, and media gateways, which differ from the traditional exchanges and transmission systems. Therefore, to ascertain which specific network elements and equipment should now be considered for the accurate and transparent calculation of port charges

^[108] **Average Length of Conversation** which expresses the average time in seconds of conversations for all the calls successfully setup in a given period of time.

^[109] **Post Gateway Ringing Delay** which expresses the time elapsed between a request for a call setup and the alerting signal for that call.

across different service categories, stakeholders' comments are solicited on the following question to further examine this issue:

Q29. Should port charges be uniform across all services and technologies?

Kindly provide detailed response for the following categories specifically:

- a. Fixed Line Service/ Mobile Service/ NLD service/ ILD service, and**
- b. E1 (TDM) based interconnection and IP based interconnection.**

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.

iii. Reviewing demand estimation procedures for IP-based Interconnection

2.278. The Telecommunication Interconnection (Port Charges) Regulation 2001, and subsequently The Telecommunication Interconnection Regulations, 2018, prescribe procedures for demand estimation, typically based on traffic projections measured in Erlangs on a half-yearly basis. This methodology has historically been effective and practical for circuit switched networks, where Erlang B table^[110] and grade of service (GoS)^[111] are standard tools for dimensioning voice circuits and estimating the

^[110] An **Erlang B** table is a precomputed chart that shows the maximum traffic load (in erlangs) a given number of circuits (lines, channels) can handle for a specified **blocking probability** i.e. the chance a call will be lost because all circuits are busy.

^[111] **Grade of Service** is a performance metric in telecommunication networks, expressed as a decimal fraction, which quantifies the likelihood that a call will be blocked due to insufficient resources or experience an unacceptable delay.

$$\text{Grade of Service} = \frac{\text{Number of Blocked Calls}}{\text{Total Number of Offered Calls}}$$

This ratio provides a direct measure of service accessibility, where lower values indicate a higher quality of service.

number of ports required based on call blocking probabilities. TIR-2018 under Schedule-II prescribes that:

“For given number of channels of POI, its capacity for 0.5% Grade of Service shall be deduced from the Erlang B table...”

Traditional E1/TDM (Time Division Multiplexing) networks rely heavily on Erlang calculations to dimension voice circuits essentially, how many simultaneous calls (voice channels) a given number of E1 lines can support, and the probability of call blocking (Erlang B). The focus is on the effective circuit utilization and reducing call blocking. The fundamental assumption of Erlang-based models is the continuous occupancy of a channel for the duration of a call, which aligns well with the behaviour of TDM voice networks which are essentially circuit switched networks.

2.279. However, the telecom industry's advanced technological development requiring IP-based interconnection presents a challenge to the continued relevance and practicality of Erlang-based demand estimation. IP-based interconnections are packet switched and handle voice and messages as data packets over a shared infrastructure between telecom operators, meaning resources are shared dynamically among multiple users, and traffic is inherently bursty rather than continuous.

2.280. As already explained in previous section about the TEC standard titled 'IP Based Interconnection between Service Providers Networks' which contains a section on quality of service (QoS) of IP based interconnections along with the relevant parameters to maintain QoS like latency, jitter, packet loss, round-trip delay, mean opinion score (MOS), answer seizure ratio, average length of conversation and post-gateway ringing delay are considered to maintain service quality and are more pertinent metrics for IP network dimensioning than Erlangs. Applying an Erlang model alone and directly to IP traffic may not be appropriate for accurate capacity planning, potentially resulting in either under-provisioning (leading to congestion, packet loss, and poor quality of service) or over-provisioning (resulting in inefficient resource utilization and higher operational costs that could be

passed on to consumers). In this context, congestion avoidance and congestion management techniques play a vital role in telecom IP interconnection. Congestion avoidance proactively prevents network overload by early detection and selective packet dropping to signal sources to reduce transmission rates, thereby maintaining optimal traffic flow. Congestion management handles excess traffic by prioritizing and scheduling packets to ensure that critical services receive the necessary resources during high traffic conditions. These methods, combined with agreed QoS parameters, help maintain service quality across interconnection points and support efficient network dimensioning and resource allocation.

2.281. Therefore, to check the effectiveness of the current Erlang-based demand estimation procedures in the context of IP interconnection, stakeholders' comments are solicited on the following question to examine this issue:

Q30. 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.

B.9 The Register of Interconnect Agreements Regulations, 1999

2.282. The Register of Interconnect Agreements Regulations, 1999^[112], were issued on 31st August 1999 and made effective from 1st September 1999. The overall objective of the Register of Interconnect Agreements

^[112] <https://www.trai.gov.in/release-publication/regulations/amendments-page/7091>

Regulations, 1999, was to establish a regulatory framework for the maintenance of a register of all interconnection agreements between telecom service providers, ensure compliance with the terms and conditions of their licences, and to regulate the terms and conditions of interconnection between providers. The register is maintained in three parts:

- i. A list of all agreements;
- ii. Confidential portions as directed by TRAI; and
- iii. Non-confidential portions of the agreement.

2.283. The non-confidential portion of the agreement shall be accessible for inspection to any member of the public upon payment of a fee prescribed in the regulations, which is ₹ 50 per hour and ₹ 20 per page for copy. Prior to these regulations, the terms and conditions of interconnection agreements between various service providers were often opaque to third parties, leading to potential disputes and hindrances to market entry and expansion.

2.284. As the communications sector evolved, the First Amendment of Register of Interconnect Agreements Regulations, 1999, were issued on 3rd February 2004, following a government notification that expanded the definition of “telecommunication services” to include broadcasting and cable services. This amendment brought broadcasters and multi-service operators (MSOs) under the scope of the regulations, requiring them to register their interconnect agreements. It also introduced several new definitions such as broadcaster, cable operator, broadcasting service etc., to reflect the inclusion of these sectors and ensure that interconnection practices in broadcasting were also monitored and standardized.

2.285. Subsequently, the Second Amendment on 31st December 2004 reversed many of the changes introduced earlier. It deleted the newly added definitions related to the broadcasting and cable sectors and removed the requirement for broadcasters and MSOs to register their agreements. The

amendment also restored the original, simplified definition of “interconnection,” focusing on the core technical and commercial arrangements between telecom networks.

2.286. To further streamline regulatory processes, the Third Amendment issued on 4th March 2005 revised the confidentiality mechanism under these regulations. It replaced the earlier detailed procedure for confidentiality with a new provision linking it to ‘The Telecom Regulatory Authority of India (Access to Information) Regulations, 2005’^[113] dated 4th March 2005.

2.287. At the time of their formulation, the technological and operational landscape of the Indian telecom sector was considerably different. The primary modes of data submission and record keeping relied heavily on physical formats, such as print copies and floppy disks. These methods were standard practice in the late 1990s and served the purpose of creating a centralized repository for regulatory oversight. The regulations also laid down procedures for requesting and obtaining copies of these agreements by interested parties, typically other TSPs or stakeholders, subject to certain conditions and charges.

2.288. However, the advancements in digital technology and the adoption of electronic communication and data management systems have since transformed administrative and regulatory processes globally. The methods prescribed in the 1999 Regulations, while appropriate for their time, may now pose practical challenges in terms of efficiency, speed, accessibility, and environmental sustainability. This necessitates a review to ascertain whether the current procedures align with modern digital governance standards and facilitate a more agile and efficient regulatory framework.

^[113] https://www.trai.gov.in/sites/default/files/2024-09/Regulation_04032005_0.pdf

i. Digitizing the Submission and Access Process for Interconnection Agreements

2.289. The 'Register of Interconnect Agreements Regulations, 1999' mandated the submission of interconnection agreements through physical means, specifically mentioning "floppy disks and print copies." These were common and accepted methods for data exchange and record keeping at that time. The reliance on physical documentation ensured a tangible record and was suitable given the prevalent storage media. However, over two decades later, the digital transformation has swept across all sectors, including governance and regulation. The continued use of largely obsolete technology, and reliance on extensive print copies are increasingly inefficient, resource-intensive, and out of sync with modern digital practices.

2.290. The current physical process for both submitting agreements by Telecom Service Providers (TSPs) and for interested parties to obtain copies presents several practical challenges. It leads to delays in processing, requires physical movement of documents, increases administrative overheads, and contributes to environmental concerns due to paper consumption. Furthermore, it hinders real-time access and efficient data management, which are crucial in a fast paced and dynamic telecom market where timely information can impact competitive strategies and dispute resolution.

2.291. One of the stakeholders in its pre consultation comments, in context of these regulations, stated that:

“...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...”

2.292. Therefore, to examine the viability of transitioning to a fully digital and online process for the submission and dissemination of interconnection

agreements, stakeholders' comments are solicited on the following question:

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

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.

C. Generic Questions pertaining to all existing interconnection regulations

i. Financial Disincentive Framework

2.293. To regulate interconnection arrangement, the Authority has, *inter-alia*, notified various interconnection regulations, including 'The Telecommunication Interconnection Regulations, 2018'; 'Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006'; 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002'; and 'The Register of Interconnect Agreements Regulations, 1999'. Among these regulations, the provision for imposing financial disincentive for non-compliance of the regulations exists only in 'The Telecommunication Interconnection Regulations, 2018'.

2.294. The Register of Interconnect Agreements Regulations, 1999 mandate that all service providers register interconnection agreements with the Authority. The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002, *inter-alia*, require service providers with significant market power to publish Reference Interconnect Offers. The Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006 provides that all eligible service providers shall allow interconnection to enable subscribers of one network to access

Intelligent Network Services of other networks. No service provider shall deny their subscribers access to Intelligent Network services available in a multi-operator environment.

- 2.295. While procedural timelines and obligations have been prescribed under these regulations, stakeholders' experience indicates that non-compliance with interconnection commitments, including delays or deviations from agreed terms, can adversely impact service rollout, competition, and consumer welfare.
- 2.296. Introduction of financial disincentives provision as a regulatory tool can serve as a deterrent for non-compliance, helping maintain the effective regulation of the interconnection framework. It can incentivize timely completion of obligations such as execution of agreements, provisioning of Points of Interconnection, and adherence to published Reference Interconnect Offers, etc.
- 2.297. Accordingly, this consultation seeks to explore and examine the need for introducing provisions relating to financial disincentives within the 'Intelligent Network Services in Multi-Operator and Multi-Network Scenario Regulations, 2006', 'The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002', and 'The Register of Interconnect Agreements Regulations, 1999'.
- 2.298. In this background, stakeholders' comments are solicited on the following question:

Q32. 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.

ii. Transition mechanism for Interconnection Agreements

2.299. This consultation process on telecom interconnections is expected to culminate in the formulation of a new regulatory framework that could potentially redefine the terms and conditions of interconnection agreements between Telecom Service Providers. This evolving framework reflects the need to align regulatory policies with the rapid technological developments. The consultation aims to comprehensively review the existing interconnection regulations and identify gaps and challenges in the current framework, which was designed in an earlier technological context.

2.300. As a result, the new framework that will emerge from this consultation process will likely impact the existing terms and conditions of the interconnection agreements among TSPs. A structured, phased roadmap with clear milestones will ensure a smooth transition to the new interconnection framework.

2.301. Timelines should be realistic and implementable, striking a balance between the urgency for regulatory modernization and the industry's practical capability to implement changes, especially considering the diversity of providers and varying technological maturity.

2.302. In the background of the above, stakeholders' comments are solicited on the following question to examine this matter:

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

Kindly provide detailed response with justification.

iii. Interconnection framework for satellite-based telecommunications services

- 2.303. The question of whether an interconnection framework should be established for satellite-based telecom services arises amidst the growing importance of satellite technologies in extending telecommunication coverage to remote and underserved areas, needs to be discussed. Satellite-based networks provide vital connectivity where terrestrial infrastructure, including PLMN and PSTN, may not be feasible or cost-effective. As such, integrating these satellite services within the broader telecom ecosystem, including seamless interconnection with existing PLMN and PSTN networks, including voice and SMS traffic interoperability across mobile and landline networks, may also need examination.
- 2.304. Further, it needs to be assessed that whether separate interconnection framework is required for Mobile Satellite Service (MSS) and Fixed Satellite Service (FSS), or the existing interconnection framework would be sufficient to meet the requirements of satellite-based telecommunications networks. In case, a separate regulatory framework is required for these interconnections, the key technical requirements may include specifying the nature and location of Points of Interconnect (POIs), which involve satellite earth station gateways and their interconnection with other satellite networks, PLMN and PSTN. Regulatory considerations could address interconnection charges, interconnection usage charges, quality of service guarantees, and terms and conditions of interconnection agreements, ensuring effective interoperability among satellite, PLMN, and PSTN operators.
- 2.305. One may argue that since MSS-based telecommunications network are largely similar to the PLMN and as FSS-based telecommunications network are similar to the PSTN, hence no separate interconnection framework for the satellite-based telecommunications network may be required. Therefore, it has to be examined whether the interconnection framework

for PLMN and PSTN can be adopted for satellite-based telecommunications networks.

2.306. Satellite-based telecommunications network would likely have a national footprint with certain limited number of gateways. The connectivity with the satellite-based telecommunications network is extended through these gateways. The interconnection of satellite-based telecommunications network with PLMN and PSTN, for which POIs are existing at LSA and below LSA level respectively, needs to be examined.

2.307. In the background of the above, stakeholders' comments are solicited on the following question to further examine this matter:

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

iv. Adoption of Global Best Practices

2.308. The Authority recognizes that global best practices in telecom interconnection regulation emphasize the need for a transparent, fair, and efficient regulatory framework that fosters healthy competition and safeguards consumer interests. Key principles observed internationally include ensuring non-discriminatory access to network infrastructure, mandating cost-based and transparent pricing mechanisms, and establishing timely and effective dispute resolution processes. Furthermore, regulators globally encourage enabling commercial negotiations supported by clear regulatory guidelines. Such practices

contribute to creating a level playing field, promoting infrastructure sharing, and encouraging innovation and investment within the telecom sector.

2.309. In light of this, all stakeholders are requested to provide their inputs, share relevant international best practices, and suggest measures that may be adapted to the Indian telecom ecosystem. Comments and recommendations from stakeholders will be crucial to shaping a forward-looking and robust regulatory policy for interconnection.

2.310. In the background of the above, stakeholders' comments are solicited on the following questions to examine this subject:

Q35. Are there any specific regulatory models from other countries that have successfully addressed interconnection related issues and challenges which can be adapted in the Indian telecom sector? If yes, kindly provide details of such international best practices.

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

Chapter 3 – Issues for Consultation

A. Regulations-wise Specific Questions

A.1. The Telecommunication Interconnection Regulations, 2018

- Q1.** For PSTN to PSTN, PLMN to PSTN and PSTN to PLMN, should the interconnection level be specified at LSA level? If yes, should the existing POIs at the LDCA/SDCA level also be migrated to the LSA level? Kindly justify your response.
- Q2.** For PSTN to PSTN, PLMN to PSTN, PSTN to PLMN and PLMN to PLMN, should interconnection be allowed at a level other than the LSA level, based on mutual agreement? Kindly justify your response.
- Q3.** Based on your response to Question 1 and 2 above, what changes, if any, are required in the level of interconnection / point of traffic handover as provided in the following:
- a) Telecommunication Interconnection Regulations (TIR), 2018, and
 - b) Guidelines annexed to the Telecommunication Interconnection (Reference Interconnection Offer) Regulations, 2002?
- Kindly justify your response.
- Q4.** 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:
- i. PSTN-PSTN interconnection,
 - ii. PLMN-PLMN interconnection, and
 - iii. PLMN-PSTN interconnection?

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

- Q5.** Is there a need to incorporate security provisions in the interconnection framework to ensure network security? If yes, kindly provide details along with an appropriate architectural diagram. Kindly justify your response.
- Q6.** (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.
- Q7.** 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.
- Q8.** 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.
- Q9.** Whether there is a need to revise the existing process of disconnection of POIs as provided in the regulation 11 of the Telecommunication Interconnection Regulations (TIR) 2018? If yes, what specific changes should be done in the disconnection procedure?
Kindly justify your response.

- Q10.** 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.
- Q11.** In order to safeguard the interest of TSPs arising due to financial obligations of interconnection, is there a requirement for furnishing bank guarantee by one TSP to the other TSP? 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.
- Q12.** 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.
- Q13.** 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.

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

- Q14.** 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.
- Q15.** 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.

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

Q16. Is there a need to revise the existing access charge to be paid by the service provider to the originating provider for IN services? If yes, kindly provide detailed explanation; if not, kindly provide justification.

Q17. 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.

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

Q18. 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.

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

Q19. 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.

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

Q21. 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.

Q22. 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.

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

Q23. 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.

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

Kindly provide your response with justification.

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

Kindly justify your response.

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

Q26. Should there be any interconnection charges? If yes, kindly provide details about the following:

- a. the types of infrastructure charges to be levied,

- b. the guiding principles for determining such charges along with ceiling, if required, and
- c. determination of time-based escalation methodology, if required.

Kindly provide your response with justification.

Q27. 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.

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

Q28. Is there a need for change, if any, required in respect of following:

- i. Port Technology
- ii. Port Size (Capacity)
- iii. Port Charges
- iv. Any other related aspect

Kindly provide a detailed response with justification.

Q29. Should port charges be uniform across all services and technologies? Kindly provide detailed response for the following categories specifically:

- a. Fixed Line Service/ Mobile Service/ NLD service/ ILD service, and
- b. E1 (TDM) based interconnection and IP based interconnection.

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.

Q30. 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.

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

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

- 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.

B. Generic Questions pertaining to all existing interconnection regulations

Q32. 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.

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

Kindly provide detailed response with justification.

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

Q35. Are there any specific regulatory models from other countries that have successfully addressed interconnection related issues and challenges which can be adapted in the Indian telecom sector? If yes, kindly provide details of such international best practices.

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

Note:

1. All principal regulations referred to in this consultation paper should be read together with their subsequent amendments, as issued from time to time.
2. For all purposes, the Gazette notifications of regulations and their amendments mentioned in this consultation paper may be referred to.

The Telecommunication Interconnection Regulations, 2018

**THE TELECOMMUNICATION INTERCONNECTION REGULATIONS, 2018
(1 of 2018)**

**TELECOM REGULATORY AUTHORITY OF INDIA
NOTIFICATION**

New Delhi, the 1st January, 2018

File No. 10-10/2016-BB&PA --- In exercise of the powers conferred upon it under section 36, read with sub-clauses (ii), (iii) and (iv) of clause (b) of sub-section (1) of section 11, of the Telecom Regulatory Authority of India Act, 1997 (24 of 1997), the Telecom Regulatory Authority of India hereby makes the following regulations, namely:-

**CHAPTER I
PRELIMINARY**

1. Short title, extent and commencement. ---

- (1) These regulations may be called the Telecommunication Interconnection Regulations, 2018 (1 of 2018).
- (2) They shall come into effect from the 1st February, 2018.

2. Definitions. - In these regulations, unless the context otherwise requires, -

- (1) "Act" means the Telecom Regulatory Authority of India Act, 1997 (24 of 1997);
- (2) "Authority" means the Telecom Regulatory Authority of India established under sub-section (1) of section 3 of the Act;
- (3) "busy hour" means the continuous one-hour period lying wholly in a given time interval for which the traffic is highest;
- (4) "interconnection" means the commercial and technical arrangements under which service providers connect their equipment, network and services to enable their customers to have access to the customers, services and networks of other service providers;
- (5) "interconnection charge" means the charges payable by one service provider to another service provider for interconnection;

- (6) “interconnection usage charges” or “IUC” means the charge payable by one service provider to one or more service providers for usage of the network elements for origination, transit or termination of the calls;
- (7) “licence” means a licence granted or having effect as if granted under Section 4 of the Indian Telegraph Act, 1885, (13 of 1885) and Indian Wireless Telegraphy Act, 1933 (17 of 1933);
- (8) “point of interconnection” or “POI” means a mutually agreed point of demarcation (based on TRAI determination/ regulations/License Agreement) where the exchange of traffic between the two parties takes place;
- (9) “port” means a place of termination on a switch/ distribution frame to provide ingress and egress of traffic between two interconnecting networks;
- (10) “regulations” means the Telecommunication Interconnection Regulations, 2018 (1 of 2018);
- (11) “Schedule ” means the Schedule appended to these regulations;
- (12) all other words and expressions used in these regulations but not defined, and defined in the Act and the rules and other regulations made thereunder, shall have the meanings respectively assigned to them in the Act or the rules or other regulations, as the case may be.

CHAPTER II

INTERCONNECTION AGREEMENT

- 3. **Interconnection agreement.** - Every service provider shall, within thirty days of receipt of request from a service provider, enter into interconnection agreement, on non-discriminatory basis, with such service provider.
- 4. **Procedure for entering into interconnection agreement. ---**
 - (1) A service provider, who intends to enter into an interconnection agreement with another service provider, shall make request to such service provider alongwith ---
 - (a) a copy of its license agreement;
 - (b) name of the services for which interconnection is sought;
 - (c) proposed locations of its points of interconnection; and
 - (d) name of technology to be used for interconnection at each POI.
 - (2) The service provider, to whom request has been made under sub-regulation (1) for entering into interconnection agreement, shall, within five working days of receipt of the request, send draft interconnection agreement to the service provider from whom the request was received.

- (3) On receipt of the draft interconnection agreement issued under sub-regulation (2), the service provider who made the request for entering into interconnection agreement shall, within five working days, submit its suggestions and objections, if any, on such draft to the other service provider.

CHAPTER III

BANK GUARANTEE

5. Bank guarantees. ---

- (1) The service provider, who made request for entering into interconnection agreement, shall be liable to furnish bank guarantee, for a period of six months from the date of establishment of initial interconnection for the total number of ports sought during such period, if demanded by the service provider to whom request for entering into interconnection agreement was made:

Provided that the amount of such bank guarantee shall be determined in the manner specified in the Schedule-I to these regulations.

- (2) At the end of six months from the date of establishment of initial interconnection or on the 1st February, 2018, whichever is later, liability to furnish bank guarantee shall be determined in the following manner:

- (a) the interconnection usage charges payable by the two interconnecting service providers to each other for the two months prior to the end of six months from the date of establishment of initial interconnection or the 1st February, 2018, whichever is later, shall be calculated and the service provider who is liable to pay interconnection usage charges, after adjustment, to the other service provider, shall be liable to furnish bank guarantee for a period of six months, if demanded by the other service provider;
- (b) the bank guarantee shall be limited to the amount of interconnection usage charges payable by a service provider after adjustment under clause (a); and
- (c) this process to determine the liability of a service provider to furnish the bank guarantee shall be repeated at the end of every six month.

CHAPTER IV
PROVISIONING AND AUGMENTATION OF PORTS AT POIs

6. Seeking ports at POIs. ---

- (1) For a period of two years from the date of establishment of initial interconnection, the service provider, who made the request for entering into interconnection agreement, shall seek ports at POIs from the other service provider to meet the demand of incoming and outgoing traffic at the POIs.
- (2) At the end of two years from the date of establishment of initial interconnection or on the 1st February, 2018, whichever is later, the total ports existing at a POI shall be converted for carrying one way traffic in such a manner that the number of ports for sending the outgoing traffic of each service provider to the other service provider are in proportion to their outgoing traffics averaged over a period of preceding three months; and
- (3) After the conversion of ports under sub-regulation (2), each service provider shall seek ports to meet the requirement of its outgoing traffic.

¹[Provided that the port charges and infrastructure charges, for all ports provided before the 1st February, 2018, shall continue to be payable as per the terms and conditions which were applicable to them before the 1st February, 2018.]

- 7. Request for initial provisioning of ports. -**After entering into an interconnection agreement, the service provider, who made request for entering into interconnection agreement, may request the other service provider to provide such number of ports at POIs which shall meet the requirement of its outgoing and incoming traffic at the POIs for a period of three months from the date of initial interconnection.

- 8. ²[Request for augmentation of POIs ---** (1) Every service provider shall provide to the interconnecting service provider, at interval of every six months, its forecast of busy hour 2 outgoing traffic, for the succeeding six months, at each POI and the first such forecast shall be provided within sixty days of

¹ Ins. by the First Amendment Regulations, 2018, reg. 2 (w.e.f. 05.07.2018)

² Subs. by the First Amendment Regulations, 2018, reg. 3 (w.e.f. 05.07.2018) for the following:

“Request for augmentation of POIs. - A service provider may request the other service provider for additional ports at a POI, if the projected capacity utilization of the ports at such POI, at the end of thirty days from the date of placing the request, is likely to be more than seventy per cent of the ports at the POI and such projected capacity utilization of the ports at the POI shall be determined on the basis of the daily traffic for the preceding thirty days at the POI during busy hour:

Provided that the service provider shall request for such number of additional ports which is likely to bring the capacity utilization of the ports at the POI at the end of thirty days from the date of making request, to less than sixty percent.”

the commencement of the Telecommunication Interconnection (Amendment) Regulations, 2018 and thereafter on the 1st April and 1st October every year.

- (2) A service provider may request the other service provider for additional ports at a POI, if the projected utilisation of the capacity of such POI, calculated in the manner as contained in schedule II to these regulations, at the end of sixty days from the date of placing the request, is likely to be more than eighty-five percent and such projected utilization of the capacity of POI shall be determined on the basis of the daily traffic for the preceding sixty days at the POI during busy hour:

Provided that the service provider shall request for such number of additional ports which is likely to bring the utilization of the capacity of such POI, at the end of sixty days from the date of making request, to less than seventy-five percent.]

9. Framework for provisioning of ports. ---

- (1) A service provider, upon receipt of request of ports under regulation 7 and regulation 8, and collocation space, if required, shall issue letter of acceptance, and, demand note, if any, within ¹[seven working days] of the receipt of the request.
- (2) A service provider, upon receipt of the demand note under sub-regulation (1), shall pay the amount within ²[five working days] from the date of receipt of the demand note.
- (3) The service provider, who issued the letter of acceptance under sub-regulation (1), shall intimate the requesting service provider about provisioning of the ports and allocation of the collocation space, if applicable,---
- (a) within ³[ten working days] from the date of issue of its letter of acceptance, in case no demand note was issued; and
- (b) within ¹[ten working days] from the date of receipt of payment from the requesting service provider against the demand note, in case a demand note was issued.
- (4) A service provider, upon receipt of the intimation under sub-regulation (3), shall, within ⁴[ten working days] of the receipt of the intimation, intimate the other service provider about establishment of the transmission link between the POIs of the two service providers.

1 Subs. by the First Amendment Regulations, 2018, reg. 4(a) (w.e.f. 05.07.2018) for the following:
"five working days"

2 Subs. by the First Amendment Regulations, 2018, reg. 4(b) (w.e.f. 05.07.2018) for the following:
"three working days"

3 Subs. by the First Amendment Regulations, 2018, reg. 4(c) (w.e.f. 05.07.2018) for the following:
"five working days"

4 Subs. by the First Amendment Regulations, 2018, reg. 4(d) (w.e.f. 05.07.2018) for the following:
"three working days"

- (5) A service provider, upon receipt of the intimation under sub-regulation (4), shall, within ¹[ten working days] of the receipt of the intimation, carry out acceptance testing and issue final letter of commissioning of the ports to the other service provider.
- (6) A service provider shall provide STM-1 ports at POIs, if any service provider requests for provisioning of such ports for augmentation of the POIs:
- Provided that the two service providers may agree for augmentation of POIs at any lower or higher level such as DS-3 or STM-16.

9A. ²[Level of interconnection for PSTN to PSTN connectivity:-----

- (1) Within a service area, the location of POI, for calls between PSTN and PSTN or between PSTN and NLD network, shall be at such place as may be mutually agreed between the interconnection provider and the interconnection seeker.
- (2) In case the interconnection provider and the interconnection seeker fail to agree under sub-regulation (1), the location of POI, for calls between PSTN and PSTN or between PSTN and NLD network, shall be at LDCC:

Provided that carriage charge for carriage of calls from LDCC to SDCC and vice versa, as applicable, shall be paid by the interconnection seeker to the interconnection provider:

Provided further that the existing POIs at the SDCC level, for calls between PSTN and PSTN or between PSTN and NLD network, shall remain in operation for a period of at least five years or till such time the interconnected service providers mutually decide to close such POIs, whichever is earlier:

Provided also that the existing POI at the SDCC level, for calls between PSTN and PSTN or between PSTN and NLD network, can be closed if the services of either of the interconnected service providers are discontinued in that SDCA.”

CHAPTER V

INTERCONNECTION CHARGES

- 10. Interconnection charges.-** The interconnection charges such as set-up charges and infrastructure charges may be mutually negotiated between service providers subject to the regulations or directions issued by the Authority from time to time:

Provided that such charges are reasonable, transparent and non-discriminatory.

¹ Subs. by the First Amendment Regulations, 2018, reg. 4(e) (w.e.f. 05.07.2018) for the following:
“five working days”

² Ins. by the Second Amendment Regulations, 2018, reg. 2 (w.e.f. 10.07.2020)

CHAPTER VI
DISCONNECTION OF POIs

- 11. Procedure for disconnection of POIs.** - A service provider, before disconnection of a POI, shall---
- (a) give a show-cause-notice of fifteen working days to the other service provider with reasons for the proposed disconnection;
 - (b) if not satisfied with the reply of the show-cause-notice issued under clause (a) or no reply is received to the show-cause-notice, give a notice of fifteen working days to such service provider specifying the date of disconnection of POI; and
 - (c) not disconnect POI before the expiry of the period of notice given under clause (b):
Provided that nothing contained in this regulation shall apply if a POI is disconnected with mutual consent, or on the direction of the Licensor or the Authority.

CHAPTER VII
FINANCIAL DISINCENTIVE ON INTERCONNECTION MATTERS

- 12. Consequences for contravention of the provisions of these regulations.**- If any service provider contravenes the provisions of these regulations, it shall, without prejudice to any penalty which may be imposed under its licence, or the provisions of the Act or rules or orders made or directions issued, thereunder, be liable to pay an amount, by way of financial disincentive not exceeding rupees one lakh per day per licensed service area, as the Authority may direct:
- Provided that no order for payment of any amount by way of financial disincentive shall be made by the Authority unless the service provider has been given a reasonable opportunity of representing against the contravention of the regulations observed by the Authority.

CHAPTER VIII
MISCELLANEOUS

- 13. Power of the Authority to issue direction.**- Without prejudice to any of the provisions of the Act or any other regulations made under the Act or direction issued thereunder, the Authority may, from time to time, issue such directions, as it may deem fit, to the service providers on any aspect of interconnection for which provisions have been made under these regulations.

Schedule-I
Bank guarantee per E1 link at a POI
(See regulation 5.)

S. No.	Item	Value (in Rs.)
1	Ceiling on bank guarantee per E1 link at POI (in Rs.)	8,00,000 <i>multiplied by</i> the interconnection usage charge per minute applicable for the traffic carried on E1 link

¹[Schedule II

For given number of channels of POI, its capacity for 0.5% Grade of Service shall be deduced from the Erlang B table. The sample calculation for augmentation of ports of POI is indicated below:

Considering that Service Provider A has, for its outgoing traffic, existing POI of 600 channels with the Service Provider B, then as per the Erlang B table, the capacity of such POI at 0.5% Grade of Service shall be 562.3 Erlang. Now when the projected outgoing traffic of Service Provider A, at the end of sixty days from today, would be more than 477.95 Erlang (i.e. 85% of the POI capacity), it may request the Service Provider B for augmentation of the POI capacity by such number of ports which takes it to more than 637.27 Erlang (i.e. $477.95/0.75$). As per Erlang B table, this would imply augmentation of ports at such POI by approximately 77 channels.]

¹ Ins. by the First Amendment Regulations, 2018, reg. 5 (w.e.f. 05.07.2018)

Annexure-II

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

TO BE PUBLISHED IN THE GAZETTE OF INDIA, EXTRAORDINARY, PART III, SECTION 4

TELECOM REGULATORY AUTHORITY OF INDIA NOTIFICATION New Delhi, the 24th May, 2013

File No. 409-10/2012-NSL-I----- In exercise of the powers conferred upon it under section 36, read with sub-clauses (ii),(iii) and (iv) of clause (b) of sub-section (1) of section 11, of the Telecom Regulatory Authority of India Act, 1997 (24 of 1997), the Telecom Regulatory Authority of India hereby makes the following regulations, namely:-

THE SHORT MESSAGE SERVICES (SMS) TERMINATION CHARGES REGULATIONS, 2013 (No. 7 of 2013)

CHAPTER-I PRELIMINARY

1. Short title, extent and commencement.-- (1) These regulations may be called the Short Message Services (SMS) Termination Charges Regulations, 2013.
(2) They shall come into force on the 1st day of June, 2013.

2. Definitions. --In these regulations, unless the context otherwise requires,-

- (a) "Access Providers" includes the Basic Telephone Service Provider, Cellular Mobile Telephone Service Provider and Unified Access Service Provider;
- (b) "Act" means the Telecom Regulatory Authority of India Act, 1997 (24 of 1997);
- (c) "Authority" means the Telecom Regulatory Authority of India;
- (d) "Originating Access Provider" means the Access Service Provider whose network is used for originating the Short Message Services (SMS);
- (e) "regulations" means the Short Message Services (SMS) Termination Charges Regulations, 2013;
- (f) "Terminating Access Provider" means the Access Service Provider on whose network the Short Message Services (SMS) is terminated.
- (g) all other words and expressions used in these regulations but not defined, and defined in the Act and the rules and other regulations made thereunder, shall have the meanings respectively assigned to them in the Act or the rules or other regulations, as the case may be.

CHAPTER-II

TERMINATION CHARGES FOR SHORT MESSAGE SERVICES

- 3. Termination charges for Short Message Services (SMS):----** Every Originating Access Provider shall pay to the Terminating Access Provider a termination charge of Re. 0.02 (paise two only) for each Short Message Service (SMS) terminated by it on the network of Terminating Access Provider;

Provided that termination charges for international incoming Short Message Service (SMS) shall be under forbearance.

Rajeev Agrawal
Secretary

Note. -----The Explanatory Memorandum explains the objects and reasons of the 'Short Message Services (SMS) Termination Charges Regulations, 2013.'

**Intelligent Network Services in Multi-Operator and Multi-Network
Scenario Regulations, 2006**

TELECOM REGULATORY AUTHORITY OF INDIA

Notification

New Delhi, the 27th November, 2006

No. 416-2/2003-FN .-----In exercise of the powers conferred by section 36, read with sub-clauses (ii), (iii), (iv), (vi) and (vii) of clause (b) of sub section (1) of section 11 of the Telecom Regulatory Authority of India Act, 1997(24 of 1997), the Telecom Regulatory Authority of India hereby makes the following regulations, namely:-

**THE INTELLIGENT NETWORK SERVICES IN MULTI OPERATOR AND MULTI
NETWORK SCENARIO REGULATIONS, 2006**

(13 OF 2006)

1. Short title and commencement.—

- (1) These regulations may be called the Intelligent Network Services in Multi Operator and Multi Network Scenario Regulations, 2006 (13 of 2006).
- (2) These regulations shall come into force from the date of their publication in the Official Gazette.

2. Definitions.--In these regulations, unless the context otherwise requires,-

- (a) "Act" means the Telecom Regulatory Authority of India Act, 1997(24 of 1997);
- (b) "Access Providers" includes the Basic Operator, Cellular Mobile Service Provider and Unified Access Service Provider;
- (c) "Authority" means the Telecom Regulatory Authority of India established under sub-section (1) of section 3 of the Act;
- (d) "Basic Operator" means a service provider who has been granted a licence under section 4 of the Indian Telegraph Act, 1885 (13 of 1885) and who provides basic telephone service in accordance with the terms and conditions of the licence;
- (e) "Cellular Mobile Telephone Service Provider" means a Cellular Mobile Telephone Service provider who has been granted a licence under section 4 of the Indian Telegraph Act, 1885 (13 of 1885) and who provides Cellular Mobile Telephone Service in a specified service area in accordance with the terms and conditions of the licence;
- (f) "Eligible Service Provider" means service provider who has been granted a licence under section 4 of the Indian Telegraph Act, 1885 (13 of 1885) and who is eligible to provide the service in accordance with terms and conditions of licence;
- (g) "Interconnection" means the commercial and technical arrangements under which the service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers;
- (i) "Intelligent Network" means a network architecture for the operation and provision of new services which is characterized by —:

- (i) extensive use of information processing techniques;
 - (ii) efficient use of network resources;
 - (iii) modularization and reusability of network functions;
 - (iv) integrated service creations and implementation by means of the modularized reusable network functions;
 - (v) flexible allocation of network functions to physical entities;
 - (vi) portability of network functions among physical entities; standardized communication between network functions via service independent interfaces;
 - (vii) service subscriber control of some subscriber-specific service attributes;
 - (viii) service user control of some user-specific service attributes; standardized management of service logic;
- (i) "Service Control Point" means a real time database ---
- (A) which stores customer records;
 - (B) which executes one of the range of software routines customized for particular applications, when accessed by an enquiry from it ;
 - (C) which sends instruction back to the Service Switching Point to process the call;
- (j) "National Numbering Plan" means the National Numbering Plan 2003, or, any such plan, made subsequently by the Government of India, Ministry of Communications and Information Technology, Department of Telecommunication;
- (k) "Service Switching Point" means the Switching Point providing the users with access to the network and performing any necessary switching functionality which--
- (A) consists of the hardware switch and basic call control software with the added functionality of Intelligent Network;
 - (B) allows access to the set of Intelligent Network capabilities; and
 - (C) contains detection capability to detect request for Intelligent Network based services;
- (l) "Regulations" means the Intelligent Network Services in Multi Operator and Multi Network Scenario Regulation, 2006;
- (m) "Unified Access Service Provider" means a Unified Access Service provider who has been granted a licence under section 4 of the Indian Telegraph Act, 1885 (13 of 1885) and who provides Unified Access Service in a specified service area in accordance with the terms and conditions of the licence;

- (n) All other words and expressions used in these regulations but not defined, and defined in the Act and the rules and other regulations made there under, shall have the meanings respectively assigned to them in the Act or the rules or other regulations, as the case may be.
3. **Provision for interconnection to all Eligible Service Providers.**—All Basic Operators, Cellular Mobile Service Providers and Unified Access Service Providers shall provide interconnection to all the Eligible Service Providers for the purpose of giving an option to subscribers of all Access Providers to exercise option for using the Intelligent Network Services of other Eligible Service Providers.
 4. **Prohibition to deny to subscribers access to Intelligent Network.**—No Basic Operator, Cellular Mobile Service Provider and Unified Access Service Provider shall directly or indirectly deny its consumers accessing Intelligent Network Services of his choice which are available in multi-operator multi network scenario.
 5. **Switches to be capable of resolving the access codes allotted as per National Numbering Plan 2003.** —All Basic Operators, Cellular Mobile Service Providers and Unified Access Service Providers shall have switches capable of resolving the access codes allotted as per National Numbering Plan made by the Government of India ,Ministry of Communications and Information Technology, Department of Telecommunication for the Intelligent Network Services available in multi-operator multi-network scenario.
 6. **Obligation to follow Numbering plan.**—All Eligible Service Providers shall follow the Numbering plan for the Intelligent Network Services in accordance with the National Numbering Plan.
 7. **Intelligent Network Services to be launched after obtaining access code allocation.** —All Eligible Service Providers shall launch the Intelligent Network Services in Multi-Operator Multi-Network scenario after obtaining adequate access code allocation from the Administrator of the National Numbering Plan or the Licensor, as the case may be.
 8. Network equipment (including circuit or packet switches) to conform to the International Telecommunication Union and Telecommunication Engineering Centre standards and Standards of the industry. —All Eligible Service Providers providing the Intelligent Network Services in Multi-Operator Multi-Network scenario shall use such type of network equipment (including circuit or packet switches) which conform to the International Telecommunication Union and Telecommunication Engineering Centre standards and standards of the industry:

Provided that in the case of new technologies where no standards have been determined, all Eligible Service Providers shall deploy type of network equipment (including circuit or packet switches) approved by the Central Government and the Licensor:

9. Compliance with Quality of Service standards. —

(1) All Eligible Service Providers engaged in providing, directly or indirectly, Intelligent Network services shall ensure that there shall be no deterioration in the Quality of Service standards applicable to the underlying bearer network.

(2) The Quality of Service standards specified for voice services or applicable to voice services shall apply to Intelligent Network Services, which includes all circuit switched, or Packet Switched Voice Services.

10. Intelligent Network Services under commercial and technical arrangements or agreement. –

(1) All Eligible Service Providers shall provide the Intelligent Network Services in accordance with the terms and conditions of the licence granted to them under section 4 of the Indian Telegraph Act, 1885 (13 of 1885):

(2) Without prejudice to the conditions of the licence granted to the Basic Operator, Cellular Mobile Service Provider and Unified Access Service Provider and other telecom service provider under section 4 of the Indian Telegraph Act, 1885 (13 of 1885), such Basic Operators, Cellular Mobile Service Provider and Unified Access Service Provider and other telecom service provider may use resources of any other telecom service provider for Intelligent Network Services under commercial and technical arrangements or agreements entered among themselves as per mutually agreed terms and conditions.

¹[(2A) All Eligible Service Providers providing Intelligent Network Services shall enter into interconnection agreement with all Access Providers under regulation 3 on such commercial and technical arrangements or agreements, as may be mutually agreed between them;]

(3) Every arrangement or agreement entered under ²[sub-regulation (2) and sub-regulation (2A)] shall specify architecture for implementation of Intelligent Network Services.

(4) Every arrangement or agreement entered under sub-regulation (2) shall be entered into within ninety days from the date commencement of these regulations for providing Intelligent Network Services to subscriber of other telecom service providers:

Provided that in a case any Basic Operator or Cellular Mobile Service Provider or Unified Access Service Provider fails to enter into arrangements or agreement under sub-regulation (2), the Authority may, on an application made by the concerned service provider and having regard to the interest of the service providers and consumers of the telecom sector, extend the said period of three months to six months.

³[(4A) Every arrangement or agreement under sub-regulation (2A) shall be entered into within ninety days from the date of commencement of the Intelligent Network Services in Multi Operator and Multi Network Scenario (Amendment) Regulations, 2012 for providing Intelligent Network Services to subscribers of Access Providers:

Provided that every Eligible Service Provider who starts offering Intelligent Network Services on or after the date of commencement of the Intelligent Network Services in Multi Operator and Multi Network Scenario (Amendment) regulations, 2012 shall enter into arrangements or agreements under sub-regulation (2A) with all Access Providers within ninety days from the date of commencement of such service:

Provided further that every arrangement or agreement under sub-regulation (2A) shall be entered into with the Access Provider who starts providing services after commencement of Intelligent Network Service in Multi Operator and Multi Network Scenario (Amendment) Regulations, 2012 within ninety days from the date of commencement of service by the Access Provider:

¹ Ins. by the First Amendment Regulations, 2012 (17of2012) reg.2(a) (w.e.f. 18.09.2012)

² Subs. by the First Amendment Regulations, 2012 (17of2012) reg.2(b) for the words, figures and brackets "sub-regulation (2)"(w.e.f. 18.09.2012)

³ Ins. by the First Amendment Regulations, 2012 (17of2012) reg.2(c) (w.e.f. 18.09.2012)

Provided also that in case any Eligible Service Provider fails to enter into arrangement or agreement under sub-regulation (2A), the Authority may, on an application made by the concerned service provider and having regard to the interest of the service providers and consumers of the telecom sector, extend the said period of ninety days to one hundred eighty days;]

(5) All Eligible Service Providers providing Intelligent Network Services shall furnish call data records of all the calls handled by him as and when required by the Central Government or any authority specified by it or the Authority.

(6) Every arrangement or agreement entered under ¹[sub-regulation (2) and sub-regulation (2A)] shall be submitted to the Authority for registration within fifteen days from the date of entering into such agreement.

(7) The arrangements or agreement entered under ²[sub-regulation (2) and sub-regulation (2A)] shall come into force within thirty days from the date of entering into such arrangements or agreements.

(8) In case any ³[Eligible service provider] fails to enter into agreements or arrangements within the stipulated time, they shall intimate within fifteen days of such failure to the Authority with complete details thereof and after examining such failure and details furnished by the service providers, the Authority shall specify the interconnection arrangement.

(9) All the provisions of these regulations shall apply to the commercial and technical arrangements or agreement entered into under which licensed Access Service Providers shall connect their equipment, networks and services to enable their customers to have access to the Intelligent Network of other Service Providers.

11. Usage Charges under the arrangements or agreement entered under ⁴[sub-regulation (2) and sub-regulation (2A)] of regulation 10. –

(1) Without prejudice to provisions of the rules made under the Act, other regulations made and directions issued thereunder, the charges and sharing of revenues for the service features , network architecture and resources used for Intelligent Network Services shall be determined on reciprocal basis and on non-discriminatory basis by the ⁵[Basic Operators, Cellular Mobile Service Providers, Unified Access Service Providers or Eligible Service Providers] themselves under the arrangements or agreements entered under ⁶[sub-regulation (2) and sub-regulation (2A)] of regulation 10.

(2) Every Basic Operator, Cellular Mobile Service Provider, Unified Access Service Provider and other telecom service provider (here referred to as the first party) shall pay the same charges and share the same revenues for the service network architecture and resources used for Intelligent Network Services referred to in under sub-regulation (1) to the other Basic Operator, Cellular Mobile Service Provider, Unified Access Service Provider and other telecom service provider (hereafter

¹ Subs. by the First Amendment Regulations, 2012(17of2012) reg.2(d) for the words, figures and brackets “sub-regulation (2)”(w.e.f. 18.09.2012)

² Subs. by the First Amendment Regulations, 2012(17of2012) reg.2(e) for the words, figures and brackets “sub-regulation (2)”(w.e.f. 18.09.2012)

³ Subs. by the First Amendment Regulations, 2012 (17 of 2012), reg. 2(f) for the words “Basic Operator, Cellular mobile service provider or Unified Access Service Provider” (w.e.f. 18.09.2012)

⁴ Subs. by the First Amendment Regulations, 2012(17of2012) reg.3(a) for the words, figures and brackets “sub-regulation (2)”(w.e.f. 18.09.2012)

⁵ Subs. by the First Amendment Regulations, 2012 (17 of 2012), reg. 3(b) (i) for the words “Basic Operator, Cellular mobile service provider or Unified Access Service Provider” (w.e.f. 18.09.2012)

⁶ Subs. by the First Amendment Regulations, 2012(17of2012) reg.3(b)(ii) for the words, figures and brackets “sub-regulation (2)”(w.e.f. 18.09.2012)

referred to as the second party) which are payable by the second party to the first party for similar service network architecture and resources used for Intelligent Network Services .

(3) The charges and sharing of revenues under sub-regulation (1) shall be in addition to the interconnection charges specified under the Telecommunication Interconnection Usage Charges Regulation, 2003 (4 of 2003) made under the Act.

Rajendra Singh
Secretary

Note,---. An Explanatory Memorandum below explains the provisions of these regulations.

Annexure-IV

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

Telecom Regulatory Authority of India

Notification

New Delhi, the 8th June, 2005

No.409-10/2005-FN

In exercise of the powers conferred upon it under section 36 read with paragraphs (ii), (iii) and (iv) of clause (b) of sub-section (1) of Section 11 of the Telecom Regulatory Authority of India Act, 1997, the Telecom Regulatory Authority of India hereby makes the following Regulation, namely:

1. Short title, extent and commencement:

(i) This Regulation shall be called “ Telecom Regulatory Authority of India (Transit Charges for Bharat Sanchar Nigam Limited's CellOne Terminating Traffic) Regulation, 2005 (10 of 2005)”

(ii) This Regulation shall come into force with effect from 3rd May, 2005 in compliance with the Hon'ble TDSAT's order dated May 3, 2005 in Petition No. 20/2004 (Cellular Operators Association of India and others Vs Bharat Sanchar Nigam Limited & others.)

2. Transit Charges for accessing BSNL's CellOne subscribers -

No transit charge shall be levied by BSNL (Bharat Sanchar Nigam Limited) on Cellular Operators for accessing BSNL's CellOne subscribers, wherever the MSCs of both BSNL's CellOne and Private CMSOs' are connected to the same BSNL switch.

3. Explanatory Memorandum

This Regulation contains at Annex A, an explanatory memorandum that explains background and reasons for issuance of this Regulation.

BY ORDER

[RAJENDRA SINGH]
Acting Secretary

**The Telecommunication Interconnection Usage Charges Regulations,
2003**

Telecom Regulatory Authority of India

**Notification
New Delhi, the 29th October 2003
No. 409-5/2003-FN**

In exercise of the powers conferred upon it under section 36 read with clauses (ii), (iii) and (iv) of sub-section (b) of Section 11 (1) of the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000, to fix the terms and conditions of interconnectivity between Service Providers, to ensure effective interconnection between different service providers and to regulate arrangements amongst service providers of sharing their revenue derived from providing telecommunication services, the Telecom Regulatory Authority of India hereby makes the following Regulation.

**THE TELECOMMUNICATION INTERCONNECTION USAGE CHARGES REGULATION,
2003**

(4 of 2003)

**Section I
Title, Extent and Commencement**

1. Short title, extent and commencement:

(i) This Regulation shall be called “The Telecommunication Interconnection Usage Charges Regulation 2003” (the Regulation) and supersedes the earlier Regulation dated 24th January 2003 (1 of 2003) and its amendments dated 27th March 2003 (1st amendment) and 16th June, 2003 (2nd amendment).

(ii) The Regulation shall cover arrangements among service providers for payment of Interconnection Usage Charges, for Telecommunication Services, covering Basic Service that includes WLL (M) services, Cellular Mobile Services, and Long-Distance Services (STD/ ISD) throughout the territory of India.

(iii) The Regulation shall be deemed to have come into force from the date of its notification in the official Gazette.

**Section II
Definitions**

2. In this Regulation, unless the context otherwise requires:

(i) “Act” means the Telecom Regulatory Authority of India, 1997 as amended by TRAI (Amendment) Act, 2000.

(ii) “ADC” means Access Deficit Charge.

(iii) “Authority” means the Telecom Regulatory Authority of India.

¹[(iv) “BSO, CMSP, ILDO, NLDO and UASP” respectively mean the Basic Service Operator, Cellular Mobile Service Provider, International Long Distance Operator, National Long Distance Operator and Unified Access Service Provider.]

(v) “Ceiling(s)” mean(s) the upper limit(s) of a charge specified by the Authority from time to time over which such charges may not be offered.

(vi) “Floor” means the lower limit of a charge specified by the Authority from time to time below which such charges may not be offered.

(vii) “Forbearance” means that the Authority has not, for the time being, notified any charge for a particular telecommunication service and the service provider is free to fix any charge for such service. The Authority, however, has a right to intervene at any stage after the introduction of the charge.

(viii) "Interconnection" means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers.

(ix) "Interconnection Charge" means the charge for interconnection levied by an interconnection provider on an interconnection seeker.

(x) “Interconnection Usage Charge (IUC)” means the charge payable by one service provider to one or more service providers for usage of the network elements for origination, transit or termination of the calls.

(xi) "Interconnection Provider" means the service provider to whose network an interconnection is sought for providing telecommunication services.

(xii) "Interconnection Seeker" means the service provider who seeks interconnection to the network of the interconnection provider.

(xiii) “International Subscriber Dialing” (ISD) means the facility by which a subscriber can have direct connection between him (in India) with another end user in another country by means of direct dialing through licensed networks. This includes the coverage of the international sector by ILDO and the related national sector by NLDO and/or access provider.

(xiv) “LDCA/ LDCC” respectively mean Long Distance Charging Area/Long Distance Charging Centre.

(xv) "Order" means the Telecommunication Tariff Order, 1999 as amended from time to time.

(xvi) “Originating Network” means the network to which an originator of a telecommunication message (voice and non-voice) is proximately connected to.

(xvii) “Originating/Transit/Terminating Service Provider” means the service provider whose network is used for originating/transit/terminating a telecommunication message (voice and non-voice) respectively.

(xviii) "Regulation" means the Telecommunication Interconnection Usage Charges (IUC) Regulation 2003 (2 of 2003).

¹ Subs. by the Third Amendment Regulations, 2003, reg. 2.1 (w.e.f. 31.12.2003), for the following:

“(iv) “BSO, CMSP, ILDO and NLDO” respectively mean the Basic Service Operator, Cellular Mobile Service Provider, International Long Distance Operator and National Long Distance Operator.”

(xix) "Reporting Requirement" means the obligation of a service provider to report to the Authority at least 45 working days before implementing any new Interconnection Usage Charge for telecommunication services under 'this Regulation' and any changes thereafter.

(xx) "SDCA/SDCC" respectively mean Short Distance Charging Area/Short Distance Charging Centre.

(xxi) "Set Up Costs of Interconnection" means the initial cost of any system upgradation needed to provide the specific interconnection facilities requested.

(xxii) "Settlement Period" is the period at the end of which the inter-carrier billing IUC/ADC payments among service providers are to be settled, based on the record reconciliation process as may be finalized through mutual arrangements among the service providers.

(xxiii) "Significant Market Power (SMP)" means "A Service Provider holding a share of at least 30% of total activity in a licensed telecommunication service area. These Services are categorized as Basic Service, Cellular Mobile Service, National Long Distance Service and International Long Distance Service." where "Activity" would mean and include any one or more of the following:

- (a) Subscriber Base
- (b) Turnover
- (c) Switching Capacity
- (d) Volume of Traffic

(xxiv) "Subscriber Trunk Dialing" (STD) means the facility by which a subscriber can have direct connection between him and another end user in another SDCA within India by means of direct dialing through the public long-distance networks.

(xxv) "Terminating Network" means the network to which a receiver of a telecommunication message (voice and non-voice) is proximately connected to.

(xxvi) "Transit Network" means the network through which telecommunication messages (voice or non-voice) from originating networks or other transit networks are transmitted and delivered to terminating or other transit networks.

(xxvii) "Usage Charge" means the charge levied by a service provider for carriage of telecommunication traffic on its network, i.e. for use of its network elements.

(xxviii) "WLL (M)" means limited mobility telephony service using wireless in local loop technology within a Short Distance Charging Area.

¹[* * * *]

²[(xxix)] Words and expressions used in this Regulation and not defined herein but defined in the Act shall have the same meanings assigned to them in the Act.

1 Ins. the following clause by the Fifth Amendment Regulations, 2005, reg. 2 (w.e.f. 11.04.2005), which has been set aside by the Hon'ble TDSAT, vide its order dated 21.09.2005 passed in TA No. 7 of 2005 titled as "COAI & Ors. v. TRAI & Anr.":

"(xxix) Roaming means the ability for a cellular subscriber to automatically make and receive voice calls, data and to access other services while travelling outside the geographical coverage area of the home network, by using the visited network. It is national roaming when visited network and the home network of the subscriber are in the same country and it is international roaming when visited network and home network of the subscriber are in different countries."

2 Clause (xxix) re-numbered as clause (xxx) by the Fifth Amendment Regulations, 2005, reg. 2 (w.e.f. 11.04.2005), which has been set aside by the Hon'ble TDSAT, vide its order dated 21.09.2005 passed in TA No. 7 of 2005 titled as "COAI & Ors. v. TRAI & Anr."

¹[(xxx) “Cellular” means fully mobile service provided by CMSPs and UASPs through GSM, CDMA or any other technology.]

Section III

3. Interconnection Charges

Interconnection Charges shall continue to be governed by “The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation, 2001(5 of 2001)” and The Telecommunication Interconnection (Port Charges) Regulation 2001 (6 of 2001), except to the extent modified by this Regulation.

Section IV

4. Interconnection Usage Charges (IUC)

The Interconnection Usage Charges are specified in Schedules hereto.

Schedule I – Termination Charges

Schedule II – Carriage Charges

Schedule III – Access Deficit Charge (ADC)

²[Schedule IV – Interconnect Usage Charge (IUC) for Short Message Service (SMS)]

(i) Unless specifically provided in the Schedules to this Regulation, the Authority forbears with respect to other Interconnection Usage Charges.

³[⁴[(ii) The date of effect for actual implementation of IUC shall be 1st February, 2004.]]]

(iii) The existing Interconnection Usage Charges arrangement between the Interconnecting networks in respect of the items as specified in this Regulation shall hold good till the date on which this Regulation comes in force.

(iv) All existing interconnect agreements/arrangements as on date shall stand amended on the date of actual implementation of this Regulation so as to conform to the present framework of the IUC regime and these shall be submitted to TRAI for registration within 15 days of implementation of this Regulation, and for subsequent changes as per reporting requirement.

(v) IUC values specified in ‘the Regulation’ shall also be applicable for all Reference Interconnect Offers by Significant Market Powers (SMPs).

1 Ins. by the Third Amendment Regulations, 2003, reg. 2.2 (w.e.f. 31.12.2003)

2 Ins. by the Tenth Amendment Regulations, 2009, reg. 2(a) (w.e.f. 01.04.2009)

3 Subs. by the First Amendment Regulations, 2003, reg. 2.1 (w.e.f. 25.11.2003), for the following:

“(ii) The date of effect for actual implementation of IUC shall be 1st December 2003.”

4 Subs. by the Second Amendment Regulations, 2003, reg. 2.1 (w.e.f. 12.12.2003), for the following:

“(ii) The date of effect for actual implementation of IUC shall be 15th December, 2003.”

5 Subs. by the Third Amendment Regulations, 2003, reg. 2.3 (w.e.f. 31.12.2003), for the following:

“(ii) The date of effect for actual implementation of IUC shall be 1st January, 2004.”

¹[(vi) Every BSO, CMSP, UASP and Unified License (UL) licensee shall offer a termination charge, for international calls terminating on its network, in a non-discriminatory manner and within the range specified in Schedule I.]

Section V

5. Reporting Requirement

(i) All service providers shall comply with the Reporting Requirement as defined in Section II in respect of Interconnection Usage Charges specified for the first time under 'the Regulation', as also all subsequent changes, subject to the provisions of Section IV above.

(ii) No service provider shall alter any Interconnection Usage Charge or any part thereof, without complying with the Reporting Requirement.

(iii) In respect of matters covered by the provisions of 'the Regulation', they shall have an overriding effect over any Regulation, Direction, Determination and Order of the Authority, Reference Interconnect Offer and existing Interconnect agreement/arrangement between Service Providers.

²[iv. Each service provider shall report to the Authority on quarterly basis, the ADC retained by it, wherever applicable, and also ADC paid by it to BSNL. In addition, BSNL shall report, on quarterly basis, ADC payments received by it from each operator. This shall include both the components of ADC, namely ADC paid in the form of percentage of Adjusted Gross Revenue and ADC on per minute basis for international incoming ³[* * * *] calls. This quarterly report shall reach the Authority within 30 days of the end of the previous quarter.]

⁴[Provided that the provisions of this clause shall, on and after the 1st day of April, 2008, have effect as if the words "ADC paid in the form of percentage of Adjusted Gross Revenue" had been omitted and the provisions in this clause relating to reporting requirement after the said date shall be construed accordingly:

Provided further that nothing contained in this clause shall apply on and after the 1st day of April 2008.]

⁵[(v) **Reporting Requirement for carriage charges for long distance calls within India specified under paragraph (a) of Schedule II.** Every National Long Distance Operator shall, on quarterly basis, report to the Authority the per minute rate of carriage charge and the total amount of such carriage charge for long distance calls within India received by it from every BSO/CMSP/UASL/ILDO, separately, and every BSO/CMSP/UASL/ILDO shall, on quarterly basis, report to the Authority, the per minute carriage charges for long distance calls within India and the total amount of such carriage charge for long distance calls within India paid by them to every National Long Distance Operator, separately, and such quarterly report shall be submitted to the Authority within thirty days of the end of the previous quarter.

(vi) **Reporting Requirement of Interconnection Usage Charge for Short Message Service (SMS) specified under paragraph (1) of Schedule IV.** Every BSO/CMSP/UASL/NLDO/ILDO shall, on quarterly basis, report to the Authority, the rate of Interconnect Usage Charge for SMS and the total amount of such Interconnect Usage Charge for SMS received by it from other BSO/CMSP/UASL/

¹ Ins. by the Sixteenth Amendment Regulations, 2020, reg. 2 (w.e.f. 01.05.2020)

² Ins. by the Sixth Amendment Regulations, 2006, reg. 4 (w.e.f. 01.03.2006)

³ Del. the words "and outgoing" by the Eighth Amendment Regulations, 2007, reg. 2 (w.e.f. 01.04.2007)

⁴ Ins. by the Ninth Amendment Regulations, 2008, reg. 2 (w.e.f. 01.04.2008)

⁵ Ins. by the Tenth Amendment Regulations, 2009, reg. 2(b) (w.e.f. 01.04.2009)

NLDO/ILDO and paid by it to other BSO/CMSP/UASL/NLDO/ILDO, separately, and such quarterly report shall be submitted to the Authority within thirty days of the end of the previous quarter.]

Section VI

6. Review

¹[(i) The Authority may, from time to time, review and modify interconnection Usage Charge and Access Deficit Charge.

(ii) The Authority may also at any time, suo-motu, or on the basis of reported information in terms of clause (iv) of Regulation (5) above or on reference from any affected party, and for good and sufficient reasons, review and modify any Interconnection Usage Charge and Access Deficit Charge.]

Section VII

7. Explanatory Memorandum

This Regulation contains at Annex A, an explanatory memorandum to provide clarity and transparency to matters covered under 'the Regulation'.

Section VIII

8. Interpretation

²[In case of any doubt regarding any provision of this Regulation, the clarification given by the Authority shall be final.]

By Order
(DR. HARSHA VARDHANA SINGH)
Secretary-cum-Principal Advisor

¹ Subs. by the Sixth Amendment Regulations, 2006, reg. 5 (w.e.f. 01.03.2006), for the following:

“(i) The Authority may, from time to time, review and modify interconnection Usage Charge.

(ii) The Authority may also at any time, suo-motu, or on reference from any affected party, and for good and sufficient reasons, review and modify any Interconnection Usage Charge.”

² Subs. by the Fourth Amendment Regulations, 2005, reg. 2 (w.e.f. 01.02.2005), for the following:

“In case of dispute regarding interpretation of any of the provisions of this Regulation, the decision of the Authority shall be final and binding.”

Schedule I

¹[²**1. Termination Charges**

The following termination charge shall be applicable for Local, National Long Distance and International Long Distance calls:-

Type of Call	Type of traffic	Termination charge
(1) Local and National Long Distance Call	Wireless to wireless	³ [(a) Re. 0.06 (paise six only) per minute with effect from the 1 st October, 2017 to the 31 st December, 2020; and (b) 0 (Zero) with effect from the 1 st January, 2021]]
	Wireless to wireline	0 (Zero)
	Wireline to wireline	0 (Zero)
	Wireline to wireless	0 (Zero)
(2) International call	International incoming call to wireless and wireline	⁵ [(⁶ Not less than Re. 0.35 (paise thirty five only) per minute and not more than Re. 0.65 (paise sixty five only) per minute]]

Note-Wireless means full mobility, limited mobility and fixed wireless access services.]]

2. Origination Charges

Forbearance.

The Originating Service Provider shall retain origination charges from the residual after payment of the charges for carriage, termination and access deficit.

3. Carriage Charges

Carriage charges have been specified in Schedule II.

4. Access Deficit Charges

Access Deficit Charge (ADC) has been specified in Schedule III.

1 Subs. by the Tenth Amendment Regulations, 2009, reg. 3 (w.e.f. 01.04.2009), for the following:

"1. Termination Charges

Termination charge for calls to Basic (Fixed, WLL (Fixed), and WLL with limited mobility) and Cellular networks would be **uniform @ Rs. 0.30 per minute**. The same termination charge would be applicable for all types of calls viz. Local, National Long Distance and International Long Distance."

2 Subs. by the Eleventh Amendment Regulations, 2015, reg. 2 (w.e.f. 01.03.2015), for the following:

"1. Termination Charges

Termination charge for Local and National Long Distance voice calls to Fixed Wireline, Wireless in Local Loop (Fixed), Wireless in Local Loop (Mobile), Cellular Mobile Telephone Service (both 2G and 3G) shall be uniform at the rate of Re. 0.20 (twenty paise only) per minute and the termination charge for incoming International Long Distance voice calls to such Fixed Wireline, Wireless in Local Loop (Fixed), Wireless in Local Loop (Mobile), Cellular Mobile Telephone Service (both 2G and 3G) shall be uniform at the rate of Re. 0.40 (forty paise only) per minute."

3 Subs. by the Thirteenth Amendment Regulations, 2017, reg. 2 (w.e.f. 01.10.2017), for the following:

"Re. 0.14 (paise fourteen only) per minute"

4 Subs. by the Fifteenth Amendment Regulations, 2019, reg. 2 (w.e.f. 17.12.2019), for the following:

"(a) Re. 0.06 (paise six only) per minute with effect from the 1st October, 2017 to the 31st December, 2019; and
(b) 0 (Zero) with effect from the 1st January, 2020"

5 Subs. by the Fourteenth Amendment Regulations, 2018, reg. 2 (w.e.f. 01.02.2018), for the following:

"Rs. 0.53 (paise fifty three only) per minute"

6 Subs. by the Sixteenth Amendment Regulations, 2020, reg. 3 (w.e.f. 01.05.2020), for the following:

"Rs. 0.30 (paise thirty only) per minute"

**Schedule II
Carriage Charges**

¹[(a) Carriage charges for Long Distance calls within India

**Table - I
(Amount in Rupees per minute)**

Carriage charges per minute for Long Distance Calls within India	As per mutual agreement between the service providers subject to a ceiling of ² [Rupee 0.35 (thirty five paise) per minute] irrespective of the distance.]
--	---

b) Transit Charges for intra-SDCA calls:

Forbearance, subject to the following condition:

Direct interconnection between Access Providers is mandatory. For exceptional cases of Intra-SDCA transit, operators may decide the charges through mutual negotiation. However this ³[shall be less than Re. 0.15 (Fifteen paise only) per minute].

c) Carriage charges for International Long Distance calls including International termination charge (i.e. International settlement):

Forbearance, subject to the following condition:

The service providers may mutually agree to the sharing of any surplus, subject to the approval of the Authority.

⁴[(d) **Trunk Automatic Exchange (TAX) transit charges.** Trunk Automatic Exchange transit charge in all cases, other than transit charge for accessing the Cellular Mobile Telephone Service of Bharat Sanchar Nigam Limited by Cellular Operators which is governed by the Telecom Regulatory Authority of India (Transit Charges for Bharat Sanchar Nigam Limited's Cell One Terminating Traffic) Regulation, 2005 (10 of 2005), shall be less than Re. 0.15 (Fifteen paise only) per minute and, subject to the said limit, may be decided by the concerned service providers through mutual commercial arrangement.

(e) **Transit Carriage Charge from Level II Trunk Automatic Exchange (TAX) to SDCA.** Transit carriage charge for carriage of intra-circle traffic handed over from Cellular Mobile networks to Fixed network, from Level II Trunk Automatic Exchange (TAX) of LDCA in which the call is to be terminated, to SDCA, shall be Re. 0.15 (Fifteen paise only) per minute, irrespective of distance.]

¹ Subs. by the Sixth Amendment Regulations, 2006, reg. 2(i) (w.e.f. 01.03.2006), for the following:

"a) Carriage charges for Long Distance calls within India

Table I (Amount in Rupees per minute)				
Carriage charges per minute for Long Distance calls within India	istance slab			
	Below 50 Kms	50 – 200 Kms	200 –500 Kms	Above 500 Kms
	0.20	0.65	0.90	1.10

The service providers are allowed to negotiate a spot value within +/- 10% of the long distance calls carriage charge beyond 50 Kms. Forbearance for carriage charge for long distance calls will be introduced once carrier selection by customers is implemented."

² Subs. by the Twelfth Amendment Regulations, 2015, reg. 2 (w.e.f. 01.03.2015), for the following: "Rupees 0.65 per minute"

³ Subs. by the Tenth Amendment Regulations, 2009, reg. 4(a) (w.e.f. 01.04.2009), for the following: "should be lower than Rs. 0.20 per minute"

⁴ Ins. by the Tenth Amendment Regulations, 2009, reg. 4(b), (w.e.f. 01.04.2009)

Notes to Schedule II:

- a) The Originating Service Provider shall retain origination charges from the residual after payment of the charges for carriage, termination and access deficit.
- b) ¹[The Carrier, as shown in Table II, would collect the applicable amounts for carriage and termination charge from the Originating Service Provider for various type of calls. The Carrier would pass on the termination charge for terminating the traffic to the Terminating Service Provider as per Schedule-I.]
- c) The call from/ to fixed line to/ from WLL(M) would be treated as a local call, if the call destination is within the SDCA where the call originated. Calls from/ to fixed line to/ from WLL(M) would be treated as long distance calls if the call terminates outside the SDCA from where the call originated.

Table II

Applicability of Carriage Charge

(F = Fixed or WLL(Fixed); W = WLL(M); C = Cellular Mobile)

Type of Traffic	Carriage Charge	Carrier (Handover at)	
Within SDCA			
F/W ↔ F/W	Nil for direct connectivity/Applicable tandem usage as in Schedule II (b)	BSO1/BSO2 (Tandem)	
F/W ↔ C	Nil (Tandem: Metro)/TAX usage carriage Charge (Level II TAX)	BSO (Tandem: Metro)/ BSO (Level II TAX)	
F/W/C ↔ ILD	As above since ILDO hand-over is at LDCC TAX	BSO (TAX)	
Intra Circle i.e. Inter (SDCA)			
F ↔ F	Carriage as per details in BSO1/ BSO2 Schedule II	BSO1/BSO2	Depending on Near end or Far end Handover
F ↔ W	Carriage as per details in BSO1/ BSO2 Schedule II	BSO1/BSO2	
F/W ↔ C	Same as Intra SDCA except TAX charge is “applicable” Charge since more than one TAX may be involved.	BSO (Level II/ I TAX)	
C ↔ ILD	No carriage/ tandem in case traffic is picked up or delivered at MSC	MSC (Direct connectivity cases)	
F / W ↔ ILD	Carriage as per Schedule II	BSO (TAX)	
Inter Circle			
F/ W ↔ F/ W	Carriage as per Schedule II	NLDO (TAX)	
F ↔ C	Carriage as per Schedule II	NLDO (TAX)	
W ↔ C	Carriage as per Schedule II	NLDO (TAX)	
F/W/C ↔ ILD	Carriage as per Schedule II	NLDO (TAX)	

¹ Subs. by the Sixth Amendment Regulations, 2006, reg. 2 (w.e.f. 1.3.2006), for the following:

“The Carrier, as shown in Table II, would collect the applicable amounts for carriage and termination charge from the Originating Service Provider for various type of calls. The Carrier would pass on the termination charge for terminating the traffic to the Terminating Service Provider as per Schedule I. In cases where the access deficit charge amount is to be collected by the terminating network or by BSNL (as per the Table III in Schedule III) the access deficit charge amount shall be passed on by the Carrier to the relevant service provider who has to be provided the access deficit amounts, as mentioned in Schedule III.”

Schedule – III
Access Deficit Charge (ADC)

¹[3.1 The Access Deficit Charges ²[for International Incoming Calls received during the period beginning on the 1st day of April, 2008 and ending as at the 30th day of September, 2008] shall be as per Table III.

³[Table III

Access Deficit Charge ⁴[for International Incoming Calls received during the period beginning on the 1st day of April, 2008 and ending as at the 30th day of September, 2008]

Type of Call (1)	Access Deficit Charge per minute (2)	Access Deficit Charge to be paid to BSNL (3)
All Incoming ILD calls	⁵ [Re 0.50 (paise fifty only)]	By ILDOs or NLDOs referred to in clause (iv) of regulation 2]

⁶[Explanation. —The Access Deficit Charge for International Long Distance Calls shall not be applicable on and after the 1st day October, 2008]

3.2 ADC as a percentage of Revenue.

3.2.1 In addition to the payment of ADC on international ⁷[* * * *] incoming calls in terms of Clause 3.1, all licensees of Unified Access Service, Cellular Mobile Telephone Service, National Long Distance Service and International Long Distance Service and Basic Service Operators shall ⁸[pay 0.75%] of their Adjusted Gross Revenue as ADC to the BSNL. BSNL shall retain ADC chargeable as percentage of its Adjusted Gross Revenue.

Provided that if a service provider has Unified Access Service License/Basic Service Licence, it shall retain ADC as percentage of Adjusted Gross Revenue of Fixed wireline subscribers and the balance shall be paid to the BSNL. MTNL shall also retain ADC as percentage of Adjusted Gross Revenue for its Fixed Wireline subscribers and shall pay the balance to BSNL.

1 Subs. by the Fourth Amendment Regulations, 2005, reg. 3 (w.e.f. 01.02.2005) and the Sixth Amendment Regulation, 2006, reg. 3 (w.e.f. 01.03.2006), the entries relating to paragraphs 3.1. and 3.2

2 Subs. by the Ninth Amendment Regulations, 2008, reg. 3, for “for International ⁹[* * * *] Incoming Calls” (w.e.f. 1.4.2008).

3 Subs. by the Eighth Amendment Regulations, 2007, reg. 3(a)(ii) (w.e.f. 01.04.2007), for the following:

“Table III

Access Deficit Charge for International Long Distance Calls

Sl. No.	Type of Call	ADC per minute (in rupees)	ADC to be paid to/retained by
1.	All Outgoing ILD calls originated from Fixed wireline subscribers.	Rs. 0.80	To be retained by originating Fixed wireline Service Provider.
2.	All Outgoing ILD calls originated from Cellular Mobile/Wireless including WLL(F) subscribers	Rs. 0.80	To be paid to BSNL by originating access provider through ILDO
3.	All Incoming ILD calls	Rs. 1.60	To be paid to BSNL by ILDO or NLDO”

4 Subs. by the Ninth Amendment Regulations, 2008, reg. 3(a)(ii)(A) (w.e.f. 01.04.2008), for the following: “for International Incoming Calls”

5 Subs. by the Ninth Amendment Regulations, 2008, reg. 3(a)(ii)(B) (w.e.f. 01.04.2008), for the following: “Rs. 1.00 (Rupee One only)”

6 Ins. by the Ninth Amendment Regulations, 2008, reg. 3(a)(iii) (w.e.f. 01.04.2008)

7 Del. the words “outgoing and” by the Eighth Amendment Regulations, 2007, reg. 3(b)(i)(A) (w.e.f. 01.04.2007)

8 Subs. by the Eight Amendment Regulations, 2007, reg.3(b)(i)(B) (w.e.f. 01.04.2007), for the following: “pay 1.5%”

9 Del. the words “outgoing and” by the Eighth Amendment Regulations, 2007, reg. 3(a)(i) (w.e.f. 01.04.2007)

¹[3.2.2 For calculating ADC, Adjusted Gross Revenue shall have the same meaning as given in the respective licences;

PROVIDED that in calculating the ADC as a percentage of Adjusted Gross Revenue (AGR) of a Universal Access Service Licensee/Basic Service Operator, the revenue from Rural Fixed Wireline subscribers shall be excluded.]

3.2.3 Adjusted Gross Revenue of Fixed Wireline subscribers for purpose of retention of ADC shall be calculated as given in Table IV.

Table IV

Calculation of AGR for Fixed Wireline Subscribers for retention of ADC

S. No	Particulars	Amount in rupees
	Revenue from Fixed Wireline subscribers: (i) Rentals (ii) Call revenue within service area (iii) National LONG DISTANCE CALL revenue (iv) International LONG DISTANCE CALL revenue (v) Pass thru revenue for usage of other networks (vi) Service tax (vii) Service charges (viii) Charges on account of any other value added services, Supplementary Services etc. (ix) Any other income/miscellaneous receipt from Fixed Wireline subscribers. (x) Revenue from other OPERATORS on account of pass through call charges on fixed wireline subscribers (xi) Any other revenue for provisioning of Fixed Wireline subscribers	
A	GROSS REVENUE from Fixed Wireline Subscribers	
	DEDUCT: 1. Charges actually paid to other SERVICE PROVIDER for Fixed Wireline subscribers 2. Service Tax paid to the Government on Fixed wireline subscribers 3. Sales Tax paid to the Government on Fixed Wireline subscribers 4. Revenue from Rural subscribers.	
B	TOTAL DEDUCTIBLE REVENUE	
C	ADJUSTED GROSS REVENUE for Fixed Wireline Service on which ADC retention is admissible (A-B)	

3.2.4 Since this Regulation shall come into force with effect from 1st March, 2006, therefore, after payment of ADC in terms of percentage of AGR ²[up to 31-3-2006, the subsequent payments before the 1st April, 2007] shall be on quarterly basis so that it matches with the payments of annual licence fee. The ADC to be paid on the basis of revenue share between 1st March, 2006 and 31st March, 2006 shall be determined on the pro-rata basis of Adjusted Gross Revenue for the last quarter of year 2005-2006.]

1 Subs. by the Seventh Amendment Regulations, 2006, reg. 2 (w.e.f. 10.03.2006), for the following:
 3.2.2 For calculating ADC, Adjusted Gross Revenue shall have the same meaning as given in the respective licences;
 PROVIDED that in calculating the ADC as a percentage of Adjusted Gross Revenue (AGR) of a Universal Access Service Licensee/Basic Service Operator, the revenue from rural subscribers shall be excluded.”
 2 Subs. by the Eighth Amendment Regulations, 2007, reg. 3(b)(ii) (w.e.f. 01.04.2007), for the following:
 “up to 31-3-2006, the subsequent payments”

¹[3.2.5. For the financial year beginning on the 1st April, 2007 and effective till 31st March, 2008, on or after the 1st day of April, 2007 during the said financial year, the Access Deficit Charge referred to in sub-paragraph 3.2.1, shall be payable at the rate of 0.75% of the Adjusted Gross Revenue for every quarter in that financial year and shall be paid in accordance within the time schedule for payment of licence fee mentioned in the licence of the concerned licensees.]

²[Provided that nothing contained sub-paragraphs 3.2.1, to 3.2.5 (including payment of the Access Deficit Charge, by way of percentage of Adjusted Gross Revenue), shall apply on and after the 1st day of April, 2008 and the Access Deficit Charge payable on the basis of percentage of Adjusted Gross Revenue after the said date shall therefore cease to have effect.]

3.3 Reconciliation and Settlement of ADC

ADC, carriage and termination payments would be based on aggregated usage in seconds (on bulk basis). The settlement would be for the aggregate total seconds expressed in terms of minutes, with the figure being rounded off in terms of the nearest minute, over the settlement period as applicable in the Interconnect Agreement. Failing agreement amongst Service Providers on the settlement period, the settlement shall be done on monthly basis on bulk basis.

³[* * * *]

¹ Ins. by the Eighth Amendment Regulations, 2007, reg. 3(b)(iii) (w.e.f. 01.04.2007)

² Ins. by the Ninth Amendment Regulations, 2008, reg. 3(b) (w.e.f. 01.04.2008)

³ Ins. the following paragraphs by the Fifth Amendment Regulations, 2005, reg. 3 (w.e.f. 11.04.2005), which has been set aside by the Hon'ble TDSAT, *vide* its order dated 21.09.2005 passed in TA No. 7 of 2005 titled as "COAI & Ors. v. TRAI & Anr.":

"3.4 All calls from the National Roaming subscribers shall be treated as Long Distance calls and all calls from International Roaming subscribers shall be treated as incoming international call for ADC purposes. As such for all calls from National roaming subscribers while in a different Service Area, ADC charge as applicable for National Long Distance calls shall be applicable at the rate of Rs 0.30 per minute. For International Roaming Subscriber while making any call while in India, an ADC of Rs 3.25 per minute shall be applicable.

3.5 For all calls from Roaming subscriber, the access deficit amount is to be collected by the visited network operator and paid to BSNL."

¹[**Schedule IV**

INTERCONNECT USAGE CHARGE (IUC) FOR SHORT MESSAGE SERVICE (SMS)

Interconnect Usage Charge (IUC) for Short Message Service (SMS).- Interconnect Usage Charge (IUC) for Short Message Service (SMS) shall be under forbearance:

Provided that such charges shall be transparent, reciprocal and non-discriminatory.]

¹ Ins. by the Tenth Amendment Regulations, 2009, reg. 5 (w.e.f. 01.04.2009)

The Telecommunication Interconnection (Reference Interconnect Offer) Regulations, 2002

Telecom Regulatory Authority of India
Notification

New Delhi, the 12th July 2002

No 409-10/2002-TRAI (FN)

In exercise of the powers conferred upon it under section 36 read with clauses (ii), (iii) and (iv) of sub section (b) of Section 11 (1) of the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000, to ensure effective interconnection between different service providers and to regulate arrangements amongst service providers of sharing their revenue derived from providing telecommunication services, the Telecom Regulatory Authority of India hereby makes the following Regulation.

THE TELECOMMUNICATION INTERCONNECTION (REFERENCE INTERCONNECT OFFER) REGULATION, 2002
(2 of 2002)

Section I

1. Title, Extent and Commencement

- (i) The Regulation shall be called "The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, (The Regulation).
- (ii) The Regulation envisages publishing of Reference Interconnect Offer (RIO) by the telecommunication service providers holding significant market power based on the Model RIO annexed hereto as annex 'B'. The RIO will stipulate the concerned service provider's terms and conditions on which it will agree to interconnect its network with the network of any other service provider seeking interconnection. The interconnection seeker may either accept this offer in full and enter into an Interconnection Agreement with the offerer i.e. the service provider on that basis or accept the offer pending execution of an Individualized Agreement after negotiations.
- (iii) The Regulation is in addition and not in derogation of the other existing Regulations/Orders on interconnection.
- (iv) The Regulation shall be deemed to have come into force with effect from the date of its publication in the official Gazette.

Section II

2. Definitions

In this Regulation, unless the context otherwise requires:

- (i) "Act" means the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000.
- (ii) "Activity" would mean and include any one or more of the following:
 - (a) Subscriber base
 - (b) Turnover
 - (c) Switching Capacity

(d) Volume of Traffic

- (iii) "Authority" means the Telecom Regulatory Authority of India.
- (iv) "GUIDELINES" mean the guidelines to RIO issued by the Authority and as amended from time to time.
- (v) "Interconnection" means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers.
- (vi) "Interconnection Provider" means the service provider to whose network an interconnection is sought for providing telecommunication services.
- (vii) "Interconnection Seeker" means the service provider who seeks interconnection to the network of the interconnection provider.
- (viii) "Order" means the order issued by the Authority pursuant to the powers granted to It under Section 11 (2) of the Act.
- (ix) "The Regulation" means The Telecommunication Interconnection (Reference Interconnect Offer) Regulation 2002.
- (x) "Regulations" mean the Regulations issued by the Authority pursuant to the powers granted to it under Section 36 of the Act.
- (xi) "RIO" means the Reference Interconnect Offer published by a Party prescribing conditions by fulfilling which other Parties would be entitled to obtain interconnection with its network.
- (xii) "Acceptance" means an acceptance of the terms and conditions contained in the RIO either unconditionally or conditionally.
- (xiii) Words and expressions used in the Regulation and not defined but defined in the Act shall have the same meanings as assigned to them in the Act.

Section III

3. Reference Interconnect Offer

3.1 A Service Provider with significant market power shall be required to publish within 90 days of issue of this Regulation, a Reference Interconnect Offer (RIO) describing inter-alia the technical and commercial conditions for interconnection based on the model RIO as at annex 'B' and the guideline as at annex 'C', as modified from time to time, with the prior approval of the Authority. The RIO so published by the Service Provider shall form the basis for all Interconnection Agreements to be executed hereafter.

3.2 A published RIO may undergo any change only with the prior approval of the Authority. Interconnection Agreements are required to be entered into by and between all Service Providers based on the RIOs so published, provided, however, that by mutual agreement the two parties concerned i.e. the interconnection provider and the seeker may modify and/or add to the terms and conditions stipulated in the published RIO for entering into an Individualized Agreement.

3.3 A Service Provider shall be deemed to have significant market power if it holds a share of 30% of total activity in a licensed telecommunication service area. These Services are categorized as Basic Service, Cellular Mobile Service, National Long Distance Service and International Long Distance Service.

3.4 The Authority may review the guidelines from time to time.

Section IV

4. General Provisions

The services listed in the RIO, published by the Service Provider, shall contain various conditions as required to meet the interconnection requirements of public network operators after taking into account, the rights enjoyed by and the obligations incumbent upon each of these Service Providers.

Section V

5. General

If any dispute arises with regard to the interpretation of any of the provisions of the Regulation, the decision of the Authority shall be final and binding.

Section VI

6. Explanatory Memorandum

The Regulation contains at Annex 'A' an explanatory memorandum that explains the reasons for the issuance of this Regulation

(Harsha Vardhana Singh)
Secretary-cum-Principal Advisor

TELECOM REGULATORY AUTHORITY OF INDIA

REFERENCE INTERCONNECT OFFER

Dated 12 July, 2002

REFERENCE INTERCONNECT OFFER
CUM- DRAFT AGREEMENT

PREAMBLE

THIS AGREEMENT is made the day of _____, 200 between M/s _____, a Company registered under the Companies Act 1956 having its registered office at _____ hereinafter referred to as Party __, which term shall include, unless contrary to the context, its successor in business, legal representatives and/or its assignees of the one part and M/s _____, a Company registered under the Companies Act 1956 and having its registered office at _____; hereinafter referred to as the Party __ which term shall include, unless contrary to the context, its successor in business, legal representatives and/or its assignees, of the other part, together referred to as the Parties.

WHEREAS, [Party __ is authorised under the Indian Telegraph Act 1885 to establish, install and operate _____ various Telecommunications Systems for the provision of _____ Telecommunications Services in India]; or [Party __ is licensed under Section 4(1) of the Indian Telegraph Act 1885 to establish, install and operate a Telecommunications System to provide _____ telecommunications services in _____ on the terms and conditions specified in such license]; and

WHEREAS, [Party __ is authorised under the Indian Telegraph Act 1885 to establish, install and operate _____ various Telecommunications Systems for the provision of _____ Telecommunications Services in India]; or [Party __ is licensed under Section 4(1) of the Indian Telegraph Act 1885 to establish, install and operate a Telecommunications System to provide _____ telecommunications services in _____, on the terms and conditions of the license], and

WHEREAS, in order to provide the specified range of services to their customers in their service areas, the Parties to the agreement are required to interconnect their networks,

NOW, THEREFORE, this Agreement, witnesseth as follows:

ARTICLE 1 - SCOPE AND DEFINITION OF SERVICES

1.1 Scope

This agreement covers the technical and commercial arrangements for Interconnection between the network of ----- and the network of ----- and stipulates the conditions under which the respective networks of the Parties shall be interconnected to provide for exchange of uninterrupted telecom traffic and the manner in which interconnection and other mutually agreed services shall be provided and invoiced, to each other, subject to the terms and conditions of the Licenses issued by the Government of India under Section 4 of the Indian Telegraph Act 1885 and the Regulations, Orders and Directions issued by the TRAI under the TRAI Act 1997 as amended by the TRAI (Amendment) Act 2000.

This agreement covers the following:

- a) Physical Interconnection between the two networks (Schedule 1)
- b) Charges for Other Services where ever applicable (Schedule 2)
- c) Charges for Sharing of Infrastructure Elements, where ever applicable (Schedule 3)
- d) Applicable Technical Standards (Schedule 4)
- e) Interconnect Unbundled Network Elements (Schedule 5)
- f) Interconnect Usage Charges for Origination, Termination, Transit Traffic (Schedule 6)
- g) Interest Rates (Schedule 7)

All attached Schedules and Annexes shall form part of this Agreement. In case of conflict or variance, the terms set out in the main body of the Agreement shall prevail.

1.2 Acceptance and Commencement

1.2.1 Acceptance of RIO

The interconnection seeker shall notify its acceptance to the RIO to the service provider. An unconditional acceptance of the offer will result in a formally signed agreement precisely on the terms and conditions contained in the RIO.

1.2.2 An interconnection seeker may also notify the service provider that it wishes to negotiate an Individualised Agreement. In that case the seeker may obtain services on the prices, terms and conditions specified in this RIO on an interim basis pending the adoption of the Individualised Agreement following further negotiations and agreement.

Letter of acceptance of RIO shall be furnished in accordance with the proforma as at Annex -A.

1.2.3 Commencement

Pursuant to 'The Register of Interconnect Agreements Regulations 1999', the Parties shall file this Agreement or modifications with the Authority within thirty (30) days of the execution or modification of this Agreement including its Schedules

This agreement shall commence on and continue [for a period of ---- years], [or, indefinitely], subject to the relevant clauses relating to termination. Note: The Parties may specify terms and condition to be fulfilled before the Agreement becomes effective.

1.3 Amendments

Any modification to this agreement or schedules shall be based on mutually agreed amendments signed by both Parties and registered with the Authority. Changes necessitated by amendments in the Regulations, Directions, Orders, or License conditions shall be deemed to be immediately effective and shall be incorporated as amendments as soon as possible. All such amendments shall be filed with the concerned authority.

1.4 Definitions

Definitions included in the Indian Telegraph Act 1885, The Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000 and Regulations, Directions and Orders published under the Act, and license agreements shall apply wherever available and shall take precedence.

In addition as used in this Agreement, the following terms shall have the meanings indicated hereunder:

Act means the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000.

Apparatus means Telecommunication Apparatus. Applicable Systems means all necessary equipment, systems, sub-systems engineered to provide the services in accordance with the operational, technical and quality requirements.

Authority means the Telecom Regulatory Authority of India.

Basic Telephone Service mean the collection, carriage, transmission and delivery of voice or non-voice messages over the Licensee's Public Switched Telephone Network (PSTN) and includes provision of all types of services except those which require separate licence.

Billing Information means information necessary to ascertain the charges payable by either party under Agreement.

Busy Hour means the continuous one-hour period lying wholly in a given time interval for which the traffic is highest.

BHCA means Busy Hour Call Attempt Call Attempt means an attempt to achieve a connection to one or more devices attached to a Telecommunications Service.

CCS means Common Channel Signaling CDR means Call Data Records

CDR means Call Data Records

CLI means the process that identifies and transfers the identity (number) of the calling party from one network to the other.

Ceiling(s) mean(s) the upper limit(s) of charges for telecommunication services as may be specified by the Authority from time to time.

Cellular Mobile Telephone Service means Telecommunication Service provided by means of a telecommunication system for the conveyance of messages through the agency of wireless telegraphy where every message that is conveyed thereby has been, or is to be, conveyed by means of a telecommunication system which is designed or adapted to be capable of being used while in motion.

The Cellular Mobile Telephone Service refers to transmission of voice or non-voice messages over licensee's network in real time only. This Service does not cover broadcasting of any messages voice or non-voice; however, Cell Broadcast is permitted only to the subscribers of the service.

Customer means any person who is, or wishes to be, provided with any relevant Telecommunications Service by a Party for which the party is licensed. Directions means directions issued by the Authority under Section 12(4) of the Act. E1 level means a primary PCM bandwidth of 2.048 Mb/s.

Effective Call means an answered call.

Effective Date means the commencement date of the Agreement Erlang means the unit of telephone traffic intensity defined by the International Telecommunication Union.

FAC means Fully Allocated Current Cost

Floor means the lower limit of charges for telecommunication services as may be specified by the Authority from time to time.

Forbearance denotes that the Authority has not, for the time being, notified any charge or revenue sharing arrangement for a particular telecommunication service and the service provider is free to fix a charge for such service.

Gateway MSC means the MSC that interfaces with another Network.

GOS means Grade of Service Interconnection means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers.

Interconnection Charges mean the charges payable for interconnection and use of Network resources of one Service Provider by another Service Provider. Interconnection Provider means the service provider to whose network an interconnection is sought for providing telecommunication services.

Interconnection Provider means the service provider to whose network an interconnection is sought for providing telecommunication services.

Interconnection Seeker means the service provider who seeks interconnection to the network of the interconnection provider.

International Long Distance Telecommunication Service means telecommunication services originating within India and terminating outside India and vice versa.

International Subscriber Dialling (ISD) means facility for direct connectivity between an end user in India with another end user in another country by means of direct dialling through licensed networks.

ISUP means Integrated Service Digital Network (ISDN) User Part IUC means Interconnect Usage Charge Leased Circuits means telecommunication facilities leased to subscribers or service providers to provide for technology transparent transmission capacity between network termination points which the user can control as part of the leased circuit provision.

LDCA is an area of the country, generally coterminous with the SSA, declared for the purpose of charging long distance trunk calls.

LDCC is the nominated charging centre of an LDCA and represents the charge determination for long distance trunk calls.

License Agreement means the Licenses referred to in the Preamble.

Local Call is a call originating and terminating in the same local area (SDCA), which is charged at local call rates.

MSC means the switching centre that performs all switching functions needed for cellular mobile systems located in an associated geographical area.

National Long Distance National Long Distance Service means picking up, carriage and delivery of switched bearer telecommunication service over a long distance network i.e., a network connecting different Short Distance Charging Areas (SDCAs).

National Standards means the standards set by the Department of Telecom {Telecom Engineering Centre (TEC)}.

Non-discrimination in interconnection charge means that service providers shall not, in the matter of interconnection discriminate between the similarly situated and similar class of service providers.

Order means the Telecommunication Tariff Orders issued by the Authority.

Originating Network means the network to which an originator of a telecommunication message is proximately connected to.

Originating/ Transit/ Terminating Service Provider means the service provider whose network is used for originating/ transit/ terminating a telecommunication message respectively.

PLMN means the Public Land Mobile Network

Point of Presence (POP) (as applicable to BSO) means setting up of switching center and transmission center of appropriate capacity by Basic Telephone Service Provider at the SDCA level to provide, on demand, service of prescribed quality and grade of service in a nondiscriminatory manner.

Point of Presence (POP) (as applicable to NLDO) means setting up of switching center and transmission center of appropriate capacities by National Long Distance Service Provider at the LDCC level to provide on demand inter-circle long distance services of prescribed quality and grade of service in a non-discriminatory manner.

Point of Presence (POP) (as applicable to ILDO) means setting up of switching center and transmission center of appropriate capacity by the Licensee to provide on demand, service of prescribed quality and grade of service in a non-discriminatory manner.

PSTN means the Public Switched Telephone Network.

Point of Interconnection (POI) means a mutually agreed upon point of demarcation (based on TRAI determinations/regulations) where the exchange of traffic between the two Parties takes place.

QOS means Quality of Service Regulations means the regulations issued from time to time by the Authority pursuant to the power granted to it under Section 36 of the TRAI Act 1997 and the Amendment.

Reporting Requirement means the obligation of a service provider to report to the Authority before implementing any new interconnection charge and revenue sharing arrangement for telecommunication services under the Regulation and any changes thereafter.

Short Distance Charging Area (SDCA) means one of the several areas into which a Long Distance Charging Area is divided and declared as such for the purpose of charging for trunk calls and within which the local call charges and local numbering scheme is applicable. SDCAs, with a few exceptions, coincide with revenue tehsil / taluk.

Short Distance Charging Centre (SDCC) means a particular exchange in Short Distance Charging Area declared as such for the purpose of charging trunk calls. Head quarters of SDCAs are generally SDCCs.

Service Impairment means any interference with or impairment of service over any facilities of a Party.

Set Up Costs of Interconnection means the initial cost of engineering work needed to provide the specific interconnection facilities requested.

Service Area means the geographical area specified under the license throughout which the services are provided.

SLA means Service Level Agreement SSA means Secondary Switching Area

Subscriber includes any subscriber or any person or legal entity, which subscribes to / avails of the service from the licensee.

System means a telecommunication network consisting of basic access, switching nodes and transmission links, together with the operation and maintenance systems and network management systems.

Subscriber Trunk Dialling (STD) means facility for direct connectivity between two end users within India by means of direct dialling through licensed networks.

Terminating Network means the network to which a receiver of a telecommunication message is proximately connected to.

Transit Network means the intermediate network through which telecommunication messages from originating networks or other transit networks are transmitted and delivered to terminating networks.

Usage Charge means the charge levied by a service provider for carriage of telecommunication traffic on its network. Value-Added Services means such services as may be available over a Telecommunications System in addition to Voice Telephony or Data Services, and specifically those services listed as "Value-Added Services" in the Regulations or Orders.

Voice Telephony Service means the Telecommunications Service that provides subscribers with the facility for conducting real-time two-way speech conversation among them.

Working Day means any day from Monday to Friday, excluding holidays.

WLL (M) means the telephone service with mobility limited to the local area i.e. Short Distance Charging Area (SDCA) in which the subscriber is registered. The system should follow the numbering plan of the respective SDCA within which the service is provided. This service is included in the License for Basic Telephone Service.

ARTICLE 2 - POI AND INTERCONNECTION PRINCIPLES

2.1 Point of Interconnection

The Parties agree:

- a) to connect and keep connected their Systems at mutually agreed feasible Points of Interconnection set up in accordance with the Authority's determinations/regulations. Such interconnection shall be provided as detailed in Article 3. The agreed POIs for each class of service are indicated in Schedule 1 of this agreement. This may be amended from time to time on mutual agreement.
- b) to supply the requested telecommunication services, facilities and information, relating to interconnection, to the other Party as provided in this Agreement or otherwise mutually agreed. Such facilities shall only be used for the agreed purpose and shall not be resold to other Parties. These services and facilities are indicated in Schedules 2 and 3.

2.2 Traffic Routing Principles RIO final draft 12th July 2002

Each Party shall carry calls offered by the other Party through its network up to the designated point. In case the call cannot be so carried due to temporary network conditions, suitable tones or announcements shall be provided as agreed to between the two Parties.

The levels and points at which interconnections may be provided for various classes of traffic shall be as per the terms and conditions of the License Agreement and Regulations / Determinations of the Authority.

Authority's RIO Guidelines and Interconnection Tables given therein, as applicable, would provide details on various interconnection and delivery of inter operator traffic/services.

2.3 Arrangements at the POI

The types of traffic to be carried across the POI are indicated in Schedule 1. Interconnection shall be based on CCS System No. 7, or on the R2 Signaling System, if CCS 7 is not available. Other facilities such as CLI that are required to be provided are indicated in Schedule 2. The transmission and electric conditions at the POI shall conform to the Standards in Schedule 4.

2.4 Co-location of Apparatus and Plant

Wherever it is possible, physical co-location should take place of the Apparatus and Plant owned or leased by one Party and used for interconnection, at the premises of the other Party.

Wherever such co-location has been mutually agreed, essential accommodation and auxiliary infrastructure shall be made available for this purpose within the time schedules for interconnection. When a Party uses the premise and/or uses facilities of the other Party, such as power etc., it shall pay a rent to the other Party. Principles for deriving such rents are included in Schedule 3.

ARTICLE 3 - INTERCONNECTION PROVISIONING PROCEDURES

3.1 Initial Demand

3.1.1 The party seeking Interconnection shall provide relevant information normally 6 months in advance on the location of POI, estimated traffic in Erlangs, BHCA, type of signaling, and any other technical information required to facilitate planning.

A formal demand in writing indicating the number of ports and other facilities required, and the time schedule, shall be separately placed on the interconnection provider.

3.1.2 The Interconnection provider shall intimate within a period of 30 days from the date of receipt of such formal demand, either the acceptance or an alternative proposal for meeting this demand fully or partially as well as the approximate dates for meeting the demand. He shall also issue the relevant demand notes for the accepted part of the demand within 30 days of receipt of the formal demand.

In case no response is made within 30 days, the formal demand will be treated as accepted and interconnection seeker shall be free to deposit the prescribed amount for the required number of ports. The date of such deposit shall be treated as the date of "firm demand". Such accepted demand shall be met within 6 months of such deposit.

However, Interconnection with a minimum number of required EI ports as ascertained by the interconnection provider, required for the launch of the service, shall be provided within 90 days of payment of the demand note, unless found to be technically non feasible. Subsequent increase of interconnection circuits should be based on actual traffic flow and growth pattern for a grade of service (GOS) of 0.5%.

3.1.3 On the acceptance of the demand, in full or part, the interconnection provider shall issue Demand Notes (Bill) within 30 days of the formal demand, for the capacity to be provided. The seeker shall then make the payment within 30 days of receiving such Demand Note (Bill). The date of payment shall be taken as date of firm demand (The Date). Any change in the firm demand shall be intimated within 15 days of making the payment, after which no changes will be allowed. The detailed payment procedure to be followed in this regard shall be laid down by the Coordination Committee (as defined in Article 16).

3.1.4 For the balance requested capacity of ports not likely to be met within 6 months, planning action shall be immediately started. This demand shall be treated, as firm demand for the next year and demand notes shall be issued accordingly.

3.2 The case shall be referred to the Coordination Committee for resolution in case of disputes.

3.3 Provisioning & Testing and Commissioning of Interconnect Circuits

3.3.1 The capacity made available within 90 days shall be taken up immediately for testing. The full capacity required shall be provided and made available for testing in accordance with the time schedule indicated in the acceptance of demand or demand note, but within 6 months of the firm demand.

3.3.2 If the demand is not met within the scheduled periods, the matter will be considered by the Coordination Committee for further necessary action under this agreement.

3.3.3 Number of Ports indicated in the firm demand for each POI, will be the deciding factor for determining the port charges in terms of the Regulations.

3.3.4 The party installing the equipment and requiring inter-connectivity tests shall, notify to the other party indicating that such capacity is ready for testing as per National Standards. The proforma for such notification and subsequent procedures shall be mutually agreed in the Coordination Committee. Both the Parties shall ensure that the testing is completed within 30 days of provisioning.

3.4 Augmentation

3.4.1 Traffic measurements shall be taken by both the Parties during agreed route busy hours for seven days, six months after commencement of service and every six months thereafter with a view to determine further capacity requirements.

3.4.2 Augmentation for additional capacity for the next 12 months shall also be initiated by either Party on the basis of such traffic observation.

3.5 Cancellation Charges

3.5.1 If the cancellation of demand is made within 15 days of the firm demand, an amount equivalent to 10% of the annual rent payable for the capacity cancelled will be payable as the cancellation charge thereof.

3.5.2 If the cancellation of demand is made after 15 days after the firm demand, the payment made towards port charges for the first year shall be forfeited for the cancelled capacity.

3.6 Utilisation

The Party seeking the interconnection shall undertake to use the capacity so made available for a minimum period of 3 years. If he fails to use the capacity, 50% of the rental for the unused capacity for the remaining guaranteed period shall be payable forthwith. A Bank guarantee shall be provided for the amount covering 50% of the rental for the agreed period of use, within 90 days from the date of firm demand.

3.7 Port Identification

Wherever a separate charging regime is applicable, the ports shall be separate and clearly identified.

3.8 Damages

If within 6 months, the Provider fails to make available the interconnect capacity as per firm demand or the seeker is unable to put in place the matching infrastructure to utilise the interconnection as per firm demand, the Party failing shall pay Damages to the other Party calculated as follows:

- a) 1% of the annual rent for each E1 port (i.e. Port Charges) for each day of delay until the connection is made available for testing, for a maximum period of 60 days.
- b) The payment of Liquidated Damages shall not release the defaulting party from the obligation to provide the ordered capacity.

ARTICLE 4 - NETWORK AND TRANSMISSION REQUIREMENTS

4.1 Traffic Forecasts

Traffic forecasts are used for the planning of sufficient switching and transmission capacity. Traffic forecasts shall be prepared and supplied by one Party to the other Party on the following basis:

The Parties shall forecast all outgoing traffic of each type, to the other Party's System for a period of one year at intervals of six (6) months for each POI. These forecasts shall be made for the route busy hour. The first forecast shall be supplied within ninety (90) days of the Effective Date and thereafter on the 1st April and 1st October every year.

All traffic forecasts shall be in terms of Busy Hour Call Attempts and Busy Hour Erlangs. For these forecasts, time consistent busy hour of the exchange and routes shall be determined.

4.2 Network Engineering

4.2.1 Diversity and Alternate Routing

Diversity may be provided by either Party in accordance with standard network engineering practices. In the case of partial network/route failure, each party shall extend the same priority to the traffic of the other party as it gives to its own traffic.

4.2.2 Circuit Provision

Circuit provision shall be made on the basis of the specified GOS of 0.5% on the Network - Network Interface allowing for adequate overload safety protection.

4.2.3 Network Changes

The Parties shall inform each other, wherever possible, 12 months in advance of changes to network configuration and facilities that may have significant impact on the engineering of the other's network.

4.2.4 Calling Line Identification

CLI of the caller shall be transmitted to the receiving (incoming) network whenever requested by that network in the course of the Signaling procedure and wherever technically possible.

4.3 Carrier Selection

Both Parties shall handle calls in accordance with the Regulations of the Authority and procedures and guidelines laid down by the Licensor in relation to Carrier Selection. The carrier identification codes allocated to the two Parties are:

Party A	XX	Party B	XY
---------	----	---------	----

On request from any Party, the other shall supply information relating to its subscribers, who have opted for a service offered by the former, or have requested for termination of such service.

ARTICLE 5- TECHNICAL SERVICE COMMITMENTS AND FAULT REPAIRS

5.1 General Commitments.

Each Party shall:

- 5.1.1 Be responsible for operating its own system and ensuring its safety.

5.1.2 Ensure that the Services it provides to the other party are of the quality comparable to what it provides to itself and to its affiliates.

5.1.3 Maintain and repair faults on Interconnection Links in the same manner as it maintains plant and repairs faults within its own Network.

5.1.4 The performance standards that shall apply for the various types of interconnecting links between two Networks are indicated in Schedule I.

5.2 Quality of Service

The Parties shall ensure that the respective interconnect facilities delivered at each Point of Interconnection (POI) conform to the applicable Quality of Service (QOS) standards set by the Authority and Technical Specifications set out by the relevant Authority [Telecom Engineering Centre (TEC)], by the relevant delivery date, determined pursuant to the provisions of this Agreement. The agreed QOS (including GOS) is indicated in Schedule I.

5.3 Fault Reporting

5.3.1 Fault reporting mechanism for interconnect operational problems will be worked out jointly by both Parties and upgraded from time to time.

5.3.2 Each party shall advise its customers to report all faults to its own Fault Reporting Centre. If a fault report is received at an incorrect centre, the complainant shall be directed to the correct centre.

5.3.3 The party who first becomes aware of the fault shall promptly notify the fault to the other.

5.3.4 If one party identifies a fault occurring in its system or if a major fault occurs, that may have adverse effect on the other party's system, the first will promptly inform the other party of the actions being taken to resolve the problem.

5.4 Network Restoration:

The Parties will manage their Networks to minimise disruption to Services and, in the event of interruption or failure of any Services, will restore those Services as soon as is reasonably practicable in accordance with the schedule set by the Coordinating Committee. Each Party shall manage, notify and correct faults arising in its Network, which affect the provision of any Services by the other party, as it would in the ordinary course for similar faults affecting the provision of Services by itself.

5.5 Operating Instructions:

The Parties will develop and record in the form of operating instructions, a series of agreed response times for different network fault conditions on the basis of following principles:

- (a) Clearance of faults affecting the network will take priority over the clearance of individual faults.
- (b) They will automatically bring in any standby capacity available and/or carry out network management actions to restore service.
- (c) They will observe equipment alarms and carry out testing to identify the nature and location of the fault in co-operation, as deemed necessary, with the other party.
- (d) They will keep each other continually informed of progress on restoration of faults during a breakdown.

- (e) If temporary repairs are made by one, the other party must be informed of this fact. Other party shall also be informed of service impact of temporary repair and the estimated time of full restoration.

5.6 Planned Maintenance works:

5.6.1 Each party will give at least 7 days notice of any planned maintenance work that may affect the other's system.

5.6.2 Each party shall make its best efforts to minimise disruption and where possible alternative routing will be provided. Equipment design and link engineering should have such redundancy that for any planned work the prescribed quality of service is maintained.

ARTICLE 6 - TECHNICAL SPECIFICATIONS AND STANDARDS

6.1 National Standards

Interconnection of Networks and Systems shall conform to National Standards as set by the Telecom Engineering Centre and Regulations applicable to Telecommunications Services in India. In the absence of National Standards set by the TEC and Regulations, they shall conform to the relevant Recommendations of the ITU. References to typical standards have been indicated in Schedule 4 of this Agreement.

6.2 Signaling and Synchronisation

Inter-network Signaling shall be on the basis of CCS 7 (ISUP) in the format standardised for India. Other standard Signaling systems such as Indian R2, may also be used by mutual consent if they fulfill the requirements of network integrity. The signal interchange points shall be those associated with the POIs.

The systems shall be synchronised in a manner required to meet National Standards. Signals, derived from the National Master Clock shall be used for synchronisation of the network of both the parties at the Network-Network interface.

6.3 Interface Approval

Neither Party shall connect or knowingly permit the connection to its System of any equipment that has not been approved by the competent authority for attachment to such Party's System. Both Parties shall ensure that the equipment at the POI has been approved by the competent authority in accordance with National Standards.

6.4 Transmission and Performance Standards

6.4.1 Transmission Interface

The normal interface for network interconnection shall be at the E1 level. However, higher order interfaces may also be used by mutual consent. In case of interconnections involving ISPs, nx64 kbit/s interfaces may also be used by mutual consent. National standards and ITUT G. Series Recommendations shall apply.

6.4.2 Switching

Switches shall conform to the National performance standards and ITU-T Q Series Recommendations.

6.4.3 Packet Network

Packet switches and interfaces shall conform to the National performance standards and to ITU-T H. Series Recommendations.

6.4.4 Speech Performance

Speech over the National network shall conform to the ITU-T P. Series Recommendations and TRAI QOS standards. Allocation of impairments shall be as prescribed in the National standards.

6.4.5 PSTN/ VOIP Interoperability Standards:

For Interoperability between Circuit based switching and IP based networks, the interface will conform to relevant national standards or guidelines of Licensor/ Regulator. Media gateway, Signaling Gateway and Gatekeeper shall conform to relevant ITU-T Recommendations and Internet Engineering Task Force (IETF) standards, as applicable.

ARTICLE 7- NETWORK MANAGEMENT, MAINTENANCE & MEASUREMENT

7.1 The Parties shall provide, install, test, make operational and maintain all interconnection facilities on their side of Point of Interconnection (POI) unless otherwise mutually agreed. The parties shall take full precautions to keep operational the equipment of other party installed in their premises for interconnect purpose and shall also allow access to duly authorised representative of the other party to such equipment for provisioning, maintenance or monitoring purposes.

7.2 All measurements of calls and traffic and interconnect charges shall be related to the POI. Where such measurements cannot be made at the POI, a mutually agreed procedure shall be followed.

7.3 Each Party shall employ its own network-specific, Network Management System, with a view to efficient traffic and facility management of its own network. In particular, he shall make arrangements to prevent overload of other interconnecting systems.

7.4 The Network Management System employed shall be non-intrusive.

7.5 Each Party shall prevent any signal from its network or the Network Management system from interfering with the other Operator's network, so as to maintain network integrity.

7.6 Each Party shall make traffic and link measurements, and inform the other about any foreseen degradation in traffic performance, before it manifests through deterioration of QoS, to allow the other operator to initiate any viable action for diversion or rerouting of traffic through the network of a third operator.

7.7 At every Point of Interconnect between the two networks, congestion signal will be conveyed through CCS7, wherever available.

7.8 IP Platforms

Each Party using IP based networks shall have a Network Management System based on the Open System Protocol (OSP) for Interoperability of Multi-operator networks.

ARTICLE 8- NETWORK INTEGRITY, SAFETY & PROTECTION

8.1 General Principles:

8.1.1 The two Parties agree to maintain network integrity and to take measures for adequate protection and safety.

8.1.2 Integrity of a network refers to the ability of its systems to preserve and retain their original operational states and remain unaffected by interconnection with other networks

8.2 Maintenance of Network Integrity

Each Party shall ensure:

8.2.1 that adequate measures are taken to prevent the transmission of any Signaling message across the connecting network, which does not comply with interworking national specification;

8.2.2 that efficient arrangement for screening functions and rejection of non-compliant messages are established to detect signals outside the Interworking national specification

8.3 Safety and Protection.

8.3.1 Each Party is responsible for the safe operation on its side of the Network, and shall, so far as is reasonably practicable, take all necessary steps to ensure that its side of the Network and its Network operations:

- do not endanger the safety or health of any person, including the employees and contractors of the other Party; and
- do not cause physical or technical harm to the other party's Network, including but not limited to causing damage, interfering with or causing deterioration in the operation of the first mentioned Party's Network

8.3.2 It shall be ensured that in case the transmission of traffic to either party's network requires power feeding, then not only the safety of the equipment shall be ensured but also that of the personnel maintaining it. In this regard, safety requirements of accidental human touch of feeding voltage as prescribed in Bureau of Indian Standards (BIS) document no. IS 8437 shall be referred for limits.

ARTICLE 9 - OPERATIONS, SPECIAL AND MANUAL SERVICES

9.1 Assisted Calls

When the services of a Party are used for completion of a special service call or for supply of information, the Party supplying the service shall be entitled to a fee for such service. This fee shall be mutually negotiated if it is not specified in the Regulations.

9.2 Other Facilities

Each Party agrees to provide access to its services/facilities to the other Party and its customers at fees/charges prescribed by the Authority for such service or otherwise mutually negotiated. All such fees for services and facilities shall be placed in Schedule 2 and 3, which may be amended from time to time.

9.3 Directory Enquiry

Each Party shall provide access to its Public Directory Services for the other Party's subscribers at the specified or mutually agreed fees. Each Party shall include the other Party's information on Directory Services access numbers in their respective telephone directories and Directory Inquiry Services.

9.4 Customer Services

Each Party shall be responsible for making arrangements to provide prescribed Customer Services to his Customers.

ARTICLE 10 - ACCESS TO INTERCONNECTION GATEWAY FACILITIES

10.1 Interconnection Gateways

Any switch that is used for transiting traffic, from one network to another network in a Multi-operator environment may be termed as an Interconnection Transit Gateway. The functionality of such Switches should conform to the relevant TEC specification. Operational and Planning requirements of the Interconnect Gateway shall be as laid down in the Regulations.

ARTICLE 11 - CHARGING MECHANISMS, BILLING AND SETTLEMENT

11.1 Subscriber Billing

Party A shall be responsible for billing.....and Party B shall be responsible for billing Billing and revenue collection services to be provided by one party to another shall be carried in accordance with Licensing conditions as detailed in Schedule 2. The description and charges for such services are also contained in the same schedule.

11.2 Inter-Carrier Billing

Both Parties shall make arrangements for collection, storage and transfer of data relating to traffic passing through their network to facilitate inter-carrier charging and settlement. Billing System may be based on Bulk Billing or where feasible on Call-by-call basis with Call Data Records (CDRs). The transit switch generates CDRs, which is inputted to the Billing Systems.

For such CDR based systems, typically the following information is required:

- a) Carrier Related Information
 - i) Identity of Originating Carrier
 - ii) Identity of Terminating Carrier
 - iii) Identity of Transit Carrier, if any.
- b) Geographical Information
 - i) Originating Charging Area Code
 - ii) Terminating Charging Area Code.

The agreed formats for inter-carrier billing information / CDRs are given in an Annex ____-. Apart from transfer of information during the call, data may also be stored in appropriate CDRs.

11.3 Settlement

The interconnect usage charges (IUC) for originating, terminating and transit traffic payable by one party to the other are indicated in Schedule 6. This schedule also indicates which party is responsible for third party payments. These charges shall be subject to the Regulations.

11.4 Accounts

Each party shall send to the other a bill / invoice in respect of the previous month for the amount due for all effective traffic sent to or received from the other party. Effective Traffic for this purpose would mean answered calls. This bill / invoice shall be sent within 7 calendar days after the close of the month for which the bill / invoice is made. The determination of the amount due shall include:

- a) The amount of POI wise traffic in minutes or call units as is applicable, handled during the month, broken down by the type of traffic (local, long-distance, international etc. as feasible) and
- b) The payable amount for such traffic shall be calculated at the rates given in Schedule 6.

In addition, the due amounts for other services and network elements (refer Schedules 2 & 3) shall also be presented wherever applicable.

Each party shall be responsible fully for the taxes, if any, imposed by the Central, State Government or any other authority in this regard.

11.5 Payments

11.5.1 The net amount for each billing period shall be remitted by the concerned Party to the other within fifteen (15) days following the receipts by both Parties (the "due date").

11.5.2 Any payment not paid by the due date shall bear penal interest at a rate agreed to from time to time and indicated in Schedule 7. This interest calculated from the due date until the date of payment, shall be payable to the concerned party.

11.5.3 If any party issuing the bill subsequently finds that some charges have been omitted from the bills issued, he may include the omitted charges in the subsequent bills at any time, but not later than six months from the date of issue of the relevant bill except in cases where additional billing becomes necessary due to the tariffs / rate changes notified by the appropriate authority subsequently.

11.6 Errors and Reconciliation

11.6.1 If either Party discovers an error in the reports, it shall promptly notify the other Party, but not later than 3 months from the date of issue of the Bill, and the Parties shall make such adjustments in accounts as are necessary to correct the error.

11.6.2 If the Parties dispute the accuracy of the traffic information or any related matter, the same shall be referred to the Coordination Committee for reconciliation and settlement of accounts, after making payment of the undisputed amount. The full amount shall however be paid if the disputed amount is less than 2%. In case reconciliation is not achieved, the Parties may jointly select an auditor to assist in resolving the dispute, if the Parties are unable to appoint an auditor, the Authority, after a reference being made by either of the Parties, shall appoint one or specify alternate measures for settlement of accounts. The cost of the auditor shall be borne by both Parties. The amount payable after reconciliation will carry interest from the due date at the rate of interest specified in Schedule 7.

Neither Party shall be allowed to reduce any amounts reported or remitted to the other Party pursuant to this Article as a set-off or compensation for amounts owing under any other obligation between the Parties.

11.7 Security Deposits

Parties shall be entitled to demand Security Deposits/Bank Guarantees in accordance with the procedure laid down in the Annexes. This is in addition to the other payable amounts prescribed in this agreement.

11.8 Fraud and Default

The Parties shall cooperate with one another to investigate, minimise and take corrective action in cases of fraud. Subject to applicable laws, information concerning defaulting customers may be supplied to the other Party.

ARTICLE 12 - COMMERCIAL TERMS AND CONDITIONS

12.1 Supply of Service

The Parties agree to supply the services and facilities listed in Schedules 2, 3 and 6 at the prices listed. These lists shall be prepared in accordance with the Orders, Directions and Regulations of the Authority wherever applicable. If not so listed, they shall be determined on the basis of the costing principles indicated in the Interconnection Regulations. The terms and conditions under which such services / facilities are to be supplied shall also be included in the schedule. Such facilities shall only be used for the agreed purpose, and shall not be resold to other Parties unless agreed otherwise mutually. These facilities shall not be used for bypass of traffic.

12.2 Third Party Rights

This agreement is intended to apply to the provision of facilities and services by one Party to the other and shall not be construed as conferring rights of any nature on any third Party.

12.3 Costs of Interconnection

12.3.1 The cost of upgradation / modifying interconnecting networks to meet the service requirements of the service shall be met by the Party seeking interconnection. However mutually negotiated sharing arrangements for cost of upgrading / modifying interconnecting networks between the service providers shall be permitted.

12.3.2 Two years after the initial interconnection is established, the issue as to who bears the cost of additional resources required shall be negotiated between the service providers. The general principle followed in these negotiations is that each party should bear the incremental costs incurred for the additional ports required for meeting the QOS standards relating to its outgoing traffic to the other Party.

12.4 Upgradation

Any upgradation of network required to meet National Standards relating to such shall be carried out by each party at his own cost.

12.5 Exclusivity

The Parties may interconnect with any other licensed Party in India according to the terms and conditions set out in their respective licenses. Neither Party shall require the other to interconnect to its facilities on an exclusive basis.

12.6 Emergency Services

Access to emergency services of each Party as specified in Schedule 2 shall be provided by mutual agreement.

12.7 Applicable Law

This Agreement shall be governed by and construed in accordance with the laws of the Republic of India.

12.8 Assignability

Neither this Agreement nor any of the rights, interest or obligations hereunder shall be assigned by any Party without the prior written consent of the other Party hereto.

12.9 Language

This Agreement has been executed in the English language, which shall be the binding, and controlling language for all matters relating to the meaning or interpretation of this Agreement.

12.10 Waivers

The waiver of the rights derived from this Agreement shall only be effective if made in writing duly sent to the other Party. No failure on the part of any Party to exercise any right, power or privilege under this Agreement shall operate as a waiver hereof.

12.11 Partial Invalidity

If any provision in or obligation under this Agreement is considered invalid, illegal or unenforceable by a court of competent jurisdiction, such judicial decision must, as regards such invalidity, be strictly interpreted and shall not affect or impair the validity, legality or enforceability of any other provision in or obligation under this Agreement.

12.12 Non-Discrimination

Service providers shall not, in the matter of interconnection charges, discriminate between service providers except on the basis of substantial cost-differential.

For considering the cost herein the factors like volume of traffic etc., which have direct bearing on the charges of interconnection shall be taken into account.

ARTICLE 13 - INTERCONNECTION USAGE CHARGES

13.1 Type of Charge: These are of the following types

- i) One time set up charge for establishing/augmenting specific interconnect facilities for example, all hardware/software modifications required to interconnect the network of the two parties for handling each other's traffic.
- ii) Rental charges for use of Ports and Interconnect links and other facilities.
- iii) Usage charges for use of network elements of one party by the other party for carriage of traffic.

13.2 Set Up Charges

Set Up charges shall be determined as per Regulations. In case major reconfigurations of plant are required the cost charged to the other Party shall be in proportion to the asset being requested/provided to that Party.

13.3 Usage Charges:

For determining usage charges for carriage of each other's traffic, both the parties will furnish the details of their network elements cost as detailed in Schedule 5 to the Authority. The Unbundled Network Element costs of both switching and transmission shall be worked out in sufficient details so that usage charges for various types of interconnections can be calculated based on various types of switches and transmission elements involved in call conveyance. These costs shall then form the basis of the IUC for various types of calls and these shall be entered in Schedule 6. Unbundled telecom network cost shall be based on the principle of Fully Allocated Current cost (FAC).

ARTICLE 14 - FUNDAMENTAL TECHNICAL PLANS

14.1 General

The Parties shall adhere to the National Fundamental Technical Plans to the extent applicable to their networks subject to conditions stipulated in the License Agreements.

ARTICLE 15 - CONFIDENTIALITY, LIABILITY AND INDEMNITIES

15.1 Each Party may disclose to the other Party such proprietary and confidential (technical or business) information in written, oral, graphic or any other forms, as may be agreed to, for the purposes of this agreement only.

15.2 Each Party shall guarantee that the equipment / systems and other articles of the service commissioned / provided by it for the purpose of interconnection or usage by the other Party in terms of this agreement, does not infringe any copy-right or trademark or on intellectual property rights of any third party.

15.3 Either Party must not use a trademark, service marks or trade names belonging to another Party as a trademark, service marks or trade names without the prior written consent of the other Party.

15.4 The conveyance of information between----- and-----which shall take place, shall not constitute or imply the granting of any rights under any copy right, patent, trademark or any other Intellectual property rights either at the time of conveyance or subsequently.

15.5 Except as otherwise provided in this agreement, either Party may not disclose the confidential information except in the following circumstances: -

- (a) the disclosure is authorised in writing by the Party, to the extent so authorised; or
- (b) the disclosure is made to any arbitrator or expert appointed to resolve disputes under this agreement; or
- (c) the disclosure is made pursuant to any applicable laws, rules, regulations or directions of a statutory or regulatory authority or order of a court of law of competent jurisdiction.

15.6 Each Party to the agreement shall inform the other Party of any disclosures made to third Party prior to any such disclosure.

15.7 Each Party to the agreement shall ensure that the information provided by one Party to the other is used solely for the purposes for which it is disclosed.

15.8 In order to protect such confidential information from improper disclosure, both Parties agree to limit access to such confidential information to authorised employees/agents who have a need to know the confidential information for performance of this Agreement and to use such confidential information only for purposes of fulfilling work or services relating to this agreement.

The authorised employees/agent to whom all or any confidential information is disclosed shall hold it strictly confidential and shall not disclose it to any other person. Each Party shall be liable for any disclosure by the authorised person(s) to any other person.

15.9 Neither Party shall be liable to indemnify the other for any claim, demand or proceeding by any third party asserting that the use of any circuit, apparatus, or system or software, or the performance of any service by either Party under this agreement constitute infringement, or misuse of any patent, copyright or any other proprietary or intellectual property right of any third party.

15.10 All written confidential information or any part thereof (including, written information incorporated in computer software or held in electronic storage media) together with any analysis, compilations, studies, reports or other documents or materials prepared by the receiving Party or on its behalf, that reflect or are prepared from any of the confidential information provided by the disclosing Party shall be returned to the disclosing Party or destroyed by the receiving Party, when requested by the disclosing Party at any time, or when this agreement expires or is terminated, whichever is earlier. In the event of destruction, the receiving Party shall certify in writing to the disclosing Party within thirty (30) calendar days, that such destruction has been accomplished. The receiving Party shall make no further use of such confidential information nor retain such confidential information in any form whatsoever.

15.11 The Parties acknowledge that the provisions of this part shall continue in full force and effect regardless of variations, assignments or termination of other provisions of this agreement. The obligation to maintain confidentiality of the confidential information provided hereof and the undertakings and obligations in this part shall continue for two (2) years upon the expiry or termination of this agreement.

15.12 Notwithstanding any provision in this agreement and unless otherwise provided the Parties shall not reveal, make known or divulge to any third party in any manner howsoever the contents of those aspects of this agreement (in full or in part) which the Authority has withheld from publication.

15.13 Save as provided under this agreement, no news releases, public announcements or any other form of publicity concerning this agreement or the terms of this agreement shall be conducted or released by the either Party without the prior written consent of the other Party.

15.14 Each Party acknowledges that a breach of any provision of this chapter may cause the other Party damage.

15.15 The agreement contains the entire understanding between the Parties with respect to the safeguarding of the confidential information and supersedes all prior communications and understandings with respect thereto.

15.16 FORCE MAJEURE

Neither *party* shall be liable for any breach of this Agreement (other than a breach for non payment) caused by an act of God, insurrection or civil disorder, war or military operations, national emergency, fire, flood, lightning, explosion, subsidence, industrial dispute of any kind. The *Party* affected by such force majeure shall promptly notify the other *Party* of the conditions and the details thereof. If as a result of force majeure, the performance by other *Party* of its obligation under this agreement is only partially affected, such *Party* shall nevertheless remain liable for the performance of those obligations not affected by such force majeure. If the force majeure lasts for more than the continuous period of 90 calendar days from the date of the notification, and continues to prevent the affected *Party* from performing its obligation in a whole or in material part, the affected *Party* shall be entitled to, but not be obliged to, terminate its agreement by giving not less than 30 calendar days written notice to the other *Party*. This will be subject to the Articles on Termination.

ARTICLE 16 - LIAISON AND COORDINATION

16.1 Coordination Committee

A Coordination Committee consisting of both Parties shall coordinate all mutual activities relating to implementation of interconnection, amendment of schedules, reconciliation of accounts etc. and lay down the detailed procedures required for smooth implementation of the agreements. Sub-committees may be set up by the Coordination Committee as may be required.

ARTICLE 17 - TERMINATION AND REVIEW

17.1 Termination

17.1.1 This Agreement shall continue for the period indicated in Article 1.2 unless:

- (a) either Party ceases to hold a licence under Section 4 of the Indian Telegraph Act.
- (b) an order is entered by a court of competent jurisdiction mandating the winding-up or dissolution of a Party, or appointing a receiver or liquidator for such Party or having a comparable effect;

In which case this Agreement shall immediately be terminated.

17.1.2 This Agreement also may be terminated by either Party giving 30 days notice to the other in the event that either Party:

- (a) breaches any provision of this Agreement; provided, however, that the breaching Party has been notified in writing of its failure by the non-breaching Party and the breaching Party has not remedied its failure within twenty (20) Working Days; and the approval of the Authority and the licensor has been obtained for such termination. In the event, the approval is accorded with conditions, regard being had to the general interest of the customers, the same will be fully complied with before the final act of disconnection of interconnection arrangements becomes effective. Provided, however, in the event no

intervention is made by the Regulator / Licensor during the notice period, the approval of the authority shall be deemed to have been accorded.

(b) ceases to carry on business.

17.1.3 Each Party shall provide assistance as is necessary for recovery by the other Party of any equipment supplied by that other Party.

17.1.4 Termination of this Agreement shall be without prejudice to a Party's rights, liabilities or obligations that may have accrued prior to such termination.

17.2 Withdrawal of Interconnection for non-payment

In case of default in payment, the creditor Party may immediately approach the Regulator/Licensor for withdrawal of services, provided that the remedy to appropriate the security deposit has been exhausted or there exists some such circumstances, which warrant immediate suspension. This will be in addition to other remedies available under the contract. Provided, however, in the event no intervention is made by the Regulator / Licensor during the notice period, the approval of the authority shall be deemed to have been accorded.

17.3 Review

Apart from changes to Schedules and Annexes that may be made at any time by mutual agreement, this Agreement may be taken up for Review by mutual consent whenever a material change in License Conditions, Regulations or otherwise etc., takes place.

ARTICLE 18 - DISPUTES

18. Settlement of Disputes

It is understood and agreed that the Parties shall carry out this Agreement in the spirit of mutual co-operation and good faith and shall seek to resolve amicably any disputes arising between them.

The settlement of disputes shall take place in accordance with the Act. It is, however, desirable that before a matter is formally established as a dispute, reconciliation is attempted in the Coordination Committee referred to in article 16.1. The Committee shall resolve the matter within 30 days. The Authority may intervene at the request of either of the parties.

During any period of dispute, before or until resolution, a Party shall not disrupt services being provided to the other Party, or take any other actions, which might materially and adversely affect that Party's service

ARTICLE 19 - NOTICES

Unless otherwise provided in the Agreement, any notifications, service of process, petitions, claims and other Communications requested or permitted pursuant to this Agreement, shall be made in writing and shall be considered validly made when delivered by hand or by courier, telex or facsimile once receipt is verified at the following addresses.

If to Party A:

Attention:
With a copy to:

If to Party B:

Attention:
With a copy to:

or to such other address or persons as may have been designated in writing by the Parties.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the day and year first above written.

[PARTY A]

[PARTY B]

By: _____
Name:
Title:

By: _____
Name:
Title:

Dated as of _____, 200__

REFERENCE INTERCONNECT OFFER SCHEDULES

SCHEDULE 1 POINTS OF INTERCONNECT

List of POIs

Station/Area	Type of Traffic	POI	QOS

Note 1: Type of Traffic means local, domestic trunk, international trunk, special services etc.

Note 2: Outgoing, Incoming and Transit Traffic should be shown separately

Note 3: For each POI, a physical description should be prepared, separate from the main interconnect agreement

Each POI should be described in the following format:

Item	Description	Remarks
Location of the POI	Address:	
Party responsible for setting up and maintaining the POI	Name and Address:	
Physical description of POI	Ex: Physical cable (gauge) or channel interface (ITU-T specification)	

Note: Both the parties will update Schedule I, at Circle level, at intervals of 6 months or when ever new POIs are added in a licensed service area.

Performance standards

	Type of Network		
	Local	Trunk	International
1. System Availability			
a. Group Down Time			
b. MTTR			
2. Bit Error Rate			
3. Slip			
4. Others			

SCHEDULE 2
CHARGES FOR MISCELLANEOUS SERVICES

TYPE OF FACILITY	CHARGE	DETAILS

Note: The types of facility may include billing and revenue collection, access to special services, advertisement etc.

SCHEDULE 3
CHARGES FOR SHARING OF INFRASTRUCTURE ELEMENTS

TYPE OF FACILITY	CHARGE	DETAILS

SCHEDULE 4
TYPICAL SCHEDULE OF STANDARDS AND SPECIFICATIONS

S. No.	Item	Specification	Remarks
1	Switching Interface	G/PNI-02/01 & ITU-T E770 G/PNI-03/01	(PSTN and Mobile) (PSTN & Private basic operators)
2	Transmission Interfaces	I/DMX-01/01 Dec, 98 & ITU-T G.703/G.707(3/96) G.782/ G.783 G/VAN-02/01 Sept, 96	2/8/34/140/ 155 Mbps For V 5.2 interface
3	Signaling CCS 7	R/NSP/-01/01 Sept, 92 S/CCS -02/03 Jan, 2000 G/CCS-03/01 Jun, 94 G/CCS-04/01 Sept, 94	National CCS 7 Plan MTP & ISUP SCCP STP
4	Other cases	G/LLT-01/04	
5	Synchronization	G/SYN-01/01 G/PNI-02/01	As per National Synchronization Plan
6	Junction Traffic	G/LLT01/04	Maximum loading = 0.7E
7	Junction Testing	G/LLT01/04	
8	Higher Layer Protocols	G/LLT01/04	
9	Interface with IP Network	I/RAS-01/01 Apr 99 I/TCP-01/01 Apr 99	Remote Access Server TCP/ IP Internet user devices
10	Electrical safety requirements	S/SFT-01/01 May, 94	
11	Quality of telecom services	TRAI Regulations	ITU-T E 800
12	Terms and definitions	ITU-T B.13	All the definitions shall be considered as per B series of ITU-T Recommendations

SCHEDULE 5
Interconnect Usage charges (IUC) for use of Unbundled Network Elements (UNEs) involved in carriage of various types of calls

No.	Network Elements	Total OPEX per DEL	Mean Capital Employed per DEL	Cost of Capital (%)	Annual CAPEX	Annual CAPEX+ OPEX per DEL	Minutes of Usage	Av. Cost per minute
1	Wireline/ Wireless Access Loop							
2	Local Exchange							
3	SDCC Tandem							
4	TAX Switch							
5	Local Exchange - SDCC transmission Link							
6	Local Exchange - SDCC transmission Length in steps of 1 km each.							
7	SDCC - TAX transmission Link							
8	SDCC - TAX transmission Length in steps of 10 km each.							
9	Inter-TAX transmission Link (Intra-Circle)							
10	Inter-TAX Transmission Length (Intra-Circle) in steps of 50 km each.							
11	Inter-TAX transmission Link (Inter-Circle)							
12	Inter-TAX Transmission Length (Inter-Circle) in steps of 50 km each.							

NOTES:

1. Based on the above average cost per minute/per unit indicated in the table, it should be possible to calculate carriage/ access charges involving various types of switching and transmission elements such as Double TAX call for transit, Single TAX/ILT call for originating and termination.
2. The element costs may be different for different network sizes/ configurations.
3. This Schedule shall be submitted by both the Parties to the Authority and will be treated as confidential.

SCHEDULE 6
INTERCONNECT USAGE CHARGES DERIVED FROM SCHEDULE 5

TYPE OF ACCESS/ CARRIAGE	NETWORK ELEMENTS INVOLVED	CHARGE/ MINUTE
Originating	Local Loop-Local Exchange Tandem Exchange plus Transmission Link & Length	
Transit	Single TAX -Transmission Link & Length (Intra-Circle)	
Transit *	Two TAXs -Transmission Link & Length (Intra-Circle and Inter-Circle)	
Transit *	Three TAXs -Transmission Link & Length (Intra-Circle and Inter-Circle)	
Transit *	Four TAXs -Transmission Link & Length (Inter-Circle)	
Terminating	Tandem exchange plus Transmission Link & Length - Local Exchange - Local Loop	

Notes:

- Usage charges are generally derived from the costs of traffic sensitive network elements, such nodes & links of the core network excluding Local Loop. The cost of the latter is generally recovered from Rentals. However, the Local Loop costs have been included in Schedule 5 in view of the unbalanced nature of the traffic at present i.e. Rental being below cost. Therefore, the usage charge of Local Loop has been included to cover the Access Deficit.
- In case of two or more TAXs are involved, the Charges per minute shall be computed in multiples of 100 Kms or part thereof.
- Where distance insensitive transmission system like Satellites, then the separate charges shall be specified

SCHEDULE 7
RATE OF INTEREST

TYPE OF INTEREST	RATES	REMARKS
Normal Rate of Interest		
Penal Rate of Interest		

LETTER OF ACCEPTANCE OF RIO _____
REFERENCE INTERCONNECT OFFER (RIO)

No.

Dated the _____

To

Sub: Acceptance of Reference Interconnect Offer (RIO)

Sir,

1. We are licensed to provide the following telecommunication services:
2. (a) We notify the acceptance of your published Reference Interconnect Offer (RIO).

Or

(b) We notify the acceptance of your published Reference Interconnect Offer (RIO)
pending execution of an Individualised Agreement in terms of Clause 1.2.2
(cancel the alternative which is not applicable)

3. We request you to provide the following interconnection and / or wholesale services:
4. The designated contact person on our behalf is

Yours faithfully,
(.....)
Authorised Signatory
Name of the Company
Service Area of Licence

REFERENCE INTERCONNECT OFFER

GUIDELINES

Dated 12 July 2002

REFERENCE INTERCONNECT OFFER - GUIDELINES

1. INTRODUCTION

Interconnection agreements are required to be established between operators for interconnection of their networks. These would enable smooth operation of telecommunication services in India. Such agreements need to be entered into between all types of operators such as basic, cellular mobile, national and international long-distance operators and also the incumbent who provides a combination of these services.

To assist operators in arriving at fair agreements, it is customary for the players with significant market power to publish a Reference Interconnection Offer. After the RIO has been accepted by the Interconnection Seeker, a mutually agreed Agreement shall be entered into, within the framework of the RIO.

Operators are not required to obtain prior permission for entering into Interconnect Agreements, but these have to be registered with the Authority in accordance with the Regulations. The RIOs, however, require the prior approval of the Authority before they are published. Operators who do not have published RIOs may use the clauses of the Model RIO for their Interconnect Agreements, after appropriate legal and commercial scrutiny.

The RIO attached to these guidelines is of a universal type that could be established between any two service providers, for the interconnection of their networks. The types of networks would be defined in the Interconnect Agreement. The agreement may be modified, to suit the specific type of network and the special requirement of the two parties.

The RIO is divided into two parts, the main clauses and the Schedules and Annexes. The main clauses represent the generally stable part of the agreement. The parameters that may vary with time or type of network are placed in the schedules and Annexes. This means that the main agreement need not be changed every time a variable parameter is changed. The corresponding schedule or annexure may be changed as required. This makes the agreements more compact.

2. PREAMBLE

The Preamble introduces the parties entering into the Agreement. References are to be made to their Licenses and the Services for which the Agreement is being entered into. In case BSNL, or any party operating directly under the Telegraph Act, is involved, the separate wording shown as an alternative in the clause relating to Party A, should be used.

3. ARTICLE 1

3.1 Scope

Once interconnection is achieved, the customer's interests demand that there should be no unilateral discontinuance of service. The term "uninterrupted" is used in this sense and is dealt with in detail in the termination clauses. The Regulations and Directions refer to the relevant sections of the TRAI Act.

3.2 Definition of Services

Clause 1.2 identifies the two networks that are being interconnected and lists the schedules to the Agreement. These schedules contain important parts of the agreement relating to charging and technical aspects relating to each type of service. Additional schedules may be specified if required. Only those schedules that are relevant to the agreement should be included. These schedules may be altered by mutual agreement.

3.3 Registration and Commencement

Interconnect Agreements shall be registered in accordance with the Regulations. Clause 1.3 indicates the commencement date (effective date) and the duration. If the Agreement is of indefinite duration this may be specified in this clause

3.4 Definition of Terms

Definitions given in various Acts and Regulations have been reproduced here. A few definitions specifically relevant to the RIO have also been included. In due course the Authority will publish a consolidated list of definitions.

4. INTERCONNECTION PRINCIPLES

4.1 Levels of Interconnection

The Points of Interconnection specified in TRAI Determinations and Directions are given in the following tables. Interconnection is required to be established within 90 days under normal conditions. The actual details of interconnection should be worked out in the Coordination Committee set up under the Agreement.

4.2 Interconnection between Fixed Network (BSOs, NLD/ILD)

As per existing license conditions NLDOs are required to establish switching and transmission facilities at LDCCs and may have POP at SDCCs and have to carry inter-circle traffic offered at these centres. An NLDO may also carry intra-circle traffic by mutual consent with the BSOs. The ILDOs may have switches/ POP at Level 1 (Primary) Centres and are authorised to carry only International Traffic.

Based on the interconnection principles specified in the previous paragraph, the possible types of interconnections are shown in the following tables.

Parenting of a dependent Remote Switching Module [RSM] located in a SDCA other than where the Main Switching Module is located may also be permitted, provided that the Operator follows the National Numbering and Charging Plan in all respects.

4.3 Sharing of Interconnecting facility:

More than one service provider may share interconnection infrastructure like transmission medium such as OFC and equipment for building up leased circuits for different operators, subject to the terms and conditions of the agreement under which such infrastructure has been provided.

4.4 Sharing of resources of interconnection seeker with others:

Operators could also share with the interconnection provider, resources of interconnection seeker, up to the POI by mutual agreement.

PSTN Interconnection

Table 1.1 – PSTN to PSTN (Out-going Traffic)

Type of Calls	POI	Remarks
Local	At SDCC Tandem or Local Exchange level situated in the same SDCA as per mutual agreement.	BSO-BSO
Intra-Circle Long Distance (Note 2)	(i) Terminating SDCC / LDCC (ii) Originating SDCC / LDCC, if BSO has no POI at the terminating end.	BSO-BSO (Far-end) BSO-BSO (Year-end)
Inter-Circle	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and conditions at the LDCC of originating LDCA.	BSO to NLDO (Near – end)
International	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and conditions at the LDCC of originating LDCA. NLDO to hand over international traffic at the Gateway Switch of ILDO. To the gateway switch of the ILDO in case the ILD Gateway Switch and the BSO's Tandem/Transit Switch are located at the same station of level I TAX.	BSO to NLDO (Near – end) NLDO to ILDO BSO to ILDO (Near-end) for traffic of same SDCA)

Table 1.2 – PSTN - PSTN (In-coming Traffic)

Type of Calls	POI	Remarks
Local	Same as Table 1.1	
Intra-Circle Long Distance	Same as Table 1.1	
Inter-Circle	NLDO to hand over terminating traffic by mutual agreement as per licence terms and conditions in the destination LDCA at SDCC or at LDCC POI.	NLDO to BSO
International	Level I TAX where the ILDO Gateway Switch is located. NLDO to hand over International traffic to the BSO at the terminating SDCC or by mutual agreement as per licence terms and conditions at terminating LDCC. Terminating local network at tandem/transit in case the ILD Gateway Switch and the Access Provider's Tandem/Transit Switch are located at the same station of level I TAX.	ILDO to NLDO NLDO to BSO ILDO to BSO (for traffic terminating in same SDCA)

Note 1. New National Long Distance Operator(s) can make necessary interconnection arrangements with other NLDOs, to ensure delivery of calls at places where POP is yet to be established as per their network rollout obligations.

Note 2. Intra-Circle Traffic may also be handed over to an NLDO by mutual consent

4.5 Interconnection between PLMN (Mobile) and PSTN

The following table indicates the handing over of traffic between these two types of networks.

Table 2.1 – Traffic from PLMN to PSTN

Licensed Area	POI	Remarks
A. Metros		
1. Local	Transit Exchange (Tandem) Local Exchange by mutual agreement	To BSO
2. Inter-Circle Call	Designated Level I TAX located in the Metro	
3. International	Designated Level I TAX of NLDO (or) Gateway Switch of ILDO if ILDO Gateway Switch and GMSC are located at the same station of Level I TAX (Metro).	Designated by NLDO/ ILDO
B. Circles		
1. Intra - Circle Call	Level I TAX for both transit to other LDCA's/termination in the LDCA in which it is located. Level II TAX for traffic terminating in the destination LDCA, at the request of interconnection seeker. POI below TAX level may also be provided with mutual agreement for terminating traffic.	To BSO
2. Inter - Circle Call	The traffic can be handed over at the designated Gateway Level I TAX of NLDO through any one of its Gateway MSC. CMTS provider can also handover traffic to NLDOs at the POP situated in the LDCA at the location of the Gateway MSC or MSC in a Circle. The NLDO shall handover terminating traffic in the destination LDCA at the SDCC or by mutual agreement as p	To NLDO NLDO to BSO
3. International Call	The traffic can be handed over at the designated Gateway Level I TAX of NLDO through any one of its Gateway MSC. CMTS provider can also handover traffic to NLDOs at the POP situated in the LDCA at the location of the Gateway MSC or MSC in a Circle. To the Gateway Switch of the ILDO if ILDO's Gateway Switch and the GMSC are located at the same station of level I TAX	To NLDO To ILDO

Note 1. New National Long Distance Operator(s) can make necessary interconnection arrangements with other NLDOs, to ensure delivery of calls at places where POP is yet to be established as per their network rollout obligations.

Table 2.2 Traffic From PSTN to PLMN

Licensed Area	POI	Remarks
A. Metros		
1. Local	Transit Exchange (Tandem) Local Exchange (by mutual agreement)	To CMTS provider
2. Inter-Circle Call	BSOs shall handover the call at the designated TAX of NLDO in the originating Metro. The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO. NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle.	BSO to NLDO NLDO to CMTS provider
3. International (Out-going)	BSOs shall handover the call at the designated TAX of NLDO in the originating Metro. To the gateway switch of the ILDO in case the ILD Gateway Switch and the Access Provider's Tandem/Transit Switch are located at the same station of level I TAX (Metro).	BSO to NLDO BSO to ILDO (Near end for traffic of same SDCA)
(In-coming)	The ILDO to handover at the Gateway MSC of the Cellular Operator if this Gateway MSC and the Gateway Switch of the ILDO are located at the same location of Level I TAX (Metro). The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO. NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle.	ILDO to CMTS provider. NLDO to CMTS provider
B. Circles		
1. Intra - Circle Call	Level I TAX or Level II TAX of the originating LDCA. If no POI is available at Level II TAX then at GMSC of the CMTS provider subject to mutual agreement.	BSO to CMTS provider
2. Inter - Circle Call	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and conditions at the LDCC of originating LDCA. The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO.	BSO to NLDO NLDO to CMTS provider

	NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle.	
3. International Call (Out-going)	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and conditions at the LDCC of originating LDCA.	BSO to NLDO
	NLDO to hand over International calls to the ILDO at the Gateway Switch.	NLDO to ILDO
	To the gateway switch of the ILDO in case the ILD Gateway Switch and the Access Provider's Tandem/Transit Switch are located at the same station of level I TAX.	BSO to ILDO (Near-end for traffic of same SDCA)
(In-coming)	ILDO to hand over incoming International traffic to NLDO at the Gateway Switch of ILDO.	ILDO to NLDO
	The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO.	
	NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle.	NLDO to CMTS provider
	The ILDO to handover at the Gateway MSC of the Cellular Operator if this Gateway MSC and the Gateway Switch of the ILDO are located at the same location of Level I TAX.	ILDO to CMTS provider

Note 1: New National Long Distance Operator(s) can make necessary interconnection arrangements with other NLDOs, to ensure delivery of calls at places where POP is yet to be established as per their network rollout obligations.

Note 2: Different level 1 TAXs can be designated for terminating calls from different circles, in case a circle has more than one level 1 TAX.

4.6 Arrangements at the POI

The complete definition of all classes of POI requires to be entered into Schedule 1. This should cover location, physical and electrical properties, transmission definitions, signalling, type and direction of traffic, information passing across the POI, quality of service and other significant parameters.

4.7 Network Elements

A party may supply network elements, such as accommodation in buildings and on towers, leased circuits, leased switch capacity etc. All agreed rental charges for these elements should be included in Schedule 3.

5. Interconnection Implementation

Article 3 prescribes procedures for the requisitioning of capacity for interconnection and subsequent augmentation of interconnects capacities to meet the QOS standards. The time schedules and penalties

have been laid down. Interconnection will mutually benefit all parties and it is therefore hoped that commercial interests, rather than application of penalties will ensure prompt interconnection.

The article prescribes maximum periods, but the principle expected to be applied is that, as long as capacity is available, reasonable requests would be met in accordance with the requested schedule. The Coordination Committee established under the Agreement is expected to settle all matters amicably.

While the requirement of Interconnect Seeker paying for interconnection is re-emphasised, once interconnection has been established, each party should be responsible for seeing that QOS is maintained for his outgoing traffic. He shall therefore pay for additional capacity required for his outgoing traffic. The parties may, however, negotiate to equally share the costs of augmentation.

Utilisation will be determined by reference to the Erlang B traffic tables and the traffic should be measured over a reasonable period (say 3 months) before reference to the Coordination Committee for surrender or withdrawal.

6. Network Engineering

Article 4 prescribes rules for traffic and network engineering. Since interconnection establishes a route between two networks, the peak traffic on the route should be used for engineering.

Operators are encouraged to use alternative routing arrangements to increase network efficiency. Such arrangements may, however, cause overload on backbone routes at times of congestion. It is therefore desirable to engineer backbone routes with a sufficient safety margin.

7. Technical Specifications and Standards

National Standards are currently set by the Telecom Engineering Centre. These shall be followed. A typical list of standards is given below. The list of applicable standards shall be included in Schedule 4 of the Interconnect Agreement.

Where national standards do not exist, the standards prescribed by the International Telecommunication Union shall be used. In case such standards are also not available, international industry standards may be used.

Interoperability standards for VOIP are currently incomplete. Available ITU standards may be used.

SCHEDULE OF STANDARDS AND SPECIFICATIONS

Sl. No.	Item	Specification	Remarks
1.	Switching Interface	G/PNI-02/01 & ITU-T E770 G/PNI-03/01	(PSTN and Mobile) (PSTN & Private basic operators)
2.	Transmission Interfaces	I/DMX-01/01 Dec, 98 & ITU-T G.703/G.707 (3/96)/ G.782/G.783 G/VAN-02/01 Sept, 96	2/8/34/140/ 155 Mbps For V 5.2 interface
3.	Signaling CCS 7	R/NSP/-01/01 Sept, 92 S/CCS -02/03 Jan, 2000 G/CCS-03/01 Jun, 94 G/CCS-04/01 Sept, 94	National CCS 7 Plan MTP & ISUP SCCP STP
4.	Other cases	G/LLT-01/04	
5.	Synchronization	G/SYN-01/01 Jun, 90 G/PNI-02/01	As per National Synchronization Plan
6.	Junction Traffic	G/LLT01/04	Maximum loading =0.7E
7.	Junction Testing	G/LLT01/04	
8.	Higher Level Protocols	G/LLT01/04	
9.	Interface with IP Networks	I/RAS-01/01 Apr. 99 I/TCP-01/01 Apr. 99	Remote Access Server TCP/IP Internet user devices
10.	Electrical Safety requirements	S/SFT-01/ 01 May, 94	
11.	Quality of telecom services	TRAI Regulations	ITU-T E 800
12.	Terms and Definitions	TRAI Regulations	ITU-T B.13

8. Network Integrity

Integrity of a network refers to the ability of its systems to preserve and retain their original operational states and remain unaffected by interconnection with other networks. Integrity issues are crucial when multiple operators, service providers, and other players inter-work. They provide confidence that this inter-working will not jeopardize the correct and proper functioning of the individual networks and systems. Integrity is a broad term encompassing a variety of issues concerning system structure, functionality and behaviour. This concept has been introduced along with the basic rules.

9. Operations and Services

Apart from physical elements, operators may provide services to each other, for example billing, revenue collection, directory enquiry etc. Schedule 2 should list and describe all these services along with the agreed rates.

10. Interconnection Gateways

In a multi-operator environment the number of interconnections at a centre may be large. It is possible for operators to provide, wherever possible, interconnection through their switches for transit traffic between other operators. Charges for such services would be fixed and entered into Schedules 5. A draft Technical Facility Schedule for such Gateways is available with the TEC.

11. Billing and Inter-carrier Charging

Each operator is normally responsible for billing his own subscribers, however, the NLDOS and ILDOs have to make their own arrangements to bill customers for their services. They may either bill directly or negotiate with the Access Providers to bill and collect revenue. The agreed arrangements should be described in this paragraph and agreed procedures placed in an appropriate annexure.

Wherever call carriage involves the networks of two or more operators, the collection from the subscriber has to be then distributed on an agreed basis. The agreed basis should be entered in Schedule 6. Article 11 lays down the rules for such transactions.

Billing settlement may be on the "cascade basis". In this method each operator settles with the next operator in the chain on a bulk-billing basis. In the other method the operator collecting the revenue from the customer has to settle with each of the operators in the chain, based on the Call Data Record (CDR) containing identities of the originating, transit & terminating operators as well as charging areas. This enables computation of network usage charge based on the resources used in each network segment. This latter method is more accurate, but requires more detailed information to be collected from the system by employing CCS7 (ISUP) and sophisticated digital switching systems at gateway points. It is recommended that Operators consider adapting this method for proper interconnect billing and settlement.

12. Commercial Terms and Conditions

Article 12 lays down the commercial conditions. The cost of upgradation / modifying interconnecting networks to meet the service requirements of the service shall be met by the Party seeking interconnection. However mutually negotiated sharing arrangements for cost of upgrading/ modifying interconnecting networks between the service providers shall be permitted.

Two years after the initial interconnection is established, the issue as to who bears the cost of additional resources required shall be negotiated between the service providers. The general principle followed in these negotiations is that each party should bear the incremental costs incurred for the additional ports required for meeting the QOS standards relating to its outgoing traffic to the other Party.

13. Charges for Originating, Terminating and Transit Traffic

For arriving at the usage charges (IUC) payable by one service provider to the other, based on the cost of network resources used, the following principles may be followed:

Unbundled element costs as a basis for the usage charge applicable to Origination, Transit and Termination. This needs to be worked out on Fully Allocated current Costs (FACC) basis. Once calculated these would be advised by the TRAI as benchmarks.

Additional items may be specified by the Authority, such as an access deficit charge to compensate the access provider, for costs the recovery of which is otherwise not provided for.

14. Fundamental Technical Plans

This is a descriptive paragraph relating to Numbering, Routing, Charging etc.

15. Coordination and Dispute Settlement

Operational problems continually arise between interconnected networks, these may be technical or relate to money matters. Before they develop into disputes it is desirable that they should be formally discussed in a coordination meeting between the two parties. A formal Coordination Committee should be

established under the Agreement. This Committee will be responsible for laying down detailed procedures in the light of experience and also try to settle matters of difference. The Committee may also seek the intervention of the TRAI in matters of interpretation of Rules and Regulations. If no settlement can be reached, the parties shall be free to pursue other avenues for settlement. Article 16 relates to the Coordination Committee and Article 18 to dispute settlement.

16. Termination and Review

The Interconnection Agreement is expected to last indefinitely, but may have to be suspended or terminated under exceptional circumstances. Article 17 lays down the conditions relating to these matters. Discontinuation of services to customers, however, requires the permission of the TRAI and Licensor.

Annexure-VII

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

Telecom Regulatory Authority of India

Notification

New Delhi, the 14TH December, 2001

No.311-4/2001 -TRAI (Econ.)

In exercise of the powers conferred upon it under section 36 read with clauses (ii), (iii) and (iv) of sub section (b) of Section 11 (1) of the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000, to ensure effective interconnection between different service providers and to regulate arrangements amongst service providers of sharing their revenue derived from providing telecommunication services, the Telecom Regulatory Authority of India hereby makes the following Regulation.

THE TELECOMMUNICATION INTERCONNECTION (CHARGES AND REVENUE SHARING) REGULATION , 2001 (5 of 2001)

Section I

Title, Extent and Commencement

1. Short title, extent and commencement:

(i) This Regulation shall be called "The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation 2001" (The Regulation).

(ii) The Regulation shall cover arrangements among service providers for interconnection charges and revenue

sharing, for Telecommunication Services, including wireless in local loop with limited mobility [WLL(M)], throughout the territory of India, as also those originating in India and terminating outside India.

(iii) The Regulation shall be deemed to have come into force with effect from the date of notification in the official Gazette.

Section II Definitions

2. In this Regulation, unless the context otherwise requires:

- (i) "Act" means the Telecom Regulatory Authority of India, 1997 as amended by TRAI (Amendment) Act, 2000.
- (ii) "Authority" means the Telecom Regulatory Authority of India.
- (iii) "Basic Telecommunication Services" mean services derived from Public Switched Telephone Network (PSTN).
- (iv) "Ceiling(s)" mean(s) the upper limit(s) for interconnection charge for telecommunication services as may be specified by the Authority from time to time.
- (v) "Domestic Long Distance Telecommunication Service" or DLD means the telecommunication services required to connect one local area of a public telecommunication network to another within the territorial limits of India so as to allow for transmission of voice and non-voice signals across different geographical areas.
- (vi) "Floor" means the lower limit of interconnection charges for a telecommunication service as may be specified by the Authority from time to time below which such charges may not be offered.
- (vii) "Forbearance" denotes that the Authority has not, for the time being, notified any interconnection charge or revenue sharing arrangement for a particular telecommunication service and the service provider is free to fix any charge for such service.
- (viii) "Interconnection" means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers.
- (ix) "Interconnection Charge" means the charge for interconnection by an interconnection provider to an interconnection seeker.
- (x) "Interconnection Provider" means the service provider to whose network an interconnection is sought for providing telecommunication services.
- (xi) "Interconnection Seeker" means the service provider who seeks interconnection to the network of the interconnection provider.
- (xii) "International Long Distance Telecommunication Service" means telecommunication services required

to

connect a local area of a public telecommunication network within India to a local area of a public telecommunication network in another country so as to allow for the transmission of voice and non-voice signals.

(xiii) "International Subscriber Dialing" (ISD) means direct interconnection between an end user in India with another end user in another country by means of direct dialing through public networks.

(xiv) "Leased Circuits" means telecommunication facilities leased to subscribers or service providers to provide for technology transparent transmission capacity between network termination points which the user can control as part of the leased circuit provision and which may also include systems allowing flexible use of leased circuit bandwidth.

(xv) "Non-discrimination in interconnection charge" means that service providers shall not, in the matter of interconnection charges, discriminate between service providers except on the basis of substantial cost-differential, and that too only to the extent justified by such cost differential.

(xvi) "Order" means the Telecommunication Tariff Order, 1999.

(xvii) "Originating Network" means the network to which an originator of a telecommunication message is proximately connected to.

(xviii) "Originating/Transit/Terminating Service Provider" means the service provider whose network is used for

originating/transit/terminating a telecommunication message respectively .

(xix) "Regulation" means The Telecommunication Interconnection (Charges and Revenue Sharing) Regulation 2001.

(xx) "Reporting Requirement" means the obligation of a service provider to report to the Authority at least 45 working days before implementing any new interconnection charge and revenue sharing arrangement for telecommunication services under this Regulation and any changes thereof.

(xxi) "Set Up Costs Of Interconnection" means the initial cost of any engineering work needed to provide the specific interconnection facilities requested.

(xxii) "Subscriber Trunk Dialing"(STD) means direct interconnection between two end users within India by means

of direct dialing through public networks.

(xxiii) "Terminating Network" means the network to which a receiver of a telecommunication message is proximately connected to.

(xxiv) "Transit Network" means the network through which telecommunication messages from originating networks or other transit networks are transmitted and delivered to terminating or other transit networks.

(xxv) "Usage Charge" means the charge levied by a service provider for carriage of telecommunication traffic

on its network.

(xxvi) "WLL(M)" means limited mobility telephony service using wireless in local loop technology within a short distance charging area.

(xxvii) Words and expressions used in this Regulation and not defined but defined in the Act shall have the same meanings respectively assigned to them in the Act.

Section III

3. Interconnection Charges

(i) Interconnection charges shall be cost based, unless as may be specified otherwise.

(ii) For determining cost based interconnection charges, the main basis shall be "incremental or additional" costs directly attributable to the provision of interconnection by the interconnection provider .

(iii) No service provider shall discriminate between service providers in the matter of levying of charges for interconnection.

Provided that a different charge may be levied if justified on the basis of a substantial difference in costs incurred for providing that particular interconnection.

(iv) No service provider shall be charged for any interconnection facility it does not seek or require.

Provided that if interconnection facility cannot be provided in the form that is sought or required by the interconnection seeker, the issue may be decided mutually between the seeker and provider of interconnection. In case such mutual agreement is not possible, the matter may be reported to the Authority for a decision. The interconnection provider shall inform the interconnection seeker within 30 days of the request for interconnection facilities whether the facilities can be provided in the form sought or required by the interconnection seeker.

(v) In the absence of a mutual agreement between the Interconnection provider(s) and the seeker(s), in respect of charges for the elements of the network used to provide interconnection, charges for the elements of the network used to provide Interconnection will be as specified by the Authority from time to time. In the event mutual agreement is not arrived at in respect of the interconnection sought and / or

charges therefor, within 30 days from the date of such request, both the parties will approach TRAI with the details of their network element costs and traffic particulars for a determination in the matter. Pending such a determination the existing arrangement, if any, will continue.

(v)(a) The existing charging arrangements, if any, between the Interconnection seekers and Interconnection providers shall hold good until changed with the concurrence of the Authority, or on the basis of a regulatory determination.

(vi) Unless specifically so provided, the Authority has forbore with respect to interconnection charges.

(vii) Where the Authority has, for the time being, forbore from specifying interconnection charges, interconnection seekers and providers shall mutually decide on such charges.

(viii) Interconnection charges mutually agreed among interconnection seeker and provider shall be based on the principles enunciated in this Section.

(ix) Where mutual agreement for interconnection charges cannot be reached within 30 days of initiating such a process for charges with respect to which the Authority has forbore, the Authority may intervene to settle the matter suo motu or on the application of either party.

Section IV

4. Revenue Sharing Arrangements

(i) Any revenue sharing among interconnection seeker and interconnection provider shall take place out of the proceeds of the amount payable by the subscriber for obtaining the service which involves the usage of the network of the interconnection provider.

(ii) Unless specifically provided in the Schedules to this Regulation, the Authority forebears with respect to revenue sharing arrangements.

(iii) Where the Authority has, for the time being, forbore from specifying revenue sharing arrangements for any telecommunication service or part thereof, service providers shall mutually decide on such arrangements.

(iv) Where mutual agreement for revenue sharing cannot be reached within 30 days of initiating such a process for revenue sharing with respect to which the Authority has forbore, the Authority may intervene to settle the matter suo motu or on the application of either party.

(v) In the absence of a mutual agreement between the Interconnection provider(s) and the seeker(s), in respect of revenue sharing, the revenue sharing will be as specified in the Schedules to this Regulation. In the event mutual agreement is not arrived at in respect of the interconnection sought and / or revenue sharing therefore, within 30 days from the date of such request, both the parties will approach TRAI with the details of their network element costs and traffic particulars for a determination in the matter. Pending such a determination, the existing arrangement, if any, will continue.

(v)(a) The existing arrangements, if any, between the Interconnection seekers and Interconnection providers shall hold good until changed with the concurrence of the Authority, or by a regulatory determination.

Section V

5. Reporting Requirement

(i) All service providers shall comply with the Reporting Requirement in respect of interconnection charges and revenue sharing arrangements specified for the first time under this Regulation, as also all subsequent changes. This includes interconnection charges and revenue sharing arrangements that are decided on a mutual basis among service providers.

(ii) The service provider may implement the proposed interconnection charges and revenue sharing arrangements after the mandatory notice period of 45 working days, unless the Authority within such period directs otherwise.

Except that an additional period of 45 days is provided for interconnection charges and revenue sharing arrangements to be reported to the Authority for the first time after the implementation of this Regulation.

(iii) When an interconnection provider informs the interconnection seeker that it cannot provide interconnection as sought for by the latter, the interconnection seeker, within 45 days of being so informed, may approach the Authority for seeking its intervention.

(iv) No service provider shall alter any interconnection charge or revenue sharing arrangement, or any part thereof, without complying with the Reporting Requirement.

Section VI

6. Review

(i) The Authority may, from time to time, review and modify an interconnection charge and/or revenue sharing arrangements.

(ii) The Authority may also at any time, on reference from any affected party, and for good and sufficient reasons, review and modify any interconnection charge or revenue sharing arrangements.

Section VII

7. Explanatory Memorandum

This Regulation contains at Annexe A, an explanatory memorandum to provide clarity and transparency to matters covered under this Regulation.

Section VIII

8. Interpretation

In case of dispute regarding interpretation of any of the provisions of this Regulation, the decision of the

Authority shall be final and binding.

By Order

(DR. HARSHA VARDHANA SINGH)

Secretary-cum-Principal Advisor

SCHEDULE I
INTERCONNECTION CHARGE AND REVENUE SHARING

ITEM	REVENUE SHARING FOR BASIC SERVICES
(1) Date of Implementation	BY 31ST JANUARY, 2002
(2) Coverage	Calls originating in a basic service provider's network and transmitted through or terminated in another basic service provider's network.
(3) Local calls	Bill and keep for each service provider .
(4) Domestic long distance calls (STD calls) in Basic Service	The originating/transit service provider to pay Rs. 0.48 per unit of measured call for traffic delivered from its network to the network of the transit/terminating service provider for the call unit s measured at the point of interconnection for it s further carriage from the point of interconnection to destination, based on the STD pulse rate.
(4.A) Domestic long distance calls (STD calls) in Wire less in Local Loop with limited mobility	The originating service provider to pay Rs. 1.14 per unit of measured call for traffic delivered from its network to the network of the transit service provider for the call unit s measured at the point of interconnection for its further carriage from the point of interconnection to destination, based on the STD pulse rate. Provided no such charge either in (4) or (4.A) above shall be payable if the point of interconnection is at the destination Short Distance Charging Area (SDCA) and also provided that no such charge will be payable if the terminating service provider requests that the call be handed over by the originating/transit service provider at an SDCA other than the destination SDCA.
(5) International calls in in Basic Service	The originating service provider to pay Rs. 0.66 per unit measured call to the transit service provider as may be applicable, for the call units to be measured at the point of interconnection .

(5.A) International calls in Wire Less In Local Loop with limited mobility [WLL(M)]	The originating service provider to pay Rs. 1.14 per unit measured call to the transit service provider as may be applicable, for the call units to be measured at the point of interconnection.
	Notes:(a) "Local calls" are calls which originate from subscribers of a service provider's network/exchange system in a SDCA and terminate either (i) within the same SDCA or (ii) in the contiguous telephone exchange system of the adjacent SDCA, provided these are delivered/handed over to another service provider's network in the destination SDCA only.(b) For domestic long distance calls in Basic Service other than WLL(M), number of units of calls for payment at Rs. 0.48 per metered call to be calculated based on the STD tariff pulse for the radial distance between the point of interconnection and the Gateway TAX where the call is subsequently delivered for further carriage/termination.(c) For domestic long distance calls in WLL(M), number of units of calls for payment at Rs. 1.14 per metered call to be calculated based on the STD tariff pulse for the radial distance between the point of interconnection and the Gateway TAX where the call is subsequently delivered for further carriage/termination.(d) No revenue is to be shared between basic service provider and cellular mobile service provider for calls originating from the former's network.

SCHEDULE II

INTERCONNECTION CHARGE AND REVENUE SHARING

ITEM	REVENUE SHARING FOR CELLULAR MOBILE
(1) Date of Implementation	BY 31ST JANUARY, 2002
(2) Coverage	Calls originating in a cellular mobile service provider's network and transmitted through or terminated in another service provider's network.
(3) Local calls from cellular mobile to basic service subscriber	Payment to basic service provider at the rate of Rs. 1.14 per metered call, with number of metered calls measured at the pulse rate applicable to a basic service local call.
(4) Domestic Long distance calls from cellular mobile to basic service subscriber	Payment to basic service provider at a rate applicable to domestic long distance calls. The charge shall be Rs. 1.14 per metered call, with the number of metered calls measured at the pulse rate applicable to basic service long distance calls, with the chargeable

	distance equal to the distance of the call carried by the basic service provider for an equivalent STD from point of interconnection to destination.
(5) International calls from cellular mobile	Payment to basic service provider at a rate applicable to international calls. The charge shall be Rs. 1.14 per metered call, with the number of metered calls measured at the point of interconnection at a pulse rate applicable to an equivalent international call made by a basic service subscriber.
(6) For calls from cellular mobile to cellular mobile	For local/domestic long distance calls carried (partly) by basic service provider, an amount to be paid to basic service provider at a rate applicable to local/domestic long distance call. The amount to be calculated on the basis of the corresponding conditions specified in Item 3/Item 4 above, i.e. Rs. 1.14 per metered call, pulse rate applicable to basic service local/long distance calls, and for long distance calls the chargeable distance equal to the distance of the call carried by the basic service provider for an equivalent STD call from point of interconnection to destination.
	Notes: (a) The definition of "local calls" to ascertain revenue sharing with basic service providers for calls carried by them is the same as in note (a) in Schedule I. (b) For domestic long distance calls from cellular mobile to basic service subscriber, number of units of measured calls for determining the amount of revenue payable to basic service provider to be calculated as the number of such calls measured at the basic service provider's Gateway TAX up to the destination Short Distance Charging Area (SDCA). (c) For domestic long distance calls from cellular mobile to cellular mobile carried by basic service provider, number of call units to be paid to the basic service provider at Rs. 1.14 per metered call to be calculated based on the radial distance between the Gateway TAX at the point of interconnection where the call is accepted for further carriage and the Gateway TAX of the service provider to whose network the call is subsequently handed over. (d) For calls originating from cellular mobile, revenue sharing arrangements among one basic service provider and another basic service provider to be as specified in Schedule I. (e) This Regulation does not specifically address any revenue sharing arrangement among cellular mobile service providers for calls from subscribers of any cellular mobile service provider to subscribers of another cellular mobile service provider.

ANNEXE - A

EXPLANATORY MEMORANDUM

1. Schedule I of this Regulation specifies revenue sharing arrangements for calls originating in a Basic Service Provider's Network including from WLL (Mobile), hand held terminals and transited or terminated in the Network of another Basic Service Provider, including the incumbents BSNL/MTNL.

2. Schedule II of this Regulation specifies revenue sharing arrangements for calls originating in a cellular mobile service provider's (CMSPs) network and transited or terminated in another service provider's network. In its Determination dated the 8th January, 2001, on six major issues relating to interconnection, the Authority has determined that 5% of the pass through revenue paid to the Basic Service Providers by the CMSPs may be retained by the latter to cover their cost of billing and collection and bad debts. Payment to the Basic Service Provider @Rs.1.14 per metered call unit against Rs.1.20 represents this arrangement. The balance 5%, i.e. Rs.0.06 per metered call unit, will be retained by the CMSPs.

3. In its Tariff Order pertaining to WLL(M), i.e. the 14th Amendment to The Telecommunication Tariff Order, 1999 dated 24th May, 2001, the Authority took note of the recommendations of the Group on Telecom and Information Technology Convergence on revenue sharing arrangements for WLL (M).

4. In this context the Authority had noted in the above Tariff Order that revenue sharing arrangement between WLL(M) based basic operators and National Long Distance Operators including BSNL can be implemented only after suitable interconnect charging and billing mechanisms have been installed at the Network to Network Interfaces of the two operators, particularly to distinguish between the traffic streams originating from WLL(M) lines and those from fixed lines, and to charge them differently. The Authority further noted that no such arrangement existed, as the exchange numbering scheme did not distinguish between a fixed line or a WLL(M) line. The Authority had specified that service providers should, therefore, by mutual agreement put in place the required technical systems in their exchanges as well as at the Points of Interconnection (POIs) so as to distinguish clearly the traffic flows originating from WLL (M) lines and POTs lines, so that revenues are shared differently for the two traffic streams. It may be recalled in this connection that since WLL (M) service has been considered as a part of the basic services, it has been clearly mentioned in the TRAI's recommendations on the subject that the numbering plan for WLL (M) will be the same as that of the basic services fixed connections.

5. The Authority is in the process of determining element based carriage charges. The relevant cost data have been sought from service providers for this purpose.

6. A Regulation specifying Port Charges and Leased Line Charges will be issued separately.

(DR. HARSHA VARDHANA SINGH)

Secretary-cum-Principal Advisor

Annexure-VIII

The Telecommunication Interconnection (Port Charges) Regulations, 2001

**Telecom Regulatory Authority of India
Notification**

New Delhi, the 28th of December 2001.

No.311-6/2001 -TRAI (Econ.)

In exercise of the powers conferred upon it under section 36 read with clauses (ii), (iii) and (iv) of sub-section (b) of Section 11 (1) of the Telecom Regulatory Authority of India Act, 1997 as amended by TRAI (Amendment) Act, 2000, to ensure effective Interconnection between different Service Providers and to regulate arrangements amongst Service Providers of sharing their revenue derived from providing Telecommunication Services, the Telecom Regulatory Authority of India hereby makes the following Regulation.

THE TELECOMMUNICATION INTERCONNECTION (PORT CHARGES) REGULATION 2001 (6 of 2001)

Section I Title, Extent and Commencement

1. Short title, extent and commencement:

- (i) This Regulation shall be called “The Telecommunication Interconnection (Port Charges) Regulation 2001” (The Regulation).
- (ii) This Regulation pertains to the Port charges payable by the Interconnection Seeker to the Interconnection Provider for terminating the interconnection links on the Network Interface of the Interconnection Provider.
- (iii) In this Regulation, a “Port” means a place of termination on a Switch/ distribution frame to provide a point of access or interconnection for ingress and egress of traffic between the two Interconnecting Networks. The bandwidth of the Port shall be 2.048 Megabits per second.
- (iv) The Regulation shall be deemed to have come into force with effect from date of notification in official Gazette.
- (v) This Regulation shall regulate Port charges as detailed herein including those in Schedule I.

Section II

2. Applicability

Unless the context otherwise requires, all the definitions as provided under Section II and the Regulations under Section(s) III and IV of “The Telecommunication Interconnection (Charges & Revenue Sharing) Regulation, 2001” notified on 14.12.2001, will be applicable to this Regulation.

⁸[2A. Port charges on or after the 1st April, 2007. - (1) Every interconnection seeker shall, on or after the 1st day of April, 2007, make his demand, for every Point of Interconnection for the total number of Ports required by him on or after the said date to the interconnection provider.

⁸ Ins. by the First Amendment Regulations, 2007, reg 2 (w.e.f. 01.04.2007).

(2) Every interconnection seeker shall make demand under sub-regulation (1) on the basis of traffic projection (in Erlangs) on half yearly basis.

(3) Every interconnection provider shall charge, on or after the 1st day of April, 2007, the Port charges in accordance with the Port charges specified in Schedule II to these regulations and raise the demand note or the invoice, as the case may be, for the Ports demanded on or after the said date by the interconnection seeker under sub-regulations (1) and (2).

(4) In case where interconnection provider does not allot and provide all the Ports on the date, or, within such period, as requested by the interconnection seeker and in accordance with the demand made by him under sub-regulations (1) and (2), the Port charges for the Ports allotted and provided shall be calculated on the basis of the total number of Ports so demanded (taking into account the Ports allotted and provided and also the remaining ports not allotted and provided by the interconnection provider as per his demand) and charges for the Ports so allotted and provided shall be calculated on the basis of the total Ports so demanded based on traffic projections (in Erlangs) and the charges for the Ports shall be calculated in accordance with the charges specified against the slabs in Schedule II to these regulations.

(5) In case where interconnection seeker does not take all the Ports in accordance with the demand made by him under sub-regulations (1) and (2), the Port charges for the Ports allotted and provided shall be calculated on the basis of the total number of Ports so actually taken by him, and, the Ports not taken by him as per his demand shall be ignored for determining the slab for calculating the Port Charges and the charges for the Ports shall be calculated on the basis of actual Ports taken by him and not on the basis of Ports demanded by him under sub-regulations (1) and (2), in accordance with the charges specified against the Port slabs in Schedule II to these regulations.

(6) The Port charges for every Port demanded, allotted and provided before the 1st day of April 2007 shall be charged before the said date in accordance with the Port charges specified in Schedule I to these regulations and the interconnection provider shall accordingly raise the demand note or the invoice, as the case may be, for such Ports demanded, allotted and provided.

(7) The Port charges for every Port demanded, allotted and provided before the 1st day of April, 2007 shall be charged on or after the said date in accordance with the Port charges specified in Schedule II to these regulations and the interconnection provider shall raise the demand note or the invoice, as the case may be, for such Ports provided by him before the aforesaid date accordingly.

(8) The slab for calculation of Port charges under sub-regulation (7) shall continue to be with reference to the slabs specified in the Schedule I to these regulations, which were taken into account for determining the Port charges before the 1st day of April, 2007.

(9) Nothing contained in the Schedule II to these regulations shall apply in case the interconnection provider and the interconnection seeker mutually agree to charge and pay charges lower than those specified in the Schedule II to these regulations.]

⁹[2B. Port charges on or after the 1st October, 2012. - (1) Every interconnection seeker shall, on or after the 1st day of October, 2012, make his demand, for every Point of Interconnection for the total number of Ports required by him on or after the said date to the interconnection provider.

(2) Every interconnection seeker shall make demand under sub regulation (1) on the basis of traffic projection (in Erlangs) on half yearly basis.

¹ Ins. by the Second Amendment Regulation, 2012, reg. 18 (w.e.f. 18.9.2012).

(3) Every interconnection provider shall charge, on or after the 1st day of October, 2012, the Port charges in accordance with the Port charges specified in Schedule III to these regulations and raise the demand note or the invoice, as the case may be, for the Ports demanded on or after the said date by the interconnection seeker under sub-regulation (1) and (2).

(4) The Port charges for every Port demanded, allotted and provided before the 1st day of October, 2012 shall be charged on or after the said date in accordance with the Port charges specified in Schedule III to these regulations and the interconnection provider shall raise the demand note or the invoice, as the case may be, for such Ports provided by him before the aforesaid date accordingly.

(5) Nothing contained in the Schedule III to these regulations shall apply in case the interconnection provider and the interconnection seeker mutually agree to charge and pay charges lower than those specified in the Schedule III to these regulations.]

Section III

3. Reporting Requirement

(i) All Service Providers shall comply with the Reporting Requirement in respect of Port charges specified under this Regulation, as also all subsequent changes.

(ii) Where a port charge below the ceiling notified herein is to be implemented, the Service Provider may implement the proposed port charges after the mandatory notice period of 45 working days, unless the Authority within such period directs otherwise.

(iii) Port charges whenever implemented as per Schedule I herein, shall be reported to the Authority within 45 days of their implementation.

(iv) When an Interconnection Provider informs the Interconnection Seeker that it cannot provide the Ports as sought for by the latter, the Interconnection Seeker within 45 days of being so informed, may approach the Authority for seeking its intervention.

(v) No service provider shall alter any Port charge, or any part thereof, without complying with the Reporting Requirement.

Section IV

4. Review

(i) The Authority may, from time to time, review and modify Port charges.

(ii) The Authority may also at any time, on reference from any affected party, and for good and sufficient reasons, review and modify the Port charges.

Section V

5. Explanatory Memorandum

This Regulation contains at Annexe A, an Explanatory Memorandum to provide the background and reasons for issuing this Regulation

Section VI

6. Interpretation

In case of dispute regarding interpretation of any of the provisions of this Regulation, the decision of the Authority shall be final and binding.

By Order
(DR. HARSHA VARDHANA SINGH)
Secretary-cum-Principal Advisor

SCHEDULE I
PORT CHARGES

ITEM	'PORT' CHARGES	
(1) Date of Implementation	28.12.2001	
(2) Coverage	Charges for 'Ports' provided by service providers (other than the Port charges for internet, which are specified in Schedule VI of the Telecommunication Tariff order 1999).	
(3) 'Port' Charges covering all switches	<u>No. of 'Port'</u> 1 to 16 PCMs 17 to 32 PCMs 33 to 64 PCMs 65 to 128 PCMs 129 to 256 PCMs	<u>'Ports' Charges in Rs.</u> N*55,000 8,80,000 + (N-16)*30,000 3,60,000 + (N-32)*20,000 20,00,000 + (N-64)*15,000 29,60,000 + (N-128)*14,000

Notes:

(1) The above Rates are Ceiling Rates and Service Providers are permitted alternative lower charges.

(2) N refers to the number of 'ports' demanded by the Interconnection Seeker within the capacity ranges under the column 'No. of Ports'.

¹⁰[**SCHEDULE III**
{See regulation 2A.}

PORT CHARGES

ITEM	‘PORT’ CHARGES	
(1) Date of Implementation	1st April, 2007	
(2) Coverage	Charges for ‘Ports’ (other than the Port Charges for Internet, which are specified in Schedule VI of the Telecommunication Tariff Order 1999)	
(3) ‘Port’ Charges covering all switches	<u>No. of ‘Ports’</u> 1 to 16 PCMs 17 to 32 PCMs 33 to 64 PCMs 65 to 128 PCMs 129 to 256 PCMs	<u>‘Port’ Charges in Rs.</u> N*39,000 6,24,000 + (N-16)*22,500 9,84,000 + (N-32)*14,500 14,48,000 + (N-64)*11,500 21,84,000 + (N-128)*10,500

Note.—N refers to the number of ‘Ports’ within the capacity ranges under the column ‘No. of Ports’.]

¹⁰ Ins. by First Amendment Regulations 2007, reg. 2 (w.e.f. 01.04.2007).

¹¹[SCHEDULE III]

{See regulation 2B}

PORT CHARGES

Item	Port Charges	
(1) Date of Implementation	1st October, 2012	
(2) Coverage	Charges for 'Ports' (other than the Port charges for internet, which are specified in Schedule VI of the Telecommunication Tariff order 1999)	
(3) Port Charges	Port Charges (in Rs.) per port per annum for providing port in MSC	Port Charges (in Rs.) per port per annum for providing port in Tandem/TAX Switch
	4,000	10,000

Note 1: The principal regulations were published vide notification dated 28th December 2001 (6 of 2001).

Note 2: 'The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007 (1 of 2007) were notified on 02.02.2007 to be effective from 01.04.2007]

¹¹ Ins. by Second Amendment Regulations, 2012, reg. 3 (w.e.f. 18.09.2012)

Annexure-IX

The Register of Interconnect Agreements Regulations, 1999

TELECOM REGULATORY AUTHORITY OF INDIA

New Delhi 31st August, 1999

[F.No. 409-1/98-TRAI (Comm)]

In exercise of the powers conferred upon it under Section 36 read with clauses (l) and (m) of Sub-section 1 of Section 11 of the Telecom Regulatory Authority of India Act, 1997 in regard to Maintenance of Register of Interconnect Agreements and matters connected therewith, the Telecom Regulatory Authority of India hereby makes the following Regulations.

THE REGISTER OF INTERCONNECT AGREEMENTS REGULATION, 1999 (2 of 1999)

Section-I

1. Title, Extent and Commencement

Short title, extent and commencement

- i) These Regulations shall be called “The Register of Interconnect Agreements Regulations 1999”.
- ii) These Regulations prescribe the modalities for the maintenance of the Register of Interconnect Agreements between service providers and matters connected therewith.
- iii) These Regulations shall be applicable to:
 - a) All service providers who are required to furnish information pertaining to Interconnect Agreements to the Authority as per these Regulations or any other Rule/Regulation/Order issued under the TRAI Act, 1997.
 - b) Interconnect Agreements between all service providers of telecommunication services throughout the territory of India.
 - c) All Interconnect Agreements between service providers whether entered into before or after these Regulations come into effect.
- iv) These Regulations shall come into effect from the First day of September 1999

Section-II

2. Definitions

In these Regulations, unless the context otherwise requires:

- i. “Act” means the Telecom Regulatory Authority of India Act, 1997.
- ii. “Authority” means the Telecom Regulatory Authority of India.
- iii. “Fee” means any charge(s) prescribed by the Authority from time to time for inspection of the Register of Interconnect Agreements, or for copies thereof.

iv. ² [³ ² "Interconnection" means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers.]]

v. "Register" means the Register of Interconnect Agreements maintained by the Authority either in the print form as a Register and/ or maintained as a data base in electronic medium or in any other form as the Authority may prescribe from time to time.

vi. "Regulations" mean the Register of Interconnect Agreements Regulations 1999.

vii. "Consumer" means any individual, group, public/ private company, any other organization or body who is/ are subscriber of any telecom service(s) in the country.

viii. "Quality of Service" means the collective effect of service performance, which determines the degree of satisfaction of a user of the telecom services. The quality of service being characterised by the combined aspects of service support performance, service operability performance, serviceability performance, service security performance and other factors specific to each service.

⁴ [* * * * *]

⁵ [ix.] Words and expressions used in these Regulations and not defined here shall bear the same meaning as assigned to them in the Act.

Section-III

3. Contents of the Register

The Register shall be maintained in three parts:

i. Part I containing a list of all Interconnect Agreements with the names of interconnecting service providers, service areas of their operation, and the dates of the execution of such Agreements;

ii. Part II containing portions of the Interconnect Agreements, which the Authority may direct to be kept confidential;

² Subs. by the Second Amendment Regulation, 2004, s. 3, for "Interconnection" means the commercial and technical arrangements under which service providers connect including through electro-magnetic signals, their equipment, networks and services to enable their customers to have access to the customers, services, and networks of other service providers '(w.e.f. 31.12.2004).

² Subs. by the First Amendment Regulation, 2004, s. 2 (w.e.f. 3.2.2004), for "Interconnection" means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services, and networks of other service providers

⁴ The following clauses ins. by the First Amendment Regulation, 2001, s.3(2.3.f.3.2.2004) and omitted by the Second Amendment Regulation, 2004,s.2(w.e.f.31.12.2004).

'ix - "cable operator" means any person who provides cable service through a cable television network or otherwise controls or is responsible for the management and operation of a cable television network;

x - "cable service" means the transmission by cables of programmes including re-transmission by cables of any broadcast television signals;

xi - "cable television network" means any system consisting of a set of closed transmission paths and associated signal generation, control and distribution equipment, designed to provide cable services for reception by multiple subscribers;

xii - "broadcasting service" means the dissemination of any form of communication like signs, signals, writing, pictures, images and sounds of all kinds by transmission of electro-magnetic waves through space or through cables intended to be received by the general public either directly or indirectly through the medium of relay stations and all its grammatical variations and cognate expressions shall be constructed accordingly;

xiii - "broadcaster" means any person including an individual, group of persons, public or a body corporate, firm or any organization or body who/which is providing broadcasting service and includes his authorised distribution agencies;

xiv - "multi-service operator" means any person who provides cable service generally through a cable operator and whose service area extends across a state/ district/ city/ town/ area, as the case may be.'

⁵ Clause ix renumbered as clause xv by the First Amendment Regulation, 2004, s. 2. (w.e.f. 3.2.2004) and again renumbered as ix by the Second Amendment Regulation, 2004, s. 4 (w.e.f. 31.12.2004).

iii. Part III containing the contents of Interconnect Agreements other than those directed by the Authority to be kept confidential. This part shall be open for inspection by the public.

4. Confidential Portion of the Register:

⁶[Where any party to an Interconnect Agreement requests the Authority to keep the whole or any part of the agreement as confidential, the Authority shall take a decision thereon in accordance with the relevant provisions of The Telecom Regulatory Authority of India (Access to Information) Regulation, 2005.]

5. Registration of Interconnect Agreements

All service providers shall register with the Authority any Interconnect Agreement to which they are parties:

a. Where such Agreement had been entered into earlier than these Regulations, within 30 days of the coming into effect of these Regulations; and

b. In all other cases within 30 days of the execution or modification of such Agreements.

⁷[* * * * *]

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.

7. The Authority may from time to time prescribe the format(s) for seeking disaggregated information of such parts of the Interconnect Agreements having bearing on inter alia technical standards/ specifications relating to interconnection, quality of service, fault resolving procedures, downtimes, access charges, port charges, revenue sharing arrangements, area of operation and consumer related information such as range of services and the like also to be included in the Register.

8. Access to the Register

The Register shall be open for inspection by any member of the public on payment of prescribed fee and on his fulfilling such other conditions as may be provided for in these Regulations or may be notified by the TRAI from time to time.

6 Subs. by the Third Amendment Regulation, 2005, s. 2 (w.e.f. 4.3.2005), for the following:--

"4. i) The Authority may, on the request of any party to an Interconnect Agreement, direct that any part of such Interconnect Agreement be kept confidential.

ii) Any request for keeping a part of the Interconnect Agreement confidential must be accompanied by a non-confidential summary of the portion sought to be kept confidential.

iii) If the Authority is satisfied that there are good grounds for so doing, it may direct that any part of such Interconnect Agreement be kept confidential. The non-confidential summary of such part shall, however, be incorporated in Part III of the Register.

iv) If the Authority declines the request of any service provider to keep any portion of the Interconnect Agreement confidential, it shall record its reason for doing so and furnish a copy of its order to the service provider concerned. In that event the service provider shall have the right to make a representation and/ or to be heard by the Authority against such order.

v) The Authority may at any time disseminate confidential information in Part II of the Register if in its opinion the disclosure of the information would be in public interest. Before making such disclosure, the Authority shall afford an opportunity of hearing to service provider at whose request such information had been kept confidential.

vi) Where a service provider requests that any part of the Interconnect Agreement be kept confidential, such portion of the Agreement shall remain confidential until the matter is determined by the Authority."

7 The following proviso inserted by the First Amendment Regulation, 2004, s. 3 (w.e.f. 3.2.2004) and omitted by the Second Amendment Regulation, 2004, s. 2 (w.e.f. 31.12.2004):--

"Provided that in respect of Broadcasting and Cable Services, the Broadcasters including their authorized distribution agencies and Multi-service Operators will register with the Authority any interconnect agreement to which they are parties"

9. Any person seeking inspection of the Register shall apply to the Under Secretary (Commercial), TRAI or any other Officer, who may be designated for the purpose by the Authority, detailing therein the information he/ she seeks.

10. The designated officer shall allow inspection of the Register and also make available extracts of the relevant portions of the Register on payment of such fee as may be prescribed from time to time.

11. The Authority may also allow access to the Register through the web-site maintained by the Authority on the same conditions and on payment of such fee as may be prescribed from time to time.

12. Levy of fees and other charges

(i) There shall be levied a fee of Rs. 50 per hour for inspection of the Register.

(ii) A fee of Rs. 20 per page shall be charged for copies of extracts from the Register General

13. General

If any dispute arises with regard to the interpretation of any of the provisions of these Regulations, the decision of the Authority shall be final and binding.

(Rakesh Kapur)
Joint Secretary (Commercial)

Annexure-X

Timelines as contained in the Telecommunication Interconnection Regulations, 2018

Activity			Timeline
Time to enter into agreement on receipt of interconnection request.			30 days
a	Providing draft interconnection agreement	5 working days	
b	suggestions and objections on draft agreement	5 working days	
letter of acceptance and demand note, if any, upon receipt of request of ports and colocation space, if required.			7 working days
Payment of demand note.			5 working days
Intimation of provisioning of Ports and allocation of Colocation space: a. In case no demand note issued, from the date of acceptance letter. b. In case demand note issued, from the date of issue of demand note			10 working days
Interconnection seeker to intimate establishment of Transmission link between POIs, after intimation port and colocation space			10 working days
Interconnection provider to issue letter of commissioning (after doing acceptance testing) after Transmission link establishment.			10 working days

**Timelines as contained in the
Telecommunication Interconnection (RIO) Regulations, 2002**

Activity	Timeline
Interconnection seeker shall provide relevant information before seeking POI	Normally 6 months in advance
Interconnection provider shall intimate interconnection seeker and issue demand notes for the accepted part of the demand	Within 30 days from the date of receipt of formal demand
In case no response is made within 30 days, the formal demand will be treated as accepted and interconnection seeker shall be free to deposit the prescribed amount.	
Accepted demand shall be met by interconnection provider	Within 6 months of such deposit
Minimum number of ports required for the launch of service, shall be provided by the interconnection provider	Within 90 days of payment of the demand note
Interconnection provider shall issue demand notes for the capacity to be provided	Within 30 days of formal demand
The Interconnection seeker shall make the payment	Within 30 days of receiving the Demand Note
Any change in the firm demand shall be intimated	Within 15 days of making the payment

For balance requested capacity of ports not likely to be met within 6 months, planning action shall be immediately started.	
The capacity made available within 90 days shall be taken up immediately for testing.	
The full capacity required shall be provided and made available for testing in accordance with the time schedule indicated in the acceptance of demand or demand note, but within 6 months of the firm demand.	
Both parties shall ensure that testing is completed	Within 30 days of provisioning
Traffic measurements to determine further capacity requirements	Six months after commencement of service and every six months thereafter
If cancellation of demand is made within 15 days of the firm demand	Cancellation charge of 10% of annual rent payable for cancelled capacity shall apply
If the cancellation of demand is made after 15 days of the firm demand, the payment made towards port charges for first year shall be forfeited	
Seeker to undertake to use the capacity for a minimum period	3 years; if it fails, 50% rental for unused capacity for remaining period payable, along with Bank Guarantee of

	this amount within 90 days from firm demand
If within 6 months provider fails to make interconnect capacity available, or seeker is unable to use, the failing party pays damages	1% of annual rent per E1 port per day for delay (max 60 days)
Both parties to forecast outgoing traffic for each POI for future planning of sufficient switching and transmission capacity.	First forecast within 90 days of effective date, then on 1st April and 1st October every year
Parties to inform each other of changes to network configuration and facilities	Wherever possible, 12 months in advance
Parties to give notice of planned maintenance work	At least 7 days prior
Each party to send invoice/bill for effective traffic	Within 7 calendar days after close of month
Net amount for each billing period to be remitted	Within 15 days following receipts by both parties
Charges omitted from bill may be included in subsequent bills	Not later than 6 months from date of relevant bill (except tariff/rate change)

Party discovering error in reports to notify other party	Not later than 3 months from date of issue of Bill
Two years after initial interconnection, cost of additional resources to be negotiated between service providers.	After 2 years
Obligation to maintain confidentiality of the information	2 years upon expiry or termination of agreement
If force majeure lasts for more than 90 days, affected party may terminate agreement with written notice	Not less than 30 calendar days' notice
Agreement may also be terminated by either party giving notice	30 days
Coordination Committee to resolve disputes before formal dispute	Within 30 days
Both parties to update Schedule I containing POI details, at Circle level	At intervals of 6 months or whenever new POIs are added
Interconnection required to be established under normal conditions	Within 90 days

**Timelines as contained in the Telecommunication Interconnection
(Charges and Revenue Sharing) Regulation 2001**

Activity	Timeline
Interconnection provider shall inform the interconnection seeker whether facilities can be provided in the form sought	Within 30 days of the request for interconnection facilities
If mutual agreement is not reached on interconnection sought and/or charges, parties will approach TRAI with network and traffic details for determination	Within 30 days from the date of such request
If mutual agreement for interconnection charges cannot be reached within 30 days of initiating the process for charges with respect to which Authority has forbore, Authority may intervene.	

Annexure-XI

Levels of Interconnection between different networks as provided in the para 4.4 and 4.5 of Annex - C titled 'Reference Interconnect Offer Guidelines dated 12.07.2002'

PSTN Interconnections

Table 1.1 - PSTN to PSTN (Out-going Traffic)

Type of Call	POI	Remarks
Local	At SDCC Tandem or Local Exchange level situated in the same SDCA as per mutual agreement.	BSO- BSO
Intra-Circle Long Distance (Note 2)	(i) Terminating SDCC / LDCC (ii) Originating SDCC / LDCC, if BSO has no POI at the terminating end.	BSO- BSO (Far-end) BSO-BSO (Near-end)
Inter-Circle	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and conditions at the LDCC of originating LDCA	BSO to NLDO (Near-end)
International	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and	BSO to NLDO (Near-end)

	conditions at the LDCC of originating LDCA. NLDO to hand over international traffic at the Gateway Switch of ILDO To the gateway switch of the ILDO in case the ILD Gateway Switch and the BSO's Tandem/Transit Switch are located at the same station of level I TAX.	NLDO to ILDO BSO to ILDO (Near-end) for traffic of same SDCA
--	---	--

Table 1.2 - PSTN - PSTN (In-coming Traffic)

Type of Call	POI	Remarks
Local	Same as Table 1.1	
Intra-Circle Long distance	Same as Table 1.1	
Inter-Circle	NLDO to hand over terminating traffic by mutual agreement as per licence terms and conditions in the destination LDCA at SDCC or at LDCC POI.	NLDO to BSO
International	Level I TAX where the ILDO Gateway Switch is located. NLDO to hand over International traffic to	ILDO to NLDO NLDO to BSO

	the BSO at the terminating SDCC or by mutual agreement as per licence terms and conditions at terminating LDCC. Terminating local network at tandem/transit in case the ILD Gateway Switch and the Access Provider's Tandem/Transit Switch are located at the same station of level I TAX.	ILDO to BSO (for traffic terminating in same SDCA)
--	--	--

Note 1. New National Long-Distance Operator(s) can make necessary interconnection arrangements with other NLDOs, to ensure delivery of calls at places where POP is yet to be established as per their network rollout obligations.

Note 2. Intra-Circle Traffic may also be handed over to an NLDO by mutual consent.

Interconnection between PLMN (Public Land Mobile Network)^[114] and PSTN

Table 2.1 - Traffic from PLMN to PSTN

Licensed Area	POI	Remarks
A. Metros		
1. Local Call	Transit Exchange (Tandem) Local Exchange by mutual agreement	To BSO

^[114] **PLMN** stands for **Public Land Mobile Network**. It is a mobile (cellular) network operated by a telecom provider to offer wireless services like voice calls, SMS, and mobile data to the public within a specific area or country. PLMN is connects users through technologies like 2G, 3G, 4G, and 5G.

2. Inter-circle call	Designated Level I TAX located in the Metro.	
3. International Call	Designated Level I TAX of NLDO (or) Gateway Switch of ILDO if ILDO Gateway Switch and GMSC are located at the same station of Level I TAX (Metro).	Designated by NLDO / ILDO
B. Circles		
1. Intra - Circle Call	Level I TAX for both transit to other LDCAs/termination in the LDCA in which it is located. Level II TAX for traffic terminating in the destination LDCA, at the request of interconnection seeker. POI below TAX level may also be provided with mutual agreement for terminating traffic.	To BSO
2. Inter - circle Call	The traffic can be handed over at the designated Gateway Level I TAX of NLDO through any one of its Gateway MSC. CMTS provider cans also handover traffic to NLDOs at the POP situated in the LDCA at the location of the Gateway MSC or MSC in a Circle. The NLDO shall handover terminating traffic in the	To NLDO NLDO to BSO

	destination LDCA at the SDCC or by mutual agreement as per licence terms and conditions at LDCC POI.	
3. International Call	The traffic can be handed over at the designated Gateway Level I TAX of NLDO through any one of its Gateway MSC. CMTS provider cans also handover traffic to NLDOs at the POP situated in the LDCA at the location of the Gateway MSC or MSC in a Circle. To the Gateway Switch of the ILDO if ILDO's Gateway Switch and the GMSC are located at the same station of level I TAX	To NLDO To ILDO

Note 1. New National Long-Distance Operator(s) can make necessary interconnection arrangements with other NLDOs, to ensure delivery of calls at places where POP is yet to be established as per their network rollout obligations.

Table 2.2 Traffic from PSTN to PLMN

Licensed Area	POI	Remarks
A. Metros		
1. Local Call	Transit Exchange (Tandem)	To CMTS provider

	Local Exchange (by mutual agreement)	
2. Inter-circle call	BSOs shall handover the call at the designated TAX of NLDO in the originating Metro. The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle.	BSO to NLDO NLDO to CMTS provider
3. International Call (Out-going) (In-coming)	BSOs shall handover the call at the designated TAX of NLDO in the originating Metro To the gateway switch of the ILDO in case the ILD Gateway Switch and the Access Provider's Tandem/Transit Switch are located at the same station of level I TAX (Metro).	BSO to NLDO BSO to ILDO (Near end for traffic of same SDCA)

	The ILDO to handover at the Gateway MSC of the Cellular Operator if this Gateway MSC and the Gateway Switch of the ILDO are located at the same location of Level I TAX (Metro). The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO. NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle.	ILDO to CMTS Provider NLDO to CMTS provider
B. Circle		
1. Intra -Circle Call	Level I TAX or Level II TAX of the originating LDCA. If no POI is available at Level II TAX then at GMSC of the CMTS provider subject to mutual agreement.	BSO to CMTS provider
2. Inter-circle call	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and	BSO to NLDO

	conditions at the LDCC of originating LDCA. The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO. NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle	NLDO to CMTS provider
3. International Call (Out-going) (In-coming)	BSO to hand over originating traffic at the SDCC in the same SDCA in which it has originated or by mutual agreement as per licence terms and conditions at the LDCC of originating LDCA. NLDO to hand over International calls to the ILDO at the Gateway Switch. To the gateway switch of the ILDO in case the ILD Gateway Switch and the Access Provider's Tandem/Transit Switch are located at the same station of level I TAX.	BSO to NLDO NLDO to ILDO BSO to ILDO (Near end for traffic of same SDCA)

	ILDO to hand over incoming international traffic to NLDO at the Gateway Switch of ILDO The traffic can be handed over at any one of the GMSC through a designated Level I TAX of NLDO. NLDO can also handover traffic to CMTS provider at the POP situated in the LDCA at the location of GMSC or MSC in the Metro / Circle. The ILDO to handover at the Gateway MSC of the Cellular Operator if this Gateway MSC and the Gateway Switch of the ILDO are located at the same location of Level I TAX.	ILDO to NLDO NLDO to CMTS provider ILDO to CMTS provider
--	---	---

Note 1 New National Long-Distance Operator(s) can make necessary interconnection arrangements with other NLDOs, to ensure delivery of calls at places where POP is yet to be established as per their network rollout obligations.

Note 2: Different level 1 TAXs can be designated for terminating calls from different circles, in case a circle has more than one level 1 TAX.”

Annexure-XII

DoT Letter dated 24.08.2020 on ERSS

Department of Telecommunications
(Access Services Wing)
Sanchar Bhawan, 20 Ashoka Road, New Delhi-110001

No. 16-04/2015-AS-III/NP/92/

Dated: 24/08/2020

To,
All Access Service Providers,

Subject: Implementation of Single Number based Emergency Response Support System.

In addition to the instructions by DoT vide letter No. 16-04/2015-AS-III/NP/67/120 dated 04.05.2016 on the above mentioned subject, following needs urgent action

- i. Single Emergency Number '112' shall be accessible on STD also which will allow a person staying outside the State to call the State 112 for seeking assistance for another person in distress in the state.
- ii. CLI for Single Emergency Number '112' shall be transmitted as STD Code +112 for outbound calls.
- iii. In order to regularly monitor the performance of emergency lines, TSPs shall provide a webpage to provide total calls routed to 112, count of answered calls and failed calls with the reason of failure for a period of 24 hours and the other details available in traffic reports generated by the system.
- iv. Location based service critical to track the location of the person calling in distress, needs to be provided seamlessly by all the Telecom Service Provider (TSPs). Accordingly, all TSPs are directed to submit the timeline by which LBS services will be implemented in all States/UTs
- v. TSPs are to provide online Subscriber Database connectivity with PSAP database through webservices/APIs to the ERC, which are the designated PSAPs in each State/UT necessary for early identification of caller and facilitating a quick response. Accordingly, all TSPs are directed to submit the timeline by which online SDR services will be implemented in all States/UTs.
- vi. A SMS sent to 112 is required to be routed to the respective State ERC from where the SMS has originated. Accordingly, all TSPs are directed to submit the timeline by which SMS to 112 services will be implemented in all States/UTs.
- vii. The PRI lines are to be provided by each TSP in each PSAP without any commercial implications.
- viii. The provision of State-specific Long codes numbers is also to be provided without any one time or recurring commercial implications.


(Sanchit Kumar Garg)
ADG(AS-III)

Copy to:

1. Shri Anil Subramaniam, Director, WS Division, MHA

List of Acronyms

A2P	Application-to-Person
ADC	Access Deficit Charge
ARE	Annual Recurring Expenditure
ASP	Access Service Provider
BSNL	Bharat Sanchar Nigam Limited
CA	Civil Appeal
CAPEX	Capital Expenditure
CMSO	Cellular Mobile Service Operator
COAI	Cellular Operators Association of India
CPP	Calling-Party-Pay
DAIC	Directly Attributable Incremental Costs
DoT	Department of Telecommunications
DTC	Domestic Termination Charge
EOI	Equivalence of Inputs
ERSS	Emergency Response Support System
EU	European Union
FD	Financial Disincentive
GMSC	Gateway Mobile Switching Center
ILD	International Long Distance
ILDO	International Long Distance Operator
IMS	IP Multimedia Subsystems
IN	Intelligent Network
IoT	Internet of Things
IP	Internet Protocol
IPTV	Internet Protocol Television
ITC	International Termination Charge
IUC	Interconnection Usage Charge
LDCA	Long Distance Charging Area
LDCC	Long Distance Charging Centre

LRIC	Long Run Incremental Cost
LSA	License Service Area
MCLR	Marginal Cost of Funds Based Lending Rate
MSC	Mobile Switching Centre
MSS	Mobile Satellite Service
MTNL	Mahanagar Telephone Nigam Limited
NFV	Network Function Virtualization
NGN	Next-Generation Networks
NLD	National Long Distance
NLDO	National Long Distance Operators
NNP	National Numbering Plan
OEM	Original Equipment Manufacturers
Ofcom	Office of Communications of the British Government
OTT	Over-the-Top
P2P	Person-to-Person
PCM	Pulse Code Modulation
PCP	Pre-Consultation Paper
PLMN	Public Land Mobile Network
POI	Points of Interconnection
PRS	Premium Rate Services
PSTN	Public Switched Telephone Network
PSU	Public Sector Undertaking
QoS	Quality of Service
RCS	Rich Communication Services
RIO	Reference Interconnection Offer
SBI	State Bank of India
SDCA	Short Distance Charging Areas
SDCC	Short Distance Charging Centre
SDN	Software Defined Networking
SMP	Significant Market Power
SMS	Short Message Service

SS7	Signaling System No. 7
STD	Subscriber Trunk Dialing
TAX	Trunk Automatic Exchange
TDM	Time Division Multiplexing
TDSAT	Telecom Disputes Settlement and Appellate Tribunal
TIR	Telecommunication Interconnection Regulations
TMG	Trunk Media Gateway
TRAI	Telecom Regulatory Authority of India
TSP	Telecommunications Service Providers
UCC	Unsolicited Commercial Calls
UK	United Kingdom
UL	Unified Licence
USA	United States of America
VoIP	Voice over IP
VPN	Virtual Private Network
WLL	Wireless Local Loop