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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:-

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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.

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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

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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.

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. 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.

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 five working days of the receipt of the request.

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(2) A service provider, upon receipt of the demand note under sub-regulation (1), shall pay the amount within three 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 five working days from the date of issue of its letter of acceptance, in case no demand note was issued; and

(b) within five 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 three 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.

(5) A service provider, upon receipt of the intimation under sub-regulation (4), shall, within five 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.

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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.

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

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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 *multiplied by* the interconnection usage charge per minute applicable for the traffic carried on E1 link

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(S.K. Gupta)

Secretary

Note: The Explanatory Memorandum explains the objects and reasons of the Telecommunication Interconnection Regulations, 2018 (1 of 2018).

Explanatory Memorandum to

"THE TELECOMMUNICATION INTERCONNECTION REGULATIONS, 2018"

A. Introduction

1. The International Telecommunication Union (ITU) defines Interconnection as *"The commercial and technical arrangements under which service providers connect their equipment, networks and services to enable customers to have access to the customers, services and networks of other service providers."*[1]

2. Interconnection is extremely important from a consumer perspective. Consumers of telecommunication services cannot communicate with each other or connect with services they demand unless necessary interconnection arrangements between telecom service providers (TSPs) are in place. The international experience suggests that interconnection is the key to success of 'open competition' in telecommunication services.

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B. The Need for Regulation of Interconnection

3. If two TSPs are not in direct competition with each other, such as those operating in different countries, they interconnect voluntarily because interconnection increases the value of a network to its subscribers by increasing the number of people they can call and the range of telecommunication services they can access (network externality effect). However, the international experience shows that in a competitive market (such as an access service market in a country in which several TSPs provide access services to the same set of consumers), interconnection is not made available freely by an incumbent to its competitors; the incumbent generally seeks to limit competition, and, thereby, preserve its market power by way of - (a) refusing to interconnect; (b) offering interconnection at a price, or on such terms and conditions that make it difficult for a new entrant to compete; or (c) seeking to sabotage the new entrant by providing it a lower quality interconnection service than the incumbent provides to itself.

4. The World Trade Organization (WTO) Reference Paper on Basic Telecommunications lays down guidelines for interconnection as below:

[1] http://www.citi.columbia.edu/elinoam/articles/interconnection_pricing.htm

"2.2 Interconnection to be ensured: *Interconnection with a major supplier will be ensured at any technically feasible point in the network. Such interconnection is provided:*

(a) under non-discriminatory terms, conditions (including technical standards and specifications) and rates and of a quality no less favourable than that provided for its own like services or for like services of non-affiliated service suppliers or for its subsidiaries or other affiliates;

(b) in a timely fashion, on terms, conditions (including technical standards and specifications) and cost oriented rates that are transparent, reasonable, having regard to economic feasibility, and sufficiently unbundled so that the supplier need not pay for network components or facilities that it does not require for the service to be provided; and

(c) upon request, at points in addition to the network termination points offered to the majority of users, subject to charges that reflect the cost of construction of necessary additional facilities."

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5. The European Union's Directive 2002/19/EC (Access Directive) provides that *"National regulatory authorities shall, … ensure, in accordance with the provisions of this Directive, adequate access and interconnection, and the interoperability of services, exercising their responsibility in a way that promotes efficiency, sustainable competition, efficient investment and innovation, and gives the maximum benefit to end-users."*

6. The USA's `Telecommunications Act of 1996' provides *that* –

"…each incumbent local exchange carrier has the following duties:…….

(2) INTERCONNECTION- The duty to provide, for the facilities and equipment of any requesting telecommunications carrier, interconnection with the local exchange carrier's network—

(A) for the transmission and routing of telephone exchange service and exchange access;

(B) at any technically feasible point within the carrier's network;

(C) that is at least equal in quality to that provided by the local exchange carrier to itself or to any subsidiary, affiliate, or any other party to which the carrier provides interconnection; and

(D) on rates, terms, and conditions that are just, reasonable, and nondiscriminatory, in accordance with the terms and conditions of the agreement and the requirements of this section and section 252."

7. It has been observed that many telecommunication regulators in the world have devised formal *ex-ante* regulatory frameworks for interconnection based on Fair, Reasonable and Non-discriminatory (FRAND) principles with an overall aim to promote and facilitate competition.

C. The Present Regulatory Framework for Interconnection in India

8. In India, the regulatory framework for interconnection has been established by Telecom Regulatory Authority of India (hereinafter, referred to as, the Authority or TRAI). Some of the important regulations and directions issued by the Authority on the matter of framework for interconnection are outlined below.

9. In the year 1999, The Authority, through 'The Register of Interconnect Agreements Regulations 1999' mandated all TSPs to register with the Authority any interconnection agreement to which they are parties.

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10. In the year 2001, the Authority issued a Determination dated 08.01.2001 on Interconnection, through which, it prescribed various points of interconnection between fixed-line networks and mobile networks.

11. In the year 2002, the Authority issued the Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002. As per the Regulation, a TSP enjoying Significant Market Power (SMP) status is required to submit its proposed RIO (describing, *inter-alia,* the technical and commercial conditions for interconnection based on the model RIO as annexed to the Regulation) to the Authority for approval and then to publish the approved RIO on its web-site. Such RIO, thereafter, forms the basis of all interconnection agreements to be entered into by/ and with the issuer of the RIO. The Telecommunication Interconnection (Reference Interconnection Offer) Regulation, 2002 also contains three Annexures containing (a) Explanatory memorandum to the regulation to explain the reasons for the issuance of the Regulation; (b) the model RIO; and (c) Guidelines.

12. Based on the stipulations contained in the Telecommunication Interconnection (Reference Interconnection Offer) Regulation, 2002, SMPs of that point of time viz. M/s Bharat Sanchar Nigam Ltd. (BSNL), M/s Mahanagar Telephone Nigam Ltd. (MTNL), M/s Videsh Sanchar Nigam Ltd. (VSNL) and other TSPs submitted their RIOs for approval of the Authority. On 09.10.2002, the Authority suggested 29 modifications in the draft RIO submitted by M/s BSNL and M/s MTNL

and directed them to immediately publish their RIOs after incorporating the suggested modifications.

13. M/s BSNL and M/s MTNL filed appeals (Appeal No. 11 & 12 of 2002) in Telecom Disputes Settlement & Appellate Tribunal (TDSAT) against modifications suggested by the Authority. Subsequently, on 27.04.2005, TDSAT passed judgement in these appeals. In compliance to the Order of TDSAT, M/s BSNL and M/s MTNL published their RIOs on their web-sites. The option was also given to the TSPs, who had already signed interconnection agreements, to migrate to the RIO regime notified with effect from the date when such RIO was actually published.

14. Though TDSAT did not strike down the Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002, it held that the Authority would remain bound by the terms and conditions of interconnectivity of the service providers as given in the licenses issued after the amendment to the Act in 2000. The TDSAT held that the Authority has power to change the terms and conditions of interconnectivity of the licenses issued prior to the amendment of 2000 to the extent that these are in conformity with the terms and conditions of interconnectivity contained in the licenses issued after the amendment of 2000.

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15. The Authority filed appeal in Hon'ble Supreme Court (Appeal No. 3298 of 2005) against the afore-mentioned Order of TDSAT; the matter is still pending before the Hon'ble Supreme Court. However, on 06.12.2013, the Hon'ble Supreme Court, in another matter in Civil Appeal No. 5253 of 2010, held the following:

> *"In exercise of the power vested in it under Section 14(b) of the Act, TDSAT does not have the jurisdiction to entertain the challenge to the regulations framed by the Authority under Section 36 of the Act."*

16. Further, in the Unified License (UL), which is the most recent license, the licensor i.e. Department of Telecommunications (DoT) has put interconnection between TSPs under TRAI's regulatory framework of interconnection. The relevant clauses of the License are reproduced below:

> *"27.3 Interconnection between the networks of different Licensees for carrying circuit switched traffic shall be as per national standards of CCS No.7 as amended from time to time by Telecom Engineering Centre (TEC) and also subject to technical feasibility and technical integrity of the Networks and shall be within the overall framework of interconnection regulations/ directions/ orders issued by the TRAI/ Licensor from time to*

time. For inter-networking between circuit switched and IP based network, the Licensee shall install Media Gateway Switch. Further, the Licensor may direct the LICENSEE to adopt any other technical standards issued by TEC on interconnection related issues.

27.4 Licensee shall interconnect with other Telecom Service Providers at the points of Inter-connection (POI) subject to compliance of prevailing regulations, directions or determinations issued by TRAI. The charges for accessing other networks for internetwork calls shall conform to the Orders/ Regulations/ Guidelines issued by the TRAI/ Licensor from time to time. The Interconnection Agreements will, inter-alia, provide the following: (a) To meet all reasonable demand for the transmission and reception of messages between the interconnected systems. (b) To establish and maintain such one or more points of Interconnect as are reasonably required and are of sufficient capacity and in sufficient number to enable transmission and reception of the messages by means of the Applicable Systems, (c) To connect, and keep connected, to their Applicable Systems.

27.5 The charges for accessing other networks for inter-network calls shall be based on mutual agreements between the service providers conforming to the Orders/IUC Regulations/Guidelines issued by the TRAI from time to time.

27.6 The provision of any equipment and its installation for the purpose of Interconnection shall be subject to mutual agreement of the concerned parties and shall conform to TRAI's regulations and orders.

27.7 The Interconnection Tests for each and every interface with any Telecom Service Provider shall be carried out by mutual arrangement between the Licensee and the other party involved. In case of disagreement for rectification of deficiencies / deviations in conducted interconnection tests, reference could be made to Licensor / TRAI."

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17. In the year 2005, the Authority issued a Direction dated 07.06.2005 to provide interconnection to the interconnection seeker within 90 days of the applicable payments made by the interconnection seeker.

D. The Present Exercise to Review the Regulatory Framework for Interconnection in India

18. The Authority received several representations from various service providers to review the regulatory framework for interconnection in order to make it useful and relevant. Accordingly, the Authority issued a Pre-consultation Paper (PCP) on 14.10.2015 and sought the views of the TSPs on the following issues:

Question (a): In view of regulatory, market and technological changes during the last few years in telecommunication sector, is any review of existing regulations on interconnection called for with a view to make interconnection agreements more effective, non-discriminatory, fair and transparent? If yes, which kind of changes are required in interconnection regulation framework?

Question (b): Should TRAI notify/ prescribe a standardized interconnection agreement (default option) in those situations, where the two service providers fail to negotiate mutually agreed terms and conditions of interconnection within a specified time frame?

19. After examining the comments received from the TSPs on the PCP dated 14.10.2015 and further analysis, the Authority decided to conduct a comprehensive review of the regulatory framework for interconnection in the country and released a Consultation Paper (CP) on 'Review of the Regulatory Framework for Interconnection' on 21.10.2016 to seek the views of stakeholders on various aspects of interconnection. Stakeholders were asked to submit written comments by 21.11.2016 and counter-comments by 06.12.2016. On the request of some stakeholders, the dates for submission of comments and counter-comments were extended up-to 12.12.2016 and 26.12.2016 respectively. Written comments were received from three industry associations, 12 TSPs and two other stakeholders. Counter-comments were received from two TSPs. The comments and the counter-comments received from the stakeholders were placed on the TRAI's website - www.trai.gov.in. An Open House Discussion was held on 17.03.2017 at Delhi with stakeholders. The issues raised in the CP and the views of stakeholders thereon are being examined in the succeeding paragraphs.

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E. Analysis of the Key Issues Raised in the Consultation Paper

20. In the CP dated 21.10.2016, the Authority had sought the views of stakeholders on the following broad issues related to interconnection:

(a) How to ensure fair, reasonable and non-discriminatory terms and conditions of interconnection agreement between TSP?

(b) Should seeker/ provider concept continue?

(c) Whether it is appropriate to mandate only those TSPs who hold significant market power (SMP) to publish their Reference Interconnect Offers (RIOs)? If yes, what should be the criteria for reckoning a TSP as SMP?

(d) What details should a new TSP furnish for entering into interconnection agreement?

(e) What should be the time-frame for entering into an interconnection agreement? Should financial disincentive be imposed TSPs for not entering into interconnection agreement within stipulated time?

(f) Is there a need for bank guarantee (BG) in the Interconnection Agreement? If yes, how to determine the amount of BG?

(g) Should an interconnection agreement between TSPs continue to operate when one of them acquires a new license?

(h) Whether existing interconnection agreements should also be allowed to be migrated to the new framework which will come out as a result of this consultation process?

(i) Should Interconnection Agreements and POIs be service-specific or service-agnostic? If POIs are merged together (service-agnostic POIs), which methods of discovery, prevention and penalization of any traffic manipulation by TSPs should be put in place?

(j) Under what circumstances, a TSP can disconnect POIs? What procedure should be followed before disconnection of POIs?

(k) Is there a need to have a co-ordination committee to facilitate effective and expeditious interconnection between TSPs?

(l) Whether there is any need to review the level of interconnection as mentioned in the Guidelines annexed to the RIO Regulations, 2002?

(m) In case, interconnection for Inter-circle calls to fixed-line network continues to remain at SDCA, should alternate level of interconnection be specified in cases of technical non-feasibility (TNF) at SDCA level?

(n) What should be the framework to ensure timely provisioning/ augmentation of E1 ports?

(o) Should separate time periods for provisioning of ports be prescribed for (a) fixed-line networks and (b) mobile/ IP networks?

(p) Should financial disincentive be imposed for (a) not providing initial POI and (b) not augmenting POI within stipulated timeframe?

(q) Whether augmentation of ports be allowed at higher levels such as STM-1 in place of E1s?

(r) How to ensure that inflated demand for ports is not made by a TSP?

(s) In case interconnection seeker agrees to bear the total cost of equipment required for augmentation in advance, should a TSP give the requested ports irrespective for the traffic at POI?

(t) What should be the method to settle IUC and how should the delayed payment between TSPs be handled?

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(u) Which policy and regulatory measures are required to be taken to encourage TSPs to migrate to interconnection at IP level?

(v) Whether there is a need to establish a framework for Interconnect Exchange to eliminate bilateral interconnection issues?Is there any need for a separate framework for Interconnect Exchanges in view of the fact that the new NLDO authorization permits transit traffic to be carried over by NLDO?

21. An analysis of these issues based on the comments and inputs received from stakeholders is presented below.

(1) How to ensure fair, reasonable and non-discriminatory terms and conditions of interconnection agreement between TSP?

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22. In the CP, stakeholders' comments were invited on the following question:

Question: Which amongst the following is the best option to ensure fair, reasonable and non-discriminatory terms and conditions of interconnection agreement between telecom service providers (TSPs), in view of the technological, market, licensing, regulatory and legal developments in the telecommunication services sector in India since 2002?

(i) To amend the Telecommunication Interconnection (Reference Interconnection Offer) Regulation, 2002 taking into consideration the technological, market, licensing, regulatory and legal changes since the year 2002;

(ii) To prescribe a Standard Interconnection Agreement, which must be entered into between interconnecting TSPs, in case they are unable to mutually agree on terms and conditions of interconnection agreement between themselves in a specified time-frame;

(iii) To prescribe only the broad guidelines based on fair, reasonable and non-discriminatory principles and leave the details of the interconnection agreement to be mutually decided by the interconnecting TSPs in a time-bound manner; or

(iv) Any other method.

Please provide justification in support of your response.

23. A large variety of views have been received from stakeholders in response to the above question. At one extreme, is a stakeholder who has stated that interconnection agreements must be left to the market forces and the Authority should maintain only a regulatory oversight over interconnection matters and should step-in *ex-post* only. At the middle, are a few stakeholders

who have opined that no change is required in the present regulatory framework for interconnection. The other extreme is occupied by most stakeholders who have stated that the present regulatory framework requires to be amended to make it more effective and enforceable. However, the stakeholders seeking change in the regulatory framework are not unanimous on any one particular method; they have expressed divergent views on the preferred method viz.-

(a) View-1: The Authority should prescribe only the broad guidelines based on Fair, Reasonable and Non-discriminatory (FRAND) principles; the Authority should leave the commercial and technical details of the interconnection agreement for mutual negotiations between the interconnecting TSPs to allow flexibility and innovation.

(b) View-2: The Authority should only amend the RIO Regulations of 2002 with a focus to ensure that the principle of reciprocity is followed by the interconnecting TSPs; and

(c) View-3: Standard Interconnection Agreement (SIA) is the best option to ensure fair and reasonable terms and conditions of interconnection agreement between TSPs.

24. One state-owned TSP has stated that prescription of SIA as a default option is not appropriate as it will always adversely impact one party or another; a party will not agree for mutual negotiation if it is likely to be benefited from such default agreement.

25. Based on the stakeholders' comments and further analysis, the Authority attempted to find answers to the following questions:

(a) Which method is appropriate - *ex-ante* regulation or *ex-post* intervention on Interconnection matters?

In a multi-service provider (or competitive) environment, interconnection is regarded as a lifeline of a telecommunication services sector. Internationally, strategic anti-competitive behavior on interconnection matters has retarded onset of competition in many telecommunication markets around the world. According to ITU surveys[2], interconnection related issues are ranked by many countries as the single most important problem in the development of a competitive marketplace. It is widely believed that the incumbent TSPs have a tendency to delay interconnection by way of prescribing one sided terms and conditions in the interconnection agreement, charging a high price etc.; such behavior leads to protracted and costly negotiations between competing TSPs at the cost of

[2] Source: Telecommunication Regulation Handbook Module 3 Interconnection Infodev, accessible on https://www.itu.int/ITU-D/treg/Documentation/Infodev_handbook/3_Interconnection.pdf

efficient services to the consumers. Clearly, it is in the interest of consumers that effective and expeditious interconnections take place between TSPs. Most countries in the world have formulated *ex-ante* regulatory guidelines for establishing proper environment to facilitate interconnection. The Authority observed that in recent past in the country, there have been several instances of - (a) refusal to enter into interconnection agreement; (b) refusal to make available adequate interconnection capacity; and (c) posturing for disconnection of interconnection facility on flimsy grounds, by some TSPs. Based on the foregoing facts and analysis, the Authority is of the opinion that the case for *ex-post* regulatory regime for interconnection in India remains weak. Accordingly, the Authority has decided to continue with the formal *ex-ante* regulatory regime for interconnection in India.

(b) Whether the present regulatory framework for interconnection in India is suited for the present-day telecom market?

The present regulatory framework for interconnection hinges primarily on the three directives of the Authority viz. – (a) Determination dated 08.01.2001;(b) The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002 dated 12.07.2002; and(c) Authority's Direction dated 07.06.2005 to provide interconnection to the interconnection seeker within 90 days of the applicable payments made by the interconnection seeker.

The Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002 mandates a TSP enjoying Significant Market Power (SMP) status to submit its proposed RIO (describing, *inter-alia,* the technical and commercial conditions for interconnection based on the model RIO as annexed to the Regulation) to the Authority for approval and then to publish the approved RIO on its web-site. Such RIO, thereafter, forms the basis of all interconnection agreements to be entered into by/ and with the issuer of the RIO. The Authority took note of the fact that with the present level of fragmentation in the telecommunication services market, not many TSPs may be reckoned as SMPs and therefore, the matter of entering into interconnection agreement requires a review.

The Authority's Direction dated 07.06.2005 mandates interconnection provider to provide interconnection within 90 days of the applicable payments made by the interconnection seeker. Though the afore-mentioned Direction enabled provisioning of POIs to interconnection seekers to a certain extent, the followings facts indicate that the time-frame for provisioning of POIs requires a review:

(i) The provisions of Direction dated 07.06.2005 come into effect only after the interconnection seeker has made the applicable payments to the interconnection

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provider, which is possible only after the interconnection provider issues demand note to the interconnection seeker; in absence of a specific time-frame mandated to the interconnection provider to issue demand note after receiving demand for provision of initial interconnection and augmentation of points of interconnection (POIs), it is possible to obey the 'letter' of the Direction even without obeying its 'spirit'.

(ii) The 90 days' time period provided for fulfilling the demand of interconnection seeker has proved to be rather long keeping in view the fact that many new entrants have acquired a large number of subscribers in rather short periods of time, in turn, requiring a ramp-up of POI capacities at much shorter notice.

Clearly, the present day regulatory framework for interconnection in the country requires an overhaul to cater to the needs of the present-day telecom market. Accordingly, the Authority has decided to prescribe a broad regulatory framework to address the contentious issues between interconnecting service providers through these regulations.

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(c) <u>What should be the broad regulatory framework for interconnection?</u>

The Authority examined the options available to it for devising a regulatory framework for interconnection with a view to ensure effective and expeditious interconnection amongst TSPs and has decided that henceforth 'The Telecommunication Interconnection Regulations, 2018' (hereinafter referred to as the TIR,2018) comprising of regulations on important aspects of interconnection (e.g. interconnection agreement, bank guarantees, provisioning of initial interconnection and augmentation of POIs, disconnection of POIs, financial disincentive on interconnection matters etc.) shall apply over all the service providers offering telecommunication services in India. The provisions of the TIR, 2018 shall prevail over the existing interconnection arrangements between the TSPs in India. Through these regulations, the Authority has decided to, *inter-alia*, mandate the following with respect to interconnection agreement between service providers:

(i) A service provider who intends to enter into an interconnection agreement with another service provider shall place request to such service provider.

(ii) The service provider, to whom request has been made 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.

(iii) On receipt of the draft interconnection agreement, 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.

(iv) The service provider to whom request has been made for entering into interconnection agreement shall, within thirty days of receipt of request, enter into interconnection agreement, on non-discriminatory basis, with the requesting service provider.

With regard to the interconnection charges such as set-up charges and infrastructure charges, the Authority has decided that the interconnection 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.

(2) Should the concept of interconnection seeker/ interconnection provider continue?

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26. Through the Telecommunication Interconnection (Charges and Revenue Sharing) Regulation 1999, the Authority defined Interconnection Provider and Interconnection Seeker as below:

"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.

27. As per the traditional practices, an interconnection seeker is liable to pay mainly the following charges to the interconnection provider:

(a) Set-up Charges (Payable towards configuration, testing and commissioning of new POI);

(b) Port Charges (In accordance with the Telecommunication Interconnection (Port Charges) Regulation, 2001 as amended from time to time); and

(c) Infrastructure Charges(Charges for infrastructure provided by the interconnection provider i.e. collocation charges etc.)

28. The Model RIO contained in the Telecommunication Interconnection (Reference Interconnection Offer) Regulation, 2002 stipulates the following with regard to the cost 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."

29. Relevant clauses in the Licenses dealing with the question of which party to bear the cost of interconnection are reproduced below:

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Clause 17.11 of Basic Services, Clause 17.9 of NLD license and Clause 17.10 of ILD license*: "The network resources including the cost of upgrading/ modifying interconnecting networks to meet the service requirements of service will be provided by service provider seeking interconnection. However mutually negotiated sharing arrangements for cost of upgrading/modifying interconnecting networks between the service providers shall be permitted".*

Clause 28.4 of CMTS license, Clause 27.3 of UASL and Clause 28.2 of UL*: "The network resources including the cost of upgrading/ modifying interconnecting networks to meet the service requirements of the licensee will be mutually negotiated keeping in view of the orders and regulations issued by the TRAI from time to time."*

30. The issue of continuation (or otherwise) of the concept of interconnection seeker/ interconnection provider is quite contentious owing to the fact that the concept in its present form, generally, requires the interconnection seeker to pay interconnection cost to the interconnection provider either perpetually or at least for certain initial period. In this background, the following question was raised for stakeholder's views in the CP:

Question: Whether there is a need to continue with the present concept of interconnection seeker/ interconnection provider? If yes, what should be the criteria?

31. In response to the afore-mentioned question, some stakeholders have supported continuation of interconnection seeker/ provider concept while some other stakeholders have suggested removal of seeker/ provider concept.

32. The opponents of the interconnection seeker/ provider concept are of the view that interconnection provision is mutually beneficial arrangement for both the interconnecting parties and, therefore, there should not be any concept of interconnection seeker/ provider and both the interconnecting parties should bear their own cost for provision of interconnection whereas the cost of the interconnection link between the two networks should be shared by the interconnecting parties. Such stakeholders have opined that the current concept of interconnection seeker/ provider has resulted in an anti-competitive situation where interconnection providers are able to dictate terms to the interconnection seekers. A stakeholder opposing the interconnection seeker/ provider concept has contended that the seeker/ provider concept was relevant in the initial days of liberalization, when only one incumbent TSP had alone to bear the cost of up-gradation to provide interconnection to all new entrants of that time; at that time the capacity of exchanges was limited and huge cost was involved in order to provide interconnection to the other TSPs; therefore, a cost causation principle was used and this led to seeker/ provider concept; however, at present, competition already exists in the market and there is no such capacity constraint in the new technology exchanges, and so the seeker/ provider concept is archaic. This stakeholder, however, holds such views only with respect to interconnection between access service providers and has argued that the National Long Distance operator (NLDO) and International Long Distance Operators (ILDOs) should always be treated as seekers vis-a-vis access service providers.

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33. On the other hand, a large number of stakeholders have supported the concept of interconnection seeker/ provider. In support of their view, they have furnished the following arguments:

(a) The interconnection provider has to create capacities in its own network for the interconnection seeker in the initial phase of interconnection. The creation of these capacities has cost implications for the interconnection provider. Therefore, it should be borne by the seeker for a (mutually agreed) pre-defined period.

(b) The interconnection seeker may use a different technology from that used by the provider. Hence, the provider may have to modify its network to facilitate interconnection to the seeker. The concept of interconnection seeker/ provider helps in shifting the responsibility to the interconnection seeker for bearing the cost of such technology changes.

(c) The Interconnection seeker/ provider concept is prevalent worldwide.

34. However, the stakeholders supporting the broad 'concept' of interconnection seeker/ provider are not unanimous in the 'description' of the concept. The views of such stakeholders on 'the period for which interconnection seeker/ provider concept should apply' may be summarized as below:

(a) View-1: Concept to apply forever: A few stakeholders including public sector service providers have argued that there can be only one criterion for defining interconnection seeker/ provider viz.- the existing TSP is interconnection provider and a new TSP is interconnection seeker and shall remain seeker for ever irrespective of the market share; all other definitions are prejudiced and mischievous and chaotic. A public sector service provider has contended that the status of PSUs as 'interconnection provider' should be perpetual as they are incumbent service providers.

(b) View-2: Concept to apply for initial two years in case of new entrants: Many stakeholders have opined that the status of interconnection seeker/ provider should be applied only when a new entrant launches the service for the first time in a particular licensed service area (LSA), for the initial period of two years from the date of launch of commercial services. After two years, each party should bear the cost of its outgoing traffic including the capacity built in first two years; this includes the cost of interlinking media.

(c) View-3 : Concept to apply differently for difference service segments: A few stakeholders have suggested the following method to implement seeker/ provider concept:

(i) For interconnection between two access service providers, the late entrant should be considered as the interconnection seeker for the initial period of two years after which the cost should be borne by both parties based on their respective outgoing traffic.

(ii) For interconnection between access service provider and NLDO/ ILDO, the NLDO/ILDO should be considered as interconnection seeker in perpetuity.

(iii) In case the license of an access service provider is renewed upon expiry of 20 years, it should no longer be regarded as interconnection seeker in the fresh interconnection agreement.

35. While evaluating the suitability of the interconnection seeker/ provider, the Authority observed that the concept of interconnection seeker/ provider has been prevailing since the onset of competition in the telecommunication services sector in India. Also, the licenses for Basis service, NLD service and ILD service recognize the status of interconnection seeker as distinct from interconnection provider (with respect to the bearing of cost of interconnection).

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36. It has been observed that, in any interconnection arrangement, the interconnecting service provider who benefits more from the interconnection assumes the role of interconnection seeker. For instance, when the Government granted Licenses to private players for offering cellular telephony in India, the basic service operators viz. Department of Telecommunications (now BSNL) and MTNL were the incumbents in the sector. At that time, the cellular service providers were to benefit more from interconnection with the basic service operators as the cellular service providers were starting from the scratch and the basic service providers had a reasonably large subscriber base. This was one of the reasons for the cellular service providers' taking the role of interconnection seeker vis-a-vis the basic service operators.

37. Similar situation occurred when the Government granted new licenses for cellular services and introduced third and fourth operators in cellular service market. In this case, the new entrants sought interconnection not only from the basic service operators but also from the then existing cellular service providers. When the National Long Distance (NLD) and International Long Distance (ILD) sectors were opened for private participation in the country, the new NLDOs and ILDOs sought interconnection from the access service providers (both basic as well as cellular service providers).

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38. The interconnecting parties in access-to-access (A2A) interconnection (where both the parties are access service providers) hold a peer-to-peer relationship. In this relationship, while they cooperate by way of entering into interconnection arrangements, at the same time, they compete in the marketplace, generally, for the same set of customers. In the initial period of interconnection between a new entrant with an incumbent, there exists a significant asymmetry in outgoing and incoming traffic at the POI. However, as soon as the new entrant gains a worthwhile market share, the two interconnecting parties start inching towards symmetry in traffic at the POI. Therefore, beyond a certain point in time after establishing interconnection, not only the interconnection seeker but also the interconnection provider begins to receive the benefits of interconnection by way of positive network externalities. Clearly, the argument that the new entrants benefit more from the interconnection holds good only in the short-to-medium run.

39. In view of the comments of the stakeholders and further analysis, the Authority has decided to put in place the following mechanism:

(a) 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.

(b) 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 after the conversion of ports, each service provider shall seek ports to meet the requirement of its outgoing traffic.

(3) Which details should a new TSP furnish for entering into interconnection agreement?

40. In response to the issue as to which details should a new TSP furnish while placing request for entering into interconnection agreement, the stakeholders have expressed a variety of views. At one extreme is a stakeholder who has argued that the Authority should not prescribe details/ documents to be furnished by a new entrant to the existing service provider; instead, these should be mutually decided and negotiated by the interconnecting service providers. On the other extreme are a few stakeholders who have suggested a new TSP should furnish a large number of details and documents including the following :

(a) letter issued by DoT intimating MSC SPC for every LSA;
(b) letter issued by DoT intimating MSISDNs/ TFN Levels/ Fixed Number Series level allocation for provisioning subscribers;
(c) company profile and market share;
(d) TEC Interface approvals for all equipment to be connected for interconnection;
(e) network architecture with low level and high level POP details;
(f) projection of likely reasonable demand for Interconnect Location wise E1 capacity for six months post-commercial launch (locations should be given with detailed Address and latitude-longitude);
(g) likely date of start of commercial operations;
(h) services proposed to be offered and proposed connectivity (with justifications);
(i) Interconnecting technology, for example, TDM/IP, SMPP, ISUP, SCCP, etc.;
(j) details of transport media such as satellite, Microwave, PDH, SDH, DWDM, ATM, etc.;
(k) KYC documents of the requesting service provider viz. Service Tax Certificate / PAN Card/GST Registration Certificate etc.

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(l) a copy of Memorandum of Association of the Company;

(m) a copy of Article of Association,

(n) the latest Annual report of the company,

(o) a list of Directors with DIN,

(p) a certified true copy of Board resolution,

(q) original Power of Attorney,

(r) specimen signature,

(s) copy of Incorporation Certificate with CIN

41. In the middle of afore-mentioned two extremes are a few service providers who have suggested that only a few documents need to be furnished by a new TSP while seeking interconnection. One of them has suggested that the new TSP needs to provide only two documents viz.- (a) a copy of its License Agreement; and (b) location of its switches/ infrastructure while another stakeholder has stated that the services proposed to be provided by the new entrant should also be furnished by the new entrant.

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42. While examining the views of the stakeholders, the Authority observed that in case the documents and details which need to be furnished by the new entrant while seeking interconnection are left for mutual negotiation between the interconnecting parties, it may lead to a situation where the existing service provider may employ delaying tactics by way of seeking a large number of unnecessary details. At the same time, the Authority is cognizant of the fact that existing service providers require certain details and documents from the new entrants prior to entering into interconnection agreement for reasons such as the following:

(a) To ascertain as to whether the requesting service provider is licensed for the service for which it is seeking interconnection;

(b) To know the location of POI and interconnection technology of the requesting service provider.

43. In view of the comments of the stakeholders and further analysis, the Authority has decided to prescribe that 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 POIs; and

(d) name of technology to be used for interconnection at each POI.

(4) What should be the time-frame for entering into an interconnection agreement?

44. As already described above, the Authority, by way of issuing TIR, 2018 has decided that interconnecting service providers shall get a time-period of 30 days for entering into interconnection agreement between themselves through mutual negotiation under compliance to the TIR, 2018 from the date on which a service provider submits a formal request (alongwith the requisite details and documents) to the other service provider.

(5) Is there a need for bank guarantee (BG) in Interconnection Agreement? If yes, how to determine the amount of BG?

45. In response to the question regarding the need for bank guarantee[3] in interconnection agreements, a variety of views have been received from stakeholders. While a few stakeholders have opined that there is no rationale for seeking bank guarantees in interconnection agreements, a few others have argued that there is a strong need for bank guarantees. In the middle of these two sides are an industry association and a TSP who have contended that the matter of bank guarantee does not require any regulatory intervention.

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46. The opponents of the provision of bank guarantee in interconnection agreements are of the view that there is no requirement for seeking bank guarantee in the interconnection agreement as both the interconnecting parties receive benefit of interconnection. A stakeholder has opined that, in general, there is a limited exposure (i.e. the amount that could be lost) in the interconnection agreements; however in the case of interconnection agreements of access service providers with ILDOs, there could be significant financial exposure and, therefore, there is a need for bank guarantees in such agreements. A stakeholder has stated that provision of bank guarantees is not justified except in the following two cases viz.-

(a) An interconnecting TSP is using the POIs for terminating traffic only and is in net payable position at all times (for example in case of interconnection with standalone NLDO/ ILDOs), and,

(b) An interconnecting TSP defaults in payment by more than 10 days for three consecutive months in the year.

[3] A bank guarantee is a guarantee from a lending institution ensuring the liabilities of a debtor will be met. In other words, if the debtor fails to settle a debt, the bank covers it.
Source: http://www.investopedia.com/terms/b/bankguarantee.asp

47. On the other hand, the supporters of the provision of bank guarantee in interconnection agreements have argued the following in support of their position:

(a) Bank guarantees are required to securitize the net receivable from the interconnecting TSP. Even the licensor follows this practice to securitize its net receivable on account of License Fees and Spectrum Usage Charges.

(b) Certain TSPs, while exiting their businesses, did not pay their dues of interconnection charges to the interconnecting TSPs. The provision of bank guarantees is required to guard against such eventualities.

48. The public sector TSPs, while supporting the provision of bank guarantees, have contended that the bank guarantees are required to be given by private TSPs and not *vice-versa*. A public sector TSP has also furnished a letter from the Department of Telecommunications (DoT) asking it to obtain adequate bank guarantees from other TSPs before their launch of services, wherever needed; and to obtain additional bank guarantees during their course of operation, whenever needed. Another public sector TSP has stated that bank guarantees are required to be obtained from interconnecting TSPs for the purpose of audits and investigations by various statutory bodies.

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49. The advocates of the forbearance in the matter of bank guarantees have opined that all commercial aspects of the interconnection should be left to the interconnecting TSPs for mutual agreement on a reciprocal basis.

50. While examining the suitability of the provision of bank guarantees in the interconnection agreements, the Authority took note of the reports that many TSPs, while exiting from operation of telecom services in the country due to cancellation of licenses or other business reasons, did not pay interconnect usage charges and other charges payable by them to other TSPs. At the same time, the Authority also took cognizance of the reports that certain incumbent TSPs have sought bank guarantees of the order of Rs. ten lakh per E1 link in access-to-access interconnection agreements.

51. Based on the comments of the stakeholders and further analysis, the Authority has decided to prescribe ceiling on bank guarantees which a TSP can seek from another interconnecting TSP as per the following scheme:

(a) 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.

(b) 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:

(i) 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;

(ii) the bank guarantee shall be limited to the amount of interconnection usage charges payable by a service provider after adjustment as discussed in the above clause; and

(iii) 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.

52. As the interconnection usage charges are settled between TSPs on monthly basis, the Authority is of the view that, for the period of six months from the date of establishment of initial interconnection, the maximum amount of bank guarantee payable by a service provider should be equivalent to maximum net IUC payable by the service provider for a period of two months. In the following table, an attempt has been made to estimate the maximum net difference in minutes sent from one service provider to the other service provider in two months per E1.

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S. No.	Item	Legend	Value
1	No. of channels in an E1 circuit	a	30
2	Average utilization of a channel for carrying payload	b	70%
3	Maximum no. of equivalent channels utilized per E1 circuit	c=a*b	21
4	Maximum minutes of usage (MOU) in busy hour per E1 circuit	d=c*60	1,260
5	Maximum MOU in a day per E1 circuit (assuming busy hour traffic as 9% of the daily traffic)	e=d/(9%)	14,000
6	Maximum MOU in one month per E1	f=e*30	4,20,000
7	Maximum MOU in two months per E1	G=f*2	8,40,000

53. As the maximum amount payable by the requesting service provider to the other service provider in two months per E1 link would be obtained by multiplying the applicable interconnection usage charge by the maximum net MOUs from the requesting service provider to the other service provider (assuming entire voice traffic flows from the requesting service provider to the other service provider and none in the opposite direction) in two months per E1, the Authority has decided to prescribe the ceiling on bank guarantee per E1 link at POI for the period of six months from the date of establishment of initial interconnection as below:

Ceiling on bank guarantee per E1 link at a POI (in Rs.)
=8,00,000 *multiplied by* interconnection usage charge per minute applicable for the traffic carried on the E1 link

54. For illustration purposes, for E1 links between two access service providers, ceiling on bank guarantees per E1 link at POI, at present rate of IUC, may be computed as below:

Ceiling on bank guarantee per E1 link at POI (in Rs.)
=8,00,000 * Rs. 0.06
= Rs. 48,000

55. As a further illustration, bank guarantee to be furnished at the end of six months from the date of establishment of initial interconnection or on the 1st February, 2018, whichever is later may be calculated as below.

(a) If IUC payable by the service provider-1 to the service provider-2 for the period of the preceding two months is Rs. 50 Lakh and IUC payable by the service provider-2 to the service provider-1 for the period of the preceding two months is Rs. 35 Lakh;

(b) then the service provider-1 is liable to pay a maximum of bank guarantee of Rs. 15 lakh for a period of six months if the service provider-2 demands for it.

(6) Should an interconnection agreement between TSPs continue to operate when one of them acquires a new license?

56. In the past three to four years, many TSPs have acquired new licenses after expiry of their old licenses. Earlier, these TSPs made representations to the Authority stating that their interconnection agreements with the public sector TSPs were co-terminus with their earlier licenses and, therefore, new interconnection agreements need to be entered into after expiry of the old licenses and onset of new licenses; however, even after several rounds of discussions with the public sector TSPs, they have not been able to finalize new agreements with public sector TSPs and traffic at the POIs is being exchanged without any formal agreement. In this background, the following question was raised in the CP for stakeholders' views:

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Question: Should an interconnection agreement between TSPs continue to operate if an interconnecting TSP acquires a new license upon expiry of an old license? Alternatively, should fresh agreements be entered into upon specific request of either party to the interconnection?

57. In response to the afore-mentioned question, a wide variety of responses have been received from stakeholders. One set of stakeholders has contended that the existing interconnection agreements between TSPs should continue to operate when an interconnecting TSP acquires a new license upon expiry of an old license. The second set of stakeholders is of the view that fresh agreement should be entered into when an interconnecting TSP acquires a new license upon expiry of old license. A variant of this view is that if both the interconnecting parties declare, in writing, to continue with the same terms and conditions of interconnection, then the interconnection agreement may continue, however, if either party seeks a review, a fresh agreement must be entered into by the interconnecting TSPs. The third set of stakeholders has argued that there is no need for any regulatory intervention on this matter; the interconnecting TSPs should be free to decide matters relating to bilateral agreements by themselves.

58. The stakeholders supporting the continuation of existing interconnection agreements between TSPs when an interconnecting TSP acquires a new license upon expiry of an old license have submitted the following arguments:

(a) As long as there is continuity in the interconnectivity, terms and conditions of the existing interconnection agreement between TSPs should continue to operate.

(b) The expiry of existing license and issuance of new license is a commercial aspect as no disconnection in the interconnection is ever effectuated and no fresh demands for interconnection are made. Also equipment are normally not replaced or for that matter even the existing system are not altered in any manner whatsoever. So, merely some technical alterations in the license/ change of license cannot be a sustainable ground in defying the existing agreement between the parties since it was signed on mutually agreed terms.

(c) The existing interconnection agreements do not contain a clause regarding termination/renewal of the agreement as a consequence of renewal of license.

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59. The stakeholders advocating that fresh agreement should be entered into when an interconnecting TSP acquires a new license upon expiry of old license have furnished the following arguments in support of their view:

(a) 20 years is a long period of time and many changes relating to technological, market, licensing, regulatory and legal developments may have happened which require changes in the agreement. Hence, fresh agreements should be entered into as and when the existing agreements expire on the expiry of license. However, status of interconnection seeker/ provider should not apply to such fresh interconnection agreements.

(b) Interconnection agreement between TSPs is legally based on the valid licenses held by the interconnecting TSPs. In case of expiry of the license of either of the interconnecting TSPs, the existing interconnection agreement would not remain legally valid unless both the interconnecting TSPs agree for the same and record the same in form of addenda to the existing interconnection agreement. Else a fresh interconnection agreement needs to be entered into by the interconnecting TSPs.

60. While examining the issue at hand, the Authority took note of the fact that when the Government grants a new License to a licensee upon expiry of an old license, the same resources (number series, MSC and SP codes etc.), the approvals for lawful interception and SACFA clearances to the licensee etc. continue to operate, and therefore, period of an interconnection agreement needs

not to be linked with the expiry of an old license agreement of either party when that party has already entered into a new license agreement.

61. In any case, the reasonable interests of the interconnecting service providers in the existing interconnection agreements would remain protected in view of the facts that the provisions of the TIR, 2018 shall prevail over the existing interconnection arrangements between service providers.

(7) Should existing interconnection agreements be allowed to be migrated to the new framework which will come out as a result of this consultation process?

62. As the Authority has already decided that the provisions of the TIR, 2018shall prevail over the existing interconnection arrangements, the issue of applicability of the new framework for interconnection on the existing interconnection agreement has already been taken care of.

(8) Should Interconnection Agreements and POIs be service-specific or service-agnostic? In case, POIs are merged together, what methods of discovery, prevention and penalization of any traffic manipulation by TSPs should be put in place?

63. As per the existing terms of the interconnection agreements, the full mobility, limited mobility and fixed-line network of UASL have separate POIs with the public sector TSPs. Such POIs are treated independently for all purposes, including setup costs, port charges etc. During the pre-consultation process, some TSPs submitted that after the migration of the Licenses to Unified License, there is a need for making changes in the interconnection agreement so that any infrastructure taken under one license should be allowed to be shared with the same licensee who has authorisation to provide other services also. In this background the following questions were raised in the CP for stakeholders' comments:

> *Question: Whether interconnection and interconnection agreement should be service-specific or service-agnostic (i.e. a TSP can send any type of traffic on a point of interconnection which is allowed under the terms and conditions of the license given to it)? What are the advantages/ disadvantages of having service specific POIs when the TSPs are equipped with call data record (CDR) based billing systems?*

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Question: If POIs are merged together, what methods of discovery, prevention and penalization of any traffic manipulation by TSPs (whereby higher IUC traffic is recorded as lower IUC traffic in the CDR of the originating TSP) should be put in place?

64. In response to the afore-mentioned questions, diverse responses have been received from stakeholders. Except for one stakeholder who has stated that the matter of service-specific or service-agnostic POIs should be left to TSPs to decide as per their mutual interconnection agreement, other stakeholders have either expressly supported the provision of service-specific interconnection and interconnection agreement or have opposed such a provision.

65. The supporters of the provision of service-specific interconnection and interconnection agreement have stated the following to substantiate their views:

(a) With respect to service-specific interconnection agreement: While the License may permit offering a wide range of services, interconnection agreement should be service-specific because interconnection for different services involves different technical and commercial aspects. The interconnection agreement includes the charges incurred on the set-up of an interconnecting network such as port charges, set-up charges etc. These charges vary as per the applicable set-up/interconnection scenario and, hence, there can be no standard interconnection agreement that covers all scenarios. The charges are required to be agreed upon, on a case-by-case basis.

(b) With respect to the service-specific interconnection (points of interconnection/ trunk groups): The type of traffic, an interconnecting TSP hands over to the other interconnecting TSP at the POI, depends upon the terms of the interconnection agreement. ATSP may have a POIat a designated location for various services with other TSP; however, the Trunk Groups (TGs) are to be kept separate for different services to ensure that only the traffic from services meant for a particular TG is handed over. While TSPs are equipped with a CDR-based billing system, a unified POI with no demarcation would induce the TSPs to tamper with the CLIs, leading to a loss to the terminating TSP. In such a situation, the TSP will have no means to check and block such traffic. The routing, numbering, IUC charges etc. are also all service specific and any attempt to have service agnostic interconnection would result in misuse and arbitrage. The CDR at terminating exchange/network does not have the provision to identify the location of calling subscriber, leading to billing disputes between TSPs.

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66. On the other hand, the supporters of the provision of service-agnostic interconnection and interconnection agreement have made following arguments in support of their view:

(a) With respect to service-agnostic interconnection agreement: At present the prevailing regime for licensing is Unified Licensing and, therefore, multiple interconnection agreements should not be insisted upon. There should be only one interconnection agreement for all the services allowed under the terms and conditions of the License signed by the TSP with specific provision for each type of License authorizations, such as NLD, ILD etc.

(b) With respect to service-agnostic interconnection: Service-specific POIs lead to inefficient utilisation of resources as there will be a level of unused capacity in multiple POIs.The requirement for service-specific POIs originates from the requirement to distinguish between the type of calls terminating on a TSPs network as different type of calls have different IUC charges. However, with enhanced CDRs the same objective can be achieved without the requirement of having service-specific POIs. Each TSP must maintain CDRs which record the originating and terminating numbers, the originating and terminating type of call i.e. wireline, wireless, Fixed Wireless Access (FWA), internet telephony. Once these CDRs are exchanged at the end of the month, the IUC payable would be easily determined and there would be no requirement to resort to service specific POIs and the POIs can be made service agnostic. This would increase the efficiency of the network and also achieve the purpose of being able to determine the correct type of call for the purpose of determining the final IUC bill.

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67. The Authority, while examining the suitability of the provision of service-specific or service-agnostic interconnection and interconnection agreement, took note of the following:

(a) Interconnection agreements are entered into by the TSPs who have been granted any of the following licenses in the country:
   (i) License for access service (viz. BSO/ CMTS/ UASL);
   (ii) License for NLD services;
   (iii) License for ILD services;
   (iv) Unified License having authorization for at least one of the access/ NLD/ ILD services.

(b) At present, termination charges for - domestic calls from wireline networks; domestic calls from wireless networks; and international calls; - are different.

(c) In the past, there have been allegations on some TSPs of passing off higher-IUC calls as lower-IUC calls by way of tampering CLI of calling party.

(d) CDR based billing systems cannot detect as to whether CLI of calling party has been tampered with.

68. In view of the comments of the stakeholders and further analysis, the Authority is of the view that the service providers should be able to enter into an interconnection agreement for multiple services; however, the issue of service-agnostic or service-specific POI should be left for mutual negotiation between interconnecting service providers. Accordingly, the Authority through these regulations, has mandated the service provider, who places request for entering into interconnection agreement, to furnish name of the services for which interconnection is sought while placing the request.

(9) Is there a need to have a coordination committee to facilitate effective and expeditious interconnection between TSPs?

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69. On the question of need for coordination committee(s) to facilitate effective and expeditious interconnection between TSPs, most of the stakeholders are of the view that there is no need for coordination committee(s). These stakeholders have stated that the matter of interconnection is a bilateral issue which should be left for mutual negotiation between the interconnecting TSPs under the overall regulatory framework for interconnection; after-all, the option of approaching TDSAT is available to the TSPs for seeking adjudication of disputes between TSPs. Some stakeholders have stated that the Authority already seeks report on interconnection matters and holds meetings with corporate level officers of TSPs to resolve issues. On the other hand, a stakeholder has opined that there is an urgent need to have a coordination committee to facilitate effective and expeditious interconnection between TSPs; the Committee should be empowered to intervene if deadlines are not met by any TSP and compel the TSP to meet the deadlines by imposing financial penalties on the TSP.

70. The Authority took note of the fact that the issues related to interconnection between TSPs keep surfacing up at various stages, even when, formal interconnection agreements between them, are well in place. When such matters are brought to the notice of the Authority by the interconnecting TSPs, the Authority attempts to facilitate the TSPs with an aim to ensure effective interconnection between them. Such a mechanism of facilitation of interconnection matters has been working fairly well till date. In case of deadlock situations between service providers, they approach TDSAT for seeking adjudication of disputes between themselves. As the present

mechanism has worked reasonably well, the Authority found no merit in introducing any scheme of Coordination Committee for resolving interconnection matters. At the same time, the Authority is conscious of the fact that new service providers, at times, face difficulties in entering into interconnection agreements and getting required ports at POIs. With a view to facilitate effective and interconnection expeditiously, the Authority, has decided to stipulate that it 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.

(10) Under what circumstances, can a TSP disconnect POIs?

71. In response to the afore-mentioned question, a wide variety of responses have been received from stakeholders. While a stakeholder has opined that no TSP should be permitted to disconnect POIs under any circumstances, a few other stakeholders have suggested that an extreme step such as disconnection of POI should not be resorted to, barring exceptional circumstances. On the other hand, several stakeholders have stated that disconnection of POIs should be permitted under certain justifiable circumstances.

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72. The stakeholders, opposing disconnection of POIs, have argued that disconnection of POIs is against consumer's interests and also is in violation of licensing conditions, there should not be disconnection of POIs based on TSPs own interpretation of terms and conditions for non-payment of dues etc.; disconnection of POIs should be allowed only as per order of the Authority or the Licensor. A few other stakeholders have contended that disconnection of POIs is an extreme step which should not be resorted to, barring exceptional circumstances such as- (a) the licensee shutting down services; (b) the licensee shutting down the relevant POP; (c) on the basis of mutual agreement; or (d) upon breach of interconnection agreement.

73. The stakeholders, who have supported provision for disconnection of POIs on justifiable grounds, have cited the following reasons as justifiable for disconnection of POIs:

(a) When a TSP bypasses traffic i.e. the TSP hands over traffic, which is meant to be handed over at a designated POI, at other POIs meant for other services, primarily to pay lower termination/ carriage charges;

(b) When a TSP transits traffic through a third party i.e. the TSP hands over its traffic to the interconnecting TSP via some other TSP without its consent;

(c) When a TSP hands over calls without CLI/ Incorrect CLI/ tampered CLI in order to pass off higher-IUC calls as lower-IUC calls;

(d) When a TSP provides a service not defined in its license;

(e) When a TSP does not make payment of IUC as per the agreed terms of interconnection;

(f) When a TSP uses services against national security or in contravention of laws, terms of License or regulations;

(g) When a TSP's network adversely affects the normal operation of the interconnecting TSP's network;

(h) When a TSP commits a breach of confidentiality provisions of interconnection agreement;

(i) When a TSP has been adjudged bankrupt or insolvent;

(j) The defaulting party has ceased to hold license under Sec-4 of the Indian Telegraph Act, 1885.

74. The Authority, while evaluating the provision of disconnection of POIs, took note of the following:

(a) The Licenses issued by the Government require *inter-alia* that interconnected networks will connect, and keep connected, to their Applicable Systems.

(b) The Authority, vide its Direction dated 31.12.2003, *inter-alia*, directed that a TSP who wish to disconnect the POIs should give a notice for disconnection of POI with a suitable time period (not less than 10 days). M/s BSNL appealed in TDSAT against the afore-mentioned Direction (Appeal No. 2 of 2004). TDSAT, vide its order dated 21.04.2004, set aside the TRAI's Direction except the period of notice (not less than 10 days) for disconnection of POI.

(c) The Authority has received numerous representations from several TSPs in the past, contending that some TSPs, unilaterally, disconnect POIs in certain circumstances based on their own interpretation of terms and conditions for non-payment of dues etc. Such disconnection of POIs results in blocking of services to consumers.

75. After taking into account the comments of the stakeholders and further analysis, the Authority is of the view that (a) the disconnection of POI should not be resorted to barring exceptional circumstances; and (b) when resorted to, it should be carried out only after following a due process. Accordingly, the Authority has decided to mandate that a service provider, before disconnection of a POI, shall –

(i) give a show-cause-notice of fifteen working days to the other service provider with reasons for the proposed disconnection;

(ii) if not satisfied with the reply of the show-cause-notice issued under above clause or no reply is received to the show-cause-notice, give a notice of fifteen working days to such service provide specifying the date of disconnection of POI; and

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(iii) not disconnect POI before the expiry of the period of notice given under the above clause (ii):

Provided that the above provision not shall apply if a POI is disconnected with mutual consent, or on the direction of the Licensor or the Authority.

(11) Whether there is any need to review the level of interconnection as mentioned in the Guidelines annexed to the RIO Regulations, 2002?

76. In response to the issue of need for review of the levels of interconnection, many stakeholders have stated that there is a need to review the level of interconnection particularly those involving PSTN. On the other hand, the public sector TSPs have argued that the present levels of interconnection should be retained.

77. The Authority examined the views of the stakeholders and observed that certain provisions of the licenses, transit/ carriage charges and numbering system etc. have a significant bearing on the levels of interconnections. The Authority is of the view that there is a need for further deliberations on the matter of levels of interconnection.

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(12) What should be the framework to ensure timely provisioning/ augmentation of E1 ports?

78. In the year 2005, the Authority issued a Direction on provision of interconnection, through which, it directed all TSPs to provide interconnection on the request of interconnection seeker within 90 days of the applicable payment made by the interconnection seeker. It is worth noting that in response to the Authority's PCP dated 14.10.2015, some TSPs pointed out that the time period of 90 days start from the date of making payment against a demand note issued by the a service provider against a firm demand made by a requesting service provider; however, some service providers, in many cases, do not raise the demand note for significantly long periods of time and, therefore, the maximum time-period of 90 days for provision of interconnection become infructuous. On the other hand, some TSPs have stated that, at times, interconnection seekers tend to place unreasonable demands for provision of interconnection ports, which becomes difficult to meet in short periods of time. In this background, the following issue was raised for soliciting views of stakeholders:

Question: What should be the framework to ensure timely provisioning/ augmentation of E1 ports? Please provide full framework with timelines including the following aspects:

(a) Minimum number of E1 ports for start of service;

(b) Maximum time period for issuance of demand note by the interconnection provider;

(c) Maximum time period for payment for demanded E1 ports by the interconnection seeker;

(d) Intimation of provisioning of requested E1 ports by interconnection provider;

(e) Space allocation for collocation of transmission equipment;

(f) Maximum time period for establishment of transmission links by the interconnection seeker;

(g) Maximum time period for acceptance testing;

(h) Maximum time period for issuance of final commissioning letter by the interconnection provider; and

(i) Maximum time period for start of traffic in the POI after provisioning/ augmentation of E1 ports for which payment has already been made.

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79. In response to the afore-mentioned question, two sets of responses have been received from stakeholders. While one set of stakeholders has stated that there is no requirement of any further regulatory intervention on the matter of provisioning and augmentation of interconnection ports, the other set of stakeholders has argued that there is an urgent need of clear and unambiguous timelines for each step of interconnection. Some stakeholders have also stated that the framework to ensure timely provisioning/augmentation of ports should be process-oriented, the compliance of which should be closely monitored by the Authority.

80. A stakeholder, who is of view that there is no need of any further regulatory intervention on the matter of provision and augmentation of interconnection ports, has stated that augmentation is a complex process involving multiple domains like core and transmission; capacity augmentation requirements can be in terms of switch ports, a single card in the transmission box or cover an entire ring/ network in transmission; the procurement process of core and transmission equipment typically takes 6to8 weeks from order to delivery and another 2to4 weeks for the justification, ordering, installation and commissioning process depending on whether it's a card level upgrade or a network level upgrade. Hence the 90-days period provided in the Authority's Direction of 07.06.2005 is reasonable and justified.

81. On the other hand, a stakeholder who has argued that there is an urgent need of clear and unambiguous timelines for each step of interconnection, has stated that the Authority's Direction dated 07.06.2005 does not serve much purpose as the incumbent TSPs do not agree to the traffic forecasts and requests of POI augmentation of new TSPs; more importantly, the

incumbent service providers do not issue the demand notes to the new TSPs, as a result the interconnection seekers are not able to make applicable payments; the incumbent TSPs issue only meagre ports for POI augmentation, and that too at their own discretion.

82. The stakeholder, who has argued that the framework to ensure timely provisioning/ augmentation of ports should be process-oriented, has stated the following:

(a) Demand should be reasonable: Demand for interconnection ports should be placed by the interconnection seeker along with justification of traffic because the provisioning of interconnection ports does not require augmentation of capacity at POIs only but also in the access network. As the interconnection seeker compensates the interconnection provider only for the cost of interconnection capacity accruing to its traffic, a substantial amount of investment made in the access network for handling the additional traffic will go waste if the actual requirement of the service provider turns out to be much lower than the demand projected by it.

(b) The Interconnection provider requires to perform 'due diligence' prior to agreeing for demand: Considering the fact that the interconnection provider has an existing network, which may require expansion and other changes to accommodate the demand of interconnection seeker, the interconnection provider needs to perform due diligence of the demand with the help of historical trends of traffic on POIs. This is important to ensure that an interconnection provider do not have to invest in creating needless capacities in its network.

(c) Initial E1s for the pre-launch phase should be limited to 1-2 E1s for testing the interconnectivity between the networks.

(d) The interconnection provider should intimate the location for POIs so that the interconnection seeker can make timely planning and arrangement.

(e) Provision for space, power, and infrastructure: If the agreement provides for space, power and infrastructure to be provided to the interconnection seeker, the feasibility for space allocation, power, etc., needs to be checked by the interconnection provider within a specified time frame. In case it is found to be unfeasible, the interconnection seeker should be required to make alternate arrangements within a defined time frame.

83. The stakeholders supporting need for clear and unambiguous timelines for interconnection and those arguing for a process-oriented framework to ensure timely provisioning/ augmentation of ports have suggested time-periods for various aspects of provisioning and augmentation of ports. The time-periods suggested by many of them are quite different.

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84. The Authority, while examining the need for a framework for provisioning and augmentation of interconnection ports, took cognizance of the fact that provisioning and augmentation of ports at POIs has always been a contentious issue between interconnecting service providers. Several TSPs have, on numerous occasions, brought the issue of non-cooperation and filibustering on part of incumbents to the knowledge of the Authority. Therefore, the contention of the stakeholders that the Authority should lay down clear and unambiguous timelines for each step of interconnection and should make it process-driven in order to ensure effective and expeditious interconnection does not seem to totally unjustified. At the same time, it does not appear to be prudent to micro-manage the various aspects of provisioning and augmentation process.

85. On the basis of the comments of the stakeholders and further analysis, the Authority has decided to put in place the following framework to ensure provisioning of initial interconnection and augmentation of ports at POIs in a time-bound manner:

(a) A service provider, upon receipt of request of ports, and collocation space, if required, shall issue letter of acceptance and demand note, if any, within five working days of the receipt of the request.

(b) A service provider, upon receipt of the demand note, shall pay the amount within three working days from the date of receipt of the demand note.

(c) The service provider, who issued the letter of acceptance, shall intimate the requesting service provider about provisioning of the ports and allocation of the collocation space, if applicable,---

(i) within five working days from the date of issue of its letter of acceptance, in case no demand note was issued; and

(ii) within five 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.

(d) A service provider, upon receipt of the intimation about provisioning of the ports and allocation of the collocation space, if applicable, shall, within three 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.

(e) A service provider, upon receipt of the intimation about establishment of the transmission link between the POIs, shall, within five 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.

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86. As an illustration, the following Chart demonstrates the various timelines to be adhered to with respect to provisioning of initial interconnection and augmentation of ports at POIs, in case demand note is issued by the service provider, to whom request for provisioning of initial interconnection or augmentation of ports is placed:

Maximum period (in working days) for service provider-2 to issue letter of acceptance and demand note, if any, upon receipt of request of ports and collocation space from service provider-1	
Maximum period (in working days) for service provider-1 to pay the amount from the date of receipt of the demand note	
Maximum period (in working days) for service provider-2 to intimate service provider-1 about the provisioning of the requested ports at the POI and allocation of collocation space	
Maximum period (in working days) for service provider-1 to intimate service provider-2 about establishment of transmission link between the POIs	
Maximum period (in working days) for service provider-2 to carry out acceptance testing and issue final letter of commissioning of the ports	

(13) Should separate time periods for provisioning of ports be prescribed for (a) fixed-line networks and (b) mobile/ IP networks?

87. Barring three stakeholders, all the other stakeholders, who have expressed their views in response to the afore-mentioned question, have opposed prescription of separate time periods for provisioning of ports for fixed-line networks and mobile/ IP networks.

88. The stakeholders, who have opposed prescription of separate time periods for provisioning of ports in fixed-line networks and Mobile/ IP networks, have expressed the following views:

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(a) Interconnection happens on the core network, whether it is fixed-line network or mobile/ IP network and hence, there is no justification for separate time periods for the provision of ports based on technology.

(b) The regulations should be technology agnostic.

(c) Interconnection for fixed-line and mobile networks is no different. Especially now with the provision of being able to interconnect over IP networks, the cost and complexity involved in interconnections has substantially reduced.

89. A stakeholder, in support of prescription of separate time periods for provisioning of ports in fixed-line networks and Mobile/ IP networks, has, *inter-alia*, stated that the PSTN fixed-line networks in the country are predominantly owned by PSUs i.e. BSNL and MTNL, having legacy networks. The capacity of such exchanges is limited and their expansion is time consuming and involves higher cost. On the other hand, there is no capacity constraint in the new technology switches deployed by various TSPs in their mobile networks. Therefore, separate time periods may be prescribed for provisioning of ports for fixed-line networks and mobile/ IP networks.

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90. It would be pertinent to mention that the public-sector TSPs, in response to the question, have stated that the time periods for provisioning of ports in fixed-line networks and mobile/ IP networks should be the same and there should be no distinction on the basis of technology.

91. The Authority, while examining the suitability of separate time-frames for provisioning of ports in fixed-line and mobile/ IP networks, took note of the fact that the various steps of the process of interconnection are, generally, neutral to the technology of service providers. Accordingly, the Authority has decided to not prescribe any separate time periods for provisioning of ports for fixed-line networks and mobile/ IP networks.

(14) Whether augmentation of ports be allowed at higher levels such as STM-1 in place of E1s?

92. In response to the above question, except for a stakeholder, who has argued for mandating initial interconnection as well as augmentation of POIs at STM-1 level, the other stakeholders have expressed their views as below:

(a) The augmentation of ports is already permitted at STM-1 level and therefore requires no regulatory prescription.

(b) The augmentation at STM-1 or other levels should be mutually agreed upon by the Parties instead of being mandated.

(c) Depending upon traffic requirement, augmentation may be allowed at STM-1 level also.

(d) When the existing POI exceeds 63 E1s, further augmentation may be done on STM-1 Level subject to technical feasibility in both the TSPs' nodes.

(e) The Telecommunication Interconnection (Port Charges) Regulation, 2001 prescribes port charges on the basis of E1 ports.

(f) Augmentation of ports must be entirely based on capacity required on both sides.

(g) The augmentation of ports may be allowed at higher levels such as STM-1 in place of E1. It leads to lower hardware costs and much better bit rates and capable of carrying both circuit switched and packet switched calls. For smaller requirements, the existing practice of E1 level ports should be allowed to be continued.

93. The stakeholder, who has sought regulatory mandate for providing initial interconnection as well as augmentation of POIs at STM-1 level, has stated that in order to cater to high POI traffic pattern in the current environment even during initial stages of network, mandatory initial interconnection capacities should be revised to one STM-1; even for augmentation of ports in modern switch, the minimum unit should be in terms of one STM-1.

94. The Authority is mindful of the fact that a new entrant may not necessarily require a STM-1 capacity (equivalent to 63 E1s) at initial stages. Also the requirement for augmentation of POIs may not necessarily be as high as a STM-1 capacity in every case. Under such scenario, mandating interconnection at a minimum level of STM-1 may be counter-productive as it may result in wastage of resources in certain instances and also may require the requesting service provider to pay for unnecessarily high port charges.

95. At the same time, the Authority is aware that augmentation of POIs at STM-1 level would, generally, be beneficial for interconnection TSPs for the following reasons:

(a) Most of the interconnect equipment (viz. Media Gateways, MSCs etc.) of the TSPs is equipped with STM-1 ports. The proportion of STM-1 ports vis-à-vis E1 ports on such equipment is growing in favour of STM-1 ports.

(b) The STM-1 ports are not only economical but also require much less rack space. As a result, the same rack/ shelf of equipment can accommodate much higher interconnection capacity if it contains STM-1 ports as against the scenario when it contains only E1-ports.

Thus interconnection at STM-1 level may be a win-win proposition for both the interconnecting TSPs.

96. In view of the comments of the stakeholders and further analysis, the Authority has decided to prescribe that 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.

(15) How to ensure that inflated demand for ports is not made by a TSP?

97. In response to the afore-mentioned question, the stakeholders have expressed a wide variety of views. While some stakeholders have opined that there is no need for regulatory prescription on the subject because such issues can be resolved through mutual agreement, a few others have argued that it cannot be envisaged as to how and why a requesting service provider would place an inflated demand to the interconnection provider; in case the actual traffic turns out to be less than demand, the extra ports can be de-provisioned by both the interconnecting TSPs on mutual basis. Most other stakeholders have responded with suggestions to ensure that inflated demand for ports is not made by a TSP. Various views expressed by such stakeholders are summarized below:

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(a) View-1: Augmentation should be based on current capacity utilization of more than 70% during network busy hour (NBH) consistently for last one week. The quantum of augmentation should be reasonable increase which should bring utilization in between the range of 50 to 70%.

(b) View-2: Some interconnection seekers tend to project inflated demands due to their ambitious traffic projections. Catering to such inflated demands would be a costly affair, and might also lead to the creation of superfluous capacities at the port, radio and switch level as well as other wasteful investments. Therefore, it should be the responsibility of the interconnection seeker to justify the demand from a technical and commercial standpoint for the ports and it should be up to the provider to agree to the calculations given by the interconnection seeker.

(c) View-3: To ensure that inflated demand for ports is not made by the requesting TSP, the Port Charges should be abolished. In case even after three months, average busy hour utilization of initial POI is below 10% continuously for a month, the Port Charges, as prescribed by TRAI, should be applicable on the interconnection seeker for a period of six

months. In case, even after expiry of six months' period from the last POI augmentation, the average busy hour utilisation of POI remains below 30% for a month, then the TSP may withdraw such augmented port capacity.

98. The Authority, while examining the matter, took cognizance of the fact that the issue of inflated demand has always been quite contentious between the interconnecting TSPs, often leading to disputes amongst them. While placing demand for unreasonably high number of ports is likely to result in wasteful expenditure in the networks, denial of reasonable demand in the guise of terming such demand as inflated one would result in POI congestion, and, thereby would lead to consumer inconvenience. Therefore, it would be necessary to clearly set rules for determining as to how much demand of ports on a POI is reasonable.

99. With a view to ensure optimum utilization of expensive network resources, the Authority has decided to lay down the following with respect to placing request of ports for provisioning of initial interconnection and augmentation of POIs:

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(a) 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.

(b) 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 70% 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 60%.

(16) In case interconnection seeker agrees to bear the total cost of equipment required for augmentation in advance, should a TSP give the requested ports irrespective of the traffic at POI?

100. In response to the afore-mentioned question, three view-points have emerged from stakeholders. The first view-point is that the matter should be left to the discretion of the TSPs themselves and

should not be prescribed by the Regulator. The second view-point is that provision and augmentation of POI should be guided solely by the traffic at POI and hence the proposition suggested in the question is unjustified. The third view-point is that an interconnecting TSP must provide the requested number of ports if the other party is willing to bear the total cost of equipment required for augmentation in advance.

101. The stakeholders, who have contended that it would be unjustifiable to mandate interconnecting TSPs to offer the requested ports irrespective of the traffic at POI in case the other party agrees to bear the total cost of equipment required for augmentation in advance, have stated the following arguments in support of their view-point:

(a) Interconnection has to be optimal and efficient and cannot be given *carte blanche* at the behest of one of the parties. It may be noted that the License states that *"…The Interconnection Agreements will, inter-alia, provide the following: (a) To meet all reasonable demand for the transmission and reception of messages between the interconnected systems."* Hence reasonableness of the demand for interconnection is *sine-qua-non* of the license and the interconnection agreements. Interconnection agreements provide for measuring traffic on agreed routes busy hours to assess future capacity requirements. Hence, there can be no case for the interconnecting TSP augmenting ports irrespective of volume of traffic at POI.

(b) The total cost of equipment includes both the capital expenditure and operating expenditure on network elements such as BTS, BSC, MSC, transmission links, interconnection ports, passive infrastructure such as tower, etc. The Interconnection seeker pays only the port charge, and that too, for a period of two years. If the traffic is less than the demanded capacity, the provider's cost of deploying the additional network will go to waste. Therefore, the provision of ports has to be justifiable and on the basis of reasonable traffic projections corroborated with actual traffic.

102. On the other hand, the stakeholders who have supported to mandate interconnecting TSPs to offer the requested ports irrespective of the traffic at POI in case the other party agrees to bear the total cost of equipment required for augmentation in advance have stated the following arguments in support of their view-point:

(a) In case a new entrant or requesting TSP is providing projections in advance and agrees to bear the total cost of equipment required for augmentation in advance, the other TSP must provide the requested ports irrespective of the volume of traffic at POI. The potential

under-utilisation of capacity, and therefore, the stuck capital could be the only apprehension for an interconnection provider to delay in providing ports (as otherwise in the case of appropriate utilisation, it is in the interest of the provider also to create this capacity). By paying for this capacity, the seeker is addressing this concern and, therefore, the provider must give the requested ports irrespective of the volume of traffic at POIs.

(b) With sufficient time required for upgradation of equipment, there should be no constraint in provisioning (capacity wise) as interconnection provider is getting the cost from interconnection seeker in advance.

(c) Depending upon the technical feasibility at the interconnection provider, if the interconnection seeker agrees to bear the total cost of equipment required for augmentation in advance, the interconnection provider should be able to give the requested ports irrespective of volume of traffic at POI. However, this has to be time staggered based on the backend capabilities of the provider and related operational matters. The demand from the seeker should be validated by the Traffic Engineering on the assumptions made for forecasting traffic and number of subscribers.

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103. The Authority, while examining the afore-mentioned matter, took note of the fact that when an interconnecting TSP provides ports on a POI, it has to incur not only the cost of ports but also has to plan for deployment of commensurate radio network (BTS, BSC, transmission links) and core equipment to cater to the increase in traffic and hence, the augmentation of ports requires to be done on the basis of a justifiable demand well corroborated with actual traffic. At the same time, the Authority is of the view that the interconnecting TSPs should be allowed to mutually decide for bulk augmentation of a POI, by way of one TSP bearing the total cost of equipment required for augmentation by the other TSP in advance. Accordingly, the Authority has decided to leave the afore-mentioned matter for the interconnecting TSPs to decide mutually.

(17) Should financial disincentive be imposed for not providing initial POI and not augmenting POI within stipulated timeframe etc.?

104. The following question was raised for stakeholder's consultation in the CP:

Question: Whether financial disincentive should be imposed on TSPs for-

(a) not entering into interconnection agreement within a stipulated timeframe;

(b) not providing initial POI;

(c) not augmenting POI within stipulated timeframe;

(d) for violation of any clause prescribed in the regulations.

If yes, what should be the amount of such financial disincentives?

105. In response to the afore-mentioned question, while some stakeholders have supported need for financial disincentives, other stakeholders have opined that there is no need for any financial disincentive to be imposed on TSPs on interconnection related matters.

106. The stakeholders who have opposed imposition of financial disincentive on TSPs have, *inter-alia*, submitted the following arguments in support of their view-point:

(a) Entering into an agreement, the provision of the initial POI, the augmentation of POIs and adherence to the clauses prescribed in the regulations involves continuous efforts at the ground level by both the interconnecting TSPs, which makes it very difficult to ascertain the cause of delay in the actual agreement/ augmentation scenario. It would, therefore, be frivolous, unfair and unjust to impose a penalty on the interconnection provider, in light of their provision of quality services to customers. The provider cannot be unilaterally held responsible as interconnection involves two networks. Any action for non-compliance should only be on the defaulting party, after proper investigation.

(b) No financial disincentive should be imposed on TSPs as provision of interconnection depends on various parameters including technical feasibility / network up-gradation etc.

(c) There is no need for prescribing any financial disincentive as the existing practice of TRAI resolving any inter-operator issue is working fine and hence should be continued. In case any party is not satisfied with the resolution provided by the TRAI, the parties also have the right to approach TDSAT or any other Higher Court for adjudicating such dispute. Further, TRAI can recommend to DoT for suitable action in line with the license conditions.

107. On the other hand, the stakeholders, who have supported imposition of financial disincentive on TSPs on interconnection related matters have, *inter-alia*, advanced the following arguments:

(a) Currently, the incumbent TSPs can block interconnection, provision of POIs and augmentation of POIs with impunity without a financial burden being placed on them. Therefore, there is an urgent need for TRAI to levy punitive financial disincentives of Rs. 5 lakh per day of violation on incumbent TSPs in the event they fail to (a) provide interconnection agreements in a time bound manner; (b) provide initial POIs to interconnection seekers within a prescribed time period; (c) augment POIs within the stipulated time frame; and (d) for violation of other terms of the regulations and their

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licenses. Only upon the inclusion of such punitive financial disincentives, incumbent TSPs will begin complying with the terms of their License and the Interconnect Regulations.

(b) Delay and denial of interconnection by existing TSPs to the new entrant violates licence conditions, disturbs level playing field tenets, stifles competition and hurts innovation and the interest of consumers. Therefore, there is a need to prescribe heavy penalty as a deterrent, for not providing initial interconnection or for not timely augmenting the interconnection capacities.

108. The Authority while examining the suitability of the need for imposition of financial disincentive on interconnection related matters took cognizance of several instances in the recent past in which new entrants have represented to the Authority stating that (a) the incumbent TSPs do not enter into interconnection agreement in a timely manner; and, (b) they do not augment POIs in a timely manner - as a commercial strategy to ensure that they do not have to complete against such new TSPs. As the Authority has already laid down a framework for entering into interconnection agreement as well as for timely provisioning and augmentation of POIs, it appears imperative to lay down a deterrent mechanism to ensure the enforceability of the afore-said framework. Accordingly, the Authority has prescribed that 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.

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(18) What should be the method to settle Interconnection Usage Charges and how should the delayed payment between TSPs be handled?

109. Regarding the method to settle IUC, several views have been received from stakeholders, a summary of which is given below:

(a) View-1: Mutual interconnection agreements should govern the matter of IUC settlement.

(b) View-2: IUC settlement should be done on net basis.

(c) View-3: The current settlement method on gross basis should be continued. This is advisable not only for ease of documentation for claiming deductions of pass through charges but also considering the upcoming GST regulation, which requires CENVAT

availability only after TSP issuing the invoice makes payment of GST to the Government and uploads required details of the same on the web-site of Government.

110. Further, regarding the manner of handling delayed IUC payments, stakeholders have expressed a wide variety of views, a summary of which is given below:

(a) View-1: Issue of delayed payments between TSPs should also be allowed to be handled on bilateral basis.

(b) View-2: Any undisputed amount not paid by the TSP within the stipulated time period, should be chargeable with penal interest.

111. In view of the comments of the stakeholders and further analysis, the Authority has decided to leave the matters relating to the settlement of IUC and the delayed payment of IUC for the interconnecting service providers to agree upon mutually. The Authority expects interconnecting service providers to deal with the matter of delayed payments of IUC in a reasonable manner.

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(19) Which policy and regulatory measures are required to be taken to encourage TSPs to migrate to interconnection at IP level?

112. In response to the afore-mentioned question, except for a few stakeholders, a vast majority of stakeholders has, either contended that there is no need for any regulatory prescription upon TSPs to encourage migration to interconnection at IP level, or stated that it is premature to take up the issue of mandating interconnection at IP level.

113. The stakeholders who have supported the requirement of policy and regulatory measures for encouraging interconnection at IP level have, *inter-alia*, stated the following:

(a) The Authority should prescribe guidelines for gradual and phase-wise migration to IP-to-IP interconnection.

(b) At present, the cost of media gateway required for interconnection between IP based network and TDM network is borne by the TSP having new technology IP based network. To stifle competition, the mobile service providers, even after having IP based networks are not providing IP based interconnection. The actual purpose will be served only if the IP based interconnection is mandated and appropriate regulatory framework of IP based interconnection is in place.

114. A summary of comments of those stakeholders, who have not supported the need of policy and regulatory measures to encourage interconnection at IP level, is given below:

(a) It is premature to take up this issue because interconnection at IP level can effectively take place only when the networks of all TSPs have migrated from Circuit Switching to Packet Switching. A separate Consultation needs to be initiated on the issue of IP-interconnection.

(b) The regulators, around the world, have moved towards technology neutrality. In India, technology neutrality is enshrined in the NTP-2012/ NTP-99 and the existing UAS/ CMTS/ UL Licenses. The mandatory deployment of a particular technology would be contrary to the principles enshrined in the NTP and license agreements.

(c) The TSPs in India have committed huge investments in the existing TDM-based networks, based on the initial license mandate and these investments have been made for larger time horizons. A mandate for migration to IP interconnection would lead to the redundancy of the presently deployed networks, which have a residual life of 5 to 10 years. Hence, any regulation towards compulsory IP interconnection will result in the unnecessary writing off of the existing assets without any corresponding techno-economic benefit to the existing TSPs. A migration to IP interconnection will also result in a very huge cost burden for the TSPs as it will involve deployment of network elements such as media gateways, signaling gateways, soft switches, session border controllers and the supporting transport network, etc.

(d) The prevailing technology ecosystem is changing very dynamically, making it difficult to predict the emergence of new advanced technologies. The investments made for building of IP networks may become redundant in the future in case of the emergence of new network technologies. Therefore, a preference for any technology will place restrictions on the flexibility of the TSPs to choose the most suitable technology and may result in sub-optimal usage of the infrastructure.

115. The Authority, while evaluating the need for policy and regulatory measures for encouraging TSPs to migrate to interconnection at IP level, took cognizance of the fact that most of the interconnections in the country are, at present, based on circuit switched technology. Most of the telecommunication (both wireline and wireless) networks in the country have, traditionally, been optimized for voice traffic. On the other hand, the new age telecommunication networks are increasingly being optimized for data traffic. Such networks make use of packet switching. Some of these networks also carry voice traffic. It is expected that, in future, when telecom networks migrate to all-IP networks, the interconnection for voice services would also be based on IP.

116. It is worth pointing out that the Authority, vide its recommendations dated 11.02.2016, made recommendations to the Government to permit IP-based Interconnection. The said recommendations were accepted by the Government and, accordingly, the Licenses have been amended allowing IP-based interconnection on 19.04.2016. The amended Clause 27.3 general conditions of Chapter 1, Part-I of the Unified License reads as follows:

> *"27.3 Interconnection between the networks of different Licensees for carrying circuit switched traffic shall be as per national standards of CCS No. 7 and for carrying IP based traffic as per Telecom Engineering Center (TEC) standards as amended from time to time by Telecom Engineering Center (TEC) and also subject to technical feasibility and technical integrity of the Networks and shall be within the overall framework of interconnection regulations/ directions/ orders issued by the TRAI / Licensor from time to time. For inter-networking between circuit switched and IP based network, the Licensee shall install Media Gateway Switch. Further, the Licensor may direct the LICENSEE to adopt any other technical standards issued by TEC on interconnection related matters."*

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117. The Authority also took note of the following:

(a) Most TSPs have IP-based core networks. However, the network elements at the POI continue to remain predominantly circuit switched, largely owing to legacy reasons. Even though the licenses now allow IP-based interconnection, not much progress has happened in this direction.

(b) At present, both circuit switched as well as IP-based access networks are being put to use for providing voice telephony. In the recent past, many TSPs have made announcements for introduction of IP-based access networks in the near future.

118. On the basis of the comments of the stakeholders and further analysis, the Authority is of the view that there is a need for further deliberations on the matter of IP-based interconnection.

(20) Whether there is a need to establish a framework for Interconnect Exchange to eliminate bilateral interconnection issues?

119. In response to the afore-mentioned question, except for two stakeholders, all stakeholders have stated that there is no need to establish a framework for Interconnect Exchange. Such stakeholders have cited, *inter-alia*, following reasons in support of their contention:

(a) Since the interconnection regime in India has evolved on a bilateral basis, there is no immediate need to establish a framework of Interconnect Exchange at this late stage, as it would not serve any useful purpose.

(b) Interconnect exchange will be additional cost burden on industry without any additional benefit. This is because majority of the TSPs have established bilateral POIs after making large investments and, hence, interconnect exchange will be an additional/ unproductive cost burden. Direct peering, both for TDM as well as for IP technology, is the only economical option at the high volume presently being handled by the POIs. This is evident from the fact that TSPs have established peer-to-peer connectivity, instead of using any kind of transit/ interconnecting points, not only for TDM connectivity but also for IP connectivity. Therefore, the option of exchanging traffic only through interconnection exchange should be ruled out at the very outset.

(c) Presently, TSPs are connected via POIs in several cities and towns. POI locations are presently based on low-cost routing. Interconnect Exchange will prevent the use of shortest path leading to the increase in latency and congestion in the network. Introduction of the interconnect exchange will also entail redesigning the transmission network for the POI traffic, which involves additional costs and huge write-offs.

(d) TRAI in its Direction on "Direct connectivity between networks of Service Providers" vide File No. 101-13/2003-MN dated 22.07.2003 has acknowledged that transiting the traffic entails avoidable costs and accordingly justified the need for direct connectivity.

(e) The required Interconnect Exchange will be of very large capacity - equivalent to the combined size of the STP Networks deployed by all TSPs. By no means, Interconnect Exchange can be compared with MNP exchange as the size and scale of a MNP Exchange is merely 5 to 7% of subscribers opting of MNP every month.

(f) The failure of the interconnect exchange would bring down the entire telecom network.

120. The two stakeholders who have supported the need for establishing Interconnect Exchange have contended, *inter-alia*, the following to buttress their view-points.

(a) An interconnect exchange would help significantly in speeding up the process of Interconnection as a New TSP would not have to negotiate individual interconnection agreements with each TSP, who being their competitors, have no reason to cooperate.

(b) Given the amount of delays experienced in obtaining interconnection agreements, the interconnect exchange will remove all bilateral interconnect issues and remove a significant entry barrier into the telecommunication industry and thereby opening up the telecommunication industry to newer players, which will enhance competition and benefit

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the end consumers. The Authority must provide a glide path to move towards an interconnect exchange over a period of time. A glide path is proposed since all TSPs have already established interconnection and borne the requisite costs and laid the infrastructure to establish interconnection. Therefore, mandating Interconnect Exchange would be an additional cost for the TSPs, which may be incurred with an appropriate glide path.

121. The Authority, while examining the suitability of Interconnect Exchange took cognizance of the fact that TSPs have established a large number of peer-to-peer POIs amongst themselves basis in each LSA in line with regulatory and licensing framework; a significantly large investment has been made in establishing such POIs and the interconnecting media amongst them; a regulatory mandate to route all inter-operator traffic through Interconnect Exchange would require TSPs to re-engineer their transmission network and hence, *prima facie*, such a mandate would have a substantial cost implication on the TSPs. Introduction of Interconnect Exchange may also have implications on the present numbering and routing system. After a careful examination, the Authority has decided, not to make any prescription with regard to the matter of Interconnect Exchange, at present.

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F. Review

122. The Authority shall keep a close watch on the implementation of these regulations by service providers. The Authority, if it deems necessary, may review these regulations from time to time.