



Telecom Regulatory Authority of India



**Consultation Paper on  
Review of  
the Telecommunication Interconnection (Port Charges)**

New Delhi, 09.05.2012

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## Index

<b>Chapter</b>	<b>Description</b>	<b>Page No.</b>
	Preface	i-ii
<b>I</b>	Background and Introduction	1-4
<b>II</b>	Estimation of the Telecommunication Interconnection (Port Charges) and Issues for Consultation	5-10
	List of Figures and Tables	11
	List of Acronyms	12

## Preface

The Authority notified 'The Telecommunication Interconnection (Port Charges) Regulation, 2001 on 28.12.2001. The Regulation, inter alia, specifies the port charges payable by interconnection seeker to the interconnection provider. The port charges were revised through 'The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007' on 02.02.2007 to be effective from 01.04.2007.

2. With a view to further review the port charges, the telecom service providers were requested to provide relevant information on the issue. The revised port charges have been estimated on the basis of the cost data and information submitted by the service providers.

3. The present consultation paper aims to obtain comments of the stakeholders on the proposal contained in the consultation paper. The stakeholders are requested to furnish their comments by 8<sup>th</sup> June, 2012. Counter-comments, if any, may be sent by 18<sup>th</sup> June, 2012.



Dr. J.S. Sarma  
Chairman, TRAI

Stakeholders are requested to furnish their written comments to the Advisor (I&FN), TRAI by 8<sup>th</sup> June, 2012. Counter-comments, if any, may be sent by 18<sup>th</sup> June, 2012. Comments and counter-comments would be posted on TRAI's website [www.traigov.in](http://www.traigov.in). The comments and counter-comments may also be sent by e-mail to [daifn@traigov.in](mailto:daifn@traigov.in) or [traigov@gmail.com](mailto:traigov@gmail.com). For any clarification/information, Shri Arvind Kumar, Advisor (I&FN) may be contacted at Tel. No. +91-11-23220209 Fax: +91-11-23230056.

## Chapter-I

### Background and Introduction

#### A- The Telecommunication Interconnection (Port Charges)

1.1. A 'port' means a place of termination on a switch/distribution frame to provide a point of access or interconnection for ingress and egress of traffic between the two interconnecting networks. The bandwidth of the port is 2.048 Megabits per second. The 'port charges' are payable by the interconnection seeker to the interconnection provider for terminating the interconnection links on the network interface of the interconnection provider.

#### B- The Telecommunication Interconnection (Port Charges) Regulation, 2001

1.2. The Authority notified 'The Telecommunication Interconnection (Port Charges) Regulation, 2001' on 28.12.2001. The regulation, inter alia specifies the port charges payable by the interconnection seeker to the interconnection provider as below:

**Table 1.1**

**Port Charges notified in 'The Telecommunication Interconnection (Port Charges) Regulation, 2001'**

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

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

- 1.3. As per the Section IV of 'The Telecommunication Interconnection (Port Charges) Regulation 2001', the Authority may, from time to time, review and modify port charges. The Authority may also at any time, on reference from an affected party, and for good and sufficient reasons, review and modify the port charges.
- 1.4. After following a consultation process, the Authority notified 'The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007' on 02.02.2007 to be effective from 01.04.2007, vide which, the revised port charges are as below:

**Table 1.2**

**Port Charges notified in 'The Telecommunication Interconnection  
(Port Charges) Amendment Regulations, 2007'**

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

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

**C- The Present Exercise to Review Port Charges**

- 1.5. In view of the various representations received from the industry associations' viz. Cellular Operators Association of India (COAI) and Association of Unified Telecom Service Providers of India (AUSPI) and the Court's order, the Authority decided to review the port charges in order to align the port charges with the prevalent costs of the relevant equipment. In order to provide fair

opportunity and to maintain transparency in the review of the port charges, letters were sent to the service providers and their industry associations on 18.08.2011 requesting them to furnish the following information by 19.09.2011:

- (a) What interfaces/ network elements/ equipment shall be taken into consideration for determining port charges? Please explain with the detailed note, justification and diagram, clearly indicating cost recovery mechanism for each element involved.
- (b) Explain the approach/ model/ costing methodology to be adopted for determination of port charges. Give justification for adopting the proposed approach, model or methodology and also provide details of the assumptions used in the model, if any.
- (c) Provide list of interfaces/ network elements/ equipment required for expansion of switch/ exchange for provisioning of additional ports. Separate list should be provided for each category of switch used for Fixed Line Service/ GSM Mobile Service/ CDMA Mobile Service/ NLD service/ ILD service.
- (d) Provide costs and capacity of each interfaces/ network elements/ equipment listed as per (vi) above.
- (e) Provide cost model in excel sheet to calculate port charges along with adjustments and justification for all assumptions used.
- (f) Whether port charges are specified by the regulator in other countries? If yes, what is the approach/ methodology being followed by the regulator in determining these charges?
- (g) Any other relevant information related to subject along with all necessary details.

Apart from the above information, all access providers (UASLs/CMTSs/BSOs) were requested to furnish the information on the number of operational E1 ports with other access service providers, NLDOs and ILDOs respectively, as on 31.07.2011.

- 1.6. In response, the service providers and their industry association submitted the desired information to TRAI, which has been given due cognizance while preparing the present consultation paper.
  
- 1.7. The following chapter describes the estimation of port charges on the basis of the inputs received from the service providers and presents a proposal for comments of the stakeholders.



## Chapter-II

### Estimation of the Telecommunication Interconnection (Port Charges) and Issues for Consultation

2.1. The present chapter describes briefly the comments of the service providers and their industry association on TRAI's letter dated 18.08.2011, following which, it estimates the telecommunication interconnection (port charges) on the basis of the cost inputs received from the service providers. Finally, it presents a proposal for the comments of the stakeholders.

#### A- Inputs of the service providers and their industry association

2.2. In their response to TRAI's letter dated 18.08.2011, some of the service providers have submitted that the provider network should also bear a proportion of the costs of interconnect, commensurate with the flow of traffic. In this regard, it may be noted that the present review exercise is limited to the revision of port charges which have been specified in 'The Telecommunication Interconnection (Port Charges) Regulations'. Further, a few service providers were of the opinion that TRAI must align the port charges on the basis of usage by merging it with termination charges to maintain the level playing field between the operators. In this regard, it may be noted that the present review exercise is limited to revision of port charges following the principles established in the principal Regulation 'The Telecommunication Interconnection (Port Charges) Regulation, 2001' of taking directly attributable incremental cost (DAIC) for estimation of port charges.

2.3. Some of the service providers have submitted that TRAI should determine a separate charge for mobile port interconnections by taking cognizance of the relevant traffic, flow balance between the interconnection provider and interconnection seeker. They have also submitted the cost of provisioning of ports in their Gateway Mobile Switching Center (GMSCs). Accordingly, in the

present review exercise, port charges for GMSC and Tandem/ Trunk Automatic Exchange (TAX) have been estimated separately.

- 2.4. The current capital expenditure (CAPEX) of an E1 port for a GMSC and for a Trunk Automatic Exchange (TAX), as provided by the service providers, are presented in Table 2.1 and Table 2.2 respectively below:

**Table 2.1**  
**Current CAPEX of E1 Port for GMSC**

S. No	Service provider/ Industry association	Current CAPEX of an E1 port (Rs.)	Name of switch	Remarks
1	An Association of telecom service providers	19,182	GMSC	The cost per E1 (allocated cost) is calculated by dividing the cost of the individual element by its capacity. The summation of these costs provides the allocated cost per E1.
2	Service provider-1	17,996	GMSC	Per E1 cost for extending 128 E1s from GMSC

**Table 2.2**  
**Current CAPEX of an E1 Port for TAX exchanges**

S. No	Service provider/ Industry association	Current CAPEX of an E1 port (Rs.)	Name of switch	Remarks
1	Service provider-2	46,430	Mix of DTAX and IP TAX switches	Costing methodology is weighted average CAPEX. Per circuit cost of main/expansion TAX equipment (TDM/IP-TAX) procured for the last five tenders have been taken into consideration. The service provider-2 has not provided the costs of individual network elements required for expansion of the switch.
2	Service provider-3	44,145	NSN make	The cost has been considered on the basis minimum configuration of the switch.
3	Service provider-4	45,000	OCB Switch	The cost per E1 (allocated cost) is calculated by dividing the cost of the individual element by its capacity. The summation of these costs provides the allocated cost per E1.
4	Service provider-5	40,450	OCB Switch	Based on 128 E1s configuration
5	Service provider-6	24,000	IP TAX	Per line price of IP TAX is Rs. 800.
6	Service provider-7	45,000	-	The cost per E1 (allocated cost) is calculated by dividing the cost of the individual element by its capacity. The summation of these costs provides the allocated cost per E1.

- 2.5. As evident from the above tables, majority of the service providers have submitted CAPEX per E1 port. They have used CAPEX per E1 in their costing methodology for estimation of the port charges. It may be noted that the service providers have not submitted slab-wise CAPEX for E1 ports.

**B- Estimation of Ceiling of Port Charges on the Basis of Current CAPEX of an E1 Port**

- 2.6. As the Telecommunication Interconnection (Port Charges) Regulation specifies the ceiling rates for port charges, the highest value of the CAPEX per E1 port as submitted by the service providers for Gateway Mobile Switching Center (GMSC) and Trunk Automatic Exchange (TAX) may be taken for estimation of ceiling rates of port charges. Accordingly, the CAPEX of an E1 for GSMC and TAX Exchange as per the following table may be considered for estimation of ceiling of port charges:

**Table 2.3**  
**CAPEX of an E1 Port for GMSC and TAX Exchange**

S. N.	Type of Switch	CAPEX of an E1 Port (in Rs.)
1	GMSC	19,182
2	TAX Exchange	46,430

- 2.7. While specifying port charges in 'The Telecommunication Interconnection (Port Charges) Amendment Regulation, 2007', the Authority had considered a reasonable return (Pre-tax weighted average cost of capital) on the capital employed (net block only) after providing depreciation based on straight line method of depreciation. Additionally, overhead on CAPEX recovery was added.
- 2.8. Using the same approach/ methodology and considering the current CAPEX as per the Table 2.3 above, the annual port charges have been estimated for

GSMC and TAX exchanges in the Table 2.4 and Table 2.5 below. The calculations have been made considering the following principles:

- (a) Useful life of the equipment = 10 years
- (b) Method of depreciation – Straight line method
- (c) Rate of Return (Pre-tax Weighted average cost of capital) =15%
- (d) Overhead on CAPEX recovery = 10%

2.9. In the other costing exercises, the TRAI has taken 15% Rate of Return. Accordingly, in the present exercise, Rate of Return (Pre-tax Weighted average cost of capital) has been considered as 15% in place of 14% which was taken while specifying port charges in 'The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007'.

**Table 2.4**  
**Calculation of Ceiling of Annual Port Charges for GMSC**

Item	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
CAPEX cost of an E1 port (Rs.) = Gross Block	19182									
Depreciation @ 10% per annum based on straight line method of depreciation (Rs.) =10% of Gross Block	1918	1918	1918	1918	1918	1918	1918	1918	1918	1918
Reasonable Return (Pre-tax weighted average cost of capital) @15% on Net Block (Rs.)	2877	2590	2302	2014	1726	1439	1151	863	575	288
CAPEX Recovery (Rs.)= Depreciation + Reasonable Return	4796	4508	4220	3932	3645	3357	3069	2781	2494	2206
Overhead @10% on CAPEX Recovery (Rs.) =10% of CAPEX Recovery	480	451	422	393	364	336	307	278	249	221
Cost per E1 (Rs.) = CAPEX Recovery + Overhead	5275	4959	4642	4326	4009	3693	3376	3060	2743	2427
<b>Average annual cost (averaged over ten years) (Rs.)</b>	<b>3851</b>									

**Table 2.5****Calculation of Ceiling of Annual Port Charges for TAX Exchanges**

Item	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
CAPEX cost of an E1 port (Rs.) = Gross Block	46430									
Depreciation @ 10% per annum based on straight line method of depreciation (Rs.) = 10% of Gross Block	4643	4643	4643	4643	4643	4643	4643	4643	4643	4643
Reasonable Return (Pre-tax weighted average cost of capital) @15% on Net Block (Rs.)	6965	6268	5572	4875	4179	3482	2786	2089	1393	696
CAPEX Recovery (Rs.)= Depreciation + Reasonable Return	11608	10911	10215	9518	8822	8125	7429	6732	6036	5339
Overhead @10% on CAPEX Recovery (Rs.) = 10% of CAPEX Recovery	1161	1091	1021	952	882	813	743	673	604	534
Cost per E1 (Rs.) = CAPEX Recovery + Overhead	12768	12002	11236	10470	9704	8938	8172	7406	6639	5873
<b>Average annual cost (averaged over ten years) (Rs.)</b>	<b>9321</b>									

2.10. Accordingly, the ceiling of annual port charges for mobile switching center (MSC) and Tandem/ TAX Exchange are as per the Table 2.6 below:

**Table 2.6****Ceiling of Annual Port Charges at MSC and Tandem/ TAX Exchange**

S. No.	Type of Switch	Port Charges (Ceiling of Rs. Per Port)
1	MSC	3,851
2	Tandem/ TAX Exchange	9,321

- 2.11. Majority of the service providers, in their submissions, have taken useful life of the equipment to be 10 years. However, M/s BSNL, in their calculation for TAX Exchange, have assumed the useful life of equipment to be eight (8) years, accordingly they have taken depreciation of 12.5% per annum for eight years using straight line method of depreciation. In case we consider the useful life of the equipment to be eight years and accordingly consider the annual depreciation to be 12.5% per annum, the average annual cost (averaged over eight years) per E1 port for TAX Exchange comes out be Rs. 10,693.

### **C- Proposal**

- 2.12. **Keeping in view the current CAPEX costs of an E1 port in GMSC and TAX exchanges, it is proposed that the ceiling of annual port Charges, as specified in The Telecommunication Interconnection (Port Charges) Regulation, 2001 may be revised as per the following Table:**

**Table- 2.7**

**Proposed Revised Ceiling of Annual Port Charges for  
MSC and Tandem/ TAX Exchanges**

<b>S. No.</b>	<b>Type of Switch</b>	<b>Port Charges (Ceiling of Rs. Per Port)</b>
<b>1</b>	<b>MSC</b>	<b>4,000</b>
<b>2</b>	<b>Tandem/ TAX Exchange</b>	<b>10,000</b>

### **Issues for Consultation**

The stakeholders are requested to send their comments on the cost data and costing methodology used for estimating the port charges in this consultation paper. The stakeholders may also send their comments on the period for which these charges should remain operative.

### List of Figures and Tables

Item	Description	Page No.
Table 1.1	Port Charges notified in 'The Telecommunication Interconnection (Port Charges) Regulation, 2001'	1
Table 1.2	Port Charges notified in 'The Telecommunication Interconnection (Port Charges) Amendment Regulations, 2007'	2
Table 2.1	Current CAPEX of E1 Port for GMSC	6
Table 2.2	Current CAPEX of an E1 Port for TAX exchanges	6
Table 2.3	CAPEX of an E1 Port for GMSC and TAX Exchange	7
Table 2.4	Calculation of Ceiling of Annual Port Charges for GMSC	8
Table 2.5	Calculation of Ceiling of Annual Port Charges for TAX Exchanges	9
Table 2.6	Ceiling of Annual Port Charges at MSC and Tandem/ TAX Exchange	9
Table 2.7	Proposed Revised Ceiling of Annual Port Charges for MSC and Tandem/ TAX Exchanges	10

### List of Acronyms

<b>S. No.</b>	<b>Acronym</b>	<b>Description</b>
1	AUSPI	Association of Unified Telecom Service Providers of India
2	BSNL	Bharat Sanchar Nigam Limited
3	BSO	Basic Service Operator
4	CAPEX	Capital Expenditure
5	CDMA	Code Division Multiple Access
6	CMTS	Cellular Mobile Telephone Service
7	COAI	Cellular Operators Association of India
8	DAIC	Directly Attributable Incremental Cost
9	E1	E-Carrier Level 1
10	GMSC	Gateway Mobile Switching Centre
11	GSM	Global System for Mobile Communications
12	I&FN	Interconnection & Fixed Network
13	ILD	International Long Distance
14	ILDO	International Long Distance Operator
15	IP-TAX	Internet Protocol - Trunk Automatic Exchange
16	MSC	Mobile Switching Center
17	NLD	National Long Distance
18	NLDO	National Long Distance Operator
19	NSN	Nokia Siemens Networks
20	PCM	Pulse Code Modulation
21	TAX	Trunk Automatic Exchange
22	TDM	Time Division Multiplexing
23	TRAI	Telecom Regulatory Authority of India
24	UASL	Unified Access Service License