Consultation Paper No. 4 /2010

Telecom Regulatory Authority of India

Consultation Paper

On

Collocation Charges

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TABLE OF CONTENTS

PREFACE

The Indian telecommunications sector has witnessed intense competition leading to unprecedented growth of telecommunication services. In a multi-operator, multi-service scenario interconnection among different service providers' networks becomes an essential requirement to allow subscribers of one network to communicate or interact with the subscribers, networks and services of other service providers. Establishment of interconnection requires installation of equipment by the interconnection seeker in the premises of the interconnection provider. This is referred to as collocation. Collocation may require facilities that include land, building space, apparatus and plants, environment conditioning services, security, site maintenance, electrical installations, backup power, fire detection and fire fighting systems.

Considering their importance TRAI had included collocation facilities and their charges in the Reference Interconnection Offer Regulation, 2002. This regulation envisages that wherever it is possible, physical collocation should take place of the apparatus and plant owned or leased by one party and used for interconnection at the premises of the other party. Wherever such collocation has been mutually agreed, required accommodation and auxiliary infrastructure shall be made available for this purpose within the time schedule for interconnection. When a party uses the premises and facilities of the other party, such as power etc. it shall pay a rent to the other party.

The aim of this consultation paper is to generate a discussion on guidelines such that the fixation of infrastructure charges by service providers is not done arbitrarily and is based on use of sound criteria.

The issues raised in this consultation paper are for the purpose of discussion. Views of the Authority will be finalised after receiving comments of the stakeholders. The stakeholders are requested to furnish their written comments to the Principal Advisor(I&FN), TRAI by 16th April, 2010. Counter-comments, if any, may be sent by 3rd May 2010. The comments and counter-comments will be posted on TRAI's website www.trai.gov.in after the last dates of their receipt. The comments and counter-comments may preferably be sent by email to dafn@trai.gov.in or in case of any difficulty these may be sent to trai.gov@gmail.com. The fax number of TRAI is 011-23220209.

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Chairman, TRAI

CHAPTER-1
INTRODUCTION TO COLLOCATION

1.1 Collocation and its requirement

1.1.1 The last few years have seen the Indian telecommunications sector evolve into a high growth competitive market. A thriving telecom sector has led to emergence of multiple service providers offering a variety of services. To facilitate seamless telecommunication across networks, it is necessary that different networks interconnect. Interconnection enables a subscriber of one service provider to access subscribers, networks and services of other service providers thereby increasing competition. The licence condition also prescribes that all access providers should interconnect with each other and with national and international long distance operators' networks.

1.1.2 Opening up of all the sectors of the telecommunications market in India has led to emergence of strong private players. Prospects of healthy business environment have resulted in multiplicity of service providers in the access and long distance markets. Various service providers have to compete, cooperate and coexist to provide a whole range of services the customers would like to have. While on one hand the fixed and mobile access providers need to interconnect to allow their respective subscribers to have access to services and subscribers on other networks, on the other hand, fixed and mobile access providers also need to interconnect with long distance operators to offer national and international long distance services to their subscribers. Besides plurality of networks, services and products, another element complicating the interconnection among networks is the large size of the country. For administrative and technical reasons the country has been divided into 22 telecommunication service areas requiring interconnection among service providers in each of these service areas making the total number of interconnections large.

1.1.3 Points of Interconnection

Interconnection takes place within the overall guidelines of the TRAI. There are well defined points of interconnection for flow of traffic among different types of networks. For instance, intra-circle mobile to fixed traffic is handed over at the Level-II or Level-I TAX of the fixed operator. Mobile to Mobile traffic within the circle is handed over at GMSC/MSC or Level-I TAX. Mobile to mobile inter circle traffic is carried by NLD operators and handed over at Level-I TAX or GMSC. Fixed to fixed traffic within the same SSA is handed over at Local Tandem. There are, therefore, a number of points where traffic will be exchanged between one operator and the other. Interconnection would imply establishing physical links between these points. The actual physical media terminates on transmission equipment which is normally installed by the operator who requires interconnection. Since this equipment is located in proximity with the equipment of the service provider who provides interconnection the process is called collocation.

1.1.4 Collocation and virtual collocation

These terms have been defined by ITU[1] as follows:

Collocation

Collocation refers to the installation of interconnection equipment (i.e., switches, racks and cages, cross-connects and other cabling) by a service provider within a facility owned and operated by another operator.

Virtual collocation

In the case of some facilities, actual collocation – frequently termed physical collocation – is simply not feasible, due to space or other limitations. When this occurs, it may be possible to establish access through establishing a secondary facility nearby for installation of the collocator's equipment. Interconnection would then be achieved through a backhaul cable linking the two operators'

[1] "Trends in Telecommunication Reform 2008" by ITU

equipment. This type of remote (but proximate) access is often called virtual collocation.

1.1.5 Collocation of equipment requires facilities that may include land, building space, apparatus and plants, environmental services, security, site maintenance, power, electrical installations, cables, transformers, fire detection and fire fighting systems and backup power. As the traffic grows and the number of transmission lines increase, the equipment may need to be enhanced which could mean installation of more racks thereby increasing space, power, air-conditioning and other requirements.

1.1.6 The existing service provider with whom the interconnection is sought usually provides collocation facilities at a mutually agreed charges. At times the service provider from whom collocation is sought may be constrained for space or other infrastructural facilities and the collocation seeker may have to locate the transmission equipment at a nearby location and only take the media to the collocation provider's premises. Accordingly the interconnection links between the two exchanges would either be classified as active or passive.

(a) **Active Links :** In the active links the transmission equipment of one service provider is installed in another service provider's exchange premises. Establishing an active link involves installation of opto-electronic equipment, like Optical Line Terminal Equipment (OLTE), at both ends. In this case charges may include charges for building space, power and other infrastructural facilities like apparatus and plants, electrical installations including power panels, cables, air-conditioning, fire fighting system, engine alternator, power plant, battery set etc.

(b) **Passive Link** : In certain circumstances it is not possible for a service provider to provide space in its exchange premises for placing the transmission equipment of another service provider. In such circumstances interconnection seeker places its transmission equipments in the nearby premises and takes only the transmission cable into the other service provider's telephone exchange

premises. The collocation seeker would, in this case, typically require using existing duct entry or constructing duct and would not need to place any physical equipment. Infrastructure facilities like space and air-conditioning would not be required.

1.2 Existing Regulatory and Licencing Framework for Collocation

1.2.1 Licencing framework

Access service licencees are mandated to provide interconnection to each other and also to long distance operators. The long distance operators need to make their own suitable arrangement for leased lines with the access providers for the last mile. Collocation facilities are not only required for initial interconnection but these facilities would also need to be upgraded as the inter-operator traffic grows and augmentation of number of transmission links becomes necessary. In broad sense collocation would not only refer to the interconnection seeker's equipment placed in interconnection provider's exchange buildings but also sharing of the provider's infrastructure like ducts and fibers for the purpose of interconnection.

Collocation facilities and Collocation charges are not directly dealt with in the licence agreements of the telecom service providers. However, there are several provisions in licenses that provide enabling framework for interconnecting service providers who wish to collocate equipment. Permission to share infrastructure, both passive and active, is one such stipulation.

Sharing of "passive" infrastructure viz. building, tower, dark fibre etc. is permitted as per clause 33 of Unified Access Service License and Clause 34 of CMTS license. Clause 28.4 of CMTS license and Clause 27.3 of UASL license stipulate that 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. Similarly Clause 17.11 of Basic Services, Clause 17.9 of NLD license, Clause 17.10 of ILD license stipulate that 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 keeping in view the orders, directions or regulations issued by TRAI/DOT from time to time.

TRAI in its recommendations on "Infrastructure sharing" dated 11th April 2007 had addressed sharing of both passive and active infrastructure including backhaul. In these recommendations sharing of physical sites, buildings, shelters, towers/masts, power supply and battery backup, etc. were considered under Passive Infrastructure sharing. DOT issued guidelines in 2008 permitting sharing of passive infrastructure, in accordance with the existing provisions in the licences of BSOs, CMSPs and UASLs. The Authority also recommended allowing active infrastructure sharing limited to antenna, feeder cable, Node B, Radio Access Network and transmission systems. The same has been accepted by DOT in the Guidelines.

With these development the service providers have been allowed to share, on mutually agreed terms and conditions, infrastructure like space, ducts, fiber, transmission systems for the purpose of interconnection.

Besides the above stipulation in the license conditions, the legal framework regarding active and passive link has been established by the Hon'ble TDSAT vide its judgment dated 11th May 2009 in BSNL Vs Reliance Petition No. 209 of 2006. In this petition M/s Reliance Infocomm Ltd had challenged the Circulars dated 16.6.2006 and 24.7.2006 issued by Bharat Sanchar Nigam Limited (BSNL), revising the infrastructure sharing charges for passive links of private telecom service providers and also imposing certain conditions of choice of Active links. In the Judgment Hon'ble TDSAT concluded that Interconnection seeker should be provided with a choice of Active or Passive link and it shall be incumbent upon every Interconnection provider, to provide the link accordingly.

1.2.2 Regulatory framework

Collocation has been dealt with in the Reference Interconnection Offer Regulation, 2002. These regulations consist of guidelines for framing Reference Interconnect Offer (RIO) contained in various Articles and Schedules. Section 2.4 of Article 2 of the Model says that wherever it is possible, physical collocation should take place of the apparatus and plant owned or leased by one party and used for interconnection at the premises of the other party. Wherever such collocation has been mutually agreed, required accommodation and auxiliary infrastructure shall be made available for this purpose within the time schedule for interconnection.

When a party uses the premises and facilities of the other party, such as power etc. it shall pay a rent to the other party. Principles for deriving such rents are included in Schedule 3. In clause 12.1 of Article 12 and Schedule 3 of the Model RIO, it has been mentioned that the prices for these services would be listed and this list should be prepared in accordance with the orders, direction and regulations of the Authority wherever applicable. If not so listed these shall be determined on the basis of costing principles indicated in the interconnection regulations. It has also been mentioned that such facilities shall only be used for the agreed purpose, and shall not be resold to other Parties unless agreed otherwise mutually. These facilities shall not be used for bypass of traffic and the terms and conditions under which such services / facilities are to be supplied shall also be included in the schedule. This provision has also been incorporated by the service providers in their RIO.

Collocation facilities, Collocation charges, virtual collocation etc have also been described and regulated in the context of submarine Cable Landing Stations (CLS) in the Regulations on “International Telecommunication Access to Essential Facilities at Cable Landing Stations Regulations, 2007” issued by TRAI on 7th June 2007. This regulation has been enabling non-discriminatory, fair and open access at the cable landing stations.

1.2.3 Prevailing practice in the industry

Prevailing practice in relation to collocation is reflected by the information available in various Interconnection agreements. Broadly, the agreements have been examined in the following two categories:.

(i) Between PSUs and private service providers;

(ii) Between private service providers

(i) Between PSUs and private service providers

The interconnection agreements indicate that the charges for infrastructure like space, provision of power supply, air conditioning, mounting of antennas on towers or building tops and other terms & conditions for the same would be as prescribed from time to time. In one case it is stipulated that after commissioning of the end link equipment, the same shall be taken over by the government operator for operation and maintenance and the collocation seeker will have no access to the premises for day to day maintenance. The operation and maintenance charges for end link equipment at government provider end will be charged from the private service provider along with the rental for space and other infrastructure such as AC, power etc. Further, it has also been provided in the interconnect agreement that if the collocation seeker leases interconnection bandwidth from some other service provider (NLD or IP) then the charges for leasing of infrastructure and resources would not be applicable.

(ii) Between private service providers

In most of the cases between private operators, specially established private service providers, it has been found that parties have agreed not to take space charges from each other. However, in some cases has been mentioned that arrangements and terms or access or installation, operation and maintenance of such equipment will be arrived at by mutual agreement at respective locations. In such cases various terms

and charges have been mutually agreed in the interconnection agreements. In all the cases interconnection seeker has to bring its own transmission media and equipment into the premises of interconnection provider for interconnection and is required to pay for necessary infrastructure within its premises viz. air conditioning, power with backup etc. as per the terms and charges prescribed.

Extracts of the relevant clauses of some of the Interconnection Agreements have been reproduced in **Annexure.**

1.3 Scope of the consultation paper

The main purpose of this consultation paper is to examine the issues of collocation with a view to frame guidelines that will help service providers to mutually negotiate and agree on reasonable terms and charges for collocation for establishment of effective interconnection.

1.3.1 The Hon'ble TDSAT in its judgements dated 19.3.07 in Petition no. 148 of 2005 and Petition no. 218 of 2006 filed by M/s BPL and M/s Reliance respectively, against the assessment of annual infrastructure charges and subsequent revision thereof by MTNL, quashed the demand notices issued by MTNL. Hon'ble TDSAT also requested TRAI to lay down guidelines to ensure that fixation of infrastructure charges by service providers is not done arbitrarily and is based on use of sound criteria, reasonable rationale and realistic assessment of the commercial rentals prevailing in the market.

1.3.2 The above said judgements of hon'ble TDSAT were challenged by MTNL in Supreme Court. Initially Hon'ble Supreme Court stayed the operation of the hon'ble TDSAT's judgements but on TRAI's request the order was modified on 17.8.2009 and TRAI was permitted to hold consultations in the matter.

CHAPTER-2
FRAMEWORK FOR COLLOCATION

2.1 Terms and conditions of collocation

In a competitive growing market there would always be operators wielding different levels of market power. Those well established would have larger amount of infrastructure while those who are just starting their services would need to hire facilities to be able to give any viable competition and grow. It can only be expected that agreements between the service providers would be fair and reasonable only if the terms and conditions offered by the service provider owning the facilities are reasonable, transparent and non-discriminatory. A number of terms and conditions usually need to be agreed to by the service providers. In such a situation a generalized framework incorporating guidelines for fixing collocation charges and terms and conditions for use of facilities could go a long way in quick negotiation of agreements.

The process of collocation would normally involve the collocation seeker making a request for appropriate space and other facilities on the collocation provider. The collocation provider would confirm the availability of the required facilities and also indicate the time frame for execution of work and the collocation charges for different facilities. Both the parties would then mutually negotiate the terms and conditions of collocation and sign an agreement. Execution of the work would then follow. The agreement would have provisions for requesting additional collocations space, access to the premises and termination of lease. These aspects are discussed in subsequent paragraphs.

2.1.1 Procedure for making collocation request

The importance of registration of collocation request and capture of all relevant information for processing of the request and provisioning of service cannot be overemphasized. One way to effectively deal with this could be to prescribe a well defined procedure for registration and processing of collocation request. A specific form could be designed by service providers in which the collocation

seeker could specify the details necessary to fill the request. The information that may be helpful includes: name of the service provider seeking interconnection, collocation equipment proposed to be installed, anticipated space and power requirements, other facilities required. This form could provide a means for the seeker to articulate its needs for space and other facilities and also valuable inputs to the collocation provider for determining charges and help in avoiding incorrect execution of work and consequent disputes. This procedure may outline responsibilities of both the collocation provider and the seeker which would ensure the availability of desired collocation in a time bound manner.

Collocation seeker may like to receive an acknowledgement for the request made and the likely timeframe for completion of request. If the collocation request is rejected, the provider may be required to provide valid reasons for such a rejection to the collocation seeking service provider. Some conditions under which the request could be rejected include - the entity requesting the facility is not a licensed telecom operator; or acceptance of the collocation request will give rise to significant health, safety, technical or engineering issues.

In some situations the collocation provider may like the opportunity to withdraw permission for collocation, before the collocation equipment has been installed. By the same token the collocation seeker may also like the flexibility to withdraw request for collocation with full refund within some time frame.

2.1.2 Time Frame for Provision of collocation facilities

It is very important that the process of providing collocation is non-discriminatory and provides some certainty on the time provider is likely to take for different activities. This would enable the collocation seeker to plan other activities. For some activities it may not be possible to standardize the likely time and mention it apriori in the collocation form or accompanying terms and conditions. In such cases the collocation provider may make an assessment on receiving exact nature of work in the application and mention the time required

while acknowledging collocation seeker's request. Stakeholders may give their opinion on specifying time frames and the appropriate time for different activities or provide an alternate proposal to fulfil the same objectives.

2.1.3 Space reserved for service provider's own use

Telecommunication networks are planned from a long term perspective. Space and building requirements are worked out for even longer durations. The buildings that exist today may not have been planned by service providers taking into the requirement of other service providers. However, change of plans or replacement of existing equipment by smaller newer technology equipment may lead to excess space that can be given for collocation. It would only be reasonable to presume that the collocation provider would like to retain some space for his own known and unforeseen expansion requirements. This, however, can sometimes be used as an excuse for refusing to provide collocation space to others. Stakeholder may give their opinion on how much space and other infrastructure should the owners keep for their own genuine future needs. It may also be useful to consider increasing transparency by putting the availability of the space etc for collocation facilities may be on the service providers' websites and taking collocation requests on first-come-first-serve basis.

2.1.4 Interconnection using passive links

In case collocation provider, due to space limitations or any other valid reasons, is unable to offer physical collocation requested by another service provider then interconnection can be provided through a passive link and the collocation provider could allow use of existing ducts or construction of new ducts to lead in cable and terminate on its equipment. In both the cases suitable method of charging for the facilities need would have to be worked out.

2.1.5 Access for installation, operation and maintenance

It would be necessary to work out the procedure to be adhered to by both the parties with regard to installation and maintenance of the collocated equipment. Issues like whether the collocation provider would carry out the initial

installation or the seeker has to do it, whether the operation and maintenance would be the responsibility of the owner of the equipment or the collocation provider need to be discussed. In case the collocation seeker needs to carry out these activities then issues such as time of access, space for storage of spares and tools, space for working personnel may need to be considered. The proper procedure for accessing the premises where the collocation facilities made available may also be necessary to be defined in the guidelines.

2.1.6 Termination of Lease

There may be certain situations under which the collocation provider may be forced to give notice of termination of the collocation agreement. Apart from the termination of licence of the collocation seeker, such situations may include restrictive or destructive activities by the seeker; use of collocation space in contravention of the applicable laws, license, regulations or directions and provider has the necessary confirmation thereof from the relevant Governmental Agencies; subleasing, causing damage to the premises or equipment; anti-social and anti national activities. There may also arise reasons for the collocation seeker to discontinue the agreement. Therefore, usually there would be provision for a notice period for termination of contract by any of the parties.

The agreement would also recognize that, although rare, there may be closure or shifting of the exchange from the existing collocation site. In such case how much time advance notice should be reasonable would also depend on whether the collocation provider is committed to provide space in the new site or the current lease stands terminated and the collocation seeker needs to carry out renewed negotiations for a new agreement. Who would bear the cost of shifting of the seeker's collocation equipment also needs to be pre-decided.

2.1.7 Additional Collocation space and Collocation equipment

Increasing traffic between interconnecting partners would mean more equipment to be collocated. There would be cases in which the space leased by the collocating seeker is larger than the initial requirement and then there would be cases where more space may be required to be leased or other facilities may

be required for commissioning more equipment. The agreement may specify the manner in which the contracted space could be used for collocating more equipment possibly with the necessity of rearranging the existing equipment in some way. There may also be stipulations for leasing more space if the already contracted space is not enough for expansion. There may be a condition on the amount of space that the service provider seeking collocation can request based on reasonable forecast for a pre-decided number of years. The terms and conditions may either be agreed to mutually by the service providers or mandated by the regulator.

2.2 Collocation charges

2.2.1 The current industry practice is to break-up the collocation charges into the following components:

a) Charges for land and building space
b) Electricity & miscellaneous charges related to power back-up
c) Charges for in-premises duct sharing
d) Charges for tower sharing (For the purpose of mounting of antenna for interconnect link)
e) Charges for sharing of other miscellaneous facilities

2.2.2 It is expected that the process by which the service providers arrive at collocation charges would be transparent and the charges themselves would be non-discriminatory in terms of quality, provisioning and pricing.

2.2.3 The Authority has used in its own determinations cost-based or cost-oriented methodology for fixation of prices of telecommunication services and network facilities. Primary concerns regarding sharing of costs between interconnecting service providers include, among others, promoting economic efficiency, promoting competition, promoting growth, keeping services affordable and fair compensation for the services rendered. If the arrangement worked out attempts to transfer a large part of the cost of a service provider to the interconnecting service provider then this would lead to inefficient arrangement as the

interconnecting service providers would not be able to offer innovative tariff plans. It is necessary that any approach that is adopted, while being consistent with economic principles, should be suitable for local conditions and should be based on cost so that the service providers are fairly compensated.

2.2.4 The Authority in their guidelines dated 27th December 2002, on the system of accounting separation has dealt with the apportionment of joint costs like costs for assets jointly used by two or more services or functional departments and also the apportionment of costs for common network elements or facilities across services. These guidelines prescribe the indicative principle for allocation of joint cost/assets etc. For example, for the assets jointly used by two or more services or functional departments e.g. land and building housing the exchange, office building, etc it was mentioned that the cost of these would have to be apportioned to the beneficiary department on an appropriate basis, e.g. floor or space occupied in building by respective departments or network elements. In the case of network elements jointly used for providing more than one service, for example, transmission facilities jointly used for providing the Internet, Basic telephony, NLD or ILD services, it was mentioned that such network elements shall be taken as part of the service to which it predominantly pertains and a transfer price will be charged to the other services based on utilisation. The transfer price in such instance will be the actual cost per unit of measurement. The unit of measurement shall be minutes of usage in case of switches and bandwidth in case of transmission.

2.2.5 The collocation charges are the charges for sharing of the facilities between service providers. The discussion here would focus on sharing of facilities required for the interconnection and not for any other purpose. While deciding the collocation charges, various costing methods can be applied. In case strictly cost-based methodology is used for deciding the collocation charges then the facility owned service provider may be hesitant to provide collocation facilities. There may be an option that while deciding the methodology for collocation charges some scope of incentive for sharing such resources may be left for the service provider owning the facility.

2.3 Land and Building Space.

2.3.1 Land & building are important constituent of collocation that normally contribute significantly towards the total cost of collocation. Various methods are available to determine these charges. One method is to charge on the basis of commercial market rent. The commercial market rent would depend on some categorization of cities and location of buildings within a city. The rents are generally higher in bigger cities and an upmarket commercial area as compared to a building in a residential suburb. If the collocation provider is able to account for market factors and expect reasonable returns then he would have a positive attitude towards demand for collocation.

2.3.2 It is noted that BSNL has categorized cities into three categories on the basis of classification followed by Government of India for House Rent Allowance i.e. A (for A1 and A), B (For B1 and B2), C (For C) and Unclassified cities and accordingly specifies space charges for each category. The MTNL has estimated charges on the basis of expenditure on account of depreciation, maintenance and interest on land and additionally considered profit margin to estimate total space charges.

2.3.3 The space for installing interconnection equipment can be charged for super built area or carpet area. The concept of carpet area and super built area is commonly used for purchasing or renting business/residential accommodation. These concepts have been explained below:

(i) Carpet Area: Carpet area is the area of the room measured inside wall to inside wall. Column projections inside the rooms are not deductible while arriving at the carpet area.

(ii) Super Built Area: Super Built-up area of the building includes area of the stair case, lift, lobby and passage on each floor and toilet on each floor distributed.

2.3.4 BSNL uses super area for purpose of charging for sharing of building space. The super area is taken to be 25% to 30% more than the carpet area. MTNL had

also used super area instead of carpet area for the purpose of deciding space charges.

2.3.5 There may be a situation where the requested capacity is not readily available with the interconnection provider and the collocation facilities are provided on rent & guarantee terms or special construction/contribution basis. In such a case full cost for new construction may have to be borne by the collocation seeker. If, however, the provider also intends to use the facility for its own use then the cost has to be apportioned appropriately.

2.3.6 In the various interconnection agreements, it has been observed that there is no consensus on the definitions of bay, rack and shelf. In some agreements, the bay and racks were interchangeably used whereas in others agreements per bay charges were defined and further in some agreements where bay is defined as one box of OF termination and DDF as required and it is mentioned that one rack can house 4 bays. One prevalent meaning is that a bay may contain a number of racks and one rack may contain a number of shelves. There seems to be a need to arrive at consensus on definitions of bay, rack and shelf for ease of understanding and uniformity across industry. Along with this the granularity of space for the purpose of charging i.e. whether the charges should be shelf wise, rack wise or bay wise also needs to be discussed. Considering the bay as a larger unit than rack, if the prices are charged on per bay basis then seeker may have to obtain space for a bay even though the seeker may require to place only one rack.

2.3.7 In cases, where the operation and maintenance(O&M) is to be done by the party seeking interconnection, there may be requirement for keeping tools, spares etc. for operation and maintenance. The space required for keeping tools, spares and for personnel visiting for maintenance has also to be agreed upon. If the O&M are done by the provider then charges may either be agreed to separately or may form part of the per unit collocation price.

2.4 Electricity and Miscellaneous Charges

2.4.1 The exchanges require electrical fittings and installations such as central air conditioning plant, window ACs, lights and fans, battery and power plants and fire alarms. To handle the situation of inadequate power supply and load shedding, generator set/engine alternators are also installed in exchange buildings. The electricity consumed for the purpose of powering interconnection equipment is charged by the Interconnection provider.

2.4.2 BSNL is presently charging a consolidated amount towards DC Power, AC power, air-conditioning charges, generator backup and other miscellaneous charges like earthing, fire equipment, security and water. For one transmission bay, different rates have been prescribed for different categories of cities considering that the rate of electricity and capital expenditure in developing facilities varies as per the size of city. The charges specified for category A,B,C and Unclassified cities are Rs 2,00,000, Rs. 1,80,000, Rs. 1,50,000 and Rs 1,20,000 per bay per anum respectively. In calculating collocation charges MTNL includes cost for apparatus and plants, electrical installations including power panels, cables, transformers, electrical fittings, air-conditioner, fire detection and fire fighting system, 25 KVA engine alternator, 50A power plant and 200 AH battery.

2.4.3 From the methodology adopted by BSNL and MTNL it is seen that the total expenses towards electricity charges and other miscellaneous charges are distributed over total bays installed. For example, BSNL in one of its circular had explained the methodology, which was distribution of electricity charges over number of bays installed and commissioned in respective building/complex of building catered by the same transformer. In addition a mark-up of 50% was also added to cover other charges like diesel, security and water

2.4.4 In one of the interconnection agreements between private operators it has been observed that a consolidated charge of Rs 1,00,000 per bay per annum has been agreed upon which includes charge for space for one transmission bay, DC power at -48V upto 10A per transmission bay, AC power for lights, fans, testing

instruments etc, air conditioning charges (sharing of existing air-conditioning system), UPS and generator backup, earthing charges and fire fighting equipment on sharing basis in case of requirement. In the agreement, it is mentioned that since energy costs contribute a significant portion of the operations cost therefore for every 1% increase in electricity tariff, the charge will increase by 0.4% and also for every 1% increase in Diesel cost, the charge will increase by 0.6%. In this agreement a bay is defined as one box of OF termination and DDF as required, and has been mentioned that one rack can house 4 bays.

2.4.5 Another way for calculating the charges for electricity and other miscellaneous services could be that relevant directly attributable operating costs may be considered for this purpose and there may be provision of justifiable mark-up to incentivise the operator.

2.5 Charges for in-premises duct sharing

2.5.1 For connecting the equipment, seeker is required to lay their cables within interconnection provider's premises through duct/pipe. There are two scenarios relating to ducts. First, the seeker provides his own duct and the second, it shares the already laid duct of provider. In the first case, when the seeker provides for his own duct, restoration and reinstatement responsibilities also need to be discussed. For the already shared or leased duct, BSNL has adopted duct rentals on following basis:

$$\text{Duct Charge-=} \frac{\text{Cost of Duct X No. of Cables X 36\%}}{\text{Total no of pipes in duct}}$$

Where 36% is the factor for Annual Recurring Expenditure(ARE) which includes 15% interest, maintenance of 9%, depreciation rate of 2% and profit of 10%.

2.5.2 In line with the principles adopted by the Authority in its various orders, for calculating the duct sharing charges, in place of 36% in the above formula, the ARE can be calculated using the following components:

(a) Depreciation (Cost of Duct/ Economic life of Duct)

(b) Cost of Capital

(c) Maintenance Charges as percentage of Capex i.e. depreciation +Cost of Capital.

2.6 Tower Sharing

2.6.1 If radio systems are installed in the building, they require antenna and waveguide hosting on the tower erected at the roof top of the building or adjacent to the building. Cost of tower depends on height of the tower. In general, the cost of sharing a taller tower would be more than the tower of a shorter height. The cost of sharing tower also depends on the maximum number of antennas which can be erected on a tower. The cost of tower also depends on the area as the cost of land is higher in urban areas compared to rural/semi-urban areas.

Presently BSNL charges a consolidated amount, depending on the height of the tower. For up to 30 meters height the charges are Rs.1,20,000 per annum; for 31-60 meters the charges are Rs.2,50,000 per annum and for more than 60 meters the charges are Rs.4,00,000 per annum.

2.6.2 While deciding the tower charges various criteria are relevant eg whether such charges should be categorized on the basis of classification of the city. In line with the principles adopted by the Authority in its various orders, for calculating the tower sharing charges, the following components are relevant:

- Depreciation (Cost of tower / Economic life of tower)
- Cost of Capital
- Maintenance Charges (percentage of Capex i.e. depreciation +Cost of Capital).

It needs to be discussed how the tower sharing charges will be arrived at using these and any other components of costs and reasonable rate of return.

2.7 Charges for passive link

Hon'ble TDSAT in the order dated 11th May 2009 in Petition No 209 of 2006 has held that interconnection seeker can make a choice of Active or Passive

link. In case of a passive link physical equipment is located in premises close to the provider's exchange and no physical equipment is located in the premises of the interconnection provider, therefore, electricity, air-conditioning etc. are not used. Only a cable enters the interconnection provider's premises through a cable duct. The collocation seeker may construct its own ducts or may share the incumbent's ducts.

2.8 Sharing of Collocation Charges between interconnection provider and interconnection seeker:

2.8.1 In the Hon'ble TDSAT judgments dated 9.3.2007 on the Petition no. 218 of 2006 in the matter of Reliance Vs MTNL and in Petition no. 148 of 2005 in the matter of BPL Vs MTNL, TRAI was also asked to examine the extent of the cost that need to be shared by MTNL, as the same infrastructure is also utilized by it for its outgoing traffic.

2.8.2 For establishing active interconnection links the collocation seeker places his transmission equipment in the collocation provider's premises and pays for use of space and other facilities. This equipment may then be utilized not only for bringing in traffic from the collocation seeker's network but also for outgoing traffic of the collocation provider. It may therefore be contended by the seeker that the collocation charges may be shared by the collocation provider. On the other hand, the collocation provider may argue that the charges borne by the collocation seeker are only for the space and other facilities provided to them and not based on the traffic carried and therefore should not be shared. Views of the stakeholders would be useful in deciding this issue as well.

CHAPTER-3

INTERNATIONAL EXPERIENCE REGARDING COLLOCATION CHARGES

3.1 Australia

In Australia, 'Collocation' is covered under the 'access regime'. In general terms the purpose of the 'access regime' is to reduce entry barriers to telecommunications carriers so they can build and operate competing networks. The 'access regime' is sub-categorised into two segments, this being the 'facilities access regime' and 'service access regime'.

Facilities Access Regime

Under Schedule 1 of the Telecommunications Act 1997, carriers are required to provide other carriers with access to certain facilities such as space in exchanges, pillars, underground ducts and communications towers to enable the physical collocation of competitors network equipment. Terms and conditions of access (to include financial charges) are initially arranged by commercial negotiations between the carriers. But if carriers are unable to agree on terms and conditions, these must then be determined by an arbitrator or, if parties cannot agree on an arbitrator, by the Australian Competition and Consumer Commission (ACCC). There is no regulatory requirement to provide the terms and conditions (including financial charges) to other parties or be made publicly available.

Service Access Regime

Under Part XIC of the Trade Practices Act 1974 the ACCC has power to declare specific telecommunications services to be subject to the access regime. Once a service is declared by the ACCC, a telecommunications provider that supplies the declared service (an access provider) is obliged to supply it to other telecommunications service providers (access seeker) on request (subject to certain exceptions). The ACCC is responsible for declaring services that are subject to this regime and for conducting arbitrations when the carrier requesting access and the access provider cannot agree on the terms and conditions of access. The ACCC maintains a Declared Services Register, that

lists the telecommunications services that are subject to the regime. The ACCC has developed broad charging principles for many declared services that indicate the price methodology the ACCC would be likely to adopt if notified of a dispute in the supply of that particular declared service.

Further details may be seen at following links:

(i) 'Facilities access regime' including a copy of the Telecommunications Act 1997 (http://www.acma.gov.au/WEB/STANDARD/pc=PC_2888)
(ii) Copy of the Trade Practices Act 1997 at: (http://www.accc.gov.au/content/index.phtml/itemId/3653)
(iii) Declared Services Register at: (http://www.accc.gov.au/content/index.phtml/itemId/323824)
(iv) Information on the charging principles: (http://www.accc.gov.au/content/index.phtml/itemId/753801)

3.2 Brazil

According to Brazilian regulations concerning network interconnection, all operators must publish a "Public Offer of Interconnection", to prevent abuses and discrimination. This offer describes all relevant conditions, including the use of space for installation of third party equipment, as well as resources, such as energy and distribution frames, necessary for the establishment of interconnection. A draft standard contract for interconnection, reference prices and criteria for the granting of discounts are published. The interconnection contract is freely negotiated by the concerned operators. This contract must be submitted to National Telecommunications Agency (ANATEL) for homologation. If operators don't reach an agreement, ANATEL may arbitrate the conditions for interconnection.

3.3 Canada

Up until 1997, the telecom local service market in Canada consisted of several incumbent regional monopolies. In 1997, the Canadian Radio-television and Telecommunications Commission (CRTC) opened up the telecom market to competition. In an effort to reduce barriers to entry and entice market entry, the CRTC mandated incumbents to provide competitors with access to certain parts of their networks that could not be economically duplicated by a new entrant. One such area that was mandated was collocation in an incumbent's central

offices. So, in Canada, collocation is a mandated arrangement between an incumbent and a competitor – it is not mutually decided by the carriers. Incumbent carriers are obligated to provide collocation to wireline competitors at cost-based rates (i.e. incremental costs), plus a prescribed mark-up of 15%.
CRTC's decision of 1997 on collocation, which still forms the basis for the current collocation framework, including the components (i.e. floor space, power consumption etc.) and how the rates were initially set for each component can be seen at http://www.crtc.gc.ca/eng/archive/1997/DT97-15.HTM . Paragraphs 59-80 contain the CRTC's rationale for determining the rates and Appendix 1 contains definitions of each of the rate elements, which may be useful in the subject matter.

In Canada, the company providing the collocation (i.e. the incumbent) is not required to compensate the co-locating company (i.e. the competitor) for use of its infrastructure to carry traffic.

In 2006, the CRTC undertook a comprehensive review of all wholesale services that were being provided by incumbent carriers to determine whether or not those services should continue to be mandated and, if so, what the appropriate pricing should be. Collocation services were part of this review. The CRTC ultimately determined that collocation services were to remain mandated on a conditional basis. The mandated status of collocation and related link services was conditional on there being mandated wholesale services requiring the collocation service or there being a mandated wholesale service to which competitors can gain access only by collocation (i.e. unbundled local loops and interconnection).
The link below may be referred for the CRTC-approved collocation arrangements and tariff for Bell Canada, who is the largest incumbent in Canada.
http://www.bce.ca/en/aboutbce/regulatoryinformation/tarrifs/index.php/ItemView.asp?Tariff=7516%20&Part=%20%20%202%20%20%20%20%20%20&Item=%20%20110%20%20%20%20%20

3.4 Egypt

Collocation in Egypt is only offered by the incumbent and it is classified to two categories:

1. Collocation for interconnection services
2. Collocation for non-interconnection services

The service description and charges are listed in the incumbent RIO, that is presented to the National Telecom Regulatory Authority (NTRA) to gain an approval before being officially published. Any services that the operator utilize as Power supply, Towers, and/or Masts are subject to other rules and prices that are also set in the incumbent RIO.

3.5 Germany

In Germany, the collocation charges are subject to cost-oriented ex-ante regulation.

Fixed rates were only set where the services and infrastructure provided by the incumbent is more or less identical in all circumstances. The charges for the provision of the collocation space alone (separate from the technical infrastructure) vary depending on in which city the collocation space is provided. The reason for this is that the price level of rents for commercial space varies from city to city, so that clusters of cities with similar price levels were formed.

In Germany, cost-sharing on the basis of traffic is applied to certain switches and leased lines in the reference offer for interconnection and not for the facilities like space. The costs are divided according to the relation of the incoming to the outgoing traffic, measured in minutes. This relation is formed by comparing the whole incoming and outgoing traffic of the interconnected operators, and not by comparing the incoming and outgoing traffic at the individual points of interconnection.

The decision dated 30/11/2009 regarding approval of fees for the collocation, issued at the request of incumbent in the fixed-line market, can be seen on:

http://www.bundesnetzagentur.de/enid/586adae85b5a29516196f4adf894babb,0/BK3a-_9-_66/BK3c-_9-_66_E_60l.html

3.6 Hong Kong

Similar to India, the collocation charge in Hong Kong is subject to commercial negotiation between the two parties concerned. Hong Kong telecommunications Regulator i.e. Office of the Telecommunications Authority (OFTA) do not prescribe the charges / cost involved in collocation OFTA will not intervene unless the operators approach for a determination because of their failure to reach an agreement. To provide the relevant procedures and rules for the industry to follow on matters related to interconnection and collocation a "Code of Practice for the Interconnection of Broadband and Narrowband Local Access Links" exists. Main points discussed in this code of practice are space utilization, procedure for making request for collocation and other associated tasks with collocation like termination of lease, request for reduction of exchange facilities etc. The detailes may be seen at web-link http://www.ofta.gov.hk/en/code/cop20050615.pdf.

3.7 Italy

In Italy, collocation includes the provision of space for systems and energy supply, by the incumbent. The cost of energy corresponds to the public cost of energy and is the same for the incumbent and the Other Licensed Operator (OLO). The cost of space is, as well, the same for the incumbent (wholesale division) and the OLO (xEuros/square meter). Collocation charges are fixed according to cost orientation approach as imposed by communication regulatory authority i.e. Autorità per le Garanzie nelle Comunicazioni (AGCOM), regulatory decisions. AGCOM decisions provide guidelines for cost evaluation starting from regulatory accounting data.

The price of collocation space currently used in Italy (useful for a possible benchmark) is: 120.38 €/m2. The price of energy, including the cost of power supplier in CC and distribution up to the collocation site, is about 2000/Euro/Year/KW (flat rate). The cost for conditioning 1KW of supplied power is about 1000/Euro/year (flat rate).

3.8 Korea

"Telecommunications Business Act" inter-alia covers the collocation facilities. Especially Article 34-3 of the Act is relevant to the collocation (or joint use) of telecommunications facility and it says that "The KCC [Korean Communications Commission] shall determine and announce the scope, conditions, procedures and methods for an access to or a joint use of the telecommunications facilities or establishments, and the criteria for calculating charges". Such determinations are published in the legal form of "Notice".

Article 34.3 is reproduced below:

> *"Article 34-3*
> *(1) A common carrier may allow access to or joint use of the telecommunications facilities or establishments by concluding an agreement, upon receipt of a request from other telecommunications carriers for an access to or a joint use of the telecommunications facilities or establishments, such as duct, cable, poles, or station buildings of the relevant common carrier, for installing or operating facilities required for interconnection of their telecommunications facilities; or*
>
> *(2) The KCC shall determine and announce the scope, conditions, procedures and methods for an access to or a joint use of the telecommunications facilities or establishments, and the criteria for calculating charges under paragraph (1).*
>
> *(3) Notwithstanding the provision of paragraph (1), a common carrier falling under any of the following subparagraphs shall allow an access to or a joint use of the telecommunications facilities or establishments under paragraph (1) by concluding an agreement, upon receipt of request under paragraph (1):*
>
> *1. A common carrier who possesses facilities which are essential to other telecommunications carriers in providing Telecommunications Service; or*
> *2. A common carrier whose business size, market share, etc. of its Common Service satisfy the criteria as specified by the Presidential Decree."*

For more details "Telecommunications Business Act" of Korea may be referred at http://www.itu.int/ITU-D/treg/Legislation/Korea/BusinessAct.htm

3.9 South Africa

At present all prices for interconnection and facilities easing are commercially negotiated between parties. More information may be seen on the website:

http://www.icasa.org.za

3.10 Turkey:

Terms and conditions regarding collocation and facility sharing are determined under the "Communique on Principles and Procedures Regarding Collocation and Facility Sharing". As per this document, collocation charges should be cost-based.

Collocation charges in Turkey have been determined considering the rental fees of equivalent buildings based on an expertise report. In Turkey, collocation services are provided for the operators performing any of these 3 access models i.e. Interconnection, Local Loop Unbundling, Bit Stream Access. In this regard, if any operator demands for collocation at any specific exchange, Türk Telekom (incumbent) provides a dedicated room, where all the other operators install their equipments. Each operator should use at least one of the 3 access models listed above. If there is no place for a dedicated room, operators may install their equipments in the same room with incumbent (co-mingling). For all cases, operators pay the collocation charges approved by NRA (ICTA). Hence, the cost is not shared by both interconnecting operators but paid by the interconnecting operator, which also use the collocation service.

Current collocation Charges can be seen below (January, 2010):

Metropolitan Cities	Cities	Towns
€ 52.8 m2	€ 45.2 m2	€ 37.1 m2

Further detailes can be found at http://www.tk.gov.tr/pdf/OY_TP_17-12-2003.pdf .

3.11 UK

Collocation services are part of the regulated Local Loop Unbundling (LLU) product suite. Local loop Unbundling is the regulated product that BT is required to offer as a consequence of its Significant Market power (in the UK excluding Hull) in the Wholesale Local Access (WLA) market review. Ofcom concluded the last Wholesale Local Access (WLA) review in December 2004 (http://www.ofcom.org.uk/consult/condocs/rwlam/statement/rwlam161204.pdf). To date, a new WLA review is undergoing.

In May 2009 Ofcom published "the New pricing framework for Open reach" where it was decided that accommodation space services belong to the "Ancillary services" and are subject to basket price controls (http://www.ofcom.org.uk/consult/condocs/openreachframework/).

Collocation services (i.e. CPs equipment is located within a dedicated equipment room) and Co-mingling services (i.e. CPs share a space within an equipment area which BT uses or could use, for its own equipment) are subject to basket price controls by means of the "Co-mingling services" basket defined in the new pricing framework . For details, Annex 1 of the document available on following link may be seen:
(http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/annexes.pdf).

Collocation charge details can be found:
http://www.openreach.co.uk/orpg/pricing/loadProductPriceDetails.do?data=kj7hq4nB6aW1RBP8FRPqwr%2FuVhXjMR5hQz3DdrCHJqBVrWsgMC%2F4dy9qJJFTkna2

3.12 Malaysia

In March 2003, the Malaysian Communications and Multimedia Commission (MCMC) formally announced the Malaysian Access Forum Berhad (MAFB) as the 'Access Forum' under the CMA 1998. MAFB is thus recognised as the industry forum dealing with access and interconnection issues in Malaysia under the Communications and Multimedia Act (CMA). In September 2008, MAFB prepared a public consultation on the Voluntary Industry Access Code. Until the publication of the code, access was regulated by the Mandatory Standard on Access which was published by the Malaysian Communications and Multimedia Commission. The code states that the access provider must provide both physical and virtual collocation to the access seeker if requested. The access seeker may also locate equipment alongside the provider's network facilities so they can use the access services. The access provider must adopt a queuing policy when dealing with collocation requests. The access seeker must give the provider a range of information such as details of the equipment that

will be co-located, power requirements, heat output and installation period. Nominated employees of the access seeker are allowed access to their equipment at any time but if an inspection is carried out the access provider needs 5 days notice and must be provided with details of the employees entering the facilities. The access provider is permitted to use an escort for the access seeker and also the use of a site register is allowed.

The access provider may agree to carry out preparatory work for the collocation. Before the work begins, the access provider must give the seeker an estimate and the provider must not exceed this charge or the agreed time-frame unless warning has been given. The access provider must also ensure that all utilities and ancillary services are provided to the access seeker. These services include access to roads and land, power, heat, light, air-conditioning, security and site maintenance.

In relation to security, the access provider shall not require the use of cages or similar structures to physically segregate co-located equipment and both parties must mark their equipment so that they are easily identifiable.

3.13 Nigeria

In Nigeria, the General rule, terms and conditions of collocation are the same as infrastructure sharing. An operator shall provide capacity to other operators on a "first-come, first served" basis, determined in accordance with the order in which the operator owning or having control over a facility, receives requests for collocation. Every operator shall reserve the right to refuse an application for collocation on grounds of:

(a) Insufficient capacity

(b) Safety, reliability, incompatibility of facilities and

(c) General engineering considerations.

A dominant operator as may be determined by the Commission should include in its Reference Interconnection Offer (RIO) an offer for the facilities available for collocation, including a price list for the different components of collocation. An operator desirous of interconnecting with another operator is at liberty to choose the type of collocation suitable for its operation. Where a

request is made for physical collocation but such collocation is not deemed feasible, virtual collocation should be offered by the interconnection providing operator. Where virtual collocation is not feasible, remote collocation should be offered in its stead and request for remote collocation shall not be rejected on any grounds including grounds of insufficient capacity, safety considerations, reliability or other general engineering considerations.

The decision to refuse an application shall be communicated in writing to the requesting operator specifying the reasons for such refusal. The agreement shall be in writing and shall specify the contractual terms and conditions agreed on by the parties. All such agreements shall be registered with the Commission. The terms have offered should be in compliance with the principles of neutrality, transparency, non-discrimination and fair competition.

Prices for collocation should be non-discriminatory, reasonable, and based on the actual costs incurred by the owner of the facility and determination of the costs underlying prices should be transparent and neutral.

An operator who is refused access may refer such refusal to the Commission and the Commission shall be at liberty to inquire into the decision refusing access. Infrastructure sharing arrangements imposed by the Commission may include rules for apportioning the costs of facility sharing.

They have made provision in their published regulation with regards to allocation capacity, reservation of capacity, re-location and separation. Nigeria has also made the provisions in their published regulation to resolve any disputes arising from collocation/ infrastructure sharing negotiations. Nigeria clearly recommended cost based pricing for Collocation/ infrastructure sharing.

3.14 Pakistan

A detailed framework for collocation agreement between other operator and Pakistan Telecommunication company limited is available on PTA’s website. In the collocation agreement, a detailed procedure for registration and processing of collocation request has been prescribed. As per the agreement a service

provider can apply in the prescribed collocation request form, for registration of the demand for Collocation along with *PKR*. 10,000/- as registration fee. Other than registration fee and no separate fee for processing of Collocation request will be charged. PTCL shall acknowledge receipt of the Collocation Request within seven (7) Business Days and indicate whether the Collocation Request is preliminarily accepted on a non-binding basis or rejected. If the Collocation Request is rejected, PTCL will provide written reasons for such rejection to the Operator. Framework shall commence on the date the Operator confirms its acceptance of the charges for the Collocation Site and shall continue for three (3) years for each such POI. PTCL may terminate the lease of Collocation Space at any time by giving notice to the Operator if the Operator fails to complete the installation of its Collocation Equipment within thirty (30) Business Days. If the Operator's failure to complete installation is attributable to circumstances beyond the Operator's reasonable control, PTCL will grant a reasonable extension of time for installation to the Operator at the Operator's request. An Operator's request under this clause must describe the circumstances beyond the Operator's control and such request must be received prior to the expiry of the aforementioned thirty (30) Business Day period. The Operator may terminate the lease of Collocation Space under this Collocation Framework by giving PTCL no less than six (6) months written notice.

Space rate for purpose built collocation centers has been prescribed as *PKR* 78 (rupees seventy eight) per sq-ft per month. This includes purpose built collocation space at designated centers with 24 hours air conditioning and generator for power backup. The area for cage of 7'W and 8'D and 10'H will be 56 sq-ft (7'W X 8'D). The minimum space for cabinet of 2'W, 3D' and 8'H will be 14 sq-ft {(2'W X (3'D + 2+2)}.

3.15 United States of America

On August 8, 1996, the Commission adopted the first collocation rules designed to implement section 251(c)(6) of the Communications Act of 1934. Section 251(c)(6) of the Act obligates incumbent Local Exchange Carriers (LECs) to provide, "on rates, terms, and conditions that are just, reasonable, and non-

discriminatory, for physical collocation of equipment necessary for interconnection or access to unbundled network elements."

The collocation requirement allows competing LECs to place their equipment on the incumbent LEC's premises. On March 31, 1999, the Commission issued additional collocation rules in the Advanced Services First Report and Order ("the Order"). The Order requires, among other things, that incumbent LECs offer cageless collocation arrangements, whereby a competing LEC obtains physical collocation space without having to build a protective cage around its own equipment. The Commission codified the cageless collocation requirement at section 51.323(k) of its rules. Section 51.323(k) became effective on June 1, 1999. US approach generally has been not to intervene in infrastructure sharing issues, but the regulator has the authority to do so if issues of competitive harm are raised.

For more details the Act is available at http://www.fcc.gov/telecom.html and the cageless collocation requirement is available at http://www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=200947 .

CHAPTER-4
ISSUES FOR CONSULTATION

1. Give your comments on the procedure for making an application and subsequent provisioning of collocation indicating clearly the time lines for each activity and the centre of responsibility.

2. Give reasons because of which request for collocation can be rejected by the collocation provider.

3. Give reasons because which an ongoing collocation agreement can be terminated by the collocation provider.

4. Give your comments on the procedure of termination of collocation including the notice period that any party may give to the other party for termination of collocation agreement.

5. What measures can be taken to ensure transparent and non-discriminatory treatment in pricing and provisioning of collocation facility? Should these be mandatorily published on the providers' websites?

6. How should a bay and a rack defined and what area they should be presumed to occupy?

7. Should the charges be quoted on a consolidated basis per unit area or per rack/bay inclusive of all facilities or should they be segregated item wise ie separate charges for space, power maintenance etc?

8. What elements should be taken into consideration for costing collocation and what should be the costing methodology for calculation of various elements like
    - Charges for space both in case of owned and rented buildings. Should the calculations be based on carpet area or super area?
    - Should the charges be based on market rent or any other criterion.

- Electricity & miscellaneous charges
- Charges for in-premises duct sharing
- Charges for tower sharing (For the purpose of mounting of antenna for interconnect link)
- Annual escalation for the charges
- Charges for sharing of any other facility required for collocating equipment for interconnection

9. A common method of costing is based on directly attributable cost. If this method is use then what should be the reasonable return allowed?

10. Should there be a well defined criteria for allowing collocation provider to retain space for own need? Explain your answer.

11. Should there be an option to the seeker for carrying out operation and maintenance(O&M) of the collocated equipment itself or through the collocation provider? In case O&M is done by seeker what should be the conditions for access to the premises while in case it is done by the provider what should be the criteria for charging for it?

12. What should be the criteria for determination collocation charges of passive links?

13. Is there a justification for the collocation cost to be shared by both the seeker and the provider? If yes what should be the criteria used?

14. Do you have any other suggestion regarding framing of guidelines for collocation charges?

Annexure

Extracts of the relevant clauses of some of the Interconnection Agreements

(A) Provisions in Interconnection agreements between Government PSUs and Private operators:

(1) Interconnection agreement between Bharat Sanchar Nigam Limited and Bharti Cellular Limited Dated 26th March 2004

"……

Clause 2.1 Interconnectivity to BSNL Network

2.1.1 ……the UASL Licensee will have to make its own arrangements for the entire infrastructure required for providing the Service. Therefore the UASL may develop its own independent network with its own transmission links within each of its service area.

2.1.2 The UASL shall be responsible for providing the required transmission links from/to his network to/from BSNL's network at interface points under Clause 2.1.1, at local/tandem and TAX levels, initially as well as for augmentation from time to time.

6.1.1 Provision of links to interconnect UASL's network with BSNL's network at the technically feasible interconnecting exchange will be the responsibility of the UASL as provided under clause 2.1.1 and 2.1.2.

6.3.3 Other Charges: It shall not be mandatory for BSNL to provide any infrastructure to UASL which UASL himself is supposed to arrange. In case the UASL is not able to bring his interconnecting transmission link upto the BSNL's designated exchange for the POI, BSNL may subject to availability and payment of the prescribed charges by UASL, provide inter exchange junctions on PCMs from the exchange upto which the UASL has brought its transmission link to the location of POI. These charges shall be same as prescribed by TRAI for leased lines from time to time or on R&G terms & conditions as the case may be. For any other infrastructure like space in BSNL's building, provision of power supply, air conditioning, mounting of antennas on towers or building tops if feasible, the charges and other terms & conditions for the same shall be as prescribed by BSNL from time to time separately.…"

(2) Interconnection agreement between MTNL (BSO) and Sistema Shyam Teleservices Limited as UASP in Delhi service area Dated 13th May 2009

"…

3.1 CAPACITY ORDERING

3.1.3 …UASP is responsible for providing the required transmission links to and from MTNL's network at permitted interface points at TANDEMS/LOCAL EXCHANGE levels initially as well as for augmentation from time to time. However, in case UASP requests MTNL in writing to provide for such links, to interconnect UASP's network to MTNL's network, then MTNL, may accept such request and set up the link upon payment of charges as prescribed by MTNL from time to time.

6.1 INTERCONNECTIVITY TO MTNL NETWORK.

6.1.1 Provision of links to interconnect UASP's network with MTNL's network at the technically feasible interconnecting exchange will be the responsibility of the UASP….. Services provided to a UASP may be disconnected after giving one month notice. Such disconnection shall be duly intimated to UASP with copy to TRAI. Such disconnection shall be subjected to license/interconnect condition / regulations issued by TRAI and the orders as issued by Licensor from time to time.

6.6.9 CHARGES FOR LEASING OF RESOURCES

……irrespective of who owns a transmission system of the link interconnecting one party's exchange to the exchange of the other party, each party subject to availability and feasibility may provide accommodation for the terminals of such equipment of the other party located in its premises. However permission to mount antennae for interconnection link shall not be mandatory and will be subject to availability keeping the long-term requirement of each party in view and mutual agreement. The charges for such accommodation and infrastructure shall be as prescribed by the Interconnection Provider from time to time. The installation of the link equipment may be done by the UASP itself. The end link equipment will be installed in the

transmission room of various buildings where interconnection will be taken by UASP. After commissioning of the end link equipment, the same shall be taken over by MTNL for operation and maintenance and the staff of the UASP will not be allowed entry for day to day maintenance. The operation and maintenance charges for end link equipment at MTNL end will be charged from the UASP alongwith the rental for space and other infrastructure such as AC, power etc. MTNL will undertake the operation and maintenance of interconnect equipment installed by UASP in its premise & will charge the UASP for the same. The entry of UASP's personnel on a regular basis shall not be allowed in MTNL's premises but shall be for level II maintenance on need basis.

B Provisions in Interconnection agreements of private operators:

(1) Interconnection agreement between Tata Teleservices Ltd. and Vodafone Essar Spacetel Limited Dated 12th June, 2008 for Assam, North East and Jammu & Kashmir Circle.

5.1 The Parties will develop/arrange for their Network links to carry out their respective obligations under this Agreement.

5.2(a) For the first two years, provision of links (including the terminating equipment) interconnecting VESL's network with UASP at mutually agreed POIs…., will be the responsibility of the UASP and at the cost of the UASP. This shall include interconnecting links between the two networks and the UASP shall provide its own SDH electronics to be installed within the premises of the UASP for provisioning of Interconnect Link.

5.2 (b) In case any further POI, apart from MSC locations set forth.., is agreed and established between the Parties at any point of time the cost shall be borne by both the Parties on the principle that each Party shall bear the cost of outgoing traffic from it's network.

(c) For any future augmentation in the existing POI, after the initial period of two years as aforesaid, the cost shall be borne by both the Parties on

the principle that each Party shall bear the cost of outgoing traffic from it's network.

(d) UASP and/or the VESL, may, subject to availability, provide the space within its premises and necessary interconnect facilities in its switch and may also provide the necessary infrastructure within its premises viz. air-conditioning, power with backup, etc. without any charges on reciprocal basis. Arrangements and terms & conditions for access or installation, operation and maintenance of such equipment will be arrived at by mutual agreement at respective locations.

12.1 The Parties agree that all payments and rates for routing of calls, Access Charges, Interconnection Charges, revenue sharing and other related issues shall be in terms of Schedule 1. The aforesaid charges may be amended from time to time in case of charges arising out of mutual discussions, amendment by TRAI or by any judicial or Statutory Authority.

12.2 All charges and rates as prescribed in the said Schedule 1 will be subject to review on request of either Party or at least once a year or pursuant to any changes in regulation by TRAI.

Schedule 1 to the Interconnect Agreement

…..

2. Port, Space and other Charges

The Parties have agreed to not to charge any Port and Space charges to provide the necessary infrastructure within its premises for Interconnection. UASP shall bring its own transmission equipment into the premises of VESL for interconnection.

……..”

(2) Interconnection agreement between Reliance Communications Ltd.(UASL) and M/s Bharti Airtel Limited(UASL) Dated 28th February, 2009 for Jammu & Kashmir Circle.

"…

5.1 The Parties will develop their own independent network with their own transmission links to carry out their respective obligations under this Agreement.

….

5.2(b) For the first two years of connectivity between Airtel & RCOM, provision of links(including the terminating equipment) interconnecting RCOM's network with Airtel's network, at mutually agreed POIs, will be the responsibility of RCOM and at the cost of RCOM. This shall include leased lines(OFC) or radio links, end links etc. and RCOM shall provide its own SDH electronics to be installed within the premises of Airtel for provisioning of Interconnect Link. In case SDH transmission equipment is already installed by any of the RCOM Group companies at mutually agreed POI, the same shall be shared for the purpose of this Agreement. Alternatively, RCOM may also lease transmission links from any other authorised service provider at its own cost, for the purpose of establishing interconnecting with AIRTEL for which AIRTEL shall provide the necessary support for establishing the POI between RCOM & AIRTEL.

The two year period as stated hereinabove shall be calculated from the date of establishment of the POI by RCOM. For locations where the 2 year period has expired, costs of connectivity and augmentation shall be shared between AIRTEL and RCOM as per the principle laid down in sub-clause(c) below.

(c) In case any further POI, apart from switch locations set forth, is agreed and established between the Parties at any point of time and for any future augmentation in the existing POIs after the initial period of two years as aforesaid, the cost shall be borne by both the Parties on the

principle that each Party shall bear the cost of outgoing traffic from it's network.

(d) Both the parties, subject to availability, shall provide space to each other within its premises and necessary interconnect facilities in its switch and may also provide the necessary infrastructure within its premises viz. air-conditioning, power with backup, etc. without any charges on reciprocal basis. Arrangements and terms & conditions for access or installation, operation and maintenance of such equipment will be arrived at by mutual agreement at respective locations.

12.1 The Parties agree that all payments and rates for routing of calls, Access Charges, Interconnection Charges, revenue sharing, rate for Space, Port Charges and other related issues shall be in terms of Schedule 1. The aforesaid charges may be amended from time to time in case of change arising out of mutual discussions, amendment by TRAI or by any judicial or Statutory Authority.

……"

(3) Interconnection agreement between Reliance Communications Ltd.(UASL) and M/s Idea Cellular Limited(UASL) Dated 23rd July, 2008 for Mumbai Service Area.

"…….

5.1 The Parties will develop their own independent network with their own transmission links to carry out their respective obligations under this Agreement.

5.2(a) For the first two years, provision of links(including the terminating equipment) interconnecting ICL's network with RCOM's network at mutually agreed POIs.., will be the responsibility of the ICL and at the cost of the ICL. This shall include interconnecting links between two networks and ICL shall provide its own SDH electronics to be installed within the premises of RCOM for provisioning of Interconnect Link.

(b) In case any further POI, apart from switch locations set forth, is agreed and established between the Parties at any point of time and for any further augmentation in the existing POIs after the initial period of two years as aforesaid, the cost shall be borne by both the Parties on the principle that each Party shall bear the cost of outgoing traffic from it's network.

(c) Both the parties , subject to availability, shall provide the space to each other within its premises and necessary interconnect facilities in its switch and may also provide the necessary infrastructure within its premises viz. air-conditioning, power with backup, etc.. Arrangements and terms & conditions for access or installation, operation and maintenance of such equipment will be arrived at by mutual agreement at respective locations.

Access to and maintenance of POIs on the other party's premises:

6.1 Each party(in this clause, "the provider") must make available to the other(in this clause, "the user") all such:

a. access from the street front to the premises in which each POI is or is to be accommodated under aforesaid clauses; and

b. consents from relevant people; and

c. facilities and services on the provider's premises.

as the user reasonable requires to enable each POI, and all equipment required to be both located in close proximity and connected to it for the user to provide or receive Services under this Agreement, to be safely and securely accommodated and installed, connected to the rest of the user's Network, inspected, worked on and removed as and when reasonable required by the user. The provider must comply with all applicable statutory requirements in meeting its obligations under this clause.

6.2 The provider shall grant the user all licences as mutually agreed and necessary for the user to carry out the activities contemplated by aforesaid clause 6.1.

6.6 Neither Party may, as a provider, cause or allow any alteration to its premises that could reasonable be expected to affect the other Party's equipment without the other Party's consent, which may be given subject to reasonable conditions and must not be unreasonably withheld.

12.1 The Parties agree that all payments and rates for routing of calls, Access Charges, Interconnection Charges, revenue sharing, rate for space, port charges and other related issues shall be in terms of Schedule 1. The aforesaid charges may be amended from time to time in case of charges arising out of mutual discussions, amendment by TRAI or by any judicial or Statutory Authority.

Schedule 1 to the Interconnect Agreement

….

2. Cost of up gradation

The charges towards enhancement of features in switching and transmission networks and their up-gradation made by either Party for providing the specific facilities, on the request of the other Party, will be paid by the requesting Party to the other Party.

3. Neither party shall charge each other port charges, space and power charges & Co-location charges.

…….”

(4) Interconnection agreement between Tata Teleservcies Limited / Tata Teleservices (Maharashtra) Limited And Swan Telecom Private Limited Dated 31st day of March 2009 for all circles.

2.4 SWAN TELECOM will be required to establish Interconnection at the Switches of SWAN TELECOM as listed. In addition to these specified location, the Parties may further agree to interconnect at any additional locations as mutually agreed to by and between the Parties during the term of this Agreement.

5. INTERCONNETION – TECHNICAL ISSUES

5.1 SWAN TELECOM shall develop its own independent Network with its own transmission links within its service area to carry out its obligations under this Agreement.

5.2 For the two years, provision and augmentation of transmission links (including terminating equipment) interconnecting SWAN TELECOM's network with TATA's existing Switches as specified .., will be the responsibility of SWAN TELECOM and at the cost of SWAN TELECOM. This shall include annual Port Charges, Lease Lines Charges, Charges for Radio Links, End Links, etc. SWAN TELECOM shall provide its own SDH electronics to be installed within the premises of TATA for provisioning of Interconnect Link, for which SWAN TELECOM shall pay TATA the charges for space, racks etc as specified in Schedule 2

5.3 In the event SWAN TELECOM has to lease media for the purpose of establishing connectivity with TATA, SWAN TELECOM shall accord first preference to TATA for leasing media, wherever TATA's media is available, at a competitive price, in order to optimize resources in TATA's Switches where TATA NLDO already has PoI. In case TATA NLDO's media is unavailable, SWAN TELECOM may lease media from Third Party.

5.4 In case any further PoI, apart from Switches Locations set, is agreed and established between the Parties during the initial period of two years, the cost shall be borne by SWAN TELECOM as per clause 5.2 above.

5.5 In case any new PoI is agreed and established between the Parties after the initial period of two years, the cost shall be borne by both the Parties on the principle that each Party shall bear the cost of outgoing traffic from its network.

5.6 In case of any future augmentation in the existing PoIs.., after the initial period of two years, the cost shall be borne by both the Parties on the principle that each Party shall bear the cost of outgoing traffic from its network.

5.7 At the end of two years, Parties shall convert the total E1s existing at the PoIs into one-way E1s for the Outgoing Traffic of each Party on the basis of the jointly agreed traffic ratio existing 3 months prior to the expiry of the initial period of two years. These E1s shall thereafter be continued as one-way E1s for the remaining term of the Agreement at the cost of SWAN TELECOM.

5.8 The Parties shall identify the total number of E1s functional at the PoI and the ratio of outgoing traffic of each Party 3 months prior to the expiry of the initial period of two years. On the basis of this, the Parties shall calculate the number of E1s required to carry outgoing traffic of each Party as one-way E1s.

5.9 SWAN TELECOM shall facilitate migration of TATA's outgoing traffic onto the identified number of "one-way" E1s in accordance with clause 5.6 and 5.7 above before the expiry of the initial period of two years.

5.10 In the event, SWAN TELECOM fails to complete the migration of traffic at the PoI onto one-way E1s for both Parties before the expiry of the initial period of two years, TATA shall be entitled and free to take any suitable remedial action including levy Port Charges for an additional period of one year (i.e. third year of commissioning of PoI).

5.11 After completion of two years, each Party shall be entitled to augment capacity for its outgoing traffic using its own fibre/media. Both SWAN TELECOM and TATA shall facilitate augmentation to each other using their respective media.

5.12 In case SWAN TELECOM is unable to allow TATA to augment PoI capacity using TATA media in locations where TATA's media is available and TATA has already submitted its written request for augmentation using TATA media, SWAN TELECOM shall not claim lease line charges from TATA for such E1s.

5.13 TATA shall provide space within its premises, the necessary interconnect facilites in its Switch and the necessary infrastructure within its premises viz. air-conditioning, power with backup, etc as per the terms and charges detailed in Schedule 2.

5.14 Arrangements for access, installation and O&M of SWAN TELECOM's equipment located within TATA's premises shall be as per terms and charges detailed in Schedule2.

12.1 The Parties agree that all payments and rates for routing of calls, Access Charges, Interconnection Charges, revenue sharing, rates for Space, Port Charges and other related issues shall be in terms of Schedule 2. The aforesaid charges may be amended from to time in case of change arising out of mutual discussions, amendment by TRAI or by any judicial or Statutory Authority.

SCHEDULE – 2

2 (iii) Charges for Inter-MSC junctions: In case SWAN TELECOM is unable to bring its interconnecting transmission links upto the designated GSMC/MSU of TATA for the purpose of establishing the PoI, TATA may, subject to availability, provide inter-MSC junctions on PCMs from MSC upto which SWAN TELECOM has brought its transmission links upto the location of PoI. SWAN TELECOM agrees to pay TATA media charges as per rates prescribed by TRAI for domestic leased circuits or as mutually agreed.

O&M charges for such Inter-MSC junctions shall be mutually agreed.

2 (iv) **Charges for Passive Infrastructure:**

Rs 1,00,000 per bay per annum which shall include the following:

- ✓ Space for one transmission bay (One box of OF termination and DDF as required) basis one rack can house 4 bays.
- ✓ DC power at 48V upto 10A per transmission bay
- ✓ AC power for lights, fans, testing instruments etc.
- ✓ Air conditioning charges (sharing of existing air-conditioning system)
- ✓ UPS and generator backup
- ✓ Earthing charges (Tapping from exchange earth bar is allowed)
- ✓ Fire equipment (sharing in case of requirement)

The above charges shall be s.t. the following terms & conditions:

(a) These charges shall be payable annually in advance

(b) Billing cycle shall be from 01-April to 31-March every year i.e. financial year wise billing.

(c) Since energy costs contribute a significant portion of the operations cost the following escalations will be applied to these charges:

- ✓ For every 1% increase in EB tariff, the charge increase will be 0.4%
- ✓ For every 1% increase in Diesel cost, the charge increase will be 0.6%

2(v) **Charges for Co-location of Third Party PoI in TATA's Premises**

In case SWAN TELECOM wants to interconnect with another Operator who is also present in TATA's premises, both operators shall be liable to pay an additional charges equivalent to the applicable charges as specified in (iv) above, over and above the charges already payable for SWAN TELECOM's own PoI with TATA.

2(v) **Charges for Duct Sharing:**

Rs 75 per meter per annum.

2.4 SWAN TELECOM will be required to establish Interconnection at the Switches of AIRTEL. In addition to these specified locations, the Parties may further agree to interconnect at any additional locations as mutually agreed to by and between the Parties during the term of this Agreement.

(4) Interconnection agreement between Bharti Airtel Limited And Swan Telecom Private Limited Dated 19th March 2009 for all circles**.**

5. INTERCONNETION – TECHNICAL ISSUES

5.1 The Parties shall develop their own independent Network with their own transmission links within their respective service areas to carry out their respective obligations under this Agreement.

5.2 For the first two years, provision and augmentation of transmission links (including terminating equipment) interconnecting SWAN TELECOM's network with Airtel's existing Switches as specified in Schedule 1, will be responsibility of SWAN TELECOM and at the cost of SWAN TELECOM. This shall include annual Port Chartes, Lease Lines Charges, Charges for Radio Links, End Links, etc. SWAN TELECOM shall provide its own SDH electronics to be installed within the premises of AIRTEL for provisioning of Interconnect Link, for which SWAN TELECOM shall pay AIRTEL the charges for space, racks etc as specified in Schedule 2.

5.3 In the event SWAN TELECOM has to lease media for the purpose of establishing connectivity with AIRTEL, SWAN TELECOM shall accord first preference to AIRTEL for leasing media, wherever AIRTEL's media is available at a competitive price in order to optimise resources in AIRTEL's Switches where AIRTEL NLDO already has PoI. In case AIRTEL

NLDO's media is unavailable, SWAN TELECOM may lease media from Third Party.

5.4 In case any further PoI, apart from Switch Locations set forth in Schedule 1, is agreed and established between the Parties during the initial period of two years, the cost shall be borne by SWAN TELECOM as per clause 5.2 above.

5.5 In case any new PoI is agreed and established between the Parties after the initial period of two years, the cost shall be borne by both the Parties on the principle that each Pary shall bear the cost of outgoing traffic from its network.

5.6 In case of any further augmentation in the existing PoIs (as per Schedule 1) after the initial period of two years, the cost shall be borne by bother Parties on the principle that each Party shall bear the cost of outgoing traffic from its network.

5.7 At the end of two years, Parties shall convert the total E1s existing at the PoIs into one-way E1s for the Outgoing Traffic of each Party on the basis of the jointly agreed traffic ratio existing 3 months prior to the expiry of the initial period of two years. These E1s shall thereafter be continued as one-way E1s for the remaining term of the Agreement at the cost of SWAN TELECOM.

5.8 The Parties shall identify the total number of E1s functional at the PoI and the ratio of outgoing traffic of each Party 3 months prior to the expiry of the initial period of two years. On the basis of this, the Parties shall calculate the number of E1s required to carry outgoing traffic of each Party as one-way E1s.

5.9 SWAN TELECOM shall facilitate migration of AIRTEL's outgoing traffic onto the identified number of "one-way" E1s in

accordance with clause 5.6 and 5.7 above before the expiry of the initial period of two years.

5.10 In the event, SWAN TELECOM fails to complete the migration of traffic at the PoI onto one-way E1s for both Parties before the expiry of the initial period of two years, AIRTEL shall be entitled and free to take any suitable remedial action including levy Port Charges for an additional period of one year (i.e. third year of commissioning of PoI).

5.11 After completion of two years, each Party shall be entitled to augment capacity for its outgoing traffic using its own fibre/media. Both SWAN TELECOM and Airtel shall facilitate augmentation to each other using their respective media.

5.12 In case SWAN TELECOM is unable to allow Airtel to augment PoI capacity using Airtel media in locations where Airtel's media is available and Airtel has already submitted its written requires for augmentation using Airtel media, SWAN TELECOM shall not claim lease line charges from Airtel for such E1s.

5.13 AIRTEL shall provide space within its premises, the necessary interconnect facilities in its Switch and the necessary infrastructure within its premises viz. air-conditioning, power with backup, etc as per the terms and charges detailed in Schedule 2.

5.14 Arrangements for access, installation and O&M of SWAN TELECOM's equipment located within AIRTEL's premises shall be as per the terms and charges detailed in Schedule 2.

12.1 The Parties agree that all payments and rates for routing of calls, Access Charges, Interconnection Charges, revenue sharing, rates

for Space, Port Charges and other related issues shall be in terms of Schedule 2. The aforesaid charges may be amended form to time in case of change arising out of mutual discussions, amendment by TRAI or by any judicial or Statutory Authority.

SCHEDULE – 2

2 (iii) **Charges for Inter-MSC junctions:**

In case SWAN TELECOM is unable to bring its interconnecting transmission links upto the designated GSMC/MSU of AIRTEL for the purpose of establishing the PoI, AIRTEL may, subject to availability, provide inter-MSC junctions on PCMs from MSC upto which SWAN TELECOM has brought its transmission links upto the location of PoI. SWAN TELECOM agrees to pay AIRTEL media charges as per rates prescribed by TRAI for domestic leased circuits or as mutually agreed. O&M charges for such Inter-MSC junctions shall be mutually agreed.

2 (iv) **Charges for Passive Infrastructure:**

Rs 1,00,000 per bay per annum which shall include the following:

- ✓ Space for one transmission bay (One box of OF termination and DDF as required) basis one rack can house 4 bays.
- ✓ DC power at 48V upto 10A per transmission bay
- ✓ AC power for lights, fans, testing instruments etc.
- ✓ Air conditioning charges (sharing of existing air-conditioning system)
- ✓ UPS and generator backup
- ✓ Earthing charges (Tapping from exchange earth bar is allowed)
- ✓ Fire equipment (sharing in case of requirement)

The above charges shall be s.t. the following terms & conditions:

(a) These charges shall be payable annually in advance

(b) Billing cycle shall be from 01-April to 31-March every year i.e. financial year wise billing.

(c) Since energy costs contribute a significant portion of the operations cost the following escalations will be applied to these charges:

- ✓ For every 1% increase in EB tariff, the charge increase will be 0.4%
- ✓ For every 1% increase in Diesel cost, the charge increase will be 0.6%

2(v) **Charges for Co-location of Third Party PoI in AIRTEL's Premises**

In case SWAN TELECOM wants to interconnect with another Operator who is also present in AIRTEL's premises, both operators shall be liable to pay an additional charges equivalent to the applicable charges as specified in (iv) above, over and above the charges already payable for SWAN TELECOM's own PoI with AIRTEL.

2(v) **Charges for Duct Sharing:**

Rs 75 per meter per annum.

4. Interconect Agreement Between M/S HFCL Infotel Ltd. Vs Bharti Mobile Ltd (Punjab) Dated 26th May 2003

Clause 5. Interconnection – Technical Issues

5.1 The Parties have developed their own independent Network with their own transmission links to carry out their respective obligations under this Agreement.

5.1.1.1 a) Both Parties acknowledge that the transmission links have been established for interconnecting the respective networks on the basis of each Party bearing the cost of its own infrastructure, i.e. transmission links, ports and media, for the purpose of carrying and exchange of traffic. The said traffic shall be handed over at the designated PoIs as specified under

Schedules I and II. The initial capacity of 18 E1s shall be shared equally between the Parties.

d) Both Parties shall provide the space within their respective premises and necessary interconnect facilities in their switch and shall also provide the necessary infrastructure within their premises viz. air-conditioning, power with backup, etc. free of cost. Arrangements and terms & conditions for access or installation, operation and maintenance of such equipment will be arrived at by mutual agreement at respective locations.

6. Access To And Maintenance Of PoIs On the Other Party's Premises

6.1 Each Party (in this clause, "the provider") must make available to the other (in this clause, "the user") all such:

a. access from the street front to the premises in which each PoI is or is to be accommodated under aforesaid clauses; and

b. consents from other people; and

c. facilities and services on the provider's premises,as the user reasonably requires to enable each PoI, and all equipment required to be both located in close proximity and connected to it for the user to provide or receive Services under this agreement, to be safely and securely accommodated and installed, connected to the rest of the user's Network, inspected, worked on and removed as and when reasonably required by the user. The provider must comply with all applicable statutory requirements in meeting its obligations under this clause.

6.6 Neither Party may, as a provider, cause or allow any alteration to its premises that could reasonably be expected to affect the other Party's equipment without the other Party's consent, which may

be given subject to reasonable conditions and must not be unreasonably withheld.

SCHEDULE III: Revenue Sharing and Infrastructure Charges

2. Infrastructure Charges

BML and HITL would set up PoI(s) at HITL switch location(s). The cost of PoI links shall be shared by both the parties in the following manner:

List of Acronyms

Acronym	Expansion
AGCOM	Autorità per le Garanzie nelle Comunicazioni (Italian Telecommunication Regulatory Authority)
ANATEL	National Telecom Agency (Brazil)
ART	Autorité de Régulation des Télécommunications, France
BSNL	Bharat Sanchar Nigam Limited
BSO	Basic Service Operator
CLS	Cable Landing Station
CMA	Communications and Multimedia Act, Malaysia
CMTS	Cellular Mobile Telephone Service
DDF	Digital Distribution Frame
DOT	Department of Telecommunications
DSLAM	Digital Subscriber Line Access Multiplexer
GMSC	Gateway Mobile Switching Center
ILDO	International Long Distance Operator
ITU	International Telecommunication Union
KCC	Korea Communication Commission
LDCA	Long Distance Charging Area
MCMC	Malaysian Communications and Multimedia Commission
MSC	Mobile Switching Center
MTNL	Mahanagar Telephone Nigam Limited
NLD	National Long Distance
NLDO	National Long Distance Operator
NTRA	National Telecom Regulatory Authority, Egypt
O&M	Operation and Maintenance
OF	Optical Fiber
OFTA	Office of the Telecommunications Authority, Hong Kong
OLTE	Optical Line Terminal Equipment
POI	Point of Interconnection
PSU	Public Sector Unit
PTA	Pakistan Telecommunications Authority
RegTP	Regulierungsbehörde für Post und Telekommunikation, Germany
RIO	Reference Interconnection Offer
SDCA	Short Distance Charging Areas
SDH	Synchronous Digital Hierarchy
SSA	Secondary Switching Areas
TAX	Trunk Automatic Exchange
TDSAT	Telecom Dispute Settlement Appellate Tribunal
TRAI	Telecom Regulatory Authority of India

UASL	Unified Access Service License
UASP	Unified Access Service Provider
UCLL	Unbundled Copper Local Loop
UPS	Uninterrupted Power Supply
VESL	Vodafone Essar Spacetel Limited