Consultation Paper No. 2001/2

Telecom Regulatory Authority of India

CONSULTATION PAPER

ON

"INTERNATIONAL LONG DISTANCE SERVICES"

3rd September 2001, New Delhi

Preface

1. Following the announcement under the New Telecom Policy (NTP) 1999 that International Long Distance (ILD) Service would be opened up, the Government has more recently announced that this Service will be opened up for private participation from 1st April, 2002. The Government has sought TRAI's Recommendations on the modalities for opening up of the ILD Service with specific reference to certain key issues. These include terms and conditions of the license, number of players in this field, selection criteria, license fee structure and other license conditions.

2. In our country, liberalization of the telecommunications sector started in the early 1990s. The opening up of Cellular Mobile Service sector was followed by private participation in Basic Service and the National Long Distance Service Sectors. While the liberalization of the ILD Sector raises some issues similar to those arising in these other cases, it also raises certain policy issues specific to the ILD Service. Until some years ago, most countries operated International Services through Government owned monopolies and used the surpluses from this as well as Domestic Long Distance Services to subsidize Basic Services. The situation has now changed in a large number of countries, following adoption by them of other accommodating policies, including tariff re-balancing and more detailed interconnection regime. As we proceed to liberalize the ILD sector in India, here too we need to consider these aspects of the matter. In the area of International Services, some additional policy considerations become very relevant due to aspects such as call-back, bypass and the fact that not all the revenues are generated domestically.

3. The TRAI has identified the following issues as key determinants of the policy regime under which the ILD Service Sector will be liberalized:

(a) Type and nature of competition

(b) Selection criteria

(c) Types of services to be permitted

(d) Terms and conditions of the license

(e) License Fee Structure

(f) Carrier selection, interconnection regime and other technical issues

4. This paper gives information on the existing global scenario regarding the ILD Sector, and provides a background for considering the various policy/operational issues relating to the ILD Sector. Each Section of the paper ends with a list of questions addressing various issues that need to be addressed by TRAI before the recommendations sought by the Government are provided. The objective is to solicit the views of various stakeholders including Service Providers, Consumers, Consumer Organizations or anybody else interested in the subject.

5. Since the Recommendations to the Government are to be made in a time-bound manner, we would like to have the comments and views on any or all issues raised in this paper on or before 30th September, 2001. For further clarifications, Adviser (Fixed Network Division), TRAI may be contacted on telephone number: 6166930. The fax number is 6103294 and e-mail is: trai@del2.vsnl.net.in. Submissions in electronic form would be appreciated.

Sd/-

M. S. Verma

Chairman

New Delhi

3rd September, 2001

LIST OF CONTENTS

INTERNATIONAL LONG DISTANCE CARRIAGE SERVICES

1 INTRODUCTION

1.1 For opening up of the Telecom Service Sector, policy makers generally consider the Local, National Long Distance and International Long

Distance Networks segments as separate entities. The sequence in which these three segments are opened up for private participation varies from country to country. However, a large number of countries have either introduced or are considering to introduce competition in the International Long Distance Service sector, as it is considered to be one of the most lucrative segments of the Telecom Network, where private sector participation can benefit the customer in terms of price reduction and improvement of Quality of Service (QOS).

1.2 In our country, the liberalisation process in the Telecom Service sector started in early 1990s. Liberalisation in the Cellular Mobile preceded that in Basic Services, and the National Long Distance Services (NLD) sector is now being opened up. The Government has now decided to open up the International Long Distance Segment of the Telecom Service sector and has sought Recommendations of TRAI on the issue of ILD License. Annexure I contains the Government's reference to TRAI on this matter, which seeks recommendations on:

a) Terms and conditions of the license
b) Number of players in this field
c) Selection criteria
d) License fee structure

1.3 The Government has already made the policy decision that the International telecom sector will be opened up for private participation. In this context, one of the important questions to be considered will be to examine, what kinds of services may be allowed to be provided by the ILDO. For example, should the ILD License provided under the liberalised environment include in addition to Telephony Services, Lease Line Services and Multi-Media Services including data and video services. Likewise, there is a need to consider the Nature of Competition and Number of ILDO Operators, Conditions for Eligibility and Selection of Operators, License Fee Structure and Technical Aspects.

1.4 Chapter 2 gives information on the Global Scenario, and provides a background for considering the various policy matters raised in this paper. Chapter 3 discusses the issues relating to Terms and conditions of License. Chapter 4 addresses the issue of Level and Nature of Competition, e.g. the number of International Long Distance Service Providers. Selection Criteria are covered in Chapter 5, Chapter 6 discusses the Structure of License Fees, and some technical issues are raised in Chapter 7. Each Section contains at the end a list of questions which address the various policy matters that need to be considered for making policy recommendations with respect to liberalisation of the ILD sector in India.

2. GLOBAL SCENARIO

2.1 This Section provides a background to a number of policy considerations that are relevant to liberalisation of the International Long Distance sector. This background is provided in terms of the global scenario pertaining to these maters. Before proceeding with these details, it would be useful to take a look at the Network statistics of the incumbent Indian international Long Distance Operator, namely, VSNL, which are indicated in the Table 1 below:

TABLE 1. VSNL's Paid Minutes and Network Statistics, 1995-96 to 1999-2000

Sl. No	Item	95-96	96-97	97-98	98-99	99-2000
1.	Telephone Paid Minutes (in Crores)	114.8	138.5	168.5	193.5	224.6
2.	Transit Paid Minutes (in Crores)	0.670	0.524	0.745	0.905	0.427
3.	Number of Internet Users	4151	20042	90042	213045	366432
4.	Number of International Telephone Circuits	12873	14184	15431	17922	19722
5.	Number of High Speed Data Circuits	245	402	603	661	659
6.	Total International Operator's (i..e. VSNL's Revenue (in Rs. Crores)	4473	5285	6436	7176	7230

Source: VSNL Annual Reports

Background

2.2 Until recently most countries operated International Services through Government owned monopolies and used the profits from Long Distance Services to subsidise Basic Services i.e., Local rental and call charges. In many countries such as Japan (KDD), Australia (OTC), India (VSNL), Thailand (CAT), the monopoly ILD Services were operated by an entity different from the National Telecom Operator. In a number of Commonwealth countries, a private company, Cable and Wireless, operated the Services either under license or in partnership with the Government. In our neighbouring countries, such as Myanmar, Sri Lanka and in certain African countries like Zimbabwe etc., the National PSTN Operator also operated the International Services. In the 1990s, when the telecom reform process gained momentum, some countries permitted competition by licensing a second Operator to offer International Services; e.g Satel_Indo (Indonesia 1994), China Unicom (China 2000). In some countries, the incumbent National PSTN Operator was allowed to enter the International market as a second operator e.g., Telstra in Australia; NTT Japan (1998). In some instances, this was done indirectly by enlarging the scope of the licenses of the existing Cellular or PSTN Operator to include ILD Operations like in Zimbabwe and Uganda.

2.3 During the 1990's, particularly in the second half of the decade, there has been a sharp rise in the number of countries that have introduced competition in the ILD sector, and the policy regime has allowed much larger number of operators, including open competition. This can be seen from Table 2 below.

Table 2. Countries Which Have Allowed Competition in the ILD Sector, 1990 to 1998

1990	1995	1998
Japan, New Zealand, UK, USA	Japan, New Zealand, UK, USA Australia, Canada, Columbia, Chile, Denmark, Finland, Korea, Malaysia, Philippines, Sweden	Japan, New Zealand, UK, USA Australia, Canada, Columbia, Chile, Denmark, Finland, Korea, Malaysia, Philippines, Sweden Austria, Belgium, Brunei, DPR Congo, Dominican, Republic, El Salvadore, France, Germany, Ghana, Guatemala, Hong Kong (China), Indonesia, Ireland, Israel, Italy, Mexico, Netherland, Norway, Peru, Russia, Somalia, Spain, Sweden, Switzerland, Uganda, Ukraine
Share of above four countries in ILD originating traffic: 35%	Share of above fourteen countries in ILD originating traffic: 46 %	Share of above thirty nine countries in ILD originating traffic: 74%

Source: ITU

2.4 A number of salient features emerge when we consider the countries that have opened their ILD sector to competition.

(a) Countries that have introduced competition in ILD include both those with large as well as small shares in global international traffic

2.5 Table 3 below shows the top 20 ILD operators in terms of total traffic in 1998. While most of the companies in this list are from countries mentioned in Table 2 above, we also have companies from China, Saudi Arabia, and India, i.e. countries which do not figure in Table 2. The top 20 companies account for a bulk of the global ILD market, and a comparison of Tables 2 and 3 shows that there are several countries in Table 2 which have allowed open competition without necessarily a large presence in world ILD sector.

2.6 Table 3 shows that the Indian ILD operator, VSNL, is also in the top 20 operators of international traffic. This is mainly because of the incoming traffic, which far outweighs the importance of outgoing traffic for VSNL. For a comparison, the top 20 ILD operators in terms of outgoing international traffic are shown in Table 4 below.

TABLE 3. Top 20 International Telecommunication Operators Ranked by 1998 total minutes (outgoing plus incoming) minutes of international telephone traffic

	Operator (Country)	International telephone traffic, minutes 1998						International telecom revenue	
		Both ways		Outgoing		Incoming		Total (US $ m)	Change (97-98)
		Total (m)	Change (97-98)	Total (m)	Change (97-98)	Total (m)	Change (97-98)		
1	AT&T (United States)	15,113	4.0 %	10,452	1.2 %	4,661	11.0 %	7,533	-9.8 %
2	Deutsche Telekom (Germany)	10,747	3.0 %	4,711	-2.1 %	6,036	7.4 %	3,357	-16.4 %
3	MCI WorldCom (United States)	10,257	2.0 %	7,195	-1.6 %	3,062	11.6 %	4,243	-10.5 %
4	France Telecom (France)	7,300	9.0 %	3,400	9.7 %	3,900	8.3 %	1,859	-17.3 %
5	BT (United Kingdom)	6,350	10.2 %	2,710	4.5 %	3,640	14.9 %	924	-14.2 %
6	Telecom Italia (Italy)	5,289	9.5 %	2,339	5.9 %	2,950	12.6 %	1,438	0.6 %
7	Sprint (United States)	4,795	6.4 %	2,916	4.4 %	1,879	9.8 %	1,820	1.1 %
8	DGT (China)	4,212	4.5 %	1,712	4.9 %	2,500	4.2 %	2,200	3.0 %
9	Hongkong Telecom (Hongkong Sar)	3,818	3.8 %	1,718	-2.1 %	2,100	8.2 %	1,995	-17.7 %
10	Tselefonica (Spain)	3,704	16.1 %	1,803	15.1 %	1,901	17.0 %	813	-3.9 %
11	Swisscom (Switzerland)	3,680	-	1,901	-2.9 %	1,779	3.3 %	1,379	2.2 %
12	KPN (Netherlands)	3,443	6.0 %	1,606	4.6 %	1,837	7.3 %	847	-23.6 %
13	Telmex (Mexico)	3,286	-12.8%	880	-12.8%	2,406	-12.8%	879	-24.3 %
14	C&W Comm. (United Kingdom)	2,670	36.2 %	971	27.3 %	1,699	41.8 %	0	36.0 %
15	Belgacom (Belgium)	2,621	0.0 %	1,271	-5.1 %	1,350	5.3 %	548	22.2 %
16	PTA (Austria)	2,270	16.2 %	1,130	13.5 %	1,140	19.0 %	424	2.0 %
17	Singapore Telecom (Singapore)	2,251	25.6 %	1,161	23.2 %	1,090	28.2 %	1,267	7.3 %
18	KDD (Japan)	2,200	3.3 %	1,105	0.2 %	1,095	6.6 %	1,903	-5.0 %
19	Teleglobe (Canada)	1,905	3.1 %	1,145	3.0 %	760	3.2 %	631	-18.3 %
20	VSNL (India)	1,679	21.2 %	422	9.6 %	1,257	25.7 %	1,600	11.8 %
	Top Twenty	**99,062**	**6.0 %**	**51,252**	**2.7 %**	**47,810**	**9.7 %**	**35,660**	**-7.3 %**

Source: ITU for Tables 3 and 4

TABLE 4. Top 20 International Telecommunication Operators Ranked by 1999 minutes of international Outgoing traffic

	Operator (Country)	Fiscal Year	International Outgoing Telephone traffic		International telecom Revenue		
			(Million)	% Change 1998-99	(M US $)	% Change 1998-99	As % of total telecom revenue
1	AT&T (United States)	31 Dec	10,900.0	4.3 %	4,921.0	-7.7 %	7.9 %
2	MCI WorldCom (United States)	31 Dec	8,306.0	15.4 %	3,489.0	27.1 %	8.6 %
3	Deutsche Telekom (Germany)	31 Dec	3,860.0	-18.1 %	1,493.5	-53.1 %	8.0 %
4	Sprint (United States)	31 Dec	3,640.0	24.8%	825.0	-10.5 %	4.1 %
5	France Telecom (France)	31 Dec	3,200.0	-5.9 %	1,333.5	-24.7%	4.6 %
6	BT (United Kingdom)	1 Apr	2,679.0	-3.9 %	1,143.5	-10.9 %	4.6 %
7	Telecom Italia (Italy)	31 Dec	2,390.0	2.2 %	1,359.2	-9.4 %	4.7 %
8	Telefonica (Spain)	31 Dec	1,935.0	14.5 %	836.4	7.8 %	3.4 %
9	China Telecom (China)	31 Dec	1,760.0	2.8 %	1,703.5	-26.2 %	6.2 %
10	Hongkong Telecom (Hongkong Sar)	1 Apr	1,668.3	-0.8 %	2,005.7	-17.9 %	55.0 %
11	KPN (Netherlands)	31 Dec	1,625.0	1.6 %	756.5	-6.1 %	7.8 %
12	Swisscom (Switzerland)	31 Dec	1,440.0	-24.3 %	875.3	-2.5 %	11.8 %
13	Belgacom (Belgium)	31 Dec	1,288.0	1.3 %	601.9	-11.5 %	14.6 %
14	PTA (Austria)	31 Dec	1,178.0	4.2 %	386.7	-4.3 %	9.8 %
15	Teleglobe (Canada)	31 Dec	1,130.0	-1.3 %	423.3	-32.8 %	-
16	KDD (Japan)	1 Apr	1,096.2 (1998)	-1.4 %	1,458.8	-19.3 %	27.8 %
17	Telmex (Mexico)	31 Dec	1,063.1	3.9 %	1,206.9	27.2 %	12.0 %
18	Etisalat (United Arab Emirates)	31 Dec	963.3	10.1 %	583.4	14.3 %	34.6 %
19	STC (Saudi Arabia)	31 Dec	932.6 (1998)	16.4 %	-	-	-
20	Chungwa Telecom (Taiwan-china)	30 Jun	897.5	8.7 %	1,303.1	55.4 %	21.2 %
	TOP 20		**51,952**	**2.7 %**	**26,706.2**	**-10.3 %**	

(b) A policy of open competition does not necessarily imply a large number of operators

2.7 The fact that the policy regime allows open competition does not necessarily imply induction of a large number of ILD operators in this sector. Table 5 below shows that the number of ILD operators may be similar for both those countries which have allowed open competition and others. Hence, it is noteworthy that the number of operators depends not only on the policy regarding open competition but also on economic factors, such as the market size, and the terms and conditions of entry and operation.

Table 5. Number of International Long Distance Operators with significant market share in some countries

Country	No. of Operators	Name of Operator
Australia	2	Telstra, Optus
China	2	China Telecom; China Unicom
Korea	3	Korea Telecom DACOM Corporation ONSE Telecom
Japan	3	Kokusai Denshin Denwa Co Ltd., (KDD) International Telecom Japan Inc (ITJ) International Digital Communications Sinc (IDC)
UK	3	British Telecommunications plc, C&W Comm, Kingston Communication (Hull) plc
USA	5	AT&T, MCI Worldcom, Sprint, WorldxChange, Pacific Gateway Exchange Inc.
Indonesia	2	PT Indosat ; PT Satelindo

Source: APT Handbook and ITU

2.8 Another noteworthy feature in this regard is that even if the number of licensees may be large, the actual number of service providers are not as many. For instance, if we consider the situation in the European Union, as on 1st August 1999, there were 490 Operators authorised to offer International

Network Services, but only 187 were actually offering these services (please see Table 6 below)

TABLE 6. Network Operators and Service Providers with license for International Long Distance Services in European Union as on 1st August 1999 and providing one or more of the licensed Services

Country	Network Operators and Service Providers authorised to offer Services	Network Operators and Service Providers actually offering one or more Licensed Services
Belgium	25	11
Denmark	4	2
Germany	10	9
Greece	1	1
Spain	14	2
France	15	15
Ireland	21	11
Italy	4	4
Luxemburg	15	4
Netherland	82	63
Austria	33	4
Portugal	10	3
Finland	18	16
Sweden	59	1
UK	179	41

Note : In European countries, there are two type of Licenses i.e., one for facilities based operation and the second only for Service provision. The latter are a kind of resellers of call minutes. In some countries, Operators have common License for all Services.

2.9 Table 6 includes Network Operators who install, manage and operate their own facilities i.e., Transmission and Switching Systems to provide public telephony/ Network services. Service Providers are a kind of resellers, who purchase Network capacity i.e., lease line or minutes of use and offer services to their customers. Operators engaged exclusively in activities like call-back, calling card operators or billing and marketing of International traffic are not included in Table 6. However, in certain countries,

the total number of licensees may be over-estimated as a common license is provided to operators which are allowed to provide a particular service but may plan to remain only in a limited market segment and not provide all the services that the license gives it the flexibility to offer.

(c) Competition is introduced through ILDOs as well as through re-sellers

2.10 As indicated in Table 6, a number of countries have also permitted Resellers or Service Providers in the market. This results in greater competition in certain regions of the country, depending on the number of re-sellers in that region. It also increases the number of the licensees operating in the country to provide International Telecom Service, thus providing greater choice to the customers.

(d) Tariffs have generally declined for international traffic, a tendency that has got enhanced due to greater competition

2.11 In general, enhanced competition also implies reduction in tariffs. For the International telephony sector, this decline has taken place also due to the tariff re-balancing exercise that is underway in a large number of countries. In the European Union, the average price of International Long Distance calls between year 1997 and 2000 has declined by 32% for Residential Users and 34 % for Business users. Within this period in India, which has the same rate for business and residential users, International call charges have declined by 32.8 to 34.7% depending upon the ILD category (geographical slab).

(e) Growth of outgoing minutes of international traffic differs across countries, including those with open competition

2.12 Though there is a general decline in International tariffs, the outgoing International traffic has not necessarily increased for all countries, including some with open competition. This is because the outgoing International traffic depends also on the relative decline in tariffs in different countries, economic

prosperity of a country, and the possibility of call-back due to arbitrage in traffic. Thus, while in general there has been an increase in outgoing calls from countries which have liberalised in recent years, this is not a uniform picture across all such countries (please see Table 7 below).

TABLE 7. Outgoing Minutes in Selected Countries which introduced competition between 1995 and 1998 (in million minutes)

COUNTRY	1995	1998	1999
Austria	901	1250	1178
Belgium	1106	1460	1590
France	2850	4043	4386
Germany	5238	5900	7385
HK (China)	1692	1880	2720
Indonesia	206	310	251
Ireland	407	885	1015
Israel	266	661	804
Italy	1839	2285	2500
Mexico	950	1316	1563
Netherlands	1459	1805	2150
Norway	437	461	567
Peru	63	99	111
Russia	897	1038	1008
Spain	1063	1803	1934
Switzerland	1733	2034	2256

2.13 There are a number of other policy issues which need to be considered in the context of the liberalisation of the International telecom sector. These include, for example, duration of the license, types of “tele” and “bearer” services permitted for the ILD operator, methods of issuing licenses (bidding, beauty parade, any other), whether equal ease of access is available to the subscribers, the evolution of the market share of the incumbent after opening up of the market. These are addressed below.

2.13.1 Duration of the license

The duration of license for International Telecom Service may vary from country to country. For example, New Zealand provides Licenses for

unlimited period. Singapore provides licenses for 10 to 20 years depending upon status as Reseller or Network Operator. Malaysia provides Licenses fo Network facilities, Network Services and Content Application Services for 10 years duration. For application Services it is 5 years.

2.13.2 Types of “tele” and “bearer” services that are allowed for the ILD operator

Bearer services are a type of telecommunication services that provides the capability for the transmission of signals between user-network interfaces. Some of the examples of bearer service include service provided include circuit switched 3.1 KHz audio bearer service; ISDN user access with circuit switched 64 kbit/s unrestricted and circuit switched 3.1 KHz audio bearer services; and 64 kbit/s, 8KHz structured for speech.

Teleservices are a type of telecommunication services that provides complete capability, including terminal equipment functions, for communications between users according to established protocols. It includes telephone, telefax, videotex and videotelephony services.

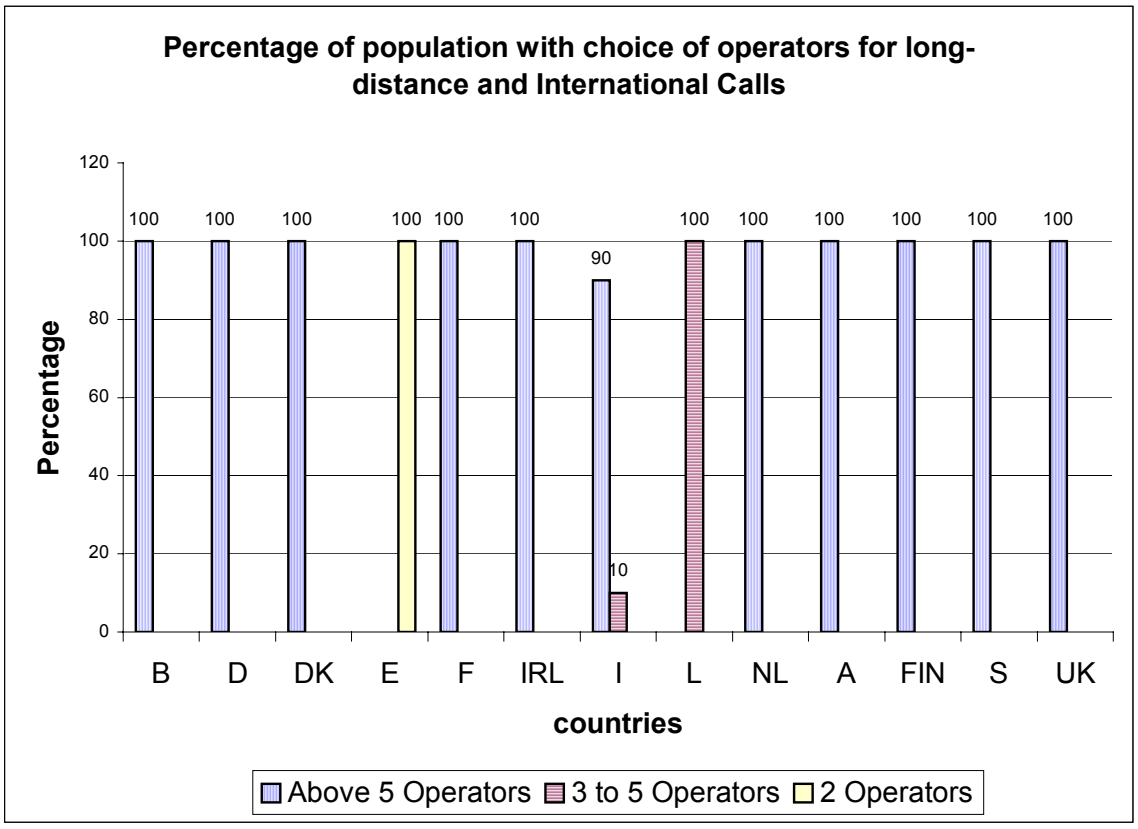
In conjunction with bearer and teleservices, a set of supplementary services like Calling Line Identification, call forwarding, call waiting, advice of charge etc. are also available.

European Union and many other countries allow various types of teleservices and bearer services.

2.13.3 Whether equal ease of access is provided to subscribers

When multiple operators are part of the market, a level playing field requires that the subscribers have equal ease of accessing any of the operators. This may be through dynamic call-by-call selection or through pre-selection of the operators by the subscribers. Experience has shown that

often the incumbent is reluctant to introduce Equal Ease of Access, i.e., he does not favour introduction of additional digits required to be dialled for Carrier Selection as also Pre-selection. However, in India this process is already progressing in the National Long Distance Sector. The issue will have to be tackled also for the ILD sector. The Figure below shows the percentage of population in European Union countries which have choice of selecting more than one International Carrier i.e. percentage of population with Equal Ease of Selection in International Long Distance Services.



Source : EU
Note : Codes and number of operators for the various countries used above are :

a) Above 5 Operators :(Austria), B (Belgium), D (Denmark), DK (Germany), F (France), FIN (Finland), IRL (Ireland), NL(Netherlands), S (Switzerland) and UK (England)

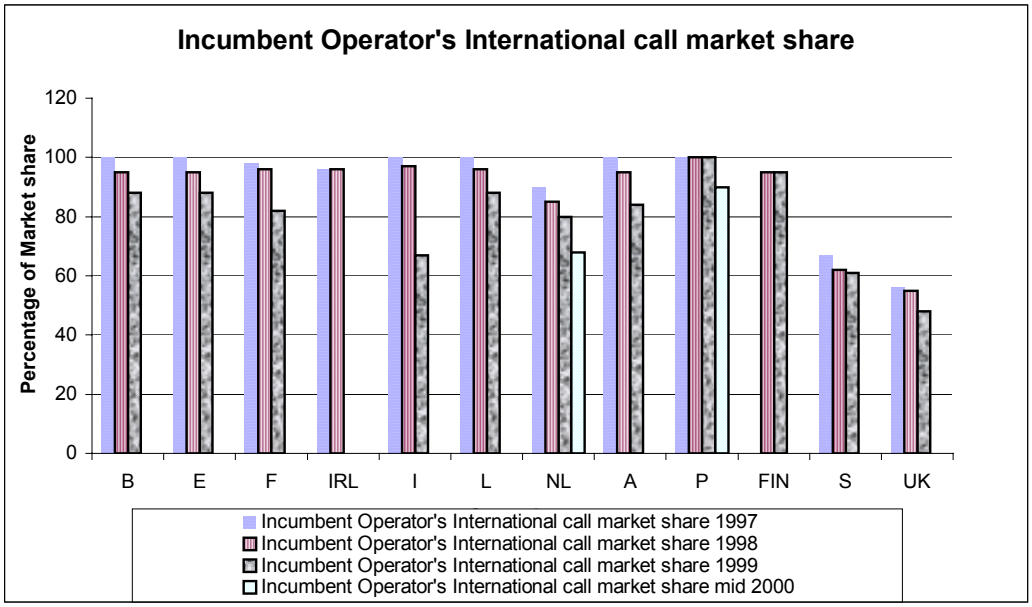
b) 3 to 5 Operators: L (Luxemburg)

c) 2 Operators : E (Spain)

d) For I (Italy), 90% of population is covered by more than 5 operators and balance 10% by 3 to 5 operators.

2.13.4 The evolution of the market share for the incumbent after opening up.

By definition, the market share of the incumbent will fall after the market is opened up. But the extent of this decline can vary, depending on a number of factors, including the time period of market opening and the competitive strategies used by the incumbent. Such differences in market share can be seen in the chart below which provides a view of the Incumbent Operator's market share in International Long Distance Services in years 1997, 1998, 1999 and 2000 (projected) in various countries of European Union. In certain other cases, such as for Hong Kong, Japan, and the United States, the decline in incumbent's market share has been larger than the general picture shown in the figure below.



Source : EU

Codes for the various countries used above are : A (Austria), B (Belgium), D (Denmark), DK (Germany), E (Spain), F (France), FIN (Finland), IRL (Ireland), I (Italy), L (Luxemburg), NL(Netherlands), S (Switzerland) and UK (England)

3. TERMS & CONDITIONS OF LICENSE

3.1 Type of Services and Technologies

3.1.1 In developing countries, including India, more than 90 % of International traffic is at present voice telephony. Volume of telecommunication data traffic is, however, picking up fast. Voice Services through Internet/ packet Networks are also likely to be offered in a big way in the near future, particularly in the developed countries. One important policy issue is whether to give different licenses for Voice and data services or to allow several selected tele and bearer services under the license of International Long Distance Operators. Yet another possibility is to adopt a technology neutral approach and grant the License for bearer Services. Since ILD is essentially a Carriage Service, most of the developed countries have not specified any teleservice, as these Services are mainly derived from the Customer's Premises Equipment (CPE), which is provided by the Access Providers.

3.1.2 Limiting licenses to a specific type of bearer or tele service, may lead to sub-optimal utilisation of the costly International bandwidth if it involves building separate international backbones for different tele services, such as voice, data, video etc. In a highly competitive and rapidly changing technical environment, Operators may find it difficult to prepare optimum business and corporate plans if they are restricted to a particular service or technology. Further, the Licensor and Regulator may find it difficult to monitor violations of the license conditions. On the other hand, proliferation of technologies can lead to difficulties in Interconnection arrangements and maintenance of QOS standards, as some of the nascent technologies do not guarantee Quality of Services for real time traffic generated by voice and video services. Unregulated service without any QOS guarantee on a particular segment of the Network can lead to undesirable commercial practices, and problems for operators who provide end to end Services.

3.1.3 It is worth careful consideration at this stage as to whether existing license formats, which specify Network architecture such as PSTN, PLMN and also protocols such as GSM, CDMA etc, should be adopted for ILD Licenses as well. Issues like fixation of tariffs for such Services, principles to be followed for revenue sharing between Interconnecting Operators etc. also require discussion. While considerable progress has been achieved in addressing these issues for PSTN based circuit switching techniques, there is a need to develop principles and concepts for packet switching (VOIP) technologies, when they are employed to carry real time voice.

3.2 Interconnection and Network Definition

3.2.1 International experience shows that in the ILD market, both Facility based and Non-Facility based Operators have been permitted in a number of countries. The latter are called Re-sellers or Virtual ILDOs. Generally in developing countries where infrastructure availability is restricted, re-sellers as ILDOs were not permitted in the first phase of opening up of the ILD market.

3.2.2 The Interconnnection issues depend on the nature of the Network architecture allowed for ILD Operators. Three possible options in this regard are the following:

a) Configuration I

The scope of International Long Distance Network is defined as consisting of International Gateway Switches, International Circuits and National connectivity to the nearest gateway switch of the NLDOs, as shown in the Figure 'I' in Annexure II.

b) Configuration II

The scope of International Long Distance Network is defined as consisting of International Gateway Switches, International Circuits and National connectivity

to the Access Providers at the Telecom Circles through leased lines, as shown in the Figure 'II' in Annexure II. It would then by-pass the network of NLDOs. This may create some techno-legal problems.

c) **Configuration III [Existing VSNL configuration]**

VSNL, the incumbent International Long Distance Operator has International Gateway switches at all Metro and some other stations like Jallandhar, Ernakulam, Kanpur and Gandhinagar (Ahmedabad). Generally all Level I TAXs have direct Routes to more than one Gateway Switch of VSNL. This may appear similar to a Interconnection with an NLDO. Many of the Level II TAXs also generally have direct routes to at least one Gateway switch based on traffic and techno-economic considerations. This may appear similar to connectivity to BSOs. At present VSNL switches do not have direct connectivity to Cellular Networks. In this approach, we will have to permit installation of International Switches generally at Level I LDCAs i.e., roughly one in each State. This could result in by-passing the NLDO's infrastructure giving rise to legal and regulatory issues.

3.2.3 The present Draft License Agreement for NLD Services does not provide for direct connectivity of ILDOs with Access Providers. NTP'99, however, mentions about such an option. The Draft License Agreement for new BSOs mentions that for International Long Distance call, the BSO shall access International Long Distance Operator through National Long Distance Operator only.

3.2.4 If the ILDOs are permitted to set up multiple gateways and inter-link them, there may not be much difference between the first configurations above. It is also noteworthy that any decision in this regard should be considered for application to VSNL also.

3.2.5 Configuration 'I' above would allow the ILDO to provide Services with a minimum investment i.e. with the establishment of a single gateway switch. All

other facilities could be leased, and as traffic increases, additional gateways could be established. Number of Point of Interconnections at minimum level could be specified as one with each NLDO. As such Roll-out could be immediate and there may not be a need for any mandatory Roll out obligations.

3.2.6 Under configuration 'II' above the ILDO would be able to pick up traffic directly from the Access Providers, by-passing the NLDO, because the ILDO would establish Points of Presence (POP) in all territorial Circles where BSOs and CMSPs are licensed. The ILDO could have various options i.e. to establish POP by leasing transmission capacity from the NLDO/ Infrastructure Providers, or lease both switching and transmission capacity from the NLDO, or to lease switching capacity from NLDO and transmission capacity from Infrastructure Providers, or establish its own infrastructure. In this configuration, there may be a need to have Roll-out obligations along with associated time periods so that advantages of competition to telecom users are not confined to pockets of high revenue generating Telecom Circles only.

3.2.7 Under configuration 'III', the number of Interconnections with the NLDO and Access Provider's switches will depend upon traffic thresholds. For example, if traffic from any Level II TAX station to ILDO justifies direct connectivity with say a minimum of two 2Mb/s streams, the same will be required to be provided by ILDO. For all Level I TAXs, direct Route in any case will be mandatory. In this configuration too, there may be a need to have Roll-out obligations along with associated time periods.

3.3 Time Period of License

3.3.1 Time Frame for the License should be such that it provides an adequate time to achieve a reasonable return of investment and to plan for the disposal of assets. A short license period raises the problem of the disposal of the Network at the end of the license period. The closure of the business may not affect users substantially if other ILDOs take over quickly. However, the Networks may

not be easily disposed off as they are likely to become rapidly obsolescent because of technology change.

3.3.2 Basic and National Long Distance Services are licensed for a period of 20 years, with a provision for extension of the license period. The issue arises whether a similar time period should be provided for ILDOs also.

3.4 The discussion leads to following set of questions:

Question 3a) What are the type of tele and bearer Services that should be permitted as part of ILD License provided under the liberalised environment? Considering the fact that tele services are basically derived from bearer services by the Customer's Premises Equipment (CPE), which is provided by BSOs, is there a need for the ILD licensee to specify tele services? Will it not be adequate, if it specifies certain bearer services and otherwise adopts a neutral approach in so far as specific tele services are concerned?

Question 3b) VSNL has International gateway switches at a few metro cities, such as Mumbai, Delhi, Chennai, Calcutta etc. Will it be the most appropriate architecture when there are multiple ILDOs? Should we mandate a similar architecture for private ILDO?

Question 3c) Three deployment options of Interconnectivity, viz a) with NLDOs only, b) directly with Access Providers, and c) the existing VSNL deployment practice, have been discussed in the Consultation Paper? Which of these or any other should be the preferred option and why?

Question 3d) Should a set of roll out obligations be imposed on ILDOs similar to the pattern of Basic Service and NLD licenses along with associated penalties for non-compliance for establishing Services and POPs?

Question 3e) What should be the license period for an ILD License?

4. Nature of Competition

4.1 Competition in a market depends on the number of players and the flexibility provided to these players to operate in the market. The determinants of competition in ILD may be considered in terms of:

a) Type of competition, that is whether only operators or carriers who own facilities such as switches (POP) be allowed to compete or switchless Re-sellers of International bandwidth shall also be permitted to enter the ILD market as is the practice in developed countries such as USA/ Canada.

b) Level of competition, i.e., whether we permit a limited number of players in the first phase and then open up unlimited competition including Re-sellers in the second phase.

c) Time period for implementing the policy regime for competition.

4.2 Type of Competition (ILD Operators/ Carriers or Re-sellers):

4.2.1 Competition can be introduced either through Facilities-based or Non-Facilities Operators. Facilities based competition involves licensing of Operators, who operate their own facilities. Non-Facilities based competition, would entail competition by Operators who do not operate their own facilities, but lease them from facilities based operators.

4.2.2 Three different entities may be considered in this context.

a) International Long Distance Operators (ILDs), who build their own Network to provide bearer or carriage services to other operators such as NLDOs and Access Providers.

b) Switch based re-sellers, who lease transmission systems from both International/ National Infrastructure providers.

c) Switch-less re-sellers who purchase bulk minutes from International Carriers and offer Services to their customers i.e. they do not have their own transmission system or switching system.

4.2.3 ILDO is essentially a Carrier's Carrier. One policy issue to consider is whether to make it mandatory for the ILDOs to establish switching facilities in the country. For inland facilities, ILDOs can either build their facilities or lease them from Infrastructure Providers.

4.2.4 As far as International links are concerned, the minimum facility required by a facility based ILDO can be an earth station and gateway switch connected to the National/ International Networks. Non-Facility based Operators can lease switch as well as circuit capacity from others, basically selling switched bearer service to other operators such as NLDOs/ BSOs/ CMSOs.

4.2.5 Availability of adequate wholesale capacity with the existing Infrastructure Providers or International Backbone Providers are essential pre-requisites for the introduction of Non-Facilities based competition. International trends show that Re-sellers are generally permitted in more mature markets, where infrastructure is well developed and tele-density is high. The consultation process needs to address the option of whether to permit Re-sellers as the ILD Sector gets opened up, and the appropriate timing of the same.

4.3 Level of Competition

The level of competition depends on the number of operators in a particular market. The number of operators may be pre-determined by the policy-maker in case of limited competition (duopoly/ oligopoly) or left to the market forces, in the case of unlimited competition. The focus in this paper is to determine the policy regime regarding the level of competition, because the

actual number of ILD operators in the market does not necessarily depend only on what the policy permits. This is evident from a comparison of the policy regime and number of ILD operators in various countries, shown in Section two of this paper.

4.3.1 Limited Competition:

We define Limited competition to mean fixing the number of players. This can lead to Duopoly or oligopoly as described below:

4.3.1.1 Duopoly:

A duopoly market structure means only two powerful operators. A number of countries have a duopoly market structure in the first phase of liberalisation of the ILD market. The duopoly market structure limits competition and provides a profitable market to the new entrant. At the same time, by reducing the extent of competitive pressure, the incumbent gets a longer time to adjust to the changed environment. However, the prices tend to remain higher than under a situation of greater competition and this implies a larger burden on the consumer.

4.3.1.2 Oligopoly

In an oligopolistic market structure, normally three or four operators with significant market power are present. The oligopoly market may arise either due to the policy maker specifying that only a limited number of operators will be allowed in the market or because the market may itself give rise to a limited number of operators, under the entry and operating conditions specified by the policy maker.

In the latter situation i.e. where the policy maker does not specify a limit on the number of operators, the focus is not on determining the number of

operators but on the entry and operating conditions. These issues are raised under the sub-section 'Unlimited Competition'.

In oligopoly/ multipoly, the operators face greater competition than duopoly and therefore have lower profit opportunities. The relatively higher competition, however, reduces prices faced by consumers and provides greater incentives to operators for being innovative in terms of their service and price packages.

4.3.2 Unlimited Competition or Multipoly

4.3.2.1 In Unlimited competition, market forces determine the number of players which may lead to multipoly i.e. a large number of players and none of them enjoying a significant market power. The key policy considerations for unlimited competition include specification of entry conditions, performance obligations and operational restrictions. Potential Operators will assess the attractiveness of the options vis-à-vis the obligations and barriers before entering the sector.

4.3.2.2 The main reason to specify the entry conditions is to discourage the entry of operators that are not capable and serious. A disadvantage of such conditions is that entry costs would add to the cost of service provisioning. Also, there is no methodology for fixing the optimal level of entry barriers, which will complement and not oppose market forces. The issue of eligibility criteria is addressed in more detail in the next section.

4.3.2.3 The full competition scenario envisages no entry barriers and licenses are available on demand. In unlimited competition, competitive forces could ensure cost-effective methods of delivering Bearer Services, and passing on the benefits to customers. Competitors could apply innovative techniques to capture market shares. However, unrestricted entry may raise a number of issues pertaining to the viability of Operations, appropriate interconnection regime and regulation of Service Quality and tariffs.

4.4 Time period for implementing the policy regime for competition

There are two possible ways of introducing greater competition. One is to phase-in more and more competition in different stages over time. Another is to allow either unlimited competition or a limited number of ILDOs, say four/ five in the initial phase of opening up the market. While several countries have increased competition in stages, a number have quickly opened up to unlimited competition , as shown by the information in Section two of this paper.

4.5 In the light of the discussions in pre-para, the following questions are brought our for public consultation:

Question 4a) Should it be mandatory for ILDOs to establish switching facilities in the country? Should we go in for facilities based competition only?

Question 4b) Should non-facility based competition be permitted? If yes, what should the terms and conditions for non-facility based Operators or Resellers? Should Resellers be permitted to purchase switched minutes of call time not only from ILD Operators (facility based), but also from NLDOs?

Question: 4c) Should there be limited or unlimited competition? In case of limited competition policy, what should be the mechanism to restrict entries and is it reasonably possible to arrive at the optimum number of operators in the ILD segment?

Question: 4d) If unlimited competition is introduced, should this be phased-in over a specified period or be introduced from the beginning itself?

Question 4e) Should the option of infrastructure leasing include the leasing of switching capacity from NLDOs?

5. SELECTION CRITERION

5.1 The licenses will offer International Long Distance Services exclusivity to the ILDOs for a given time period. Selection can be through a bidding process, or alternatively by prescribing and announcing a set of criteria for selection. Such criteria may include provision of Entry Fee and /or Technical and Roll-out requirements.

5.2 Eligibility Criteria:

5.2.1 Certain eligibility criteria may need to be specified to ensure that non-serious entities do not enter the market. These criteria may focus on various attributes such as those specified for the Basic Services and National Long Distance Operators.

5.2.2 One criteria to consider is whether to allow entry to only those with a proven track record in the field of Telecommunication Services. Similarly sound financial background is another criteria worth considering. Under this criteria, the promoter of a company may be required to have a combined net worth above a particular threshold. Adequacy of experience in the field may also be considered important and thus, for example, it may be required that the applicant or at-least one or some of the constituents of a group or joint venture having a certain percentage of the total equity in the applicant company, should have experience of telecom sector.

5.2.3 An Entry Fee may be considered for the purpose of keeping non-serious players out. Entry Fees get determined by the policy objectives , including the competition strategy adopted for the market. In case of limited competition, Entry Fee may be determined through bidding. In contrast, in the case of unlimited competition, where licenses are available on demand, Entry Fees may be pre-decided amounts, to be paid by all licensees. Alternatively, the Entry Fee could have a linkage to the expected revenues from the licensee's areas of operations, i.e. it may be fixed considering the market potential.

5.3 Selection Criteria:

5.3.1 The technical proposal may be evaluated on the basis of various criteria such as ownership parameters, performance record, sector experience, transmission facilities, Points of Presence and other parameters considered relevant by the Licensor/ Regulator.

5.3.2 In case limited competition is to be introduced either through duopoly or oligopoly/ multipoly, a detailed evaluation process should be in place to select and award the stipulated number of licenses. Both the technical and financial proposals will need to be evaluated. After evaluation of the Technical proposals, the qualifiers may be allowed to bid in accordance with a pre-announced bidding methodology.

5.3.3 Another issue requiring some consideration is whether there should be some disabilities/ pre-emptions from participating in the process of obtaining the ILDO License. For example, should parties having acquired the incumbent's (VSNL) equity in the course of its disinvestments, be allowed to bid for this license. The rationale in prescribing the disability would be to avoid conflict of interest as well as concentration of market power.

5.4 In the light of the discussions in this section, the following questions come up for discussion.

Question: 5a) What should be the eligibility criteria? Should it include Financial parameters and minimum experience of ILD operations elsewhere. Should it also include the combined net worth of promoters above a particular threshold, a minimum percentage of stake in the total equity, a stipulated number of years of experience in Telecom Service Sector particularly in Long Distance Operations, or any other criteria?

Question : 5b) In case limited competition is preferred, should the criteria for financial selection include both Entry and Annual License Fees payments?

Question: 5c) Should an Entry Fee be specified or should it be subject to bidding? What should be the optimum level of the Entry Fee if it has to be specified?

Question: 5d) Should the selection criteria include technical parameters? If the answer is in the affirmative, then what parameters should be included and what weightage should be given to the parameters taken into account?

Question: 5e) Should the parties acquiring VSNL equity through the disinvestment process, be permitted to obtain licenses for new ILDOs?

6. STRUCTURE OF THE LICENCE FEES

6.1 General Considerations

A License Fee having one or more of the following components may be prescribed:

i) One Time Entry Fee

a) Operators to pay a Fixed Entry Fee to obtain a license.
b) Entry Fee may be linked to roll-out performance

ii) An Annual License Fee

An annual License Fee based on a percentage of Gross collected Revenue less 'pass-through' revenue is payable

(iii) USO Levy

USO levy is also applied, either separately or as part of the annual License Fee.

The details of these components may need to be determined by the policy maker.

6.2 Factors important for consideration of the License Fee Structure relating to ILD licenses

6.2.1 Till full tariff re-balancing takes place, the International Services will generally be the most remunerative part of the telecom business. The opportunity for business development in the ILD sector is also higher, since a number of advanced Services are often available with a matching clientele.

However the business scenario is changing with an increase in competition in the sector, and a decrease in tariff for International calls.

6.2.2 The above factors are relevant in a consideration of the Entry Fee and Revenue Share License Fee for ILDO.

6.3 Estimating Gross Revenues for License Fee

6.3.1 A definition of adjusted gross revenue for determining License Fee has already been arrived at in the case of revenue sharing arrangements of NLD operators. This is the gross collected revenue of the Operator for all licensed activities less the deductions on account of 'pass through' revenue.

6.3.2 This approach, however, is inapplicable in the case of incoming International calls, because these calls emanate from the Operators in other countries, and calculating the relevant revenue from these calls may not be a straight forward exercise. Incoming traffic to India is higher than outgoing traffic. The settlement regime through accounting rate mechanisms also do not provide any reliable estimate of total revenues. Call back and Reverse Call revenues introduce additional complications. For example, it may be possible for an ILDO in India to enter into a bi-lateral settlement agreement with a remote International Operator and thus maximise the amount retained abroad and minimise the payment to the Indian ILDO.

6.3.3 Based on the above, there may be a need to treat outgoing call revenues separately from incoming call revenues . The License Fee could be applied separately for these two type of revenues. For the incoming part, traffic could, for example, be measured and settlement worked out on the basis of the standard accounting rates arrived at between VSNL and the other Operators, or some other alternate formula. One such possibility is the payment of a fixed license fee on each unit of incoming call minutes.

6.4 Questions

The following questions emerge from the foregoing discussions:

Question 6a) What factors should be taken into account while determining the License Fee for ILD operations?

Question 6b) How should License Fee be estimated? For example, should it be a certain percentage of the ILDO's revenue? Whether this percentage should be the same as was fixed for NLD Services?

Question 6c) How should the revenue on incoming calls be determined and included in gross revenue of the ILDO for the purpose of arriving at the license fee payable by the operator?

7. TECHNICAL

7.1 All Long Distance Carriers i.e., both National and International, are examining the technical feasibility of deploying VOIP techniques based on packet switching instead of PSTN or circuit switching techniques in their Backbone Network, because of the possibility of sharing the same IP Backbone for both data and voice. Although this may be effectively implemented in developing countries after a longer period, in developed countries, the data traffic is about to overtake voice traffic. The possibility of transmitting voice over IP-based Networks, with the associated opportunities, such as voice and data integration, constitutes a milestone in the convergence of the communication sector. The key issue is that IP-based Networks, are increasingly being used as alternatives to the circuit-switched telephone Networks and the likelihood of ILDOs deploying this technology in their Network has to be taken into account. We discuss the main issues after introducing certain relevant terms in use.

7.2 Terms in Use

7.2.1 Voice-over-IP (VOIP) refers to the transmission of voice, fax and related Services over packet-switched IP-based Networks. VOIP is different from Internet Telephony. VOIP is a technology, whereas Internet telephony is a Service, provided to the public on the Internet. VOIP and Internet telephony are not permitted in India at present.

7.2.2 The Public Internet: (also referred to as the Internet): The global, public, IP-based meta-Network created by the interconnection of many public and private IP-based Networks.

7.3 Issues Relating to VOIP

Greater volumes of IP Telephony now travel over managed, private IP Networks as opposed to the public Internet. It is estimated that the total volume of Voice over Internet Protocol (VOIP) traffic carried over International Networks

in 2000 may have been around 4 billion minutes, or just over 3 per cent of the global total. This percentage is much lower for developing countries. IP based Networks are designed for non real time data traffic and still do not guarantee QOS for voice. Due to its lower Quality of Service, it is not a preferred mode when QOS is an important issue.

7.4 Impact of VOIP on the Public Telecommunication Operator

7.4.1 If telephony via internet or VOIP is allowed, one major impact on Public Telecommunication Operators is likely to be loss of income from International calls, both direct (loss of collection charges) and indirect (loss of settlement payments). There are, however, a growing numbers of public Telecommunication Operators that have chosen to offer IP Telephony Services, even though this may cannibalise their existing revenue streams. These Operators include Telecom Egypt, GamTel (Gambia), Matav (Hungary), Cesky Telecom (Czech Republic) and CAT (Thailand).

7.4.2 Voice over IP (VOIP) gateways can provide not only Basic telephony and Fax Services but will also enable several value-added Services, e.g., call-centers, integrated messaging, least-cost routing etc. These will increase marketing flexibilities and provide additional sources of revenue. However, VOIP gateways are largely proprietary products and they do not inter-work if one operator has one product and the other a different product.

7.5 Interconnection issues

Two issues relating to interconnection are likely to arise.

7.5.1 Carrier Selection

7.5.1.1 The Telecom users could have the option of selecting the ILDO of their choice on the pattern of NLDO option recommended by TRAI. Options available could be Dynamic Carrier Selection (Dial around) in which the Carrier

is selected through a dialling procedure in which '10XY' is to be dialled after '00' and prior to International significant number. 'XY' would represent the selected carrier code. Pre-selection is another option in which the user informs his Access Provider about his choice of the ILDO., and all ILD calls by the user automatically get transferred to the chosen ILDO.

7.5.1.2 To enable the ILDO to collect traffic, the user should be able to express a choice of the carrier. Difficulties, however, arise in permitting a simultaneous choice of the ILDO and NLDO. These difficulties relate to existing limitations in storage and analysis of the additional digits required for Carrier Selection. At present, it is difficult to provide for a selection of the ILDO and the choice would have to be left to the NLDO. National and International services would be offered as a package by the NLDOs. Further studies are being conducted on the possibility of providing a pre-selected choice of the ILDO in addition to a choice of NLDO and should it be possible, additional costs would be involved. If a technical solution can be found, a decision as regards who will bear this cost and in what manner, will have to be taken.

7.5.2 Billing

Differential rates and concessions are likely to be offered by the ILDO, and this has been one reason for giving the responsibility of billing to the ILDO itself. However, various alternatives are available for collecting ILD charges from customers, e.g., collection may be through the NLDO or through the Access provider.

7.6 Based on the discussions of the pre-para, the following questions emerge for public discussion:

Question 7a) Should ILD Operator be permitted to deploy VOIP network instead of PSTN for carriage of International voice traffic?

Question 7b) In case the answer to the previous question is in the affirmative, then how to regulate the Quality of Service on VOIP links? Should a degraded performance on ILD link be acceptable with a reduced tariff?

Question 7c) Whether existing Regulatory frameworks will be adequate for IP based Networks? What QOS standards should be applicable until ITU standards become fully mature?

Question 7d) Whether VOIP based Networks need special considerations on issues like Numbering, Routing, addressing, inter-operability and QOS?

Question 7e) Can ILD operator be allowed to engineer two networks, one based on PSTN with QOS guarantees and other based on VOIP with no QOS guarantee? How to regulate QOS and Interconnection in such a scenario?

Question 7f) Should there be Carrier Selection of ILDO? If yes, what should be the modality of ILD access i.e. pre-selection or dial around or both?

Question 7g) What should be the technical arrangement and responsibilities for Billing for ILD calls? Where should the call data records (CDR) be generated for example, should these be generated by Routers in addition to the Switches?

ANNEXURE 1

No. 10-19/2001-BS-I

Government of India
Ministry of Communications
Department of Telecommunications
Sanchar Bhawan, 20-Ashok Road
New Delhi 110 001.

To
The Secretary,
Telecom Regulatory Authority of India,
Jawahar Vyapar Bhawan, Janpath
New Delhi 110 001. Date: 12.03.2001

Subject: Recommendations of TRAI on the issue of license for International Long Distance Telephone Service – Regarding

The Government has decided to open the International Long Distance Service sector for private participation from April' 2002. For this purpose the Government has to decide the terms and conditions for issue of the license.

In terms of Clause 11(1)(a)(ii) of the TRAI Act 1997, it is requested that the recommendations of the TRAI may be given on the:

b) Terms and conditions of the license
c) Number of players in this field
d) Selection criteria
e) License fee structure

The recommendations should also include other facts of license conditions.

It is further stated that the Government has already decided, except for Cellular services, free and open competition in other services such as National Long Distance service, Basic services, GMPCS etc.

It would be appreciated if TRAI can give the recommendations at the earliest so that new players can be inducted by 1st April 2002.

Yours faithfully,

Sd/
(P.K. Mittal)
Deputy Director General (BS)
Tele: 3710437/FAX: 3372061

Annexure II

All ILD Calls through NLDO only

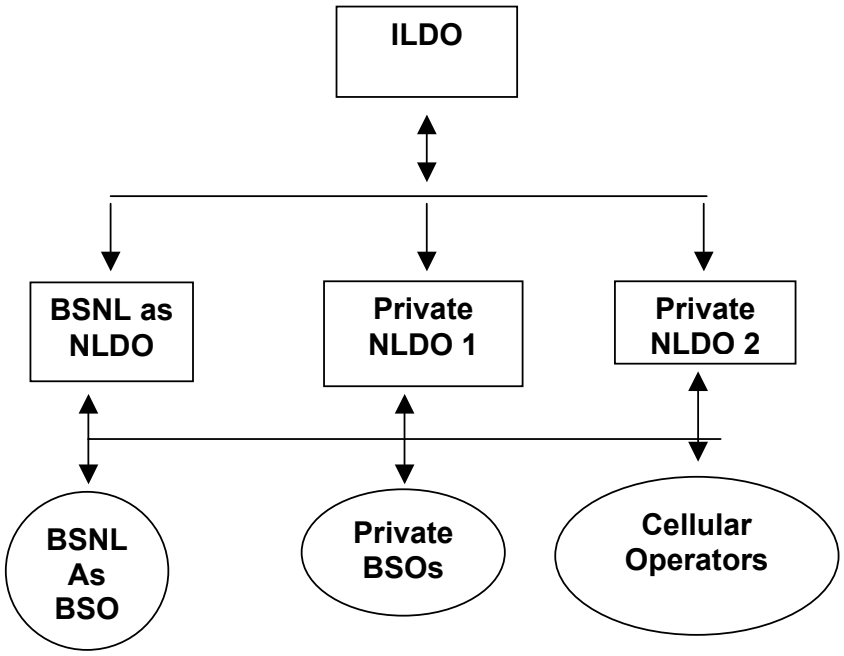


Figure I (Configuration 1)

All ILD calls from APs directly To ILDO **Annexure II**

(Note: This is presently not permitted as per NLD and Basic Service Licence conditions)

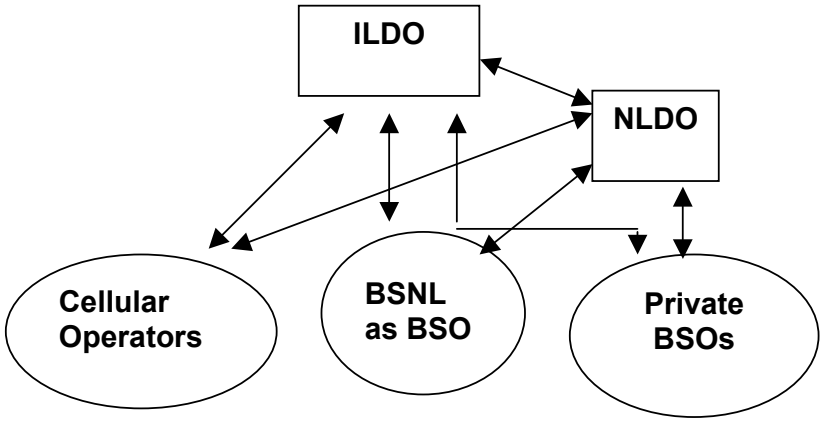
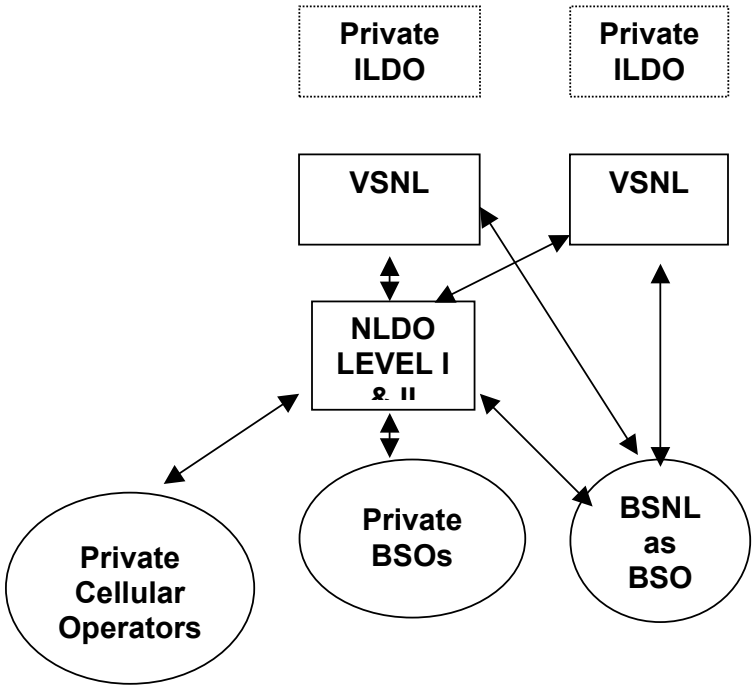


Figure II (Configuration 2)

Present arrangement with VSNL **Annexure II**
(BSNL presently is the NLD) (contd..)



At many Level I Stations

Note: Private ILDOs to be the mirror image of VSNL

Figure III (Configuration 3)