



IDEA CELLULAR LIMITED

**Response for
TRAI Consultation Paper
on
Internet Telephony (VOIP)
Consultation Paper No. 13/2016
Dated: 22.06.2016**

Introduction:

IDEA Cellular Limited (Idea) is surprised by TRAI consultation on Internet Telephony (VoIP). In this regard are core submissions are as under:

A. Not clear on intent behind Internet Telephony consultation

- I. The TRAI consultation aims at provisioning of services that would only be useful for niche number of urban high end customers (who can afford expensive smartphones), while ignoring the need to provide basic voice services to millions of customers. **The Authority would like to note that the current smartphone penetration as a percentage of mobility subscribers in the country is estimated to be only 25 – 30% while the broadband adoption is in low double digits at approximately 12%. Internet Telephony, as of now, would be clearly a service for elites.**
- II. Thus, Internet Telephony would benefit only the urban population that too those who use smartphones and are familiar with the concept of internet telephony. Today these urban internet users are high ARPU consumers of telecom industry. We invest revenue earned from these urban internet users to expand rural voice and broadband coverage. Internet telephony would significantly reduce the revenue from these consumers and would create a large barrier to expand mobile voice and broad band coverage in rural hinterlands of India. **Idea Cellular does not support the introduction of internet telephony which is beneficial for few people but would take away the opportunity to experience high speed internet services from the majority of Indians.**
- III. TRAI is further trying to regulate the price of a service, which is niche and largely unknown. We are unable to comprehend this urgency when contrasted with the fact that TRAI itself has chosen not to regulate the prices of other niche services till they mature, or have failed to take off.
- IV. Critically, we are puzzled by TRAI focus on introduction of Internet Telephony, when the Licensor as well as the Regulator have repeatedly been asking the operators to increase investments on providing good quality voice services and address issues like call drops etc. The Authority seems to be not taking into account the massive disruption and lack of investments which would take place if operators shift their focus in Internet Telephony.

- V. **Naturally the introduction of Internet Telephony cannot be linked with need for more competition.** Indian voice tariffs are acknowledged as one of the lowest globally. The Indian telecom space already has 7 – 8 operators per circle offering voice services and the DoT has permitted Virtual Network Operators.
- VI. Since neither enhancing competition nor need of mass customers explain the need for introduction of internet telephony, we are not clear on the purpose or intent of this consultation paper.
- VII. **Thus the TRAI consultation seems to be prompted by the new operators on horizon or even ISPs or unlicensed telecom OTT players who want to access billions of customers without building telecom infrastructure or buying expensive spectrum for participating in telecom Infrastructure build out for making the calls to be terminated in deep rural pockets.**

B. Consultation paper pre-mature - no clarity on "Same Service Same Rules"

Discussion on Internet Telephony, as raised in the consultation paper, is premature since the core issue of OTT Communication Services and corresponding issue of 'SAME SERVICE SAME RULES' by the Licensor and the Authority have not been decided so far.

- I. The Government, TRAI and Telecom Service Providers are bound by the provisions of Indian Telegraph Act, 1885 and TRAI Act of 1997 and the licenses are issued and regulated accordingly.
- II. Thus for provisioning of any telecoms service, the entity providing such service must at least have a license else such service would be illegal under the Indian Telegraph Act, 1885.
- III. The scope of UASL/ CMTS/UL provide for Internet Telephony (VOIP), however the issues like numbering etc. are yet to be decided by the Licensor.
- IV. The TRAI consultation paper has cited examples on various kinds of SIP Calls (like SIP to PSTN, FMT value added service etc.), which, we submit, are forms of 'OTT Communication Services' who are seeking interconnection of their SIP servers with PSTN/PLMN networks. The authority has itself in clause 4.7 on page 23 of the consultation paper has stated *"In case of Internet Telephony, voice services are simply software applications riding over the internet"*.

- V. Further, **the consultation paper has cited various examples of internet telephony** like proposed BSNL FMT (clause 4.3 on page 21), etc. but is very **silent on whether the same complies with the security requirement of the government and the LEA's.**
- VI. **However, the TRAI in its Consultation on OTT and DoT in its Committee report have, inter alia, stated that OTT Communication Services are not presently subject to any regulatory or licensing regime.**
- VII. Thus, for VOIP cases like SIP to PSTN Bridging and FMT value added service, the DoT and the TRAI cannot view such services, being planned by OTT Communication providers as 'telecommunication services', since this would require a License.

Hence, it is necessary that the DoT and the TRAI must first bring all such OTT Communication services being provided/ planned through 'Apps' under the ambit of licensing and regulations and follow the principle of "Same Service Same Rules".

C. "VOIP is Content as per TRAI" & hence no consultation can take place on this issue

- I. **TRAI's own regulations on prohibiting differential tariffs for data services based on content, has inter alia, observed that VOIP and Messaging Services Apps are content as per TRAI.**
- II. These regulations define content as follows:
 - a. "(e) "content" includes all content, applications, services and any other data, including its end-point information, that can be accessed or transmitted over the internet;"
- III. **If a TSP intends to offer different rate for any or all such VOIP Apps, then it is barred from doing so under the Prohibition of Discriminatory Tariffs for Data Services Regulations, 2016 dated 8 February 2016.**

TRAI, therefore, cannot treat such VOIP as telecommunication service and hence TRAI has no power under the TRAI Act, 1997 to hold said consultation or pass any regulation in view of the above.

D. Faulty approach - consultation cannot precede a clear definition of concept and common understanding of Internet Telephony / VOIP

- I. The Authority has correctly pointed out that the ICT Sector is developing rapidly. Technological advances are making new services, and new modes of service delivery, possible. However, we are surprised that the TRAI has issued this Consultation Paper without even having a discussion around the concept of “Voice Over Internet Telephony”. It needs to be understood that nowhere has VOIP been defined. Even the license only mentions “Internet Telephony” which is naturally not the same as Voice over Internet Telephony. The authority through the clause 1.5 on page 2 of the consultation paper has also indicated the same concern by stating *“The terms “IP Telephony”, “VoIP”, Internet Telephony and other variants often generates confusion as there are many different definitions used by various organizations. Some use them interchangeably while others give them distinct definitions. Further confusion is caused by using the terms to refer to both the IP-based technologies and the services that are enabled by these technologies”.* Hence the need is to first have a discussion and common understanding around the concept of VOIP before proceeding with discussion on the other aspects to make it possible.

- II. Currently there is lack of clarity on critical issues on the concept of the Internet Telephony and its interconnect / network architecture and numbering/ routing etc. and hence before any further consultation w.r.t Interconnection, licensing conditions and Interconnect Usage Charges (IUC) take place, clarity is required on following issues :
 - a) **Network Architecture** - The current Network architecture and interconnection between the PSTN/PLMN networks has well defined architecture; on the other hand, there is no clear architecture which has been laid down for Internet Telephony. PSTN/PLMN networks follow a well-defined call origination, numbering scheme and analysis, call routing and call termination. Although there is a provision of Internet Telephony under the unified license but the architecture for call routing and numbering scheme is yet to be defined.

 - b) **Routing scheme:** In the present scenario, PSTN/PLMN route calls to destination following a well-established hierarchy viz. through local POI in case of a local call, through NLD operator in call of inter LSA call and through ILD operator in case of ISD call. The current regulation mandates that inter circle traffic be carried over through the network of NLD operator and international traffic

through ILD network. However, the Public Internet is a global network which does not recognize these boundaries.

- c) **Roaming:** Networks deployed by Unified Licensee with Access Authorization comply with all the Regulatory and licensing requirements in call scenarios such as calls made or received by subscriber while roaming outside home LSA. But there is no clarity on how these would be taken care of in case of Internet Telephony.
- d) **Numbering Scheme:** The PSTN/PLMN and Internet are two different types of networks. The PSTN/PLMN networks are governed by the standards from organizations like ITU-T/ETSI and 3GPP whereas Internet follows the standards laid down by IANA which is an independent body. Both have evolved differently and follow different addressing schemes. The interconnection between the two networks would require numbering scheme translation, protocol conversion etc. Therefore, the Interconnection between the two networks is a complex issue on which various stakeholders don't have a clear understanding.
- e) **Location of a user cannot be determined from IP address:** In order to frame the interconnection architecture, the location of the calling user needs to be known but the same is not possible in case of Internet accurately. To put it into perspective, SIP servers/gateways can identify the location of the user by the IP address only. But the IP Address itself is not a reliable source of knowing the location of the user. Although bodies like APNIC have tried to regularize the use of IP Address as per the Geo-location but in reality within a country or even internationally IP Addresses are being used without following this scheme as one ISP may allow the use of IP address assigned to it at some other location as well and technology does not restrict the same.

In context of internet telephony or VOIP, calls essentially need to reach the home network or VOIP Application server over the internet. This is based on either fixed domains/IP configured in the App or through FQDN procedure where the Domain is derived by App or UE. Further call processing, routing and accounting is done by the home network or application server of the operator. In case the called party is not from the home network then the call has to pass through the interconnection with operator where call has to terminate. Thus it is very clear internet telephony will have limitation of routing based on location of origin (until the same is initiated from operator controlled network only) and hence, there is high propensity that internet telephony may violate current routing norms. It will be difficult for operators where call is

terminating to determine whether one needs to apply Domestic mobile termination rate or International mobile termination rate.

The authority has also highlighted this concern in clause 4.12 on page 26 of the consultation paper *“The most important issue with Internet Telephony calls is that it is very difficult especially by the terminating operator, to identify the originating network (if same number is used for Internet Telephony and PSTN/PLMN) or country of the call. Difference in termination charge between Internet Telephony and PSTN/PLMN will lead to the possibility of arbitrage and the impact on the market can be substantial. Further, even when a PSTN operator is able to detect Internet Telephony traffic, it may not be able to differentiate between domestic and international Internet Telephony calls”*.

- f) **Licensing conditions for providing Internet Telephony** – As per our understanding of the current licensing conditions, only the CMTS/UASL/UL are allowed to provide unrestricted Internet Telephony, however such licensee is mandated to install telecom switching equipment all the LSAs as per the current licensing condition. Clarity on this aspect is necessary since the Public Internet is not restricted by boundaries of LSA.
- g) **Subscriber Verification & Other Security Requirements:** Further, in case any entity offers the unrestricted Internet Telephony, the said entity providing the Internet telephony will be required to fulfil all security and subscriber verification norms/requirements as is required under CMTS/UASL/UL.

All the above issues need discussion and analysis.

- III. We thus find this consultation paper devoid of logic, written in hurry and incomplete as it does not elaborate the complete frame work of Internet telephony on regulation, cost , national security, number plan and issues concerning Legal Interception & Monitoring. **Without clear principles and robust regulatory framework, internet telephony introduction would be detrimental for the health of telecom industry and national security.**
- IV. **In addition, the TRAI seems to be in a hurry to decide termination charges for class of service for which even the routing and numbering plan are not defined.** In fact the TRAI has devoted considerable pages in consultation to explain as to how the internet telephony works. In this

background it is puzzling indeed that discussion includes issues like termination charges, when even definition of the service and its routing plan is not clear.

- V. **Interconnection charges are based on principle of fair compensation for work done / cost incurred. Historically, the question of cost arises only when the framework of providing the services are clear. However in present case, operators have been asked to provide comments on cost, when even the routing and numbering issues have no finality. The subject of interconnect charges should be addressed through a separate consultation paper only after the framework for provision of services is established and cost can be determined.**

Thus, there is need to first get clarity on the Interconnect/network architecture before the costing with respect to the Interconnect Usage Charges (IUC) for Internet Telephony can be responded to. In any case, the current Mobile Termination Charges and Fixed Termination Charges being below cost is a subject matter of our appeal at Honourable High Court of Gujarat. Hence, we request that no discussion on any element related to IUC cost should be reinitiated prior to final decision on the same.

E. No immediate need to introduce unrestricted Internet Telephony

- I. The subscribers today have a wide choice of services on voice platform with all operators focussing on increasing investments for voice business and to improve customer experience. Besides GSM and CDMA technology, the operators are in the process of launching 3G mobile broadband with voice platform and 4G high speed data services with voice to be served on 'Voice over LTE (VoLTE)'. Thus, consumer has choices of voice delivery on 2G, 3G and 4G, besides fixed line services.
- II. In addition, we would like to submit that any voice call whether delivered on circuit switching or packet switching (VoIP) or by way of any other technology would still be a voice call and cannot be distinguished due to the different technologies used. Circuit switched network or packet switched network is only the underlying technology/network architecture on which voice services are provided and is distinct from the data service.
- III. We would further like to submit that the advanced features which are claimed to be offered by Internet Telephony are in fact being provided by TSPs even today through their PSTN and PLMN networks. PSTNs/PLMNs have evolved with time and offer the same or better features such as

efficiency, high definition voice codecs etc. as claimed to be offered by Internet Telephony. Along with the advanced features they possess the following advantages over the Internet Telephony:

- a. Guaranteed QoS as mandated by the Regulator
- b. Voice services can be used even without internet connection
- c. Comply with the security requirements as laid down by Government
- d. Full support to Emergency Services
- e. Can be used even on the basic handsets; do not require smartphones

IV. **It is also incorrect to say that VOIP enables network operators, service providers, and consumers to make significant savings, by reducing the underlying costs of a telephone call. Further, it is also erroneous to point out that VOIP uses network resources much more efficiently than conventional telephone service, reducing the costs of providing a call and creating opportunities for regulatory arbitrage that enable TSPs and consumers to reduce or avoid call charges.**

V. **Irrespective of the technology being deployed, i.e. whether one uses Packet Switching based IP networks or Circuit Switching based TDM networks, the cost of carrying a call that a telecom operator incurs includes elements such as:**

1) Operational expenditure in form of

- a. Network expenses which mainly include costs towards Site Rental, Energy and Maintenance (O&M) of sites, etc.
- b. Cost of Acquiring and Servicing customers across 400,000 – 500,000 towns and villages spread over the country.
- c. Manpower and Administrative expenses required to support these services
- d. IT & connectivity cost
- e. Marketing, advertising and other promotional costs.
- f. Government levies such as license fee charges including SUC

2) Costs on account of the huge capital expenditure incurred for creating the necessary telecom infrastructure which includes

- a. Spectrum Amortisation costs over a period of 20 years
- b. Depreciation of capex deployed

3) Return of capital employed

However, without prejudice, even if one were to consider and include only those costs that TRAI considers as relevant, our cost of carrying a call turns out to be 31.3 paise per minute (based on Q1 –FY17 information).

- VI. It is agreed that VOIP is an example of both an innovative and disruptive technology. The Consultation Paper touches upon many complex issues which are both technical and techno commercial in nature while trying to address the topic of VOIP. Each of the issues has different impact and solution for different category of operators. **It is imperative that before advocating or jumping into complete network technologies transformation, true market conditions, smartphone adoption rate among different economic strata of consumers, be taken into consideration so as to ensure that critical mass of consumer from all strata of economy would be in a position to adopt and benefit from this technology transformation. As highlighted earlier, the current smartphone penetration as a percentage of mobility subscribers in the country is estimated to be only 25 – 30% while the broadband adoption is in low double digits at approximately 12%, indicating low market readiness for the introduction of such technology at this juncture.**
- VII. Further, keeping in mind the needs of millions of customers who still use basic mobile telephony services currently delivered on the 2G platform, it is a matter of social obligation to ensure continued services to these subscribers who are mainly rural or belong to lower strata of society.

F. Consultation based on incomplete understanding of both the evolution of telecom services in India and the importance of voice services

- I. The TRAI Consultation states that operators are reluctant to introduce since VoIP cannibalizes their higher margin voice business. This statement lacks complete understanding of evolution of telecom in India.
- II. **It needs to be considered that the industry has evolved with voice as the main service. Hence, the base cost of the investment was largely allocated to voice business and voice pricing is a reflection of that cost. When data services came to India in a big way post the allocation of 3G**

spectrum in 2010, in the interest of growing data business, the data pricing was based on incremental cost of providing data services. Hence, the full cost has been absorbed by the voice business and the data pricing is based on incremental cost. This was workable in an environment where data traffic was a small proportion of the total business. However, with the growth of data traffic, the ability of the voice business to absorb the investments required for data business is constrained.

III. More importantly, with the advent of VOIP services, the voice business which was absorbing most of the costs of telecom operators will no longer be able to do so. This will result in the following –

- Data prices will have to go up significantly from current levels just to maintain the existing revenue. The difference in customer revenue between a CS call and a VOIP call is quantified below:

	Particulars	Unit	Outgoing	Incoming	Total
1	Voice call on CS network				
	Customer Revenue for 1 minute call	Paise/min.	60	0	60
2	VOIP call as data traffic				
a.	Data Usage per minute of call	MB / min	0.15	0.15	0.3
b.	Data Tariff per MB	Paise / MB	21.1	21.1	21.1
c.	Consumer Revenue for 1 minute call	Paise/min.	3.17	3.17	6.33
3	Consumer Revenue for CS call / Consumer Revenue for VOIP Call (1/2.c)	Multiple			9.5
4	Equivalent data price to have parity with voice call on CS network (2.b x 3)	Paise / MB			200

- Based on above tariff pattern (which does not provide adequate return to operators in any case), if all the current Voice and SMS traffic was to convert to data traffic on OTT applications, the scenario will be as under using a sample calculation for Rs.100,000 of consumer revenue.

Working for Rs.100,000 consumer revenue						
Service	UOM	Traffic		Tariff (P/unit)	Revenue (Rs.)	% of Revenue
		Current Traffic	Equivalent Data (MB)			
Voice	Minutes	1,27,333	38,200	60	76,400	76%
SMS	Nos.	16,216	29	18.5	3,000	3%
Data	MB	97,630	97,630	21	20,600	21%
Total			1,35,860	74 p/MB	1,00,000	

- IV. It is clear that if data pricing for all services (including VOIP) will be the same, then the current tariffs of Voice (60p / min), SMS (18.5p/SMS) and Data (21p/MB) will have to converge to anywhere between 74 p/MB to 200 p/ MB for data just to maintain the current revenue (Rs. 100,000 in the above example) as shown above. This will have to be increased further to be able to cover the current deficit vis a vis cost of capital.
- V. The objective of “Digital India” is to provide data connectivity to the entire Indian population, including the current bottom of pyramid Indians, so that they can benefit from data access. This data access supports multiple applications including ecommerce, support of payment systems, education, health services and the list is endless. Most importantly, it provides affordable internet access, the benefits of which are well known. The industry is presently supporting rapid growth in data penetration as the data prices are at affordable levels based on incremental costs. However, if there was only one service being data which will fulfil all requirements, then while the voice price per minute may come down, the rate for data will have to be increased from current Rs.0.21/MB to as explained above, making data services unaffordable for a large percentage of Indian population. This will hinder growth of data services.
- VI. Further, current networks of operators have been built mainly for voice (GSM networks). These networks have the widest coverage in the country today. However, if all voice was to convert to data, then significant new investments will have to be made in new data networks, whereas the current large investments in the GSM networks will be wasted to a large extent and will need to

be written off. GSM coverage over 1.3 billion population reaching 500,000 towns and villages is 'National Network' and efforts to disrupt or destroy 'National Assets' will have far reaching consequences to Telecom Financials the debt provided by the Government of India and the Banking sector, along with denting the morale of Indian & Foreign investors who have committed large funds (nearly Rs. 750,000 crores) with commitment of stable policy and regulatory regime.

- VII. **If VOIP service is allowed to spread, either through legalizing the entry by way of licensing, or allowing unlicensed entities to offer the same through apps, etc. then it would lead to rise in data tariffs. We must prevent a single application to negatively impact all other critical and beneficial internet applications.**
- VIII. **In view of the same, we feel that Internet Telephony should only be introduced when broadband penetration is more than 60-70% of subscriber base.**

G. Internet Telephony would destroy Voice business when Stable Voice Revenue stream is key for the future of Mobile data growth

- I. If Internet Telephony is introduced at this juncture, it would necessarily lead to decline of the circuit switched voice and decline of 2G services. Is the death of 2G services desirable at this stage when the voice service are already subsidizing mobile data services (as explained earlier).
- II. Currently, the internet penetration is low in our country and broadband penetration is in low double digits (130 million mobile broadband users as per TRAI release of March 2016). In fact more than 90% of subscribers are today on voice traffic. Further, the current tele-density based on active subscribers (VLR) in the country is approximately 75%. Considering the existence of multiple connections with a single subscriber, the percentage of Indian population currently using basic mobile voice services would be further lower. While the Indian TSPs are actively working to get a higher percentage of Indian population to enjoy the benefits of mobile voice telephony for the first time, the shift to Internet Telephony would cause them to shift their focus to the elite population again. **Does the Regulator intend to deprive the current low income users who are receiving subsidized services in order to support the high end niche customers / global OTT players with no serious financial investments in India?**

- III. Further, the beginning of the last financial year witnessed key regulatory interventions in the mobile voice segment. Reduction in Interconnect Usage Charges from 20 to 14 paise per minutes, sharp drop of 20 – 40% in headline tariffs for Roaming Services and a near 75% decrease in SMS ceiling charges on national roaming resulted in a steep decline of estimated 8 – 10% in the voice realization rates. **As a result, despite volume expansion in voice minutes and addition of 79 million new active subscribers in CY15, the overall mobile voice segment recorded a near zero growth for the first time in the history of Indian mobility sector, with the threat of registering negative growth in coming years.**

- IV. **Given the national imperative to rollout a ubiquitous broadband infrastructure in India, ensuring stable voice revenues for TSPs needs to be an absolute imperative for the Licensor / Regulator, who need to usher in suitable interventions required to stem further decline. However the migration to Internet Telephony would result in massive impact of voice revenues thus impacting future growth of telecom services.**

H. India needs Digital services – However can we allow a single application, VOIP (Voice Over Internet Protocol), to kill all other revolutionary internet applications – the reason for which internet has been built

- I. **The objective of “Digital India” is to provide data connectivity to the entire Indian population, so that they can benefit from data access. This data access supports multiple applications including ecommerce, video, social networking, payment systems, education, health services and the list is endless. Most importantly, it provides affordable internet access, the benefits of which are well known.**

- II. India has a highly penetrated and evolved voice communication service, but needs Digital services for growth in the sectors like Education, Mobile Banking, Health, Governance, Information, E-Commerce, Entertainment, Gaming, etc.

- III. If VOIP service is allowed to spread unhindered, then it would lead to exponential increase in data tariffs. We know that VOIP is not the main application of Internet. We all use internet for much more critical online services such as e-governance, email, medical, services, commerce, education, browsing, IT industry connectivity, social interactions, video services etc. today and in future for introduction of Machine to Machine Services.

IV. However VOIP significantly compromises TSPs ability to offer affordable data services to lower strata and rural India and thus would be the single biggest reason for the rise in data tariffs. This data tariff increase would thus impact other important applications of internet and would jeopardize the real use of internet and prevent the spread of benefits of Internet to the unconnected population of India. We must prevent a single application to negatively impact all other critical and beneficial internet applications, to support creative energy and innovative skills of new entrepreneurs and services arising out of the net.

I. The consultation completely ignores the massive investments made by the existing operators and further threaten to worsen the already dismal state of the industry

- I. It is already well acknowledged that the Indian Telecom sector is amongst the most competitive in the World, and already has amongst one of the lowest tariffs across the World, despite the highest spectrum costs. In such a situation, will the introduction of VOIP, as is being envisaged by the Authority, not act against the interest of the telecom industry that is already reeling under the pressures of huge financial debt and nil or low Return on Investment. As explained earlier internet telephony is not technically more cost efficient, but it appears so because the data services are being provided on incremental cost basis, with voice services absorbing the base cost. There are no precedents anywhere in the world where introduction of internet telephony has reduced the cost or tariffs for voice services.

- II. Further, Telecom Service Providers (TSPs) have committed huge investments in GSM technology, based on the initial license mandate and these investments have been made for larger time horizon specifically since the product life cycles and monetization of equipment requires larger time intervals. It is important to note that the renewal of GSM spectrum based on policy of government has happened recently in the auctions held in Feb'14 and Mar '15 and the industry has invested an amount of ~ Rs. 90,000 crores in renewing the GSM spectrum for 20 years. Most of the investment in equipment is also recent with large investments made to expand coverage to deep corners of the country. GSM as a service is still prevalent even in all developed countries and will continue be the main source of voice services in India for the foreseeable future. Hence, it is of utmost importance that these investments are protected with consistent policies to ensure the financial health of the industry.

- III. The Authority needs to seriously consider as to how the proposed change will help the state of the telecom market in India – Telecom sector is a core infrastructure that helps all economic and social activities, connects different parts of the society and economy, generates employment and directly contributes to GDP growth - we cannot have a situation where the existing operators are already struggling to make profits or break even and new Voice operators are introduced by way of VOIP. The Regulator has already acknowledged that hyper-Competition has created a significant dent in the profitability of some of the telecom service provider. **Thus there exists no business case for allowing standalone unrestricted internet telephony operators.**

J. Only a UL Licensee with full network roll out including last mile connectivity is eligible for internet telephony

- I. **Internet Telephony requires Access Network (Last Mile) of UL/UASL under Licensing Framework**
- I. **The UL (Access Service) provides that any service can be given over Licensee’s network.** Further it is Internet Telephony network of the Licensee which may interconnect with PSTN/PLMN network. License Condition is reproduced below:
- a. *“**Scope of Access Service:** Scope of this authorization covers the following:*
- b. *2.1(a)(i) The Access Service under this authorization covers collection, carriage, transmission and delivery of voice and/or non-voice MESSAGES over Licensee’s network in the designated Service Area. The Licensee can also provide Internet Telephony, Internet Services including IPTV, Broadband Services and triple play i.e. voice, video and data. While providing Internet Telephony service, the Licensee may interconnect Internet Telephony network with PSTN/PLMN/GMPCS network. The Licensee may provide access service, which could be on wireline and / or wireless media with full mobility, limited mobility and fixed wireless access.”*
- II. **UL (Access Services Authorization) and UAS/CMTS License are all ACCESS Licenses.** Only in capacity of ACCESS Licensees, they have been permitted to provide Internet Telephony on their Access Networks. This has been very well explained by TRAI in its 2008 Consultation. **An Internet Telephony session, like a data session, has to originate from device with the Subscriber of that UASL/UL who is providing Internet Telephony and therefrom the routing has to be through the access network of such UASL/UL up to a point after which routing will be on Public Network.**

- III. In other words, even a licensee which is not giving such access network to its subscriber (last mile), cannot provide internet services/internet telephony. Thus a licensee may secure a license, but if it has not set up access network for last mile linkage, cannot be allowed to provide Internet Telephony.
- IV. However, in the current consultation, TRAI has completely ignored the pre-requisite of Access Network (last mile) of UL(Access)/UASL/CMTS for accessing the internet, which includes Internet Telephony. The current consultation only deals with IT infrastructure required for Internet Telephony like SIP System Architecture, User Agent, Registrar etc.
- V. Since the Access Network to Subscriber of UASL/CMTS/UL(Access) has to be given by that UASL/CMTS/UL(Access), this forms an important consideration for any discussion on Internet Telephony.
- VI. Further, for Internet Telephony Service, IP Address is given by the internet service provider to its customer, which address should conform to IP addressing Scheme of Internet Assigned Numbers Authority (IANA) only. An OTT Communication Service (even given by licensee where that licensee does not have access network) cannot further use any number or address to show such OTT Communication Service as Internet Telephony. This will be in breach not only of the numbering plan and routing but also of the license conditions.
- VII. Thus, if TRAI has to consider interconnection issues and other Internet Telephony issues, it can only deal with cases where UASL/CMTS/UL(Access) has its access network to provide internet/internet telephony service to its subscriber and such licensee has given IP address conforming to IANA to its subscriber. Any other case is only of an OTT Communication Service (i.e. without network).
- VIII. The Authority also needs to consider the fact that delivery of Internet telephony is contingent on a robust access network. However, the “last mile” of this access network entails the maximum costs due to high costs of spectrum and equipment, which are incurred by TSPs. Hence, in case of a non TSP offering internet telephony services by riding on the infrastructure created and operated by the TSP, the internet telephony service provider will have to bear only the minimal cost of a license with the TSP bearing the disproportionate burden of costs. In this context, it is just that only TSPs are permitted to offer unrestricted internet telephony. If Internet Telephony Service Provider wants to ride on Mobile Network Infrastructure, a

commensurate per minute charge needs to be compensated to mobile operator for using its 'Access Network' to deliver the call.

Thus in summary:

- Since, neither enhancing competition (India has highest number of operators and has one of the lowest voice tariffs globally) nor need of mass customers explain the need for this consultation paper, we are not clear about the intent or purpose of this consultation.
- Under the current regulatory regime, the nature of VOIP services remains unclear. If Internet Telephony / VOIP is deemed to be equivalent to current voice services, then the principle of "Same Service Same Rules" should be made applicable. On the other hands, if VOIP is considered as "content", then no consultation can take place on the issue.
- TRAI has issued this Consultation Paper without even having a discussion around the concept of "Voice Over Internet Telephony. There is complete lack of clarity on host of critical licensing issues such as Routing, Numbering etc. and hence no discussion on costs can take place without clarity on the same. In absence of a clear definition of concept and common understanding of Internet Telephony / VOIP, the entire consultation process adopted by authority is faulty and akin to putting the cart before the horse.
- The current market realities of the country, including low smartphone and broadband penetration are non-conducive for introduction of Unrestricted Internet Telephony in our country at this stage. Further, this service will serve the interests of only the elites at the cost of compromising extension of voice and broadband services to the masses. Hence, there is no need for introduction of Unrestricted Internet Telephony in our country at this stage.
- Internet Telephony would lead to death of 2G Voice, undermining the massive investments made by existing operators and severely worsen the Industry health. This would result in stagnation of mobile data growth and thwart the vision of Digital India.
- Only the CMTS/UASL/UL licensees, who set up network for last mile access, should be allowed to provide Internet telephony.

- Introduction of unrestricted Internet Telephony should take place when broadband penetration increases to over 70% and benefits should accrue to mass of subscribers and not just elite niche class.
- We have off late seen a trend where while TSPs are obligated to provide interconnect to other licensees without choice, they are being forced to bear losses by providing termination services without full cost recovery, as while spectrum costs have soared, termination charges have been reduced. This is unacceptable.

In view of the above, we request the TRAI to scrap this consultation paper and begin holistic discussion on critical issues as highlighted in our introduction.

Without prejudice to the above, if the Authority still decides to move ahead with the consultation, the we request that our above submissions, may be please be considered as primary response to each of the queries raised. Our additional responses to TRAI queries are as below:

Question 1:

What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?

Idea Response:

Please refer to our submissions in the introduction.

As already submitted, we fail to understand the intent for allowing unrestricted internet telephony when the voice market is already competitive and unable to take on further competition.

However, should the Authority still feel the need for the same, it is critical that only serious players are able to enter the market. Hence, it is imperative that only entities that obtain a UL with authorization for access services be allowed to offer unrestricted internet telephony.

Thus the ISP licensees willing to offer such service :

- Firstly should be asked to migrate to Unified License (Access Authorisation) and
- Pay additional amounts as prescribed under that license to be able to offer Internet Telephony services.
- The ISP or any UL license holder should be allowed to offer internet telephony only on the access network built by them and should ensure that they meet all licensing requirements like Security, numbering, routing etc.
- Any internet service provider who wishes to enter Internet Telephony should bear the cost of Auctioned spectrum used by incumbent operator.

Question 2:

Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?

Idea Response:

The current arrangement of interconnection, dialling and routing plans are time tested and there is no dire need of changing the same, thus should be continued for any kind of Telephony services. Any changes to the same needs to be done by expert committee through proper technical deliberation and not through consultation papers. However, it is important to point out that such deliberation can be done typically post clarity on likely technology to be used and network architecture for different technologies clearly specified.

Please also refer to our submissions in the introduction which clearly depicts lack of many technical aspects which are important to be deliberated and decided before any decision related to internet telephony or VOIP is initiated. There is currently complete lack of clarity on following issues:

- a) **Network Architecture** - The current Network architecture and interconnection between the PSTN/PLMN networks has well defined architecture; on the other hand, there is no clear architecture which has been laid down for Internet Telephony. PSTN/PLMN networks follow a very well defined call origination, numbering scheme and analysis, call routing and call termination. Although there is a provision of Internet Telephony under the unified license but the architecture for call routing and numbering scheme is still to be defined.

- b) **Routing scheme:** In the present scenario, PSTN/PLMN route calls to destination following a well-established hierarchy viz. through local POI in case of a local call, through NLD operator in case of inter LSA call and through ILD operator in case of ISD call. On the other hand Public Internet is a global network which does not recognize these boundaries. It is mandatory that inter circle traffic is carried over through the network of NLD operator and international traffic through ILD network

- c) **Roaming:** Networks deployed by Unified Licensee with Access Authorization comply with all the Regulatory and licensing requirements in call scenarios such as calls made or received by subscriber while roaming outside home LSA. But there is no clarity on how these would be taken care of in case of Internet Telephony.

- d) **Numbering Scheme:** The PSTN/PLMN and Internet are two different types of networks. The PSTN/PLMN networks are governed by the standards from organizations like ITU-T/ETSI and 3GPP whereas Internet follows the standards laid down by IANA which is an independent body. Both have evolved differently and follow different addressing schemes. The interconnection between the two networks would require numbering scheme translation, protocol conversion etc. Therefore, the Interconnection between the two networks is a complex issue on which various stakeholders don't have a clear understanding.

- e) **Location of a user cannot be determined from IP address:** In order to frame the interconnection architecture, the location of the calling user needs to be known but the same is not possible in case of Internet accurately. To put it into perspective, SIP servers/gateways can identify the location of the user by the IP address only. But the IP Address itself is not a reliable source of knowing the location of the user. Although bodies like APNIC have tried to regularize the use of IP Address as per the Geo-location but in reality within a country or even internationally IP Addresses are being used without following this scheme as one ISP may allow the use of IP address assigned to it at some other location as well and technology does not restrict the same.

In context of internet telephony or VOIP, calls essentially need to reach the home network or VOIP Application server over the internet. This is based on either fixed domains/IP configured in the App or through FQDN procedure where the Domain is derived by App or UE. Further call processing, routing and accounting is done by the home network or application server of the operator. In case the called party is not from the home network then the call has to pass through

the interconnection with operator where call has to terminate. Thus it is very clear internet telephony will have limitation of routing based on location of origin (until the same is initiated from operator controlled network only) and hence, there is high propensity that internet telephony may violate current routing norms. It will be difficult for operators where call is terminating to determine whether one needs to apply Domestic mobile termination rate or International mobile termination rate.

Thus, we reiterate that any technical discussion on internet Telephony or Telephony using App needs to be preceded by a discussion on the concept of the VOIP. However, on a conceptual level, any such decisions where the well-defined, time tested and fundamental architecture of Telephony network is being dealt with need to be taken very judiciously and by expert groups.

Question: 3

Whether accessing of telecom services of the TSP by the subscriber through public Internet (internet access of any other TSP) can be construed as extension of fixed line or mobile services of the TSP? Please provide full justification in support of your answer.

Idea Response:

1. **Please refer to our submissions in the introduction which clearly depicts lack of many technical aspects which are important to be deliberated and decided before any decision related to internet telephony or VOIP is initiated. There is currently complete lack of clarity on following issues:**
 - a) Network Architecture
 - b) Routing scheme
 - c) Roaming
 - d) Numbering Scheme
 - e) Location of a user cannot be determined from IP address

2. **Examples given in Consultation lead to additional complexities / violations:** From the Consultation Paper and the BSNL FMT example (clause 4.3 on page 21 of consultation paper), it is evident that in context of internet telephony or VOIP, calls essentially need to reach the home network or VOIP Application server over the internet.

This is based on either fixed domains/IP configured in the App or through FQDN procedure where the Domain is derived by App or UE. Further call processing, routing and accounting is done by the home network or application server of the operator. In case the called party is not from the home network then the call has to pass through the interconnection with operator where call has to terminate. Thus it is very clear internet telephony will have limitation of routing based on location of origin (until the same is initiated from operator controlled network only) and hence, **there is high propensity that internet telephony may violate current routing norms.** It will be difficult for operators where call is terminating to determine whether one needs to apply Domestic mobile termination rate or International mobile termination rate.

3. **Further, we will also like to emphasise that Internet Telephony operators may claim to the possibility of routing calls based on point of origin by customisation in their APP, but as per our understanding, in custom App based solutions these norms are susceptible to tampering / manipulation / malfunction from call to call and there may be no data available in any network element for audit to determine from where the call originated. This can have various security, compliance and financial implications for the Government.**

As there is lack of clarity on :

- 1) technology standards
- 2) Network architectures to be followed
- 3) Possible non-compliance to laid down telecom principles of routing,

It is recommended that internet Telephony over Public WiFi should not be introduced till full clarity on standards and technology is achieved.

4. **However if still the same has to be done under current circumstances where so many questions arising from the Consultation Paper remain unanswered, we feel that internet telephony should be treated as separate category (i.e. neither fixed nor mobile) for the mode of usage where there is a possibility of violation of existing routing norms based on location of origin. And it is recommended that for this category either the IUC to be at the highest bracket i.e. level of termination charges of international calls (@ 53 paise/min) or it can be left for the parties to mutually agree through bilateral interconnect agreement. This will allow the Internet Service Provider to offer Internet Telephony services while compensating the telecom operators for the**

spectrum cost and capital costs incurred by them for establishing nation-wide Mobile Access Network.

Question 4:

Whether present ceiling of transit charge needs to be reviewed? In case it is to be reviewed, please provide cost details and method to calculate transit charge.

Idea Response:

Currently, unified access operators are interconnected to each other and hence there is no specific need for transit of calls, except in cases where BSNL continues to be intransigent about its traffic etc. This current practice has been in vogue for 20 years. No change in circumstances is happening and hence we do not understand the need for review of these charges.

In view of the same, the only other party needing transit may be ISP, that too after they have migrated to UL. It is strongly recommended that ISP migrated to UL may be asked to interconnect like all other operators and no exception be given in this regard.

However if still the same has to be done under current circumstances (where so many unanswered questions arising from the Consultation Paper), the transit charges should be similar to carriage charges permitted under the Present IUC regime viz. ceiling of 35 paise per minute and the actual rate is mutually agreed by the parties.

Question 5:

What should be the termination charge when call is terminating into Internet telephony network?

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Question 6:

What should be the termination charge for the calls originated from Internet Telephony Network and terminated into the wire-line and Wireless Network?

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Question 7:

How to ensure that users of International Internet Telephony calls pay applicable International termination charges?

Idea Response:

TRAI seems to be in a hurry to decide termination charges for class of service for which even the routing and numbering plan are not defined. In fact the TRAI has devoted considerable pages in consultation to explain as to how the internet telephony works. In this background it is puzzling indeed that discussion includes issues like termination charges, when even definition of service is not clear.

Historically, the question of cost arises only when the framework of providing the services are clear. However in present case, operators have been asked to provide comments on cost, when Internet Telephony Network Architecture has not been defined and even the routing and numbering issues have no finality.

TRAI is further trying to regulate the price of a service, which is niche and largely unknown. We are unable to comprehend this urgency when contrasted with the fact that TRAI itself has chosen not to regulate the prices of other niche services till they mature, or have failed to take off.

Please refer to our submissions in the introduction which clearly depicts lack of many technical aspects which are important to be deliberated and decided before any decision related to internet telephony or VOIP is initiated. There is currently complete lack of clarity on following issues:

- a) Network Architecture
- b) Routing scheme
- c) Roaming
- d) Numbering Scheme
- e) Location of a user cannot be determined from IP address

Examples given in Consultation lead to additional complexities / violations: From the Consultation Paper and the BSNL FMT example (clause 4.3 on page 21), it is evident that in context of internet telephony or VOIP, calls essentially need to reach the home network or VOIP Application server over the internet. This is based on either fixed domains/IP configured in the App or through FQDN procedure where the Domain is derived by App or UE.

Further call processing, routing and accounting is done by the home network or application server of the operator. In case the called party is not from the home network then the call has to pass through the interconnection with operator where call has to terminate. **Thus it is very clear internet telephony will have limitation of routing based on location of origin (until the same is initiated from operator controlled network only) and hence, there is high propensity that internet telephony may violate current routing norms.** It will be difficult for operators where call is terminating to determine whether one needs to apply Domestic mobile termination rate or International mobile termination rate. Further, we will also like to emphasise that Internet Telephony operators may claim to the possibility of routing calls based on point of origin by customisation in their APP, but as per our understanding, in custom App based solutions these norms are susceptible to tampering / manipulation / malfunction from call to call and there may be no data available in any network element for audit to determine from where the call originated. This can have various security, compliance and financial implications for the Government.

We have also submitted earlier (in response to Question .No. 3), **that internet telephony should be treated as separate category (i.e. neither fixed nor mobile).**

Under the above cited circumstances, it is recommended that for this category either the IUC to be at the highest bracket i.e. level of termination charges of international calls (@ 53 paise/min) or can be left for the parties to mutually agree through mutually agreed bilateral interconnect agreement.

If in future, a standard technology is prescribed by the expert committee considering compliance to all the routing norms, we would suggest that the cost of termination should be based on actual costs incurred by operators, which as per our calculations happens to be approximately 31.3 paise minute (based on Q1 –FY17 information).

In any case, the current Mobile Termination Charges and Fixed Termination Charges being below cost is a subject matter of our appeal at Honourable High Court of Gujarat. Hence, we request that no discussion on any element related to IUC cost should be reinitiated prior to final decision on the same.

Question 8:

Should an Internet telephony subscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber?

Idea Response:

Going by the examples quoted in the Consultation, it is presumed that Internet Telephony services will be powered by smartphones using data network of TSP or public WiFi network. Hence, typically **Internet telephony subscriber will be able to initiate or receive calls from outside the SDCA, or service area, or maybe even the country using the public Internet facilities. Thus, providing limited mobility to such subscriber may not be practical and** any solution required for enabling such capabilities will be both cumbersome and not fool proof, and should therefore, be avoided.

However this question opens up the fact that regulator is not very clear on the subject of how Internet Telephony will be manifested. Thus, any such decisions where the well-defined, time tested and fundamental architecture of Telephony network is being dealt with need to be taken very judiciously and by expert groups.

Question 9:

Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO?

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Question 10:

What should be the framework for allocation of numbering resource? For Internet Telephony services?

Idea Response:

As highlighted earlier in introduction (please refer to our complete introduction) , Internet Telephony requires Access Network (Last Mile) of UL/UASL under Licensing Framework .

Importantly, as discussed, we firstly require clarity on:

- a) **Network Architecture** - The current Network architecture and interconnection between the PSTN/PLMN networks has well defined architecture; on the other hand, there is no clear architecture which has been laid down for Internet Telephony. PSTN/PLMN networks follow a very well defined call origination, numbering scheme and analysis, call routing and call termination. Although there is a provision of Internet Telephony under the unified license but the architecture for call routing and numbering scheme is still to be defined.
- b) **Routing scheme:** In the present scenario, PSTN/PLMN route calls to destination following a well-established hierarchy viz. through local POI in case of a local call, through NLD operator in case of inter LSA call and through ILD operator in case of ISD call. The current regulation mandates that inter circle traffic be carried over through the network of NLD operator and international traffic through ILD network. However, the Public Internet is a global network which does not recognize these boundaries.
- c) **Roaming:** Networks deployed by Unified Licensee with Access Authorization comply with all the Regulatory and licensing requirements in call scenarios such as calls made or received by subscriber while roaming outside home LSA. But there is no clarity on how these would be taken care of in case of Internet Telephony.
- d) **Numbering Scheme:** The PSTN/PLMN and Internet are two different types of networks. The PSTN/PLMN networks are governed by the standards from organizations like ITU-T/ETSI and 3GPP whereas Internet follows the standards laid down by IANA which is an independent body. Both have evolved differently and follow different addressing schemes. The interconnection between the two networks would require numbering scheme translation, protocol conversion etc. Therefore, the Interconnection between the two networks is a complex issue on which various stakeholders don't have a clear understanding.

Examples given in Consultation lead to additional complexities / violations: From the Consultation Paper and the BSNL FMT example (clause 4.3 on page 21), it is evident that in context of internet telephony or VOIP, calls essentially need to reach the home network or VOIP Application server over the internet. This is based on either fixed domains/IP configured in the App or through FQDN procedure where the Domain is derived by App or UE. Further call processing, routing and accounting is done by the home network or application server of the operator.

In case the called party is not from the home network then the call has to pass through the interconnection with operator where call has to terminate. **Thus it is very clear internet telephony will have limitation of routing based on location of origin (until the same is initiated from operator controlled network only) and hence, there is high propensity that internet telephony may violate current routing norms.**

It will be difficult for operators where call is terminating to determine whether one needs to apply Domestic mobile termination rate or International mobile termination rate. Further, we will also like to emphasise that Internet Telephony operators may claim to the possibility of routing calls based on point of origin by customisation in their APP, but as per our understanding, in custom App based solutions these norms are susceptible to tampering / manipulation / malfunction from call to call and there may be no data available in any network element for audit to determine from where the call originated. This can have various security, compliance and financial implications for the Government.

It is clear that termination of calls may not be always possible using NLDO / ILDO thus it is important that regulator might have to mandate operator to allow calls only for the mode of usage i.e. from operator controlled network only, where routing can be done based on location of origin and it in no way violate the NLDO / ILDO regulation.

This presents a fundamental issue on current licensing structure in India since the very existence of NLD / ILD will come into question and the investments made by such licensees would be at grave risk, along with financial implications for the exchequer.

Thus, any such decisions where the well-defined, time tested and fundamental architecture of Telephony network is being dealt with need to be taken very judiciously and by expert groups.

Question 11:

Whether Number portability should be allowed for Internet Telephony numbers? If yes, what should be the framework?

Idea Response:

This is a hypothetical question at this point of time. Allowing MNP would be one of the last decisions on Internet Telephony. First, the entire concept of Internet telephony, regulations, entry norms, IUC and LI, etc. need to be established. The MNP discussion can happen only once there is clarity on fundamental issues and the networks have matured.

Question 12:

Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?

Idea Response:

Providing Emergency services in VoIP networks is vital to the success of Internet Telephony and cannot be overlooked. It must be kept in mind that Access providers have invested significant amounts to provide toll free emergency services to their subscribers.

It needs to be kept in consideration that the possibility to make emergency calls and to route the call to the nearest authority (fire department, police, hospitals, etc.) has been defined as a core element of Public Available Telephony Services in Europe. Similar requirements are part of regulation in other countries, including ours.

The possibility to provide location information depends on the capability of App used for providing Telephony services, the capability of the UE and the typical location information allowed by OS to be captured by App. These are not fool proof till the operator controls the OS and UE eco system.

It also depends on the technology that will be finally by operator providing internet Telephony and the way the services will be manifested by the operators and solution cannot be suggested without full clarity on Technology to be used for internet Telephony.

However location information to applicable police station in case the call cannot be routed based on location of customer is important should not be overlooked. This is a complex topic, and as suggested earlier, has to be deliberated by the expert committee and can only be determined once clarity on technology and standards to be followed is made available.

Question 13:

In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient?

Idea Response:

This is a mandatory requirement as per regulation and no relaxation can be given as the same is related to public safety and security. The solution is to mandate the same and let the expert technical committee deliberate the same and determine the standards that should be followed by the technology that is used by the Internet Telephony operator.

Question 14:

Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.

Idea Response:

In view of our submissions above, we submit that it is pre-mature to discuss about QoS issues on Internet Telephony till standards and technology for the same are clearly determined.

However as a basic any Telephony services should be falling under the ambit of QoS regulation. Real-time applications set high requirements on the reliability and quality of service capabilities of IP networks.

Typical QoS parameters which impact the voice services over IP are:

1. **Packet loss**, which can cause important parts of a conversation not to arrive at all.
2. **Latency**, which can cause parts of the conversation to take too long to arrive, which confuses callers and causes them to speak at the same time.
3. **Jitter**, or variation in delay, which can garble conversations to the point of unintelligibility.
4. **Guaranteed minimum bit rate**

Protocols, techniques and standards for technology of IP telephony should be evaluated and deliberated by the expert technical committee so that no Internet Telephony operator is allowed to provide substandard quality of service.

Q15.

Any other issue related to the matter of Consultation.

Idea Response:

All the relevant issues have been highlighted by us in the introduction and the same is relevant on responses to each of the questions highlighted above. Thus our comments in introduction need to be considered, discussed and addressed by the Regulator, before taking any decision on the subject of this consultation paper.
