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**STANDING COMMITTEE ON  
INFORMATION TECHNOLOGY  
(2016-17)**

**SIXTEENTH LOK SABHA**

**MINISTRY OF COMMUNICATIONS  
(DEPARTMENT OF TELECOMMUNICATIONS)**

**ISSUES RELATED TO QUALITY OF SERVICES AND REPORTED CALL DROPS**

**THIRTY-EIGHTH REPORT**



**LOK SABHA SECRETARIAT  
NEW DELHI**

*April, 2017/ Chaitra, 1939 (Saka)*

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*Presented to Lok Sabha on 11.04.2017*

*Laid in Rajya Sabha on 11.04.2017*



**LOK SABHA SECRETARIAT**

**NEW DELHI**

*April, 2017/ Chaitra, 1939 (Saka)*

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**COMPOSITION OF THE STANDING COMMITTEE ON INFORMATION TECHNOLOGY**

**(2016-17)**

**Shri Anurag Singh Thakur - Chairperson**

**Lok Sabha**

2. Shri L. K. Advani
3. Shri Prasun Banerjee
- \*4. Shri Harish Dwivedi
5. Dr. Sunil Gaikwad
6. Shri Hemant Tukaram Godse
7. Dr. Anupam Hazra
8. Dr. Jayakumar Jayavardhan
9. Shri P. Karunakaran
10. Shri Virendra Kashyap
11. Shri Harinder Singh Khalsa
12. Shrimati Hema Malini
13. Shri Keshav Prasad Maurya
14. Dr. K.C. Patel
15. Shri Raosaheb Danve Patil
16. Shri Paresh Rawal
17. Dr. (Shrimati) Bharati Shiyal
18. Shri Abhishek Singh
19. Shri D.K. Suresh
20. Shri Ramdas Tadas
21. Shrimati R. Vanaroja

**Rajya Sabha**

22. Shrimati Jaya Bachchan
23. Shri P. Bhattacharya
24. Shri Suresh Gopi
25. Shri Prabhat Jha
26. Shri Santiuse Kujur
27. Shri Derek O'Brien
28. Shrimati Kahkashan Perween
29. Dr. K.V.P. Ramachandra Rao
30. Dr. Vinay P. Sahasrabuddhe
31. Shri Sachin Ramesh Tendulkar

**Secretariat**

1. Shri R.S. Kambo - Additional Secretary
2. Dr. Preeti Srivastava - Joint Secretary
3. Shri Y.M. Kandpal - Director
4. Dr. Sagarika Dash - Additional Director
5. Shri Shangreiso Zimik - Under Secretary

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\* Nominated to the Committee w.e.f. 19.10.2016 vide Bulletin Part-II dated 19.10.2016.

## **Abbreviations**

AGR	Adjusted Gross Revenue
BTS	Base Transceiver Station
CBBH	Cell Bouncing Busy Hour
CoW	Cell-On-Wheels
COAI	Cellular Operators Association of India
CPGRAMS	Centralized Public Grievance Redress and Monitoring System
DG	Diesel Generators
EMF	Electro Magnetic Field
EMR	Electromagnetic Radiation
GSM	Global System for Mobile
IVRS	Interactive Voice Response System
IJRASCT	International Journal for Research in Applied Science and Engineering Technology
IUC	Interconnection Usage Charge
KPI	Key Performance Indicators
LWE	Left Wing Extremist
LSA	Licensed Service Area
LTE	Long Term Evaluation
MNRE	Ministry of New and Renewable Energy
MoUD	Ministry of Urban Development
NLD	National Long Distance
OHD	Open House Discussion
PoI	Points of Interconnection
QoS	Quality of Service
RAN	Radio Access Network
RLT	Radio Linked Timeout
RIO	Reference Interconnect Offer
RESCO	Renewable Energy Service Company
RET	Renewable Energy Technology
RWAs	Resident Welfare Associations
RoW	Right of Way
RTT	Roof Top Towers
SSAs	Secondary Switching Areas
SDCA	Short Distance Charging Area
SPV & SPV-wind hybrid	Solar Photo Voltaic
TDSAT	Telecom Dispute Settlement and Appellate Tribunal
TRAI	Telecom Regulatory Authority of India
TSPs	Telecom Service Providers
TEC	Telecommunication Engineering Centre
TERM	Telecom Enforcement Resource Monitoring
TCBH	Time Consistent Busy Hour

TCH  
USOF  
VSAT  
WOL  
WMO

Traffic Channel  
Universal Service Obligation Fund  
Very Small Aperture Terminal  
Wireless Operating License  
Wireless Monitoring Organization

## INTRODUCTION

I, the Chairperson, Standing Committee on Information Technology (2016-17), having been authorized by the Committee to present the Report on their behalf present the Thirty-eighth Report on 'Issues related to Quality of Services and reported call drops' relating to the Ministry of Communications (Department of Telecommunications).

2. The Standing Committee on Information Technology (2015-16) selected this subject for detailed examination and report to the Parliament. The examination of the subject could not be completed during the term of the Committee (2015-16). In view of the importance of the subject and considering the need for wider consultation, the Standing Committee on Information Technology (2016-17) re-selected the subject for further examination and to complete the unfinished task.

3. During the course of examination of the subject, the Committee took evidence of the representatives of various Telecom Service Providers and organizations, such as Bharti Airtel, Vodafone India Limited, Idea Cellular Limited, Reliance Jio Infocomm Limited, Aircel Limited and Cellular Operators Association of India (COAI). The Committee also took evidence of the representatives of the nodal Department/Regulator *i.e.* the Department of Telecommunications and Telecom Regulatory Authority of India (TRAI).

4. The Committee at their sitting held on 10<sup>th</sup> April, 2017 considered and adopted the Report. The Committee wish to express their thanks to the representatives of the Department of Telecommunications (Ministry of Communications) and TRAI who tendered their evidence before the Committee and furnished the valuable information. The Committee also wish to express their sincere thanks to the representatives of various TSPs/organizations for appearing before the Committee and furnishing written information/views, which was of great help to the Committee in arriving at conclusions.

5. The Committee also place on record their appreciation for the invaluable assistance rendered by the officials of Lok Sabha Secretariat attached to the Committee.

6. For facility of reference and convenience the Observations/Recommendations of the Committee have been printed in bold in Part-II of the Report.

**New Delhi;**  
**10 April, 2017**  

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**20 Chaitra, 1939 (Saka)**

**Shri Anurag Singh Thakur**  
**Chairperson**  
**Standing Committee on**  
**Information Technology**



## REPORT

### PART-I

#### I. Quality of Service Regulations

##### (i) Legal provisions

Quality of Service (QoS) is an important parameter for telecom services. Sub-Clause (v) of clause (b) of sub-section (1) of section 11 of Telecom Regulatory Authority of India Act, 1997 (24 of 1997) mandates the Authority to 'lay down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical survey of such service provided by the service providers so as to protect the interest of the consumers of telecommunication services'. In the discharge of these functions and in order to (i) create conditions for customer satisfaction by making known the quality of service which the service provider is required to provide and the user has a right to expect, (ii) measure the Quality of Service provided by the Service Providers from time to time and to compare them with the benchmarks so as to assess the level of performance; and (iii) to generally protect the interests of consumers of telecommunication services, the TRAI, in exercise of its functions under the above provisions in the TRAI Act, had notified the 'Regulation on Quality of Services (QoS) of Basic and Cellular Mobile Telephone Services, 2000' *vide* Notification dated 5th of July, 2000. The benchmarks for these QoS parameters were to be achieved in three stages *viz.* (i) in the short term before the end of 12 months, (ii) in the medium term before the end of 24 months; and (iii) in the long term of 36 months for cellular and 48 months for basic service operators.

##### (ii) Evolution of QoS Parameters

2. The Quality of Service (QoS) standards in the above regulation were reviewed in 2005, keeping in view the performance of service providers against the QoS standards, the international standards on QoS and utility of the laid down QoS parameters. Based on the review of QoS standards undertaken by the Authority in 2005, the QoS standards

were revised and the revised QoS standards for Basic Service (Wireline) and Basic Service (Wireless) & Cellular Mobile Telephone Service were issued by the Authority on 1<sup>st</sup> July, 2005. In these regulations the parameters for basic service (Wireless) and Cellular Mobile Telephone Service were combined as the Quality of Service aspects associated with wireless medium is common for both the services.

3. After the implementation of the regulations, a need was felt for deletion of some of the parameters as they were no longer relevant in the era of competition and also a need was felt to define each parameter extensively and also to explain the measurement methodology for each parameter so that uniform practice is adopted by all the service providers for measuring, recording and auditing of such parameters. Accordingly, TRAI undertook review of the parameters during the period December 2008 to March 2009 and notified the “The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009.” These regulations are still in force for basic service and cellular mobile service.

4. The Quality of Service 2009 Regulations were first amended on 7<sup>th</sup> May, 2012 through notification of the ‘The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Amendment) Regulations, 2012’. Through these amendment regulations TRAI had notified the Quality of Service standards for 3G services.

5. TRAI further issued “The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Second Amendment) Regulations, 2012” to provide for Financial Disincentives for delay in submission of Compliance Reports, non-compliance with the benchmarks for Quality of Service Parameters and for wrong reporting of QoS performance. These regulations provide financial disincentives for non-compliance with the benchmarks, delay in submission of compliance reports and false reporting. For non-compliance with the benchmarks the

financial disincentive is Rs. 50,000/- per parameter. However in the case of cellular mobile service for network parameters the financial disincentive for second or subsequent non-compliance is Rs. 1,00,000/- per parameter.

6. Subsequently, TRAI reviewed the Quality of Service parameters for basic service (Wireline) keeping in view the practical difficulties expressed by the service providers in meeting the benchmarks and issued 'The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Third Amendment) Regulations, 2014' after rationalizing the benchmark for some of the parameters. At the same time TRAI had tightened the benchmark for some of the parameters concerning call centers so as to protect the interest of the consumers in both basic and cellular services.

7. To create further deterrent against consecutive non-compliance with the benchmarks, TRAI had recently notified 'The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Fourth Amendment) Regulations, 2015' on 15<sup>th</sup> October, 2015 providing for increased Financial Disincentives in cases of repetitive non-compliance, as under:-

- I. Not exceeding Rupees One lakh per parameter for first non-compliance with the benchmark in a quarter,
- II. Non-compliance with the benchmark of the same parameter consecutively in two or more subsequent quarters, not exceeding Rupees One and a half lakhs for second consecutive contravention and not exceeding Rupees Two lakhs for each consecutive contravention thereof;
- III. Non-compliance with the benchmark for the same parameter in any subsequent quarter, which is not a consecutive non-compliance, Rupees One lakh per parameter.

The financial disincentives amounting to Rs. 12.09 Crore has been imposed till 06.09.2016 on various service providers towards non-compliance of Quality of Service benchmarks and other violations out of which Rs. 12.02 Crore has so far been deposited by the Service Providers.

## II. Issue of Call Drops

8. One of the major concerns raised by consumers regarding Quality of Service is call drop. The calls on mobile phones which due to technical reasons get cut off before the speaking parties had finished their conversation and before one of them has hung up, are classified as dropped calls. The user experiences a call drop when the call has been correctly established but is interrupted prior to normal completion by the user. The issue of service providers not meeting standard quality parameters leading to 'call drops' thereby inconveniencing consumers have been in the public domain. Consumers at various fora raised the issue of call drops complaining that their experience of making voice calls has deteriorated. The issue of too frequent call drops annoyed not only the consumers and businesses but also became a major cause of concern for policy makers and Parliamentarians. The Committee also received representations from Members of Parliament on the subject which alleged that some of the service providers used it in specific service areas to garner revenue at the cost of consumers. Telecom Authority Regulatory of India (TRAI) also issued a Consultation Paper on Compensation to Consumers in the event of dropped calls.

### (i) Quality of Service Benchmark for Call Drop

9. The performance of Service Providers on call drop is accessed for both 2G and 3G services through two parameters viz. "*call drop rate (benchmark  $\leq$  2%)*" on monthly average basis for the Licensed Service Area and "*worst affected cells having more than 3% Traffic Channel (TCH) drop/ Circuit Switched Voice drop rate (benchmark  $\leq$  3%).*" Any Cell with TCH drop/Circuit Switched Voice drop rate  $>$  3% is treated as bad cell whose performance is to be improved. The details of the parameters and their benchmarks as applicable now for Basic Service (Wireline) and Cellular Mobile Telephone Services (2G & 3G) are enclosed at **Annexure**.

10. Vodafone India Limited in their submission made to the Committee stated that the network performance of Vodafone is well within the quality of service benchmarks that have been prescribed by TRAI. At the national level their drop call rate is at 0.62% for both 2G and 3G network combined as against the TRAI benchmark of 2%. Vodafone India is working tirelessly to address localised issues especially in congested dense urban areas and all the networks are sharing improved performance with intense focus on optimization. The Network Accessibility Rate is 99.6% and Vodafone has rolled out High Definition Voice in their 2G and 3G networks across all circles giving an enhanced subscriber experience. As a result Vodafone India has been able to deliver significant improvements in Delhi and Mumbai where it was facing significant challenges. For Mumbai Network drop call rate is at 0.61% for 2G and 3G combined and for Delhi Network Drop Call Rate is at 0.72% for 2G and 3G combined.

11. Vodafone further submitted that it is committed to digital India, it is pro-consumer, pro-choice and pro-innovation. It conducts the business in adherence to all applicable regulations and norms and in a manner that creates value for the consumers, the industry and the country.

12. The Cellular Operators Association of India (COAI) submitted that call drops may happen because of several reasons and many of them are beyond the control of TSPs which are classified under Type 1, 2 and 3 and it will be unfair to attribute the reason of call drops solely on the TSPs. There are several challenges being faced by the industry which include issuance of fresh spectrum after license expiry leading to complete re-tuning of network equipment, spectrum interference at their allocated band in J&K, Punjab Circle, unabated disconnection of electricity supplies, sealing of premises, dismantling towers by local authorities, non-adherence of State policies by local authorities, Right of Way (RoW) issues such as protracted delay in approvals for RoW for fibre and the issue of unfounded fears of alleged EMF related issues.

13. COAI further submitted that the problem of call drop which has surfaced in the last 2 years is not a Pan India phenomenon. It is restricted to some of the selected areas wherein the issues such as lack of site availability, lack of RoW permission for in-building solutions, non-operational towers etc., are prevalent.

14. On the issue of quality of service and call drop, Reliance Jio submitted that Jio has revolutionized the Indian telecom landscape by making voice calls for Jio customers absolutely free across India to any network and always. Data charges on Jio network are amongst the lowest in the world. It has created an eco-system comprising network, devices, applications and content service experience and affordable tariffs for everyone to live Jio Digital Life and make India the highest quality, most affordable data market in the world. Jio is committed to improving India’s rank in the Global Broadband Index from 155<sup>th</sup> to within the top 10.

15. The Committee desired to know the current scenario of call drop in the country, to which TRAI in a written note submitted that as per the performance monitoring report for the quarter ending December 2016 for 2G, 3G & 4G VOLTE services being provided by Reliance Jio, all the service providers are meeting the benchmark for the parameter “call drop rate /Circuit Switch Voice drop rate (benchmark  $\leq$  2%)”. However, in the case of the parameter “worst affected cells having more than 3% TCH drop/Circuit Switched Voice drop rate: CBBH (benchmark  $\leq$  3%)”, 16 licensees are not meeting the benchmark in 2G network and 10 licensees are not meeting the benchmark in 3G network. The details are as under:-

Service Provider	Service Area	Performance in % against benchmark of $\leq$ 3%
2G Services		
Aircel	Assam	15.98
	Bihar	12.49

	Delhi	4.15
	Himachal Pradesh	8.63
	Jammu & Kashmir	8.58
	Kerala	3.58
	Mumbai	3.91
	North East	15.02
	Odisha	9.62
	Tamil Nadu	4.14
	West Bengal	9.31
BSNL	West Bengal	14.61
Telenor	Bihar	3.97
	UP E	5.18
Tata CDMA	Kolkata	4.12
Vodafone	Madhya Pradesh	4.44
3G Services		
Aircel	Assam	5.24
	Bihar	7.03
	Jammu & Kashmir	7.95
	Karnataka	3.56
	North East	11.15
	Odisha	8.86
	Punjab	3.65
	Tamil Nadu	6.11
	West Bengal	3.84
BSNL	West Bengal	7.62

16. On an overall position in the service areas the call drop problem is addressed as all the service providers are meeting the benchmark of 2%. However, certain BTSs are experiencing higher call drop and as a result the areas served by these BTSs will be experiencing more call drop. The problem is acute in category - C service areas such as North East, Bihar, Assam, Himachal Pradesh, Jammu & Kashmir and Odisha & also in West Bengal Service area. Also the problem is more in Aircel Network.

17. When the Committee desired to know the criteria for measuring call drop, TRAI in a written note submitted that call drop experience is worst during the busy hours. Therefore, the Quality of Service standards prescribe the minimum performance to be achieved during such periods. For each Licensed Service Area (LSA), the busy hour is

defined as the one hour period when it handles the maximum number of calls. This is called the Time Consistent Busy Hour or TCBH. For the LSA, the maximum permitted call drop rate during TCBH is 2%. Further, for each cell in the service area (*i.e.* at the level of Base Transceiver Station, or BTS) call drop performance is worst when the cell locally experience maximum call rate on any day. This is called the Cell Bouncing Busy Hour (CBBH). The QoS benchmark (for the LSA) is that no more than 3% BTS should exceed 3% call drop during CBBH. In other words, the QoS benchmarks target the worst period for the LSA and the Cell Sites, and prescribe the limits that must not be exceeded. The performance of mobile operators on the both the above parameters are measured for the service area as a whole and averaged for a quarter. This measurement gives a good mechanism of assessment of QoS of entire service area. However, this measurement does not provide information about disparities in performance among different areas or cities.

18. TRAI have also provided formula for calculating dropped call and worst affected cells as under:-

**"(a) Call drop rate**

The measurement can be made via an automatic data collection system, based on the network counters which register the real traffic of the network. The counter is available on the switch or OMC and is recorded 24 hours a day, every day of the years. However, for reporting the performance the measurements have to be taken during TCBH. The formula for calculating the percentage of dropped calls is:

$\frac{(A * 100)}{B}$  where:

B

A = The total number of interrupted calls (dropped calls)

B = The total number of calls successfully established (where traffic channel is allotted)

The formula includes the interrupted calls which consist of failures which cause the dropping of the call once the TCH has been successfully established, and the successful seizure of TCH for an originated or terminated call.



**(b) Worst affected cells having more than 3% TCH drops (call drop rate):**

The reporting of achievement of Quality of Service against the parameter call drop rate does not reveal the extent of number of areas or localities where the call drop rate is worst. Worst affected cells are defined as cells in which the call drop rate exceeds 3% during cell Bouncing Busy Hour (CBBH) or at any other hour of a day. In the consultation paper the benchmark proposed for this parameter is  $\leq 3\%$ .

The formula for calculating the Percentage of worst affected cells having more than 3% TCH drops (call drop rate) is –

Percentage of worst affected cells having more than 3% TCH drops (call drop rate) =  $\frac{\text{No. of worst affected cells having call drop rate } > 3\% \text{ during CBBH in a month}}{\text{Total No. of cells in the licensed service area}} \times 100$

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Total No. of cells in the licensed service area

Cell Bouncing Busy Hour (CBBH) means the one hour period in a day during which a cell in cellular mobile telephone network experiences the maximum traffic."

**(ii) Effectiveness of service level monitoring**

19. The Committee desired to know the basis and rational for service level area monitoring and the feasibility of shifting this into more granular structure monitoring. To this, TRAI informed that they had issued a Consultation Paper on "Review of the network related Quality of Service Standards for Cellular Mobile Telephone Service" on 5<sup>th</sup> August, 2016. Comments were invited from stakeholders on the various issues raised in the Consultation Paper by 2<sup>nd</sup> September, 2016 and Open House Discussions were held at Chennai on 21<sup>st</sup> December, 2016. One of the issues raised in the Consultation Paper is about revision of the measurement methodology for Quality of Service *i.e.* whether Quality of Service should be mandated at sub-service level or not and if so, at what level. Regarding measurement of call drop, comments of stakeholders were sought as to how should the call drop rate calculated – either at the Licensed service area level calculated during TCBH, or calculated during the Cell Bouncing Busy

Hour (CBBH) at BTS level should be the benchmark. The comments and counter comments received during the consultation process are being examined by TRAI. During consultation process the service providers, in general, are not in favor of shifting the measurement from service area to sub-service area level. The issues raised by them in this regard are –

- i. Maintaining uniform quality of services in all the parts of LSA due to various factors are beyond the control of operators.
- ii. No international reference of sub-service area level benchmarking in geography comparable to India is found.
- iii. The problem areas are well identified through the raw data network counters submitted to the Authority and also through regular drive tests.
- iv. The networks are architected for a Service Area and not designed and built on LDCA or District basis. Moreover, there is Lack of availability of digital maps with clearly defined towns.
- v. In case existing DHQs/town/city definitions are considered, this would mean varying size of sub-service area and quantum of BTSs and the parameter averaging being done in a non uniform manner.

20. According to them, Cell Bouncing Busy Hour may vary drastically with various factors like sudden movement of subscribers, any outage etc. Whereas, TCBH accounts for the network performance as a whole not just for a particular cell. Therefore, QoS parameters should be measured at TCBH only. TRAI is examining the inputs of Telecom Service Providers and appropriate decision will be taken in due course."

21. As per the submission of TRAI it is possible to obtain BTS-wise information on call drop. TRAI has been obtaining the information relating to Call Drop BTS-wise from service providers on fortnightly basis. TRAI has recently launched TRAI analytics portal [www.analytics.trai.gov.in](http://www.analytics.trai.gov.in). The information relating to the BTS-wise call drop is depicted graphically on this portal. The TRAI QoS Analytics portal provides a graphical view on the map of India the performance of the 2G service providers on call drop (on all India

level, service area level, district level and Base Transceiver Station(BTS) level), BTS density per square kilometer and network utilisation so that the consumers can have informed choice based on quality of service. As regards BTSs not improved and continue to remain in black spot, TRAI has been monitoring the extent of such BTSs in mobile network in percentage terms. As on September, 2016, there are 665521 BTSs in the country. As such, comparison of performance of each BTS is not undertaken by TRAI regularly. However, TRAI has undertaken an analysis of performance of BTSs of major service providers in Delhi and Mumbai service area for the period July to December, 2016. The details in this regard are given below:

**Delhi:**

<b>Service Provider</b>	<b>Total BTS/Cell</b>	<b>No. of BTSs/Cells having &gt;2% call drop</b>	<b>BTSs/Cells having &gt;2% call drop</b>
Vodafone	22,778	2,370	617
Airtel	18,727	334	124
Aircel	11,742	725	243
Idea	16,013	542	215

**Mumbai:**

<b>Service Provider</b>	<b>Total BTS/Cell</b>	<b>No. of BTSs/Cells having &gt;2% call drop</b>	<b>BTSs/Cells having &gt;2% call drop</b>
Vodafone	10,006	559	224
Airtel	10,022	473	230
Aircel	10,008	568	226
Idea	10,001	221	66

(Ref: Post evidence Replies furnished by TRAI,Q.9)

**(iii) Monitoring of quality of service and call drop**

22. TRAI monitors the performance of service providers through quarterly Performance Monitoring Reports submitted by service providers. TRAI also regularly conducts audit and assessment of the quality of service performance by service providers through independent agencies. The audit involves generation of performance monitoring report, audit of performance and drive test of the network. TRAI had undertaken extensive drive test of the network of service providers in many Secondary Switching Areas (SSAs). The drive test reports have provided detailed information SSA-

wise about the voice quality, coverage and network quality, including call drop. Also, these reports have provided information about areas of insufficient coverage, where the service provider need to improve quality of service. The drive tests reports were shared with service providers for improving Quality of Service.

23. Wherever the quality of service benchmarks are not met TRAI has also been imposing financial disincentives on service providers, for failure to comply with the benchmarks in accordance with the provisions of the regulations.

24. The Committee were further informed by TRAI that apart from closer monitoring of QoS performance, TRAI will be conducting extensive drive tests in cities of more than one million population and in all state capitals through Independent agencies. An exclusive Tender for this purpose will be issued shortly. Operator Assisted Drive Tests of the networks of mobile operators is being/will be conducted in the cities of Mathura, Jaisalmer, Jhansi, Barabanki, Jaipur, Ujjain, Kalyan, Bhopal, Rajkot, Tiruchirapalli, Hyderabad, Mangalore, Mysore, Ansaol, Durgapur, Brdhaman, Guwahati, Dispur, Jamshedpur, NOIDA and Jammu during the period 19<sup>th</sup> January 2017 to 31<sup>st</sup> March 2017. These drive tests will give insight about the Quality of Service performance in these cities and the areas where the performance needs to be improved.

25. About the limitation of Test Drive, Idea Cellular Limited stated that Drive Test and Network probes are meant to provide analysis of limited usage period of the network. For example, Drive test done for a day of 100 kms. in a city will provide analysis of only marginal area of city geography (typically less than 5%) and limited calls (say 250) against millions of calls generated by all users in the city during the day.

26. The present system of assessing Quality of Service benchmark are based on methods like Test Drive and Core Network Probing etc. and consumer feedback is not taken into account. TRAI informed the Committee that seven parameters have been laid down and their benchmarks for assessing customer perception of service. The customer perception of service is assessed through surveys by independent agencies. The results of these surveys are shared with stakeholders for appropriate action. Further, during audit & assessment of quality of service by independent agencies the feedbacks of consumers are also obtained by live calling of customers. In assessing the download and upload speed of wireless data services, TRAI has been receiving the feedback from consumers through the TRAI MySpeed App.

27. Regarding consumer feedback, Secretary, DoT submitted in evidence as under:

"...xxxx... we have established free four digit number 1955 from wherein we reach out to consumers to find out whether they are suffering from poor quality, on the basis of a random sample, or there are dark spots etc. Of the 2 lakh odd customers that have been contacted more than 30,000 have given in the details which are then passed on to the telecom service providers so that they can do improvements in those specific areas. This is something which also seems to be helping in optimising the networks and attending to the most difficult areas".

28. TRAI further informed that they are in the process of assessing customer perception of services through Survey using Interactive Voice Response System (IVRS) in the service areas of Delhi, Madhya Pradesh and Karnataka in Hindi and Kannad language. This survey is being done on a pilot basis as IVRS is being used for the first time for the purpose of Survey. Based on the outcome of this survey, this method of Survey may be extended to other service areas of the country.

**(iv) Factors responsible for call drop**

29. The Department of Telecommunications in their Background Note have submitted that call drop in any mobile network may be due to variety of reasons, which, *inter-alia*, include:

- I. Poor radio coverage :
  - a. Non availability of suitable tower-locations due to acquisition problems;
  - b. Sealing of towers by local authorities/ RWA/ Owners due to EMF/ Other issues –
  - c. Clearance by Government including SACFA
- II. Radio interference due to unauthorized use of repeaters/ Wi-Max frequencies/ at international borders.
- III. Change in pattern of traffic :
  - a. Exponential growth in data traffic due to more use of smart phones which results in Shrinkage of 3G/ 4G cell size.
- IV. Loading of available spectrum :
  - a. Limited spectrum with very high users;
  - b. Towers too close to each other in same band causes interference in 3G/ 4G;
- V. Non availability of 24x7 power resulting in shutdown of tower/BTS;
- VI. Poor RF optimization efforts. Network Optimization is a process through which different soft parameters (BTS power, neighbor definition) and hard parameters (e.g. Electrical Tilt, Mechanical Tilt, Azimuth etc.) of the Base Transceiver Stations (BTS) are changed in order to improve the coverage area and improve quality of signal. Besides there are various Key Performance Indicators (KPI) which have to be constantly monitored and necessary changes carried out in order to keep KPIs in agreed limits;
- VII. Up-gradation of network maintenance tools to International standards; and
- VIII. Inadequate investment in Network causing capacity constraints.

30. To a query on the possible reasons which may cause call drop, TRAI submitted that the reasons for call drop were examined in detail in consultation with the service providers and call drop in a network can occur due to the following reasons:-

- I. Handover failure due to congestion, coverage issues, traffic imbalance between two cell sites and wrong network configuration or wrong neighbour definition;
- II. Co-channel and adjacent channel frequency interference;

- III. Transmission problems due to faulty transceiver (TRX) within the base station or faulty transmission media;
- IV. Hardware related issues, including equipment failure;
- V. Various antenna related issues;
- VI. High difference between uplink signal and downlink signal level due to high transmit power of the BTS, malfunction of the Tower mounted amplifier or BTS amplifier, the antenna at the connector not properly connected leading to call drop at the edge of the coverage area;
- VII. Deficient spectrum availability or non-installation of BTSs by the service providers in keeping up with the growth of the subscriber base;
- VIII. Network tuning issues after changeover of frequencies in the 900 MHz and 1800 MHz bands on the live networks after the recent spectrum auction;
- IX. Closing down of BTS due to local body issues and owner related issues;
- X. Objections and protests by resident welfare associations against installation of mobile towers; and
- XI. Interference due to unauthorised installation of signal boosters by users.

31. Cellular Operators Association of India have also submitted that there are several scenarios which are responsible for the Call Drops in the networks. These scenarios can be classified into four categories as under:-

<b>Type</b>	<b>Reason of call drop</b>	<b>Example</b>	<b>Remarks</b>
Type 1	Call drop attributable to customer alone	Mobile hand-set battery drain	Not linked with Radio failure/radio link remains functional
Type 2	Call drop attributable to customer/network however beyond the control of TSP	Customer in a moving lift	Not linked with Radio failure/radio link remains functional
Type 3	Call drop attributable to network however beyond TSP's control	Site sealed, external interference	Force majeure conditions/external factors beyond control
Type 4	Call drop attributable to network issues	Poor optimization	Internal reasons

32. The Committee desired to know short term and long term measures taken both by the Government and service providers to arrest call drop to which the Department, in a written note informed that the Government have taken a series of policy initiatives which include:

- (i) Allocating additional spectrum through auction in 2016 – 965 MHz has been allocated based on the auction;
- (ii) Permitting Sharing and Trading of allocated Spectrum;
- (iii) Permitting Active and Passive infrastructure sharing;
- (iv) Notifying Indian Telegraph Right of Way Rules, 2016 to regulate underground infrastructure (optical fibre) and over-ground infrastructure (mobile towers);
- (v) Facilitating faster rollout of the mobile BTS by waiving-off the necessity of Wireless Operating License (WOL) for each radio-station;
- (vi) Facilitating the permissions for using the Government buildings and estate for setting up of mobile service towers at required locations on co-sharing basis; etc.

The action taken by Telecom Service Providers (TSPs) include:

- (i) Installation of new BTS sites;
- (ii) Installation of IBS (Indoor building solutions);
- (iii) Expansion of existing sites by adding additional hardware;
- (iv) Resolution of access issue/ locked sites revival;
- (v) Resolution of long powers cuts;
- (vi) Adjusting soft parameters/ neighbour tuning;
- (vii) Use of Self-optimizing Network technology;
- (viii) Regular monitoring of QoS on area-based clusters; and
- (ix) Regular drive tests to identify areas of poor network coverage and redress the same.

33. The Committee were also informed that for addressing the call drop issue & for improving the quality of service TRAI have taken following steps:-

1. Close monitoring of performance of service providers, against the benchmarks for various Quality of Service parameters laid down by TRAI, through periodic reports from service providers.
2. Follow up action with service providers and action plan for improving quality of service, including for Call Drop parameters.



3. Meeting with the service providers at CMD/CEO level to evaluate the performance against action plan including for Call Drop parameters.
4. Imposition of financial disincentives for non-compliance with the benchmarks for Quality of Service parameters.
5. Review of network related Quality of Service parameters and benchmarks for mobile services, including for call drop parameters, to improve quality of experience by consumers.
6. TRAI has recently launched TRAI analytics portal [www.analytics.trai.gov.in](http://www.analytics.trai.gov.in). The TRAI QoS Analytics portal provides a graphical view on the map of India the performance of the 2G service providers on call drop (on all India level, service area level, district level and Base Transceiver Station(BTS) level), BTS density per square kilometer and network utilisation so that the consumers can have informed choice based on quality of service.
7. For addressing Call Drop, TRAI regularly undertakes the drive tests of mobile networks in select cities, highways and railway routes to assess the Quality of Service and coverage around the areas covered in the drive test routes.
8. The results of Drive tests are shared with the service providers for improving Quality of Service and coverage in the areas identified in the Drive Tests.
9. Creation of awareness about EMF radiation so as to allay the fears of Resident Welfares Associations etc, which could facilitate installation of mobile towers in residential areas. This could in turn improve quality of service in these areas. TRAI has been holding Consumer Outreach Programmes in various cities to educate consumers in this regard.
10. TRAI is currently reviewing the measurement methodology and benchmarks for the various network related quality of service parameters for Cellular mobile services. TRAI had already undertaken public consultation process in this regard and appropriate decision in the matter will be taken shortly. A more closer monitoring of the network could help in identifying the problem areas at a micro level, so that the problem could be addressed more effectively.

a). **Call Drop due to consumer fault**

34. As per 'Technical Paper on Call Drops in Cellular Network' issued by TRAI on 13<sup>th</sup> November, 2015, call drop can take place due to a variety of reasons. It pointed out that Electromagnetic cause (RF related), the single largest cause, is responsible for 51.4 per cent call drop whereas 36.9 per cent of call drop, the second largest cause, is attributable to consumer's fault.

35. On being asked about the factors attributable to consumers fault and the irregular user behavior that can cause call drop, the Committee were apprised that TRAI had not undertaken any specific study to identify the factors that are attributable to consumers fault for call drop. The technical paper has drawn reference to a paper published in International Journal for Research in Applied Science & Engineering Technology (IJRASCT) by S/Shri Pradeep Singh Rana, Vikas Singh, Yashwant Sinha and Ravi Pratap Singh, B Tech CSE Scholars UPTU under the guidance of Shri Navin Trivedi, Professor, MGM CoET, Noida. The paper has further drawn reference about occurrence of call dropping to a paper "Modeling the effect of drop calls on cell traffic in established 3G based cellular networks by M. Ekpenyong and J. Iasbona, published in IEEE Journal. As per this paper, call could also drop due to irregular user behavior such as mobile equipment failure, phones switched off after ringing and finish of tariff plan etc. Other causes can be due to abnormal network response (e.g. radio and signaling protocol error.

36. On the issue, Idea Cellular Limited submitted as under:-

"Call drops happening on account of consumer behavior like battery drain, entering into no or poor coverage area (lift, basement, deep indoors) is very normal scenario and is applicable to every wireless network by default. Subscriber by virtue of his/her experience in most cases remains aware of this and may choose to avoid outgoing calls in such scenarios. However incoming calls cannot be controlled since dialing person is not aware about the physical location of the dialed person. There could also be situations wherein even after knowing that call drop could occur, the user opts to continue the call till it drops (lift scenario, extremely low battery scenario). It is practically not required to educate consumer about these dynamics and such things are best learnt by consumer through his/her experience. With respect of call drops happening on account of non-availability of BTS due to issues beyond control of operator, customer is informed by call center as and when queries to this effect are raised by consumer."

37. The Committee also specifically enquired about any guidelines issued for the knowledge of consumer and measures taken to educate the consumers to avert call drop. To this, TRAI in a written note stated that TRAI has not issued any guidelines to educate consumers about irregular user behavior that can cause call drop. However, TRAI has been taking steps to create awareness about EMF radiation so as to allay the fears of Resident Welfares Associations etc, which could facilitate installation of mobile towers in residential areas.

**b). Sub- standard mobile handsets**

38. Bharti Airtel submitted that as an endeavor for continuous improvement they are engaging with device ecosystem for better voice and data experience getting pre certification of devices for sensitivity and network performance. On being asked to clarify further on the issue, the representative of Bharti Airtel submitted as under:

"There was a question asked on devices. ---xxxx---. You are referring to devices that Rs. 3000 or Rs. 4000, some smart phones that come in from China and places like these. These devices tend to have poorer quality of antenna, poorer quality of radio equipment and some of these have problems. So, there are combinations of reasons."

39. When the Committee sought clarification on the issue, Secretary, DoT stated as under:-

"The Telecom Engineering Centre has set a handset interface requirement. These are requirements which were not very strictly enforced. Recently, in 2012, the Department of Electronics and IT has mandated that there should be BIS standards which should be applicable to all consumer electronic items including handsets. That is in vogue. It is a Deity notification implemented by the BIS, the Bureau of Indian Standards. That follows it and all electronic items that are sold in India which are imported or otherwise have to have that mark and that certification which is based on tests."

40. When enquired about the specific steps taken to stop import and sale of such mobile handsets in the country, the Department of Telecommunications informed that it has been brought to the notice by the Telecom Service Providers that the inferior quality mobile phone handsets available may be responsible for call drop to certain extent.

41. On being enquired as to what extent call drop can be attributed to mobile handsets of certain make, TRAI in a post-evidence reply stated that TRAI does not have data at present about the extent call drop can be attributed to mobile handsets of certain make. Issues relating to technical aspects of mobile handsets sold in India are dealt by Department of Telecommunications.

**(v) QoS Benchmark for 4G and Data Services**

42. As there is a gradual shift from voice to data, the Committee desired to know whether any service quality benchmarks specifically for 4G and data services have been laid down by TRAI and steps taken by TRAI for monitoring the standards of data services provided by telecom service providers. To this, TRAI, in a written note, submitted as under:

"Though TRAI has not laid down any Quality of Service standards for 4G data services separately, the existing Quality of Service Regulations for wireless data services cover 4G data services also. For wireless data services, TRAI has prescribed the Quality of Service Standards through "The Standards of Quality of Service for Wireless Data Services Regulations, 2012" on 4th December 2012. These regulations are technology agnostic and also applies to 4G data services. The service providers are reporting its performance on data services, against the quality of service standards laid down in these regulations through quarterly performance monitoring reports. Further, TRAI has launched a portal for capturing the download and upload speed of wireless data through crowd sourcing. The TRAI - "MySpeed" Portal, which also a part of the TRAI - "MySpeed" Portal, allows the users to explore the mobile data experience of consumers across India. The "Myspeed" App, which could be downloaded from the mobile sewa app store, allows users to measure their data speed experience and send the results to this Portal. The application also sends

coverage, data speed and network information along with device and location of the test to TRAI servers. The customers can view the data experience of all TSPs from the TRAI MySpeed Portal.

As regards 4G voice service, currently none of the service providers except M/s Reliance Jio Ltd., is providing voice service in 4G. TRAI will be laying down the Quality of Service standards for 4G VOLTE services, currently being provided by M/s Reliance Jio Ltd. However, it may be mentioned that M/s Reliance Jio Ltd. has been reporting its performance on network parameters to TRAI on monthly basis."

43. TRAI further informed that the Quality of wireless data services to a user depends on various factors such as number of users, traffic handled by the cell being served to the customer, the mobile equipment of the user etc. Hence, it is difficult to prescribe and enforce Quality of Service standards. The Quality of Service standards laid down by TRAI are mostly based on test files sent. Similar practices are being followed in other countries.

**(vi) Hon'ble Supreme Court Judgment against TRAI Regulations**

44. The Telecom Regulatory Authority of India is mandated to regulate the telecommunication services, to protect the interests of service providers and consumers of the telecom sector and to promote and ensure orderly growth of the telecom sector in the country. Safeguarding consumer interests is of paramount importance to the Authority. The problem of call drops seemed to have accentuated in the recent past causing significant dissatisfaction. A consumer relief measure against call drops would be effective only if it reaches the affected consumers. These measures could extend from not charging the consumers for dropped calls to compensating them by crediting talk time or amounts in their accounts.

45. Feeling the need for evolving consumer relief measures through consultative process, TRAI issued a Consultation Paper on compensation to the consumers in the event of dropped calls for comments of stake holders on 4<sup>th</sup> September 2015. After undertaking public consultations on this issue and keeping in view the comments received during public consultations and the interest of consumers, TRAI notified “The Telecom Consumers Protection (Ninth Amendment) Regulations, 2015 (9 of 2015) on 16<sup>th</sup> October 2015, to be effective from 1st January 2016. These regulations mandate originating CMTSPs to credit one Rupee for a dropped call to the calling consumers as notional compensation, limited to three dropped calls in a day. The service providers and their Associations filed a case in Hon’ble High Court Delhi against this regulation. The Hon’ble High Court pronounced its verdict in TRAI’s favor and TRAI issued instructions to service providers for the compliance of above regulation. However, the service providers appealed in the Hon’ble Supreme Court. The Hon’ble Supreme Court has pronounced its verdict in Service Provider’s favour, quashing the regulations.

**(vii) TRAI proposal for Amendments in the TRAI Act**

46. In the light of the observations made by the Hon’ble Supreme Court, TRAI has proposed certain additional amendments in TRAI Act seeking (i) insertion of specific provision in TRAI Act under Section 11 conferring power upon TRAI to take measures to protect the interest of the consumers including award of compensation and mechanism for complaint redressal; and (ii) conferring power upon the Authority to impose fine and power upon the court to award imprisonment and fine for violation of the direction of the Authority and also for furnishing false report. These provisions are akin to those existing under the Reserve Bank of India Act, 1934, the Competition Act, 2002 and the Electricity Act, 2003. TRAI has requested the Government to amend the existing TRAI Act and tightening of the existing QoS regulation to monitor the network performance more effectively.

47. On being asked about the follow up action taken after the Hon'ble Supreme Court Judgement, the Department/TRAI informed that in the light of observations made by Supreme Court, TRAI *vide* its letter dated 03.06.2016 has proposed amendments to the TRAI Act, 1997 which *inter alia* includes (i)Protection of interests of consumers(Amendment to Section 11(1)(b),Consumers' grievance redressal (Amendment to Section 11(1)(b),Enforcement of regulations, directions and orders of the Authority (Amendment to Section 29). The said proposal seeks to statutorily empower TRAI to enforce its directions, orders and regulations as well as terms and conditions of license issued to service providers, through imposition of penalties/fines for contravention of such regulations, directions, etc.

48. When asked to provide a comparative note on autonomy and powers enjoyed by other regulatory bodies which is at present not enjoyed by TRAI, the Department, in a written note have stated that each regulatory body under law has been empowered with powers and functions which are specific to a sector. Thus, in general there cannot be a comparison and uniformity of powers of regulatory bodies. Section 13 of TRAI Act, 1997 empowers TRAI to issue directions. As per Section 29 of the TRAI Act 1997, the Authority has the power to impose penalty for contravention of its directions. To give more teeth to TRAI, the Department is considering TRAI proposal for increasing the amount of penalty. The general view of the Department is that adjudicatory functions should be separated from the regulatory functions for balance of powers.

49. On the issue of empowerment of the Authority, TRAI in a note submitted to the Committee stated that for enforcing its regulations, TRAI needs to be strengthened with more powers. While responsibility has been given to ensure Quality of Service, Interconnection etc., TRAI has not been vested with the required powers to enforce its regulations and directions. Further, on many issues TRAI has also recommendatory role and TRAI has no say in the acceptance of its recommendations.

50. Asked about the response of the Government to TRAI's proposal for amendment of TRAI Act, the Committee were informed that the suggestions of TRAI are under consideration in the Department. The Department proposes to prepare a comprehensive legislative framework to review and harmonize the existing TRAI Act, 1997.

**(viii) Public awareness regarding EMF radiation**

51. As per the TRAI Consultation Paper, TSPs have contended that resistance of Resident Welfare Associations (RWAs) against installation of towers in residential colonies have resulted in increase in call drop rates. RWAs are not letting new mobile towers to come up in residential colonies and are insisting on removal of existing ones owing to fear of EMF radiation. Objections and protests by resident welfare associations against installation of mobile towers is one of the reasons for call drop in the country. On this issue, Secretary, DoT elaborated during evidence as under:-

"The third issue has been the closing down of sites and shutting down of operations because of what I could call the imagined fear of health risks of electro-magnetic radiations. The Department of Telecom, where the Minister himself in the vanguard of this, through outreach efforts including workshops in State headquarters and down the line, is trying to ensure that telecom towers are not closed for fear of the radiations coming out of these towers affecting the health of citizens. We are trying to educate people that the radiations are not ionizing radiations and do not have an impact on human health as proved by 25,000 articles which the WHO has analyzed and looked at. Secondly, the norms for electromagnetic radiation in India are ten times stricter than in USA, Japan and other countries. Thirdly, we have robust monitoring systems to ensure that these norms are adhered to. Working with development authorities, we have been able to reverse certain policies of some State Governments and authorities like the DDA which had at one point of time put restrictions on installation of towers in residential areas because without towers for emitting signals providing service would not be possible. The feedback that we have been receiving is that this has improved the quality of service for the poor 2G customers who are dependent on voice services compared to what it was in November-December last year."



52. As per the background note submitted by TRAI, TRAI is going to interact with the consumers and with Consumer Advocacy Groups through Workshops, Seminars and Consumer Outreach Programmes about EMF Radiation to allay the fears of consumers and Residence Welfare Associations (RWAs) about EMF Radiation. This will facilitate service providers for speedy installation of mobile towers in residential areas so that incidences of call drop could be reduced.

**(ix) Investment on Network Expansion**

53. As per the Consultation Paper issued by TRAI, the growth of telecommunications market in the country has been impressive. Most of the growth has come from mobile telephony. From a modest mobile teledensity of 1.2 in March, 1999, the mobile teledensity of India leap frocked to 77.27 in March, 2015. The revenue streams of Telecom Service Providers (TSPs) in the country have been growing steadily with the increase in the subscriber base. Besides, with the recent introduction of data focused technologies (3G/4G) in the telecommunications networks in the country, the TSPs have witnessed a significant surge in consumer spending towards internet (data) services. As a result, the Adjusted Gross Revenue (AGR) of telecommunications service sector in the country has grown by more than 11% on year on year basis in past two years. The growth of overall demand of the telecommunication services has contributed to the increase in the revenue streams of the TSPs. At the same time, the growth in demand puts an onus on the TSPs to ramp up their supply size of telecommunication network adequately. If TSPs, do not upgrade their telecommunication networks suitably the service performance would deteriorate and in turn consumer expectations from service delivery would not be met.

54. The Committee desired to know the extent of investment and network upgradation being done by TSPs. To this, the Department in a written note informed that Secretary (T) chaired a meeting on 10.06.2016 with CEOs/MDs of the service providers to seek their full participation in resolving the issue of call drops in national interest. While discussing their action-plans for the coming months, TSPs have indicated a target of around 60,000 additional BTS equipment to be installed in different parts of the country. They have also assured to make use of the latest available technology to assess the position and carry out optimization on regular basis with finer granularity.

55. The details of infrastructure added as reported by TSPs is as under:

<b>Sr</b>	<b>Period</b>	<b>BTS Added (rounded to thousands)</b>
1	July 2015 to May 2016	109,000
2	June 2016 to October 2016	129,000
3	November 2016 to December, 2016	40,000
	<b>TOTAL</b>	<b>278,000</b>

56. The TSPs have also optimized about 4,97,000 BTSs for improvement in Network Performance during June 2015 onwards and in addition, frequency re-planning has also been done for more than 4,25,000 BTSs for handling interference issues. During review dated 1<sup>st</sup> November 2016, addition of around 156,000 BTS, on aggregate basis, by March 2017 has been further committed. Around 40,000 BTS on this account has been already added as shown above.

57. During the sitting of the Committee on 16<sup>th</sup> June, 2016, the representatives of TRAI had informed the Committee that in China the investment in telecom network is 50 Billion in one year whereas in India the investment is 5 Billion in one year while the customer base of both countries is comparable.

58. Reacting to the above comparison, Idea Cellular Limited in a written note stated that in the wake of an ill-founded comparison between Indian and Chinese telecom operators solely based on the customer base of both countries, following points need to be noted:

i. Government support - Chinese Government through its investment companies holds 74.4%, 72.7% and 70%+ of China Unicom, China Mobile and China Telecom respectively. Thus any investments made by Chinese telecom operators should strictly be compared with the investments made by government operators like BSNL / MTNL in India and not with private Indian operators.

ii. Cost of spectrum - Chinese operators are allocated spectrum at almost no cost, and pay only approx. 1% of their revenues as annual fees. Resultantly, the entire funds are available to them for investment in networks. Contrary to this, Indian operators are levied 13% of their revenues as license fees and spectrum usage charges, in addition to the cost of the spectrum that has to be acquired through auctions. Further, the exorbitant cost of spectrum takes away the largest chunk of capital available for investment (as on March '16, spectrum constituted 45% of fixed assets).

iii. Market size and consumer ability to pay – Despite having comparable number of subscribers, the market sizes of China and India for telecom services is not comparable. Illustratively, revenue of top 3 Chinese operators was approx. 6 times that of the top 3 Indian operators, owing to the higher ARPU levels in China (arising from higher consumer ability to pay). Market size and potential in terms of revenues naturally impact the ability to invest in the markets. Moreover, the Gross Block to Revenue ratio for top 3 Chinese and Indian operators were comparable over a 12 month period in recent past.

59. Nevertheless, Idea Cellular has made investments to the tune of Rs. 99,000 crore as of Mar'16. Further, with spectrum commitment of Rs. 13,000 crore in Oct'16 auction and the estimated capex spent of Rs. 7,000 to 8,000 crore during Apr'16-Mar'17, the overall investment by Idea will be over 1.2 lakh crore by End of Mar'17. It has already deployed more than 2,30,000 sites across 2G, 3G and 4G services. Idea's GSM coverage is available to 1 billion Indians in more than 4,00,000 towns and villages.

60. On the issue of investment, Vodafone India Limited submitted that it is the largest FDI investor in the country and has brought largest equity infusion of Rs. 48,000 in FY2017; this is in addition to the Rs. 115,000 crore already invested in India since 2007-2008 and further, in addition to the investments made in networks prior to 2007-08. Vodafone have stated that a predictable and stable policy and regulatory regime is a necessary to encourage investments in the sector. 4G have started in 17 circles however, we are observing various inconsistencies like free services, test services being launched by competition before commercial launch etc. that are undermining the orderly growth of the sector.

61. Bharti Airtel submitted the details of cumulative investments made by them as under:-

Spectrum Spends	Rs. 1,00,000 Crores
Capex - Gross Block	Rs. 83,000 Crores
Likely Cap till 31st Mar '17	Rs. 4,500 Crores
Share of Infratel Gross Block @ 100% (Towers)	Rs. 13,000 Crores
Share of Indus Gross Block @ 42% (Towers)	Rs. 14,300 Crores
<b>Total</b>	<b>Rs. 214,800 Crores</b>

Bharti Airtel further submitted that they are also committed to investing Rs. 60,000 crore over the next three years to upgrade their networks with the aim to provide better quality services to our subscribers amid increasing competition. Bharti Airtel believes that the investments made by them are commensurate with the optimum requirement for QoS.

62. With regard to investment, Reliance Jio submitted that they have invested over Rs.1,60,000 crore in the project and has already installed 2,82,000 BTSs. They are also in the process of installing an additional 1 lakh BTSs by March 2017.

63. The Department have provided the possible reasons for insufficient investment by TSPs for network expansion as under:

- a. High indebtedness of the Telecom Sector, approx. 4,00,000 Crore;
- b. High cost of infrastructure due to difficult terrain;
- c. Falling tariffs due to high competition;
- d. Business case; etc.

64. When asked the initiatives that can be taken by the Government to the TSPs to invest more, the Department, in a written note, have stated that the Government have been taking various initiatives in critical areas to fill some of the gaps in infrastructure and thereby helping the TSPs to invest more, which are as under –

- a. Extending support from the USOF for provision of Telecom infrastructure in North East Region & Left Wing Extremists (LWE) areas.
- b. Laying of submarine cables between Indian mainland and Andaman & Nicobar and Lakshadweep islands.
- c. Bharatnet project is under implementation for creating reliable fiber based backhaul infrastructure for connecting the Gram Panchayats, which can also be used to provide connectivity to mobile BTS in those areas.
- d. Coordinating with State Governments for issuing directives to Authorities & Local Bodies in States to ensure speedy clearance for rollout of telecom infrastructure.

**(x) Issues related to Spectrum**

65. TSPs have contended spectrum crunch as one of the reasons for increase in call drop. TSPs have argued that they are facing shortage of spectrum due to high growth of subscribers; besides there are delays in additional spectrum by the Government. On the shortage of spectrum, Secretary, DoT, during evidence held on 20<sup>th</sup> October, 2016 submitted as under:-

“The industry has continuously been complaining and with some good reason that they are constrained from providing quality of services because they have shortage of spectrum. In the recent spectrum auctions conducted by this Government, we have in this area had extraordinary success in that. We have been able to provide 965 megahertz of spectrum to our telecom operators at a market determined price in a transparent manner. This volume of spectrum which they have got in this auction is more than the spectrum that they have

acquired cumulatively in the last four auctions of 2012, 2013, 2014 and 2015. This will, to a great extent, address the issue of loading of spectrum and its impact on quality of services and this cannot remain a reason or some sort of excuse for poor quality of service. This is one major problem that we believe will get solved once these operators are able to roll out network in the freshly acquired spectrum in this auction.”

66. When the Committee enquired about the average spectrum held by operator in India when compared with other developed countries, TRAI in a written note have stated that a telecom operator can acquire spectrum through auction as well as spectrum trading. In the auctions held in 2016, telecom operators procured spectrum rights of 274.8 MHz paired and 690 MHz unpaired spectrum. It has resulted in additional spectrum availability of around 20 MHz to 84 MHz in most Licensed Service Areas (LSAs). As a result, spectrum holding per Telecom Operator increased by around 2 to 9 MHz in different LSAs. Now, spectrum holding per Telecom Operator is around 28 to 45 MHz in each LSA. Spectrum holding per telecom operator in India is still very less as compared other countries. This is mainly on two accounts:

- (i) Total spectrum assigned to commercial telecom operation is less as compared to other countries. This gap will become narrow once the unsold spectrum rights mainly in 700 MHz, 2100 MHz and 2500 MHz bands are procured by the telecom operators, whenever it is put to auction again.
- (ii) Number of telecom operators in each LSA is 7 to 11. In comparison, number of telecom operators in other countries is in the range of 3 to 5. Consolidation in the Indian telecom sector is beneficial as far as spectrum holding per operator is concerned.

**(xi) Fulfillment of Spectrum Roll out obligations**

67. The Department also informed that the call drop can also be due to poor coverage of mobile signals in various service areas. The poor coverage may be due to non-fulfillment of roll-out obligations by TSPs in the respective service areas. In the event of non-compliance on part of any of the service provider in the licensed service area, the Department initiates the action in accordance with the stated terms and

conditions of the license and grant of spectrum resources. The non-compliance may result in imposition of liquidated damages (LD) or the termination of license or the withdrawal of spectrum granted to the defaulter.

68. During the sitting of the Committee held on 27<sup>th</sup> January, 2017, the Committee enquired about the spectrum roll out obligations by different Telecom Service Providers. To this, Secretary, DoT had submitted as under:

"We have put out roll out obligations. We look at the international practices and for each auction, we put in a roll out obligation. The roll out obligation is something like this. In the first year, ten per cent of district headquarters and 90 per cent of metros have to get coverage whatever is the number of towers. That installation will depend on the spectrum they have, the topography, the terrain, the buildings, rural areas and urban areas. Secondly, in three years, 50 per cent of the district headquarters has to be covered and from the third year, 30 per cent Block Headquarters have to be covered in five years in block headquarters. So, there is an obligation for metros, district headquarters and block headquarters and this is for all spectrums that are auctioned.'

69. TRAI also informed the Committee that roll-out obligation mandates minimum coverage requirement. It has two effects (i) the obligation reflects both the need to ensure the efficient use of spectrum and provide a reasonable level of service to a wide cross-section of customers, and (ii) with the timely roll-outs of the services, the Government starts getting revenue in the form of licence fee and the spectrum usage charges.

70. To a specific query as to whether release of 965 megahertz of spectrums will be able to address the spectrum requirement of the telecom operators, the Department in a written note stated that no spectrum scarcity has been reported by any TSP. Only 965 MHz spectrum out of 2300 MHz on-offer has been acquired by TSPs in auction held in 2016. Further, with the issue of spectrum sharing and trading guidelines, the TSPs are also resorting to sharing/ trading of spectrum among themselves to meet their requirements.

(xii) **Installation of Towers, Right of Way (RoW), provision of 24/7 power backup, billing and interference related issues**

71. Cellular Operators Association of India submitted the following requests and recommendations from their Association:-

- (i) Government support is required to have uniform enforceable guidelines across all the States for providing permission for installing more mobile cell sites and Right of the Way (RoW) to lay additional fiber (OFC).
- (ii) Single Window time bound clearance should be enforced for installation of cell sites to ensure the rapid development of national networks.
- (iii) Permission/space should be provided for installation of mobile towers and IBS on Government buildings, defence land, transit hubs like airports, railway stations, residential complexes, etc.
- (iv) 24/7 power to the cell sites on priority basis and on industrial rates should be provided.
- (v) Concrete/enforceable Government policy for remaining interference in the mobile networks caused due to illegal jammers/boosters.
- (vi) Government need to ensure that there is no site shut down by local bodies without DoT permission.

c). **Setting up of Towers in Government buildings**

72. The Department of Telecommunications informed that a meeting was held between Secretary (T) and Secretary (Ministry of Urban Development) on 22.07.2015, wherein it was in-principle agreed that Ministry of Urban Development (MoUD) shall permit installation of mobile towers/in-building solutions in the Government buildings under their control subject to structural safety and payment of appropriate Licence fee by the TSP. Such mobile towers/in-building solution shall be a shared facility for all TSPs



73. As per the Background Note submitted by DoT, Government have also taken initiatives by allowing Central Government Buildings/ Estate, NDMC Buildings/ Estate in Lutyens Zone, Delhi, as well as allowing Defence Estate and Postal Buildings for installation of mobile towers/ BTSs in order to address the issue of call drops and quality of services. Department of Defence has issued the detailed Policy Guidelines for installation of Cell-On-Wheels (CoW) in Cantonment Areas. 61 locations in Delhi Cantonment Area have been identified in the joint survey conducted by DoT/ Defence Estate/ Service providers and Defence authorities. Tender has already been opened on 04/01/2017 and under evaluation. Department of Defence has initiated a Cabinet Note for leasing out defence land for installation of mobile towers on all-India basis to improve the quality of service and address the problem of call drops. Department of Posts (DoP) has also issued Guidelines on 21.07.2016 for use of postal buildings for BTS-installations. Service providers have raised certain concerns and held a meeting on 05/01/2017 for certain modifications which are under consideration by DoP.

74. On the number of Government buildings identified so far for installing BTS, the Department have stated that Directorate of Estates, Ministry of Urban Development (MoUD) has allotted 15 (fifteen) site-locations in Lutyens' Zone, New Delhi. Installation of BTSs at 5 (five) sites on sharing basis (housing 24 BTSs) has been completed. Work on the remaining sites is likely to be started by the TSPs shortly. The response of MoUD has been very positive.

75. Bharti Airtel submitted before the Committee that setting up towers in Government buildings would definitely prove to be of considerable help in improving network performance further, as in many cities, Government buildings and Defence areas are the only places where towers can be set up. For example, Lutyens Zone, CBD (Central Business Districts), etc.

76. When asked about resistance encountered from Government bodies in setting up of towers on their buildings, Bharti Airtel stated that a majority of Government Departments do not allow the installation of BTS as a matter of policy. Some Government Departments do not allow the setting up of towers due to security concerns.

77. Vodafone India Limited submitted that they are thankful to Hon'ble Minister, DoT and different Government bodies for their support in setting up of towers on their buildings. Setting up of towers in Government building helps a lot in network planning and site addition, especially in congested areas and is good from an EMF perspective as no much resistance from general public, which eventually leads to better Quality of services.

78. Idea Cellular Ltd., however, in their submission stated that subsequent to the meeting held between Secretary (IT) and Secretary (MoUD) on 22<sup>nd</sup> June, 2015, multiple rounds of discussion have taken place between telcos and Government authorities. While there has been improvement in getting permissions for setting up towers in these Government premises, the actual rollout on ground is much less than what is required. Out of the 207 sites (NDMC – 107; Ministry of Urban Development– 73, Dept of Post – 27) requested by Idea, only 7 sites have come on air as on date. They would seek extended support from Govt. bodies across the country so that network quality experience can be further improved.

**d). Shutting down of towers by local agencies**

79. The Department informed that Secretary (T) chaired a meeting on 28.06.2016 with different Civil Agencies (in Delhi and Mumbai) which deal with granting of permission for mobile towers so that each of such Agency facilitates the augmentation of telecom infrastructure in their jurisdiction. Issues relating to public fear due to EMF

radiations, sealing of operating telecom sites by Municipal bodies and possibility of de-sealing them have been duly taken up.

80. The Committee enquired about the restrictions imposed by local agencies of the States/UTs in setting up of telecom towers, to which Bharti Airtel submitted as under:

"DoT had prescribed uniform advisory guidelines for tower installation vide its letter dated 1/8/2013, but the States have come up with their own tower policies, which are non-uniform and impose many restrictions relating to the setting up of towers near schools, hospitals, colleges, jails, etc.

Even if the towers do not fall under the restrictions as per the state tower policy, several municipal corporations refuse to grant approvals for setting up towers on account of public pressure due to EMF concerns."

81. Vodafone India Limited have also stated as under:-

"We have been facing challenges in setting up towers as every state/municipal/local body/corporation have their individual policies and a very cumbersome process as such, the approval process, terms & conditions and charges vary a lot. In fact some States have come up with separate 4G policies. We would like to request that the policies should be kept same for all the TSPs – for all services and all technologies. Moreover, we would strongly advocate for acceptance and implementation of the DOT rules on ROW as gazetted on November 15th 2016 including a single window and time bound clearances, by all states, municipal bodies and corporations."

82. Idea Cellular have further submitted as under:-

"Some States/Municipal Corporations have laid down Zoning restrictions for setting up of new towers in Residential Areas, near Schools and Hospitals. Also in some areas where there are only Government owned land and buildings, permissions are not given for setting up of towers. These areas are generally the Defence Cantonment areas, Lutyens Delhi, areas around the State Assembly and Government office areas in State Capitals, Forest areas. We remain in touch with all agencies to pursue necessary approvals of sites. In some areas like NDMC, etc., support is also being given by the DoT. We would like to request the enforcement of spirit of below mentioned letters from Government (copy of letter attached along with the same):

1. Letter dated 03rd Aug 2015 {D.O. No. 2-61201 4-Policy-I (Pi.ft)} by Hon. Telecom Minister to the state Chief Ministers

2. Revised DOT guidelines via letter titled Department of Telecommunications Guidelines for issue of CLEARANCE FOR INSTALLATION OF MOBILE TOWERS (Effective from 1st June 2013)
3. Notification by DOT dated 15th Nov 2016 of Indian Telegraph Right of Way Rules, 2016.

83. The Department submitted that the reasons for sealing of towers by local bodies are different at different locations. Some of the reasons are representations by RWA/residents, EMF radiation concerns, non-payment of revised rent/security charges on account of challenge of revision in rent/security charges by municipal bodies in various legal forums, etc.

84. To a specific query regarding the steps taken to convince the civic agencies/local bodies in various other States/UTs, the Department have stated that followings steps have been taken to convince the civic agencies/local bodies in various other States/UTs:

- a. Hon'ble Minister took-up the matter with Union Urban Development Minister and all Chief Ministers of States citing "Digital India" and "m-governance" programs for providing Single window clearances; Space in government buildings for mobile sites; and Ensuring 24x7 electricity supply.
- b. Indian Telegraph Right of Way Rules, 2016 notified on 15.11.2016 to regulate underground infrastructure (optical fibre) and over-ground infrastructure (mobile towers) will facilitate timely permissions for installation of towers/optical fiber to enhance mobile coverage and capacity.
- c. EMF Awareness: Six EMF awareness programmes have been conducted so far –in Dehradun on 30 June 2016, in Hyderabad on 13 July 2016, in Mumbai on 23 August 2016, in Chandigarh on 21<sup>st</sup> October 2016, in Jaipur on 17<sup>th</sup> December, 2016 and in Guwahati on 24<sup>th</sup> January, 2017. This has helped in bringing a lot of clarity on this issue where participants included the Chief Secretaries of Uttarakhand, Telangana and Maharashtra, Senior Officers of State Governments, representatives of local bodies & RWAs.

Extensive EMF awareness programs were conducted in 16 Gram Sabhas in Goa to enhance coverage for BRICS Summit.

- d. DoT has issued an informative guide on '*Mobile Communications-Radio Waves and Safety*' and the same is available on DoT website. The document covers basic introduction to radio waves, various terminologies, clarification of various myths regarding deployment, use of Radio waves/ Safety Standards and frequently asked questions relating to Mobile phones & Human health.
- e. Advertisements are issued periodically by DoT in National & Regional Newspapers for ensuring safety from radiations of Mobile Towers & handsets.
- f. Telecommunication Engineering Center (TEC), is carrying out a pilot project on EMF web portal for implementation of online database for EMR of BTS towers. The portal is envisaged to provide a public interface for viewing the EMF compliance status of mobile towers, anywhere in India. The portal is meant to generate confidence among the public about effectiveness of the EMF compliance process in India.

e). **24/7 power backup and Introduction of Green Energy**

85. Quality of Service is impacted due to shortage of power. The standard electrical infrastructure of all telecom sites consists of battery backup and Diesel Generators (DG) in addition to grid power. The telecom equipment gets switched off if the battery backup is drained off and battery recharge is not possible due to absence of grid power or power from stand by DG. As a result QoS gets impacted when telecom hardware goes to switched off mode due to lack of grid power supply.

86. According to the Cellular Operators Association of India, there are few basic engineering aspects regarding deployment of solar solutions which need to be kept in mind. First one is that Solar generation is possible only for about Eight hours a day which is only one third of the requirement. Second point is that 1 KW Solar deployment requires about 10 Sq.mtr area and the average generation from 1 KW Solar is about 4.5 KWh per day. The average Solar capacity deployed in Telecom Sites (in present

deployments) is about 4.5 KW, which occupies about 45 Sq.mtrs. This amount of space is available only in few Ground Based Sites and such kind of space availability is almost impossible in Roof Top Sites. About 7.4% of Sites are working with renewable hybrid systems in India and many of those Sites have Solar Plants deployed to meet partial power requirements of the Site. Solar Power generation is not a solution for the power requirements of the Telecom Sites. Wherever feasible Solar Deployments are done and solar deployment is a continuous process. However it's already proven that Solar Power Generation is not a remedy for Power outage at Telecom Sites. The Industry has done extensive Trials for generating power at Telecom Sites using other identified renewable energy sources namely Wind, Hydrogen , Methanol & Biomass. The inferences are Wind power generation is Location Specific and unreliable. Not suitable for most of the telecom Sites. Hydrogen and Methanol are renewable only when these are available as a bi-product of some other manufacturing process. There is no ecosystem existing in India for Production and Operation & Maintenance of such Fuel Cells. Bio-Mass is very much localized.

87. In light of the above, COAI have submitted that there is need to make Grid Power available to telecom sector on priority basis at industrial/favourable rates. Further, an exemption from scheduled power load shedding be granted to telecom sector. Also, we request that grid power to Operational Telecom Sites should not be disconnected without hearing the Operator first.

88. On being enquired about the status of adoption of Green Energy and the policy initiatives taken to promote Green Energy, the Department in a written note have stated that to examine the Technical feasibility and financial viability of use of renewable energy, DoT undertook 20 Pilot projects in USOF Phase-I sites using Green Energy (SPV & SPV-wind hybrid) with support from Universal Service Obligation Fund (USOF) and Ministry of New and Renewable Energy (MNRE). Based on the outcome of these pilots, MNRE further extended subsidy support to Telecom operators for carrying

out 400 Renewable Energy Technology (RET) projects. The Telecom Industry has executed RET projects on RESCO (Renewable Energy Service Company) model.

89. The Department further informed that based on TRAI recommendations on “An approach towards Green Telecom”, DOT has issued broad directions in 2012 for greening of the telecom sector and to achieve the desired reduction in carbon emission using RETS solutions and energy efficient equipment. The adoption of renewable energy sources like solar panels and wind turbines has been slow due to various reasons that, inter-alia, includes –

- (i) A major constraint is the availability of minimal essential area to place the solar panels – due to which Roof Top Towers (RTT) sites have to be ruled out for the eligibility for solar installations
- (ii) Due to space and techno-economic constraints, the typical capacity of a Solar Power System is about 2-3 KW, which is suitable only for the sites with single tenancy. DoT has been advocating infrastructure sharing at towers to reduce costs and avoid duplicity.
- (iii) Periodic PV panel cleaning is a challenge due to non-availability of water at site, adversely effecting solar output. This results in considerable maintenance expenses to maintain Solar set up.
- (iv) Viability of wind power technologies is dependent on the duration of useful wind speed and quality of wind. Further, the location of BTSs is mostly in populated areas where the required wind speed for running the turbines is not available.

However, Telecom service providers have adopted state-of-art storage battery technology and Energy management & monitoring systems as a cleaner and greener solution for powering such sites where 24x7 power availability is a challenge.

90. Bharti Airtel submitted that there are only a very small number of sites, which are installed in remote or disturbed areas and are difficult to be reached for refuelling,

results in poor quality. The installation of renewable energy solutions depends upon the techno-commercial feasibility of the solution to be deployed, and not every site will be feasible. For example, it is very difficult to deploy solar solutions on rooftop towers due to the lack of space. Solar solutions require space and a shadow-free zone in the southward direction. Airtel has deployed around 3,500 BTSs on renewable energy. It has also deployed solar power solutions at several technically feasible MSC locations. Airtel has far exceeded the requirements affixed by the DoT directions for a reduction in the carbon footprint. As of September 2016, Airtel has achieved a 17% reduction in carbon footprint per subscriber as compared to FY2011-12 (base year).

91. As per the submission of Idea Cellular Limited, out of 9600 sites of Idea Cellular, currently 1020 sites are operating on solar hybrid solution. Typically, solar power supply can cater to 8-10 hours a day of BTS operations which is not sufficient for running a site round the clock. Wind energy solutions are very much location specific and hence are deemed not viable. Hence, the requirement of conventional power supply is unavoidable for operating a site 24x7.

92. Non-availability of 24x7 power resulting in shutting down of tower/BTS is one of the main reasons for call drops. To look into deployment of clean and renewable energy like wind and solar energy, TRAI has issued the Consultation Paper on 'Approach towards sustainable telecommunications' on 16.1.2017. Through this consultation paper TRAI is seeking the views of stakeholders on many significant issues *i.e.* mechanism for calculating carbon footprint of a telecom network and option available for renewable energy solutions, the methodology for setting new renewable energy targets in the telecom sector and the timeframe for achieving these targets etc. The last date for comments and counter comments of the stakeholders on the consultation paper is 13.02.2017 and 27.02.2017 respectively.



93. In order to address the issues of installation of towers and supply of electricity, tower space of various power corporations could be taken on lease for installation of antennae or BTS of the telecom operators. Asked about their views on the above suggestion of the Committee, TRAI informed that they had submitted their recommendation on 'Telecommunications Infrastructure Policy' to the Government on 12.04.2011. The recommendations contained important issues such as incentives for infrastructure providers, right of way, tower design and standardisation, distributed antenna systems and indoor building solutions, mobile virtual network operators and migration to IPv6. The Authority in its recommendation addressed the issues of lack of space for installation of towers and supply of electricity, tower space of various power corporations for installation of antennae or BTS of the telecom operators. The relevant recommendations are as under:-

- i) Telecom infrastructure should be treated as an essential infrastructure. (Para 1.7)
- ii) Telecom infrastructure provider companies should be extended tax benefits under Section 80 IA. (Para 1.13)
- iii) DoT should address all State Governments to direct the Power Distribution companies in the States to provide grid power connectivity on priority for telecom tower sites. (Para 1.70)
- iv) Infrastructure providers should be permitted to install and share active network limited to antenna, feeder cable, Node B, Radio Access Network (RAN) and transmission system, subject to the condition that they are brought under the Unified Licensing regime as recommended by this Authority in May 2010. (Para 3.11)
- v) In order to curtail the delay, the Authority recommends that the payments for subsidy claims shall be made in a certain time 122 frame based on the self certifications of the service providers. In case any discrepancy is found after verification, the recovery, if any, shall be made from the service provider. (Para 3.87)
- vi) The installation of towers and related equipment in rural areas serves the purpose of local population and to some extent business organisations. Hence the requirement for land conversion (around 400 Square metre of

land) for setting up tower in rural areas by the telecom service providers should be dispensed with. (Para 3.89)

- vii) State electricity boards should provide power supply to rural BTSs on priority basis. (Para 3.90)
- viii) DoT should review the existing procedure for various approvals regarding VSAT and prescribe strict timelines so as to reduce the delay. It is also recommended that DoT should also simplify the procedures with emphasis on automatic clearances in case of non critical approvals. It is further recommended that the charges for VSATs (except transponder charges) may be borne by USOF initially for a period of three years for all the VSATs installed in rural areas. The TERM cell may be entrusted to certify the eligibility for the exemption.

94. Idea Cellular stated that Provision of Telecom installation in Transmission Towers or in areas occupied by Power companies is an excellent concept. It will help in building more sites required for coverage and improving quality of services. Idea has installed sites in 3 such locations through IP companies. However, it is to be noted that most of these power corporations are located in sparsely inhabited areas rather than in urban towns where the constraint of space is more prominent.

**f). Installation of unauthorized signal boosters**

95. One of the reasons cited by TRAI for call drop is interference due to unauthorised installation of signal boosters by users. The Committee enquired about the interference faced by the Telecom Operators from repeaters/boosters/jammers, to which Cellular Operators Association of India in their written note submitted as under:-

“The interference from repeaters/boosters/jammers and faulty/leaky cable TV equipment have become so prominent that it prevents the licensees from providing flawless telecom services and even in launching of services. We along with our members have repeatedly represented this problem to DoT/WPC for the interference caused due to illegal deployment of Repeaters/Boosters/Jammers and transmission from faulty /leaky cable TV equipment, however, the issue still remains unresolved. Some operators are also facing interference from across the international borders. The operators are facing such interference in many service areas including Delhi,

Mumbai, Punjab, Kolkata, Gujarat, Haryana, Rajasthan, Pune, Pondicherry and Karnataka.

96. COAI through their submission requested that law should be enacted to make the sale, possession or use of jammers as 'illegal', and to ban the sale of illegal repeaters and direct TERM/WMO wings to conduct raids to check this. Authority should be granted to TERM/WMO wings for seizure/confiscation of illegal Repeaters, Boosters, Jammers and faulty/leaky cable TV equipment causing interference, and time bound resolution of identified Interference cases, so as to provide flawless services.

97. Bharti Airtel also stated interference issues related to out-of-band emissions as well as illegal repeaters, boosters and jammers have increased manifold. To solve the issue, they have recommended that WMO wings/TERM Cells are not equipped to identify and take necessary action. TERM Cells and WMO need to be adequately empowered to penalize and take necessary action to prevent the misuse of these illegal repeaters.

98. When the Committee enquired about the measures taken to control use of illegal jammers, the representative of DoT during the sitting of the Committee submitted as under:-

“Regarding the signal boosters and the effect on the network, the problem is till some time back and even now in many parts, services are not satisfactory. It is difficult to mandate that you do not use boosters. It is like saying that power will not be there and you do not use generators. It is against the customers interest. We have had a dialogue with the telecom service providers. The problem is not with the boosters. The boosters should operate in the correct frequency with the correct power. We are trying to encourage some of the telcos to choose their own outlets, sell authorised boosters and we have promised that we will give you licence so that in the interim that can be a measure, but ultimately consumer networks have to be improved especially for indoors where more boosters are used”

99. On the initiative taken to stop sale of such signal boosters and jammers, Department further stated that the Telecom Service Providers have been advised to identify areas of poor coverage and install regular BTS/authorized signal boosters wherever required so that there is no need for the public at large to resort to unauthorized repeaters.

**g). Accuracy of metering and billing**

100. TRAI in their background note submitted to the Committee informed that it has prescribed the standards for metering and billing through the Quality of Service (Code of Practice for Metering and Billing Accuracy) Regulations, 2006 dated 21<sup>st</sup> March 2006. These regulations contain a Code of Practice for Metering and Billing Accuracy, which every service provider has to comply with. The regulations provide for Audit of the Metering and Billing system of the service providers by the service provider every year through any one of the auditors from the panel notified by TRAI. The service providers have to submit the Audit Report to TRAI by 31<sup>st</sup> July every year. Also they have to take action on the audit observations and Action Taken Report have to be submitted to TRAI by 15<sup>th</sup> November every year. The audit of metering and billing system has helped the service provider in identifying systemic issues and rectifying the problems in a timely manner.

101. TRAI have further informed that the following systemic issues are identified in the audit report:

1. Wrong configuration of tariff plans in the billing system. It was observed that service providers launch new plans without proper configuration the billing system. To address this issue TRAI had mandated a Master Table to maintained by every service provider to ensure that the tariff plan is correctly configured.
2. Delay in configuration/opening of new codes and number series in the network leading to wrong charging of consumers. The TRAI has since

- directed service providers to open new codes/number series within the specified time limit.
3. Wrong charging of calls due to wrong configuration in the billing system of the type of calls. Because of this, in some cases local calls are charged as STD calls. During the metering and billing audit the occurrence of such charging is verified.
  4. Large instances of wrong dialing pattern by consumers were observed. In many cases, the consumers prefix "0" and "00" before the dialed numbers leading to charging at national/international rate, especially for SMS. TRAI has been educating consumers through Consumer Outreach Programmes about the correct dialing procedures.
  5. Synchronisation of clock: it was observed that the service providers have configured their clock in the network with different reference points such as BSNL level 1 TAX, Atomic clock, NPL clock etc. and in many cases it was found that difference switches and exchanges have different clock reference point. With the intervention of TRAI the service providers are now configured their clock in the network with reference to a uniform clock.

102. On the mechanism available to consumers to address their grievances, it was informed that TRAI Act 1997 does not envisage handling of individual complaints by TRAI. However, TRAI has been receiving complaints from the consumers and these complaints are forwarded to the service providers for redressal. At the same time, TRAI suo moto looks into issues affecting large number of consumers or practices adopted by service providers which are against the interest of consumers. Examination of such issues has led to issue of several directions and regulations by TRAI in the interest of consumers. In the case of billing or overcharging complaints, these complaints are also forwarded to the metering and billing auditors for verification.

103. TRAI have also informed the Committee that the Quality of Service (Code of Practice for Metering and Billing Accuracy) Regulations, 2006 dated 21<sup>st</sup> March, 2006 provide for financial disincentives for delay in submission of audit report and action taken report, at a rate not exceeding rupees one lakh per report for every week or part thereof during which the default continues, financial disincentive for delay in refund of overcharged amounts to affected consumers in excess of two months at the rate equivalent to the overcharged amounts, financial disincentives not exceeding Rupees ten lakhs for failure to submit details of action taken on audit observations or for submitting false information about action taken to TRAI. During the audit of the metering and billing system of service providers during the financial year 2014-15, 83 cases of overcharging involving a customer base of 3704510 were detected. The amount refunded was Rs.15355201.33 to the customers. The service providers could not make refund of Rs.1917648.17 to 1151518 customers, which was deposited in the Telecom Consumers Education and Protection Fund maintained by TRAI (for educating consumers and for creating awareness about consumer issues).

104. The Committee enquired about the best practice with regard to billing viz. per-second or per-minute billing followed internationally and the methodology being followed by Telecom Service Providers for billing in India. To this, Vodafone have replied that both units have their own advantages and disadvantages and that customer should be given the choice to choose an option that best suits their requirements. In India, Vodafone provides choice of both per-minute and per-second tariff plans to the customers, owing to competitive offers and regulatory requirements.

105. Idea Cellular Limited stated that per-minute billing is the preferred mode of call charging across operators internationally. This is majorly on account of postpaid subscribers forming the bulk of telecom customers internationally and per minute billing being the norm for postpaid business. However, in India, Prepaid business dominates the telecom space and per-second billing has become prevalent across all operators in

the last few years. Per-second billing provides added convenience to customers and enhances customer-operator relationship by bringing much more transparency in the billing process. With Per Second Billing, customers have greater control over their spend as they pay for the exact duration used and extract more value.

106. Bharti Airtel submitted that globally, the majority of tariff plans are based on per-minute basis. In India, the majority of the customers are on the prepaid platform. TSPs are providing both the options to their customers—per-second billing as well as per-minute billing. Taking cognizance of the Indian scenario, TRAI has mandated all telecom service providers to offer at least one per-second plan to its customers. The majority of our prepaid customers utilize per-second plans.

**h). Technology to mask call drop**

107. It is reported that mobile operators are taking refuge in a new technology (Radio Link Technology) to “mask” call drops that shows a call as remaining ‘connected’ even when the network connection is lost and the caller is unable to hear voice from the other side. When the Committee desired to know details about the technology, the representative of DoT clarified during evidence held on 16.06.16 as under:-

“This RLT is called Radio Linked Timeout. This parameter is normally set to 32 to 36 which is the value. What 36 means is half the number, that is 18 seconds. So, what happens is that if a call is made, during the call the radio signal goes up and down. So, when it becomes down so that the call can be disconnected. This RLT parameter holds this call. So, if a figure is set to 36 the call is held for almost 18 seconds and after that only it drops. If the service provider increases this RLT to let us say 60 seconds, then the call will be held for 30 seconds. In those 30 seconds if there is no communication, the customer only says hello, hello, he disconnects the call. So, it goes into his account as if he has disconnected the call rather than the call having been dropped. So, that is the fallout of this. It is not a software or something which is camouflaging, but it is the parameter which is set in the telecom service provider’s network. Some of them have tried to put it on the higher side. During the test that we have conducted during May and early June, we have found that out. We have already taken action and seeking

explanation from the service providers. We will make sure that it will not happen in future.”

108. Bharti Airtel submitted that GSM standards have built-in features such as the radio link timer (RLT) to make the technology robust enough to handle sporadic variations in radio conditions. RLT is defined as per GSM standards (GSM 05.08, dated July 1996), and its value ranges from 4 to 64. Since there is a dynamic variation in the quality of radio link due to clutter, traffic, fading, inherent noise, etc., this counter helps to optimize the duration for which the device waits to decode the signalling on the radio link and hence allows the radio link to restore before dropping the call. Depending on the prevailing radio conditions, this counter is configured so that the customer experience is optimal in case of sporadic bad radio transmission. Configuring a low value of counter would result in a highly intolerant system that does not give the RF link an opportunity to recover. GSM standards have defined the value of this parameter between 4 and 64 i.e. the values that are allowed for an acceptable quality of voice service. All operators fix this value within the range prescribed by GSM standards *i.e.* 4-64. Furthermore, RLT is very important in case of emergencies, such as natural calamities, that lead to massive outages in the network. In such cases, the outage of a large number of base stations hampers the consistency of radio connectivity. RLT helps to hold the calls in such difficult conditions.

109. Idea Cellular Limited also submitted that globally RLT setting vary from 04 to 64 as permitted by technology standard. TRAI in their drive tests conducted in select cities chose to highlight BTSs that had RLT setting greater than 40. We would like to submit that for more than 95% of the cells, RLT values are set less than/equal to 40.

110. On the parameter laid down for Radio linked Timeout and the action, TRAI have stated that during drive test of mobile networks it was observed that in some areas the service providers had set a higher volume for Radio Link Timeout (RLT), because of



which customers would face bad quality of call for a short duration without the call getting dropped. The service providers had set the RLT volume in their network to address traffic management issues and there is presently no benchmark for the RLT volume. As such, TRAI has not taken any action against service providers in the matter.

**(xiii) Grievance Redressal Mechanism**

111. During the sitting of the Committee on 20<sup>th</sup> October, 2016, Chairman, TRAI had stated as under:-

“In the consumer grievance, specifically, currently the situation is this. Consumer has no place to go. Whatever complaint he has got, he goes to that company on the IVRS or things like that. If he is not satisfied, then he goes to an appellate authority which is also lying in the company. Then, the Hon. Supreme Court in one of the orders has barred the, sort of, justification of the consumer courts. So, essentially, it is a situation where a party is the judge and that is the end of the matter.”

112. Explaining the present scenario of grievance redressal mechanism, Department in a written note have stated that as per provisions of Telecom Regulatory Authority of India (TRAI) Act, 1997, TRAI has laid down the framework for redressal of complaints by Telecom Service Providers (TSPs) through “The Telecom Consumer Complaint Redressal Regulations, 2012.” These regulations provide for a two tier complaint redressal mechanism viz. Complaint Centre and Appellate Authority. The complaint centre shall have a toll free consumer care number for lodging complaints and service requests. The TSPs can also have a general information number at its complaint centre for information/enquiry. The IVRS (Interactive Voice Response System) access on this number is free but the TSPs can charge nominal tariff for speaking to consumer care agent. The consumers can also lodge appeal with the Appellate Authority through the toll free consumer care number. In accordance with these regulations, the service providers have established toll free consumer care number for complaints and services.

Some of the service providers have also established separate 'General Information Number' for information/query. In addition to the above, the customers can also register their grievances through Centralized Public Grievance Redress and Monitoring System (CPGRAMS) portal of Government of India. The TRAI Act, 1997 does not envisage handling of individual consumer complaints by TRAI. As such, the complaints received in TRAI are forwarded to the concerned TSPs for taking appropriate action. Similarly, the complaints received through CPGRAMS portal are also handled by the concerned TSPs under the existing framework of redressal of grievances.

113. When the Committee desired to know the initiatives taken to strengthen the existing grievance redressal mechanism, Secretary, DoT submitted as under:-

"...xxxx....TRAI had made a recommendation for an Ombudsman before 2004. At that time, the Consumers Act was applicable on these telecom cases. Thereafter, in a decision which I find difficult to understand, in the case of BSNL versus another party where Government was not a party, the Supreme Court decided that consumers of telecom sector will not be a part of it. Chairman, TRAI is absolutely right in saying that these are small items in large numbers but the fact is that their idea is taken up. There is no other right beyond your company. It is not a very good way of enforcing the right of a consumer. The Government is considering amending the Consumer Protection Act. The Department of Telecom has made a recommendation that we should amend the Act to provide for consumer complaints and telecom will be a part of that. I would request that the Committee may like to add its voice to it.

This will be in addition to the licence requirement where they have to have call centres and so on. We also suggested for e-commerce and for problems like consumer grievance redressal in telecom sector where the volume is large, e-courts should function, they should have e-evidence, they should give e-judgements. Now, electronic commerce is growing. A person uses electronic commerce to buy an item for Rs. 2000 or Rs. 4000. He will not buy a huge item. If you have to go to the court and spend hours together, it is not something the consumer of e-commerce would like to do. For e-commerce and for areas like telecom, e-courts are allowed. The Evidence Act has been amended. The Supreme Court itself is monitoring the expansion of e-courts. These are areas where it will be very useful and give real relief to the consumers."

114. Chairman, TRAI had also informed the Committee that there are 54 consumer organisations registered with TRAI and they have regular interactions with them. TRAI also has consumer outreach programmes where they go to various places, talk to them and listen to their problems.

115. On the initiatives taken to strengthen consumer grievance redressal mechanism, the Committee were apprised that TRAI had issued a consultation paper on “Complaints/Grievance Redressal in Telecom Sector” on 28<sup>th</sup> July 2016. The Consultation Paper revisits the issue of redressal of individual consumer complaints and grievances in the telecom sector so that consumer complaints are resolved in a timely, efficient and effective manner. It sought views, opinions and comments from stakeholders on possible options to improve the existing grievance redressal mechanism, alternatives including establishing an office of Telecom Ombudsman etc. An Open House Discussion (OHD) on the paper was conducted on 26.10.2016 to elicit the views of all stakeholders. TRAI is currently in the process of finalizing its recommendations on the subject.

116. The Committee have also been informed that IVRS consumer satisfaction survey is under progress in cities of Karnataka, Madhya Pradesh and Delhi service areas. As and when the survey reports received, the same will be published on TRAI website for information of all stakeholders.

**(xiv) Development of Consumer Engagement Application**

117. The Ministry of Power have launched a new app GARV-II to provide real time data on electrification of all six lakh villages of the country. Enhancing citizen engagement, the app has a SAMVAD corner where citizens give their feedback and suggestions. To the query regarding development of consumer engagement Application in the line of the Ministry of Power, the representative of TRAI informed the Committee during the evidence held on 16<sup>th</sup> June, 2016 as under:-

“I would just like to inform you that because quality of service is the TRAI’s function, we are going to launch this in a couple of days a portal which is called quality of service portal where we are showing the tower-wise location throughout the country and what is the call drop percentage of these towers, etc.”

118. The Committee enquired about the status of development of this application, to which TRAI in a written note stated that TRAI has recently launched TRAI analytics portal [www.analytics.trai.gov.in](http://www.analytics.trai.gov.in). This portal has three sub-portals viz. TRAI QoS Analytics Portal, TRAI MySpeed Portal and TRAI Drive Test Portal. The TRAI QoS Analytics portal provides a graphical view on the map of India the performance of the 2G service providers on call drop (on all India level, service area level, district level and Base Transceiver Station (BTS) level), BTS density per square kilometer and network utilisation so that the consumers can have informed choice based on quality of service. The Portal allows a user to check the call drop rate of all the 2G networks or of any particular telecom operator on an all India level, at a service area level, district level and BTS level. The all India view shows the average call drop rate for the entire country. The users can also view the comparative performance of service providers or service provider wise performance. Users can also navigate and view the performance of all the operators or of a particular operator for a service area or a district in a service area and even up to BTS level. Thus the portal facilitates information about call drop in a

particular area covered by a BTS. The portal also provides a search facility so that the user can search a location anywhere in the country and can get information about the BTS's within 4 Kms of the location.

### **III. Points of Interconnection (PoI)**

119. Interconnection is an essential component of telecommunication networks. It is the physical linking of a carrier's network with other operators which enable calling from customers of one operator network to another operator network. All operators need to have adequate interconnection among themselves for seamless flow of traffic. Unless both parties co-ordinate, it is not possible to provide good end-to-end QoS to customers.

120. Reliance Jio announced the commencement of their services as per Unified License with Jio welcome offer which became effective from 5<sup>th</sup> September, 2016. As part of the Jio offer, users got access to unlimited LTE data and national voice, video and messaging service along with full bouquet of Jio applications and contents free of cost upto 31<sup>st</sup> December, 2016.

121. Reliance Jio submitted that they have entered into Interconnection Agreements with all the telecom licensees to ensure that adequate interconnection facility is available for customers to be able to call from one network to the other. Under the UASL and UL licenses, it is mandatory for licensees to provide adequate Interconnection capacity to each of the other operators. This is a mandatory and unconditional obligation. Adequate interconnection capacity has to be provided by each operator based on Firm Demand of new operator, which Jio provided to all operators in June prior to its commencement of services.

122. Furthermore, it has been provided in the Interconnection Agreements that parties are obligated to maintain 0.2% Grade of Service and 70% utilization of POIs. All

the licensees are also obligated to meet QOS parameters specified by TRAI as per which congestion at interconnection points should not be more than 5 calls per 1,000 call attempts. Operators are required to provide both-way E1s at least for the first two years as per the Interconnection Agreement to ensure optimum utilisation of interconnection resources.

123. Reliance Jio in their submission made to the Committee have stated that all the above conditions have been breached by the incumbent leading operators viz. Vodafone, Idea and Airtel. More than 740 crore calls have been blocked from the Jio network to Vodafone, Idea and Airtel from 8<sup>th</sup> July to 27<sup>th</sup> October, 2016. 12-15 crore calls are being blocked every day. The problem is of alarming proportions and the total call drops due to call blocking from Jio network alone is of the order of total call drops in the country. Call failure rate/Pol congestion is in excess of 55-60%. The details of call drop due to call blocking on Vodafone, Idea and Airtel are as under:-

Period	Total Call Drop
08-Jul to 31-July, 2016	24,11,99,208
01-Aug to 31-Aug, 2016	90,83,48,941
01-Sep to 30-Sep, 2016	2,98,77,29,782
01-Oct to 27-Oct, 2016	3,25,65,66,423
Total	7,39,38,44,354

124. Reliance Jio submitted that augmentation of Pols by Vodafone, Idea and Airtel is highly inadequate. The details of Jio's requirement are as under:-

Operator	Jio Firm Demand for 100 mn subscribers	Working E1s*	Additional Allocated but not operational*	E1s not	BH Util %**
Vodafone – Local	9,314	4,196	258		100% - 110%
Vodafone – NLD	2,184	620	77		97% - 110%
Idea – Local	8,140	3,839	1,178		88% - 106%
Idea - NLD	1,930	1,165	350		69% - 109%

Airtel - Local	11,395	4,204	1,172	91% - 103%
Airtel - NLD	2,769	1,344	575	88% - 111%

\* Considering Both-Way E1s and Jio outgoing E1s. \*\* Should be below 70% at all times

125. When the Committee asked the views of Idea Cellular on the above submission of Reliance Jio, Idea Cellular Limited submitted as under:-

"We strongly disagree to the submission given by RJIO that call blocking is happening due to denial of adequate interconnections. In fact, Idea has provided POI E1s more than RJIO's own forecasted demand. While, RJIO had forecasted a requirement of 10,070 POIs (8,140 for Access, 1,930 for NLD) for a base of 100 million subscribers by March 2017 (as per its communication to Idea via its letter dated 21.06.0216), Idea Cellular had completely met this requirement by second week of November 2016, i.e. well before the RJIO projected timeline of March 2017 despite the fact that RJIO was yet to attain subscriber base of 100 million subscribers."

126. Idea Cellular have further stated that currently there are no call failures between RJIO and Idea. Whatever call failures reported by Reliance JIO are attributed to RJIOs internal issues and unpreparedness like Core Capacity constraints (12-bit CIC issue in RJIO MSC), TXN capacity constraints & re-arrangements, erroneous reporting of call failures etc. Congestion & call failures at Idea Pools in excess of the benchmark of 0.5% in the QoS Regulations, has been caused not by Idea's failure to make available the requisite number of Pools, but by the fact that RJIOs offer of totally free talk/speech calls, resulted in a deluge of long duration calls being made by RJIO subscribers, exponentially in excess of RJIOs own projections of usage.

127. Reacting on the issue, Vodafone India Limited submitted as under:

"We strongly reject and refute the submission made by RJio that calls are being blocked, for it being factually incorrect. Please note that there is no issue of call blocking involved between VIL and RJio interconnection and VIL has not blocked any call from RJio. Further, in case there is congestion in POI then the call may not connect at all, at the first place. POI congestion will not be a reason of call drop as call may not be initiated."

128. Vodafone India Limited also submitted that they have provided Jio all the Pols asked for and sufficient for 75 million subscribers, even when they have lesser number of subscribers. These Pols have been offered on Jio's own projections. Vodafone have even waived pre-payment of demand notes, changed E1s from their outgoing traffic to Jio's outgoing traffic.

129. Vodafone further submitted that RJio's demand of 21<sup>st</sup> June 2016 (as per RJio itself) was for a requirement till March 2017, and since RJio's projections were faulty and service was given free, it led to an abnormal situation with their Outgoing and Incoming traffic ratio of 9:1. By 25<sup>th</sup> November 2016, we provided more number of E1s than they demanded upto March 2017. As on 26.01.2017, we have provided more than 15300 E1s for RJio's local access Outgoing traffic and more than 5400 E1s for its NLD traffic. This is besides more than 3300 E1s for Vodafone local outgoing traffic. It may be important to note that we have given more number of E1s than that were demanded by RJio by its letter dated 16.11.2016, in some circles. It may be noted that RJio had sought 9314 E1s for Access & 2184 E1s for NLD by 21<sup>st</sup> March 2017 (i.e. 9 months from the date of its letter dated 21 June 2016), considering 80% of these E1s for RJio's outgoing traffic, these were provided/exceeded by 25.11.2016. It may also be noted that these E1s were required to cater to a subscriber base of 100 million – as of date almost double the required number of E1s have been provided and the subscriber base is believed to be around 72 million.

130. The representative of Bharti Airtel submitted before the Committee as under:-

“The points of interconnect that we have provided is four times ahead of comparable operators. All those numbers are just one-way E1s which are incoming E1s. It means we have provided the capacity to receive calls from Reliance Jio which is the problem that they have been talking about. Normally, you see the traffic exchange is 50:50. In this case, almost all the traffic is coming from them because it is free. So, we have shown the more stringent criteria rather than relaxed criteria.”



131. Bharti Airtel further submitted that RJIL's allegation of incumbent operators having adopted the same strategy of not releasing adequate Pols is false and baseless. There has been no blocking of RJIL's calls by Airtel, as alleged by them. The Pols provided to RJIL are in excess of their demands. RJIL's demands, as per their letter dated 21.06.2016, have been met far in advance of the time frame specified by RJIL and well ahead of RJIL meeting its customer forecasts.

<b>Time from Launch Date</b>	<b>No. of Projected Customers (in Mn)</b>	<b>No. of Actual Customers (in Mn)</b>	<b>Total E1s</b>	<b>Total Local &amp; NLD Incoming E1s allocated</b>
3 months	22	~ 39.3 <i>(as on 4<sup>th</sup> Dec, 2016)</i>	5,246	13,650 <i>(As on 4<sup>th</sup> Dec, 2016 and number of E1s higher than RJIL demand for 75mn forecasted for 9 months)</i>
6 months	50	~ 62# (72.5 mn claimed by RJIL) <i>( as on 1<sup>st</sup> Feb, 2017)</i>	9,924	27,719 <i>As on 1<sup>st</sup> Feb 2017 and number of E1s higher than RJIL demand for 100mn forecasted for 12 months and insufficient for 190 mn</i>
9 months	75	-	12,754	-
12 months	100	-	14,164	-

132. In the light of Airtel's submission that network connectivity issue and call failures are due to Jio's own 'under-preparedness', insufficient testing efforts and acquiring a large number of customers at the pre-launch stage itself, the Committee enquired about views of TRAI in the matter. TRAI, in a written note have submitted as under:-

"It cannot be conclusively established that the Reliance Jio's network connectivity issue and call failure are due to Jio's own under-preparedness, insufficient testing efforts etc. During the meetings held by TRAI with the service providers, it was observed that most of the problems of Reliance Jio network

connectivity stem from the lack of communication between the service providers."

133. With regard to steps taken to resolve the matter, TRAI have further stated as under:-

"Reliance Jio Infocomm Ltd. (RJIL) raised issues related to difficulty in obtaining E1-links at Points of Interconnection (POIs) from the existing telecom service providers.

In this regard, TRAI has conducted several meetings with the representatives of Bharti Airtel Ltd., Vodafone India Ltd., Idea Cellular Ltd. and RJIL on 09.09.2016, 01.11.2016, 24.11.2016 and 16.12.2016 urging them to ensure that the customers should not suffer due to delay in augmentation of POIs. TRAI has also been constantly monitoring the situation of congestion at POIs with RJIL for which it is collecting reports on traffic and congestion at POIs from various service providers.

On 27.09.2016, TRAI issued Show Cause Notices to the concerned telecom service providers for violation of Standards of Quality of service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009, dated 20.03.2009 and the provisions of Licenses.

On 07.10.2016, TRAI directed all service providers to comply with the Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 dated the 20.03.2009 and the terms and conditions of their respective Licenses.

After examining the replies to the Show Cause Notices received from the concerned telecom service providers, TRAI, on 21.10.2016, recommended to Department of Telecommunications that a penal action of Rs.50 crore per licensed service area, where POI congestion exceeded the allowable limit of 0.5%, may be initiated against Bharti Airtel Ltd., Idea Cellular Ltd. and Vodafone India Ltd."

**(i) Issues relating to Interconnection Agreement**

134. Reliance Jio submitted that in clear breach of Interconnection Agreement and sign of collusion, Vodafone, Idea and Airtel have together insisted for One-Way E1s from Jio, without traffic consideration. QoS has not improved as half of the E1s are heavily congested while the other half are underutilized (less than 20% utilization) and results in wastage of interconnect resources – therefore, Both-Way E1 is the only efficient way for resource utilization. Vodafone, Idea and Airtel among themselves only have Both-Way E1s. Barring these three operators, all other operators have only Both-Way E1s with Jio.

135. However, the representative of Airtel had also submitted that the above statement of Reliance Jio is factually incorrect. 23,351 E1s out of 30,000 which is 78 percent is dedicated for their traffic and only 22 per cent of the traffic is reserved for us. So, it is not 50:50.

136. Explaining the concept of one-way and both-way E1s, the representative of Bharti Airtel during the sitting of the Committee on 27th January submitted as under:-

"Sir, imagine there is a road with 10 lanes. If five cars are going this way and five that way, you can provide equal. If nine cars are going one way, if I provide 5:5, there will be a bigger problem. So, what I have done is that I have gone the other way and provided 9 to them for more flow of the traffic which is actually riding on my traffic and coming to my network. If I provide equal, there will be even more call blocks. So, what I have done is actually gone beyond the call of duty and provided even more incoming E1s in order to prevent the problem that they are facing. The second point I would like to make is that while we are absolutely committed to continuing to provide points of interconnect, there are constraints on their end. As I mentioned in my presentation, they have not got the transmission readiness, there are delays at their end, their projections are wrong and there have been inconsistencies in their data that they have themselves shown to us."

137. Bharti Airtel informed that the same Trunk Group (TG) carries the traffic from both directions. It is generally used for small-sized trunk groups in the initial phase of

connectivity. Both-way TGs are mostly used in the initial stages of interconnection when the traffic is low. The low traffic volumes are on account of the fact that either both or one of interconnected networks is new. The flow of traffic is less and the pattern is unknown.

138. One separate trunk groups are used for incoming and outgoing traffic. One-way TGs are used when traffic increases between networks, hence justifying the creation of separate trunk groups. Having separate trunk groups increases PoI efficiency and reduces the chances of call failure. Having one-way TGs is a well-established practice in the industry. In fact, more than 96% of Airtel’s total working PoIs with other operators, as shown in the table below, have one-way trunk groups. It is only the small-sized PoIs that have been configured as both-way trunk groups.

<b>TSP</b>	<b>Percentage of both-way E1s</b>	<b>Percentage of one-way E1s</b>
Airtel	7.5%	92.5%
HFCL	0.0%	100.0%
Idea	4.1%	95.9%
MTS	0.9%	99.1%
RCom	6.2%	93.8%
RJIL	3.2%	96.8%
TTSL	6.9%	93.1%
Telenor	0.1%	99.9%
Vodafone	2.0%	98.0%
<b>Average</b>	<b>3.9%</b>	<b>96.1%</b>

139. The average size of a both-way trunk group is of the order of 10 E1s. However, the average size of trunk groups provided for RJIL during the month of September 2016 was more than 50 E1s and, presently, the average size is more than 250 E1s.

140. Idea Cellular stated that one-way E1s would provide additional capacity to RJio, compared to the capacity offered by Two-way PoIs. Idea has provided One-way E1s (for RJIO subscribers calling to Idea) more than the total RJIO demand of Two-way E1s which

can be seen from below table. For example, against a total RJIO demand of 8,140 Two-way E1s for Access traffic (which would be used for traffic in both directions – RJIO to Idea as well as Idea to RJIO), Idea has provided 11,515 One-way E1s for Access traffic originating from RJIO (i.e. from RJIO to Idea), along with providing 4,375 One way E1s for Access traffic originating from Idea (i.e. from Idea to RJIO).

141. As per Vodafone Limited, conversion to one-way E1s are not a violation since, it has been specifically provided for in the mutually agreed and executed Interconnect agreement. As per mutually agreed and executed interconnect agreement with RJio and most private operators, new operator acts as seeker and is responsible to bring transmission media and equipment set up at provider operator's location, for first 2 years from date of commercial traffic. The provider operator bears the cost of providing the POIs. Post 2 years, each party bears cost for its outgoing traffic. This is mentioned in TRAI's 2002 regulation of Reference Interconnect offer as well.

142. On being enquired about the obligations for the TSPs under Interconnection Agreement, TRAI in a written note have submitted as under:-

" The relevant provisions pertaining to augmentation of E1 links at POI contained in the Interconnection Agreement dated 03.03.2014 between Bharti Airtel and RJIL under the clause 9 (Enhancement of Ports) are reproduced below for reference:

- "9.1. A minimum of 4 weeks written notice has to be given by either party for augmentation of Interconnect Links.
- 9.2. Augmentation shall be completed within 90 days of receipt of requisite charges specified in Schedule 2 from RJIL.
- 9.3. Any request for augmentation of capacity shall be in writing in the Proforma prescribed in Schedule 4.
- 9.4 Traffic measurements for 7 days shall be taken by both the Parties during agreed route busy hours at least 6 months after commencement of traffic at the POIs to determine further capacity requirements.

- 9.5 Either Party shall provide a forecast in writing in advance for its requirements of port capacity for Telephony Traffic for the next 6 months to enable the other Party to dimension the required capacity in its network.
- 9.6 RJIL shall undertake to use its capacity so made available during initial 2 years from establishment of first POI in that Service Area for a minimum period of 2 years.
- 9.7 In the event either Party does not fully utilize the capacity augmented within 3 months of provisioning (“underutilization of port capacity”), other party shall be free to resume the capacity for its own consumption or for allocation to another operator without any refund to RJIL for such underutilized ports.”

143. TRAI have also informed the Committee that in case, there is a breach of Interconnection Agreement by any of the Parties to the Agreement, the other party can file an application in the Telecom Dispute Settlement and Appellate Tribunal (TDSAT). However, as per the Section 11(1) (b) of the TRAI Act, 1997, the Authority is also mandated to discharge the functions to ensure compliance of terms and conditions of licence; fix the terms and conditions of inter-connectivity between the service providers; and ensure technical compatibility and effective inter-connection between different service providers. Clearly, ensuring effective interconnection between service providers is one of the important functions, as bestowed upon the Authority under TRAI Act, 1997. Accordingly, the Authority constantly monitors the situation of congestion on POIs and issues Show Cause Notices and Directions to the concerned service providers to protect consumer interest. Further, as per the terms and conditions of the Licenses granted by the Government, the Service Providers are mandated to provide interconnection to all eligible telecom service providers.

144. On the need to have some models of PoI agreement based on which telecom operators can enter into bilateral PoI agreement or other model of agreement for the industry, TRAI have further stated that through the Telecommunication Interconnection (Reference Interconnect Offer) Regulation, 2002, The Authority has mandated publishing of Reference Interconnect Offer (RIO) by the telecommunication service

providers holding significant market power based on the Model RIO annexed to the Regulation. The Model RIO provides a broad framework for arriving at a bilateral Interconnection Agreement. The Authority has undertaken a review of the present framework for interconnection by way of issuing a Consultation Paper on 'Review of Regulatory Framework for Interconnection' on 21.10.2016. The last dates for furnishing comments and counter-comments on this Consultation Paper were 12.12.2016 and 26.12.2016 respectively.

**(ii) TRAI recommendation for imposing penalty**

145. TRAI had stated that on perusal of the information furnished by Airtel, Idea and Vodafone, the Authority, *prima-facie* noted that in most of the licensed areas, the percentage of failed call attempts during busy hour with RJIL is exorbitantly high, thus these telecom service providers have failed to meet the benchmark for PoI congestion prescribed in the Standard of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 at the PoIs with RJIL and relevant provisions of the license. The Authority, on examination of the reply to the Show Cause Notices and after giving sufficient time and opportunity to the above telecom service providers, recommended to Department of Telecommunications (DoT) on 21.10.2016, a penal action of Rs.50 crore per licensed service areas (LSAs) against Airtel, Idea and Vodafone each, in all LSAs where PoI congestion exceeds the allowable limit of 0.5%.

146. On the status examination of the above recommendation, the Department have stated that a committee was set up in the Department of Telecommunications to examine the issue. The Committee has submitted its report which inter-alia includes the arguments forwarded by M/s RJIO, M/s Bharti Airtel, M/s Vodaone & M/s Idea Cellular Ltd., is under consideration. The Department have now stated that M/s Vodafone India

Ltd. and M/s Idea Cellular Ltd has filed a writ petition in Delhi High Court against the above said recommendations of TRAI.

147. When the Committee enquired about the status examination of the above recommendation, Department in a written note have submitted as under:-

"The recommendations of TRAI for imposition of penalty against M/s BhartiAirtel Limited, M/s Idea Cellular Limited and M/s Vodafone India Limited has been examined in the department and the same are being referred back to TRAI for furnishing its reconsidered opinion in the light of observations of the department on various issues, which include:

- Section 11(1)(a) (iii) of TRAI Act, 1997 provides that TRAI has the function of making recommendations for revocation of licence for non-compliance of terms and conditions of licence; however, TRAI has recommended a penal action, which is not covered under the TRAI Act;
- Basis of amount of penalty recommended;
- TRAI's "Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Fourth Amendment) Regulations, 2015" dated 15<sup>th</sup> October 2015 provide for financial disincentive in case of non-compliance of QoS benchmarks; however, TRAI has not invoked the said provisions in the instant case and went beyond the mandate given to it under the TRAI Act.

After receiving and reconsidering the reconsidered opinion of TRAI, DoT will form a view on its withstanding legal scrutiny."

148. Considering that TRAI Regulation of 2015 to provide for compensation to consumers was struck down by Supreme Court, the Committee specifically enquired whether this recommendation of TRAI will withstand legal scrutiny. TRAI have replied as under:-

"Upon receiving representations from RJIL regarding difficulty in obtaining E1-links at Points of Interconnection (POIs) from the existing telecom service providers, TRAI collected data from the concerned service providers on traffic and congestion at POIs with RJIL, issued Show Cause Notices to them and carefully examined their responses to the Show-Cause-Notices. Only after being fully satisfied with the facts that (i) these service providers are in non-compliance of the terms and conditions of license; and (ii) their denial of Interconnection to RJIL appears to be with ulterior motive to stifle competition, TRAI made Recommendations to the Department of



Telecommunications to initiate penal action against Bharti Airtel Ltd, Idea Cellular Ltd. and Vodafone India Ltd. of Rs. 50 crore per licensed service area where POI congestion exceeded the allowable limit of 0.5%.

#### **IV. Free Services and Predatory Tariff Structure**

149. As per the submission made by Idea Cellular Limited the difference in telecom industry is that the decision of one operator impacts the cost structure of the other operator. If one operator is offering free services, then a number of incoming calls coming on their network which they have to create capacity in their network, that increases the cost. That is why the fare decision on the inter connect cost which is currently determined as 14 per cent that does not cover our cost. So, most of the industry is not in that situation where there is an inter dependency of cost based on the decision of the other operator and so, TRAI regulation also somewhere provides the pricing decision or the inter-connect has to see the relative prosperity of operators.

150. During the sitting of the Committee, Secretary, DoT elaborated on the overall impact of providing free service on telecom industry as under:-

"But one thing which worries me personally is, free services in the short run are great for the consumers. But the kind of impact it is having on the industry is very worrisome. In the last quarter of this year, October to December, the revenue of major service providers in the private sector is likely to fall by seven to eight per cent. Airtel has come out with the results. Idea and Vodafone are to come out with the results. The BSNL which is not a listed company, but we know is down revenue by about 12 per cent. So, while we can have measures to improve ease of doing business, have reforms, have the best of governance, unless the private sector has the possibility of making profits, investments will not come. This is an industry which has quarter after quarter in the last 25 years, have increased its revenue. This unfortunately is the first quarter when the industry revenue is going to be down. For the next quarter it is expected to be 10 to 12 per cent down. So, if this continues, the foreign investments and private investments will get affected and it will have a negative impact on the growth of the telecom sector and the services and the technology that can be made available. We also worry that the Government is the largest creditor. Our nationalised banks are huge term lenders to these companies. If they start defaulting on their

instalments of spectrum or term loans, the problem will move from telecom to banking sector as well.”

151. When it was pointed out that a company cannot do predatory pricing unless it is in a dominant position, Idea Cellular have stated as under:-

"Yes. We believe that RJIO enjoys a position of redoubtable strength that enables it to determine how the market operates and, is, therefore, dominant. Apart from its unmatched financial muscle, it has the highest share of LTE spectrum amongst all operators in India (including control of 100% of the total spectrum in 800 MHz for LTE purposes), it has acquired an unprecedented 72 million subscribers in less than four months and its subscribers account for nearly 30% of the incoming voice traffic (on Idea network) and 80% of the total data consumption in the industry.

RJIO's free pricing offer is clearly predatory. It is pertinent to note that in case of voice services, it is not just the revenue that is being forgone by RJIO. Every voice minute that is terminated on a non-Jio network implies a cost of 14 paise per minute that is to be incurred by Jio (Interconnect Usage Charges - IUC). Hence, in essence, RJIO is not only realizing zero revenue for every minute of a voice call, it is in fact offering a negative price of 14 paise per minute by subsidizing IUC. Given the humongous operational costs e.g. network expenses, interconnect charges, publicity, depreciation and amortisation charges, and the interest charges on debt, etc., it is reasonably estimated that the monthly expenses for running its current operations is in the range of Rs. 3500 crore - Rs. 4000 crore. RJIO has continued to bear these huge losses, month on month for past several months already, and is showing no signs to start charging for its services. As a result of RJIO's free services, the Indian wireless sector is facing massive revenue decline. With costs remaining largely fixed and the necessary revenues to support these costs shrinking, operators may be forced to scale back their operations/ completely exit markets / curtail new investments, etc. which will render them uncompetitive in near future. Natural outcome will be a monopolistic/ oligopolistic market structure resulting in limited consumer choice."

152. Vodafone stated that Rjio case is a case of IUC non-compliant tariffs, which stifles competition and will impact entire telecom industry. The IUC non-compliant tariffs of Rjio has dented the growth, in terms of decrease in revenues and eventual payments of statutory levies and regulatory charges to National Exchequer. Further, the financial

performance of VIL has significantly deteriorated since the offer of free services by RJio. Vodafone group has recently written off Euro 5 billion of its investments in India. The revenue for the month of December 2016 has declined by -5.6% over previous month, and is third month in succession with revenue decline. Also, December month revenue is lowest in last 2 years. EBIDTA for the month December 2016 has declined by 9% and is lowest in last two and half years. Gross revenue has dropped by 1.8% in Q3 of current financial year (October 2016 to December 2016, on year on year basis). Due to decline in Revenues, license fee pay-out for the quarter (October 2016 to December 2016) has declined resulting in loss of contribution to exchequer. Adjusted Gross Revenue for the quarter (October 2016 to December 2016) has declined by 5.3% over previous quarter (July 2016 to September 2016). Under pressure, VIL had to also launch competitive offers, which will further impact financial condition. We are also pursuing legal recourses before Court of Law against the non-compliant tariff offers of RJio.

153. Bharti Airtel also submitted that RJIL has been providing free services for more than 5 months now, generating a tsunami of incoming voice traffic on Airtel's network, which has resulted in abnormal levels of asymmetric traffic, with 93% of the total traffic directed from RJIL towards Airtel. The huge asymmetry in traffic due to RJIL's free offers has led to the complete failure of the present IUC regime, which assumes nearly symmetric traffic while fixing the below cost termination charge. The present termination charge of 14 paise is already less than half of the actual cost of termination. Therefore, an asymmetry of such enormous magnitude is causing huge losses for Airtel. The per-minute cost of half the leg of the call, either outgoing or incoming, is approx. 35 paise/minute for Airtel's network. Due to fixation of the termination charge for an incoming call at 14 paise/minute by TRAI, Airtel makes a loss of 21 paise/minute for each incoming call. With continuation of the free services by Reliance Jio, this asymmetry in traffic is getting further skewed, thereby increasing the losses incurred on this account. Further, the free services provided by RJIL are predatory and in complete

violation of TRAI's tariff orders, which require that their tariffs should be in compliance with the Interconnection usage charge (IUC) regime.

154. When the Committee enquired about the views of TRAI in this matter, it is stated that through the Telecommunications Interconnection Usage Charges (Eleventh Amendment) Regulations, 2015 dated 23.02.2015, the Authority prescribed termination charge of Re. 0.14 per minute for wireless to wireless calls on the basis of 'work-done principle' which allows recovery of full-cost to the terminating service providers. This was done after following a comprehensive consultation process with stakeholders and on the basis of cost information furnished by the service providers including Idea Cellular Limited.

## PART-II

### Observations/Recommendations

#### Evolution of Quality of Service Regulations

1. Telecom Regulatory Authority of India Act, 1997 (24 of 1997) mandates the Telecom Regulatory Authority of India (TRAI) to lay down the standards of quality of service to be provided by the service providers and ensure the quality of service and also conduct the periodical survey of such service provided by the service providers so as to protect the interests of the consumers of telecommunication services. The Committee note that TRAI, in exercise of its functions under the above provisions had notified the “Regulation on Quality of Services (QoS) of Basic and Cellular Mobile Telephone Services, 2000”. This was reviewed in the year 2005 according to which the parameters for basic service (wireless) and Cellular Mobile Telephone Service were combined as the Quality of Service aspects associated with wireless medium common for both the services. TRAI undertook review of the parameters and notified “The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009.” These regulations are still in force for basic service and cellular mobile service. The Regulations of 2009 were first amended on 7<sup>th</sup> May 2012 and through these amendment regulations TRAI had notified the Quality of Service standards for 3G services. TRAI further issued “The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Second Amendment) Regulations, 2012” which provides for financial disincentives for delay in submission of compliance reports, non-compliance with the benchmarks for Quality of Service Parameters and for wrong reporting of QoS performance. Subsequently, TRAI reviewed the Quality of Service parameters for basic service (Wireline) keeping in view the practical difficulties expressed by the service providers in meeting the benchmarks and issued “The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Third Amendment) Regulations, 2014” after rationalizing the benchmark for some of the

parameters. At the same time TRAI had tightened the benchmark for some of the parameters concerning call centers so as to protect the interest of the consumers in both basic and cellular services. To create further deterrent against consecutive non-compliance with the benchmarks, TRAI have very recently notified “The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service (Fourth Amendment) Regulations, 2015” on 15<sup>th</sup> October 2015, providing for increased financial disincentives in cases of repetitive non-compliance. The Committee note that financial disincentives amounting to Rs. 12.09 crore has been imposed till 06.09.2016 on various service providers towards non-compliance of Quality of Service benchmarks and other violations out of which Rs. 12.02 crore have been deposited so far by the Service Providers.

From the above chronology of events, the Committee find that the Regulations relating to Quality of Service have undergone amendments and review from time to time to improve the quality of service provided by the telecom service providers. However, the increase in the number of complaints regarding the deteriorating quality of service and call drops rates have shown that successive reviews of the regulations have not been adequate to address the issues relating to quality of service and protect the interests of the consumers of telecommunications services. Besides, TRAI has not been adequately empowered to enforce various Regulations it had issued over a period of time. It is disquieting to note that even imposition of financial disincentives which is considered to be one of the strongest measures to ensure compliance, has not been an effective deterrent. Taking due cognizance of the fact that the increasing complaints of the consumers about poor quality of services being provided by TSPs especially relating to call drops, has drawn the attention of all including legislators, policy makers, Government, consumers and people at large, the Committee took up the subject ‘Issues related to Quality of Services and reported Call Drops’ for detailed examination. Apart from hearing the views of Department of Telecommunications and TRAI, the Committee also heard the views of Cellular Operators Association of India

(COAI) and also the TSPs such as Airtel, Vodafone, Idea, Reliance Jio, etc. The Committee examined the subject in the light of documents/information furnished by DoT, TRAI and the Telecom Service Providers, the Consultation Papers issued by TRAI from time to time and also the comments of stakeholders and consumers. All the issues relevant to the subject have been dealt with in the succeeding paragraphs.

### Quality of Service Benchmark for Call Drop

2. The Committee note that one of the major concerns raised by consumers regarding Quality of Service is Call Drop. The dropped call rate is an important measure for voice calls. The performance of Service Providers on call drop is assessed for both 2G and 3G services through two parameters viz. “call drop rate (benchmark  $\leq$  2%)” on monthly average basis for the licensed Service Area and “worst affected cells having more than 3% TCH drop (benchmark  $\leq$  3%).” Thus, any Cell with TCH drop/Circuit Switched Voice drop rate  $>$  3% is treated as bad cell whose performance is to be improved. As per the information furnished by the Department all the service providers had met the benchmark for the parameter “*call drop rate (benchmark  $\leq$  2%)*” in respect of 2G and 3G. In case of the parameter, “Worst affected cells having more than 3% TCH drop”, service providers did not meet the benchmark in 16 License Service Areas (LSAs) under 2G for the quarter ending in December, 2016 (M/s Aircel in 11, M/s BSNL-01, M/s TTSL (CDMA) -01, M/s Telenor-02, and M/s Vodafone in-01 Service Areas respectively). With regard to 3G also all the service providers had met the benchmark for the parameter “Call drop (Circuit Switch Voice drop) rate (benchmark  $\leq$  2%)”. In case of the parameter, “Worst affected cells having more than 3% TCH drop”, service providers did not meet the benchmark in 10 License Service Areas as on December, 2016 (M/s Aircel in 09 and M/s BSNL in 01). The Committee also note that call drop experience is worst during the busy hours defined as the one hour period when the maximum number of calls are handled. The Quality of Service benchmarks target the worst period for the LSA and the Cell Sites, and prescribe the

limits that must not be exceeded. The performance of mobile operators on the both the above parameters are measured for the service area as a whole and averaged for a quarter. The major limitation of this mechanism of average assessment of QoS is that it does not provide information about disparities in performance among different areas or cities such as rural or urban areas. The Committee are of the view that parameters worst affected cells having more than 3% Traffic Channel (TCH) drop/circuit switched Voice Drop Rate (benchmark  $\leq 3\%$  ) is the real measurement through which performance of each BTS can be analysed and ascertained. The fact that 16 Licensees are not meeting the benchmark in 2G and 10 Licensees are not meeting the benchmark in 3G service, in case of the parameter, "Worst affected cells having more than 3% TCH drop", points to the existence of dark spots and area of poor performance of call drop. Thus the method of averaging the service area as a whole does not give the realistic picture of quality of service, as factors, such as, density of population, vehicular traffic, hilly terrain, etc. are not uniform across a License Service Area Level. This had been proved from the fact that inspite of claims made by telecom operators that their performance on call drop is well within the TRAI limit of 2% benchmark, increasing complaints on call drop have been confirmed by several test drives conducted by TRAI from time to time. The Committee feel that there are critical gaps in the quality of service parameters which need a review. Instead of assessing the performance of Service Providers on call drop by averaging the licensed Service Area as a whole, the quality of service should be measured at more micro granular level, such as at Secondary Switching Area (SSA) level or at district/city level or at Short Distance Charging Area (SDCA) level, BTS level, etc. This will not only give a more realistic assessment of call drop in the country, but also provide detailed information about areas/places where performance is poor, so that coordinated action can be taken for addressing such problem areas. As the Chairman, TRAI, candidly submitted before the Committee that this overall percentage of call drop over service area as a whole hides the variations which might have. The



Committee recommend the TRAI to revise the QoS parameters and work on a whole new set of parameters taking the above factors into account.

3. The Committee also note that to provide good insight within service area, TRAI had invited a Consultation Paper on “Review of network related Quality of Service standards for Cellular Mobile Telephone Service” on 5th August, 2016, seeking comments on review of the quality of service standards for call drop and other parameters, including measurement methodology, so as to enhance the “Quality of Experience” for consumers. The consultation paper has sought comments on review of the granularity of measurement of Quality of Service standards *i.e.* whether QoS should be measured at Secondary Switching Area (SSA) level or at district/city level or at Short Distance Charging Area (SDCA) level. The Committee note that during the consultation process regarding measurement of call drop, Service Providers in general were not in favour of shifting the measurement from service area to sub-service area level and have cited numerous reasons, such as factors beyond TSPs control, no international reference of sub-service area level benchmarking in geographical comparable to India, network architecture for a service area and not designed and built on LDCA or District basis, lack of availability of digital maps with clearly defined towns, etc. The Committee recommend the Department/TRAI to examine the method of measurement of call drop carefully so that better measurement parameters are adopted which besides giving a good insight will lead to improvement in quality of services provided by the TSPs. The Committee desire that the process of consultation on measurement of call drop be completed in a time bound manner and Committee be apprised of the outcome.

#### Monitoring of quality of service

4. The Committee note that TRAI is monitoring the performance of service providers through quarterly Performance Monitoring Reports submitted by service providers. TRAI also regularly conducts audit and assessment of the quality of service performance by service providers through independent agencies. The audit involves

generation of performance monitoring report, audit of performance and drive test of the network. TRAI had undertaken extensive drive test of the network of service providers in many Secondary switching Areas (SSAs). The drive test reports have provided detailed information SSA-wise about the voice quality, coverage and network quality, including call drop. These reports have provided information about areas of insufficient coverage, where the service provider needs to improve quality of service. The Reports of Drive Tests were shared with service providers for improving Quality of Service. TRAI also assesses the Customer Perception of Service provided by service providers through getting the surveys undertaken by independent agencies. The reports submitted by the Audit agencies and results of these surveys are also published on TRAI website for information of all stakeholders and action by service providers. The Committee have learnt that TRAI will be conducting extensive drive tests in cities of more than one million population and in all state capitals through Independent agencies. Recently, the Department have established free four digit number 1955 through which they reach out to consumers randomly to find out whether they are suffering from poor quality or there are dark spots etc. TRAI has further informed the Committee that they are in the process of assessing customer perception of services through Survey using Interactive Voice Response System (IVRS) in the service areas of Delhi, Madhya Pradesh and Karnataka in Hindi and Kannada language. Based on the outcome of this survey, this method of Survey is proposed to be extended to other service areas of the country. While taking note of all the above measures, the Committee feel that the present system of monitoring of quality of services through Test Drive and network probing covers analysis of only limited usage period of network. A Drive Test done for a day of 160 kms. in a city will provide analysis of only marginal area of city geography (typically less than 5%) and limited calls (say 250) against millions of calls generated by all users in the city during the day. Moreover, TRAI Test Drive is limited to cities and urban areas. From the information given to the Committee, it appears that no efforts have been made so far to conduct

Test Drives in rural areas which may give a completely different picture. The Committee strongly recommend that Test Drives should not be limited only to cities and urban areas but it should also be carried out in vast rural and hilly areas. The Committee are of the view that monitoring of QoS by relying on technological method alone will not give the complete picture of the ground situation. The most accurate and actual picture will come from the customers who are actually facing the problems on the ground. The Committee, therefore, recommend that apart from methods like test drive and audit assessment, efforts should be made by the Department/TRAI for greater involvement of customers in monitoring of the QoS by taking their feedback into account. The Committee desire that the process of assessing customer perception of services through Survey using Interactive Voice Response System (IVRS) in the identified service areas should be initiated by TRAI at the earliest.

#### Reasons for call drop

5. The Department and TRAI have informed the Committee that Call drop in any Mobile network may be due to variety of reasons, which, *inter-alia*, include poor radio coverage due to non availability of suitable tower-locations, sealing of towers by local authorities/RWA/Owners due to EMF/ Other issues, radio interference due to unauthorized use of repeaters/ Wi-Max frequencies/ at international borders, change in pattern of traffic due to exponential growth in data traffic due to more use of smart phones which results in shrinkage of 3G/ 4G cell size, loading of available spectrum due to limited spectrum with very high users, non availability of 24x7 power resulting in shutdown of tower/BTS, poor RF optimization efforts, inadequate investment in network causing capacity constraints, interference due to unauthorised installation of signal boosters by users, etc. During the course of evidence, Cellular Operators Association of India (COAI) also submitted that there are several factors responsible for the Call Drops in the networks and most of these are beyond TSP's control. The Committee take note of the short term and long term measures being taken by the Department, TSPs and TRAI to address the issue of call drops. At the policy front, the

Department have taken initiatives which include allocation of 965 MHz spectrum during 2016, permitting sharing and trading of allocated spectrum, permitting active and passive infrastructure sharing, notifying Indian Telegraph Right of Way Rules 2016, waiving off the necessity of Wireless Operating License (WOL) for each radio station, facilitating the permissions for using the Government buildings and estates for setting up of mobile service towers, etc. TSPs on their part are also taking measures such as installation of new BTS sites, expansion of existing sites by adding additional hardware, use of self-optimizing network technology, regular monitoring of QoS on area-based clusters etc. TRAI being mandated to regulate the telecom services are also taking measures like close monitoring of performance of service providers, meeting with the service providers at CMD/CEO level to evaluate the performance, imposition of financial disincentive for non-compliance with the benchmark, launching of TRAI analytics portal which provides a geographical view on the map of India, undertaking regular test drive of mobile services in select cities, highways and railway routes, conducting awareness campaigns about EMF radiation so as to allay the fear of Resident Welfare Associations, etc. Since call drop takes place due to several factors and no single isolated reason can be attributed to call drop, there is an urgent need for all stakeholders, the Department, the Telecom Authority, TSPs and consumers at large to act together in unison on various issues so as to address the problems. All stakeholders need to have a constructive partnership for resolution of issues relating to quality of services and call drop. The Committee, therefore, recommend that DoT should review the status at regular intervals and take corrective/remedial measures in consultation with all stakeholders. The Committee hope that this will not only facilitate speedier implementation of various policies and plans of the Department/TRAI/TSPs but also help avoid any conflict of interest among them.

### **Measures to educate the consumers**

6. As per the 'Technical Paper on Call Drops in Cellular Network' issued by TRAI call drop can take place due to a variety of reasons. It was pointed out that Electromagnetic cause (RF related), the single largest cause, is responsible for 51.4 per cent call drop whereas 36.9 per cent of call drop, the second largest cause, is attributable to consumer's fault. The Committee note that while drawing such a conclusion TRAI has not undertaken any specific study to identify the factors that are attributable to consumers fault for call drop. On the other hand, the Technical Paper has drawn reference to a paper published in International Journal for Research in Applied Science and Engineering Technology (IJRASCT). In this regard the submission of Idea Cellular Limited that call drop takes place due to consumer behaviour like battery drain, entering into no or poor coverage area, (life, basement, deep indoors) is very normal scenario and is applicable to every wireless network by default. That being the case educating the consumers and creating consumer awareness through elaborate dissemination of information becomes very important. This also calls for greater insight into the factors which may lead to call drop due to consumer fault. Since TRAI had also not issued any guidelines to educate consumers about irregular user behaviour that can cause call drop, the Committee recommend that necessary information may be compiled in both the national and major regional languages for the benefit of the consumers. The Committee feel that consumer's fault is mainly due to ignorance and they can be made aware of the faults through proper awareness campaigns.

### **Sub- standard mobile handsets**

7. The Committee note that sub-standard mobile handsets are also responsible for poor Quality of service including call drop in the country. In order to ensure continuous improvement there is a need to continuously engage with device ecosystem for better voice and data experience getting pre certification of devices for sensitivity and network performance. These devices are mainly imported from China

and they tend to have poor quality of antenna and poor quality of radio equipment. The Committee note that though the Telecom Engineering Centre has set a handset interface requirement, these requirements have not been enforced strictly. The Ministry of Electronics and Information Technology have mandated that there should be BIS standards which should be applicable to all consumer electronic items including handsets and all electronic items which are imported or otherwise. The Committee are aware of the fact that though there is a progressive development of domestic electronic hardware manufacturing, the telecom equipment requirement in the country are still met to a large extent through substantial quantity of import. Considering the fact that the telecom equipments are vulnerable to security risks if not tested properly, DoT in co-ordination with Ministry of Electronics and Information Technology should ensure that BIS standards are strictly enforced. The Committee recommend that all consumer electronic items including handsets which are imported or otherwise should strictly conform to BIS standards. The Committee may be apprised about the steps taken in this direction.

#### QoS Benchmark for 4G and Data Services

8. The Committee note that TRAI has not laid down any Quality of Service standards for 4G data services separately and the existing Quality of Service Regulations for wireless data prescribed by TRAI in December, 2012 also covers 4G data services. The service providers are reporting their performance on data services, against the quality of service standards laid down in these regulations through quality performance monitoring reports. Further, TRAI has launched a portal – ‘Myspeed’ Portal for capturing the download and upload speed of wireless data through crowd sourcing. The Committee also note that Reliance Jio Limited is the only TSP providing voice service in 4G and TRAI will be laying down the quality of service for 4G VOLTE services. The Committee are given to understand that the quality of wireless data service depends on various factors such as number of users, traffic handled by the call being served to the customer, the mobile equipment of the users, etc. In view of the

shift from voice to data services at a rapid speed and hyper data consumption with introduction of 4G services, the Committee feel that there is a need to upgrade the QoS parameters keeping in view the issues in data and 4G service. Therefore, the Committee recommend that QoS for 4G voice services should be laid down at the earliest taking into account all the parameters required in these services. The Committee are also of the view that data services being provided by TSPs need considerable improvement in terms of its proliferation and increase in broadband speed. In this regard, the Committee desire that the QoS parameters for wireless data services be reviewed urgently and stringent regulations laid down so that data services provided by TSPs improve in terms of speed, quality and performance.

#### **TRAI proposal for Amendments in the TRAI Act**

9. One of the important measures taken by TRAI in the direction of quality of service and call drop was the Regulation issued by TRAI in October, 2015 to provide for compensation to consumers in the event of call drop. These regulations mandated originating CMTSPs to credit one Rupee for a dropped call to the calling consumers as notional compensation, limited to three dropped calls in a day. However, the Committee were informed that TRAI's punitive compensation for call drop was termed as arbitrary and unreasonable. Hon'ble Supreme Court held the Regulation to be *ultra vires* the TRAI Act which pronounced its verdict in Telecom Service Provider's favour, quashing the regulations. Consequently, TRAI have now proposed certain additional amendments in TRAI Act seeking (i) insertion of specific provision in TRAI Act under Section 11 conferring power upon TRAI to take measures to protect the interest of the consumers including award of compensation and mechanism for complaint redressal; and (ii) conferring power upon the Authority to impose fine and power upon the court to award imprisonment and fine for violation of the direction of the Authority and also for furnishing false report. These provisions are akin to those existing under the Reserve Bank of India Act, 1934, the Competition Act, 2002 and the Electricity Act,

2003. TRAI have requested the Government to amend the existing TRAI Act and tightening of the existing QoS regulation to monitor the network performance more effectively. The Committee note with concern that while on the one hand TRAI has been given the sole responsibility to ensure Quality of Service, Interconnection etc., on the other the requisite powers have not been vested with TRAI to enforce its regulations and directions. The Committee strongly feel that making suitable amendments to the Telecom Regulatory Authority of India Act, 1997, in order to statutorily empower TRAI to carry out its functions effectively and proactively is the need of the hour. TRAI should have penal powers including powers to impose financial penalties. More so, this has to be accorded top most priority since the thrust of the Government is on Digital India, broadband penetration and expansion of telecom services in rural and remote areas. These power may be along the lines of similar penal power available to other sectoral regulators. TRAI also needs to be empowered to strictly enforce the quality parameters. Further, as pleaded by Secretary, DoT, and Chairman, TRAI on many issues TRAI has only recommendatory role and it has no say in the acceptance of its recommendations. The Committee note that TRAI is mandated to protect the interest of Service Providers and Consumers. Considering that huge responsibility has been cast on TRAI and in view of the growing consumer complaints against poor quality of service, the Committee feel that TRAI should be vested with required powers to enforce its regulations and directions. At the same time, the Committee desire that revision in the TRAI Act for empowering TRAI with punitive powers should not act as a hindrance to the ease of doing business for telecom service providers also. There needs to be harmonious balance between the authority of the regulator and the business interest of the TSPs. While formulating necessary provisions for arresting call drop, it is essential to take into consideration the business environment of service providers because it is they who are instrumental in the much needed growth of this sector.



### **Public awareness regarding EMF radiation**

10. The Committee note that objections and protests by resident welfare associations against installation of mobile towers is one of the factors which is impacting the quality of services leading to frequent call drop in the country. The Department had stated that this is mainly because of the imagined fear of health risks of electro-magnetic radiations. The Committee note that the Minister himself through outreach efforts including workshops in State headquarters is trying to ensure that telecom towers are not closed due to these reasons. Efforts are also being made by the Department to educate people that the radiations are not ionizing radiations and do not have an impact on human health as proven by 25,000 articles which the WHO has analyzed and looked at. The Department have further informed the Committee that the norms for electromagnetic radiation in India are ten times stricter than in USA, Japan and other countries and robust monitoring systems have been put in place to ensure that these norms are adhered to. TRAI proposes to interact with the consumers and with Consumer Advocacy Groups through Workshops, Seminars and Consumer Outreach Programmes about EMF Radiation to allay the fears of consumers and Residence Welfare Associations (RWAs) about EMF Radiation. The Committee have examined the subject 'Norms for setting up of telecom towers, its harmful effects and setting up security standards in expansion of telecom facilities' and submitted the Report wherein the issues related to EMF radiation and public fear have been dealt with extensively. The Committee have given a set of recommendations on which the Department are already working on. While appreciating the ongoing efforts of the Department/TRAI, the Committee feel that the aforesaid efforts are still inadequate to dispel the fear from the minds of the consumers of the ill effects of EMF radiations from BTS of mobile towers as is clear from the submission of TSPs who have cited this for poor service quality. The Committee in this regard suggest that massive advertising campaigns in print, electronic and digital media involving various public figures, cine actors, artistes both at national and regional levels should be started by

the Department/TRAI. The Committee feel that collaborative efforts by all TSPs in this regard will have a greater impact on the ground since they have greater appeal to the masses.

### **Investment on Network Expansion**

11. The Committee note that Idea Cellular Limited has made an overall investment of Rs.1.2 lakh crore by March, 2017. Vodafone is the largest FDI investor in the country and has brought largest equity infusion of Rs.48,000 crore in FY, 2017, this is in addition to Rs.1,15,000 crore already invested in India prior to and after 2007-08. Vodafone have further stated that a predictable and stable policy and regulatory regime is a necessary to encourage investments in the sector. Bharti Airtel had made cumulative investment of Rs.2,14,800 crore and also committed to investing Rs.60,000 crore over the next three years to upgrade better quality services. With regard to Reliance Jio, an amount of Rs.1,60,000 crore has been invested and installed 2,82,000 BTS. They are now in the process of installing an additional 1 lakh BTS by March, 2017. The Committee have been informed that in the meeting chaired by Secretary (T) on 10.06.2016 with CEOs/MDs of the service providers to seek their full participation in resolving the issue of call drops in national interest, TSPs have indicated a target of around 60,000 additional BTS equipment to be installed in different parts of the country. They have also assured to make use of the latest available technology to assess the position and carry out optimization on regular basis with finer granularity. As per the information provided by the Department, the Committee note that during the period from June 2016 to October 2016, 1,29,000 BTS have been added. During the review done on 1<sup>st</sup> November 2016, addition of around 156,000 BTS, on aggregate basis, by March 2017 was further committed. Around 40,000 BTS on this account have already been added. The Committee feel that this is one of the perfect example of how things can be improved if the Department and various TSPs work in close coordination. While appreciating the achievements made by the TSPs, the Committee feel that the investment in infrastructure made by TSPs

does not correspond to their expansion and reach and overall revenue being generated by them. There is certainly more scopes for more investment in the country as large parts of the rural areas are bereft of qualitative service. Concerted action from Telecom Service Providers, stretching and fine tuning their infrastructure will help improve the situation. The Committee note that India and China have a comparable customer base. Considering that spectrum is provided without any cost in China and it has to be bought at huge price in India, it may not be fair to compare the investment made by telecom operators in the two countries, however, the difference in investment made during one year in telecom network which is 50 billion in China as compared to 5 billion in India speaks a lot about the lack of requisite investment in the country. Since lack of infrastructure due to poor investment has been cited as one of the reasons for poor connectivity especially in rural areas, the Committee recommend that the Department should take up the matter with the CEOs/MDs of TSPs and impress upon them to add more BTS by increasing their investment especially in rural areas. The Committee also recommend that telecom Infrastructure being core infrastructure, efforts should be made by the Department for speedier implementation of various initiatives being taken by the Government to fill the gaps in infrastructure in critical areas thereby helping the TSPs to invest more. The Committee may be apprised of the progress made in this regard.

#### Issues related to Spectrum

12. The Committee note that the TSPs have cited deficient availability of spectrum as one of the reasons causing call drop. Issues relating to allocation of spectrum is under the purview of the Department. In the recent spectrum auctions conducted by the Government, the Department have been able to provide 965 megahertz of spectrum to telecom operators at a market determined price in a transparent manner. This volume of spectrum is more than the spectrum the TSPs have acquired cumulatively in the last four auctions of 2012, 2013, 2014 and 2015. The Committee

note that this has resulted in additional spectrum availability of around 20 MHz to 84MHz in most Licensed Service Areas (LSAs). As a result, spectrum holding per Telecom Operator has increased by around 2 to 9 MHz in each LSA. However, spectrum holding per telecom operator in India is still very less when compared to other countries mainly because the total spectrum assigned to commercial telecom operators is less as compared to other countries and number of telecom operators in each LSA is 7 to 11 vis-à-vis 3 to 5 in other countries. The Committee note that there will be further improvement in the situation once the unsold spectrum rights mainly in 700 MHz, 2100 MHz and 2500 MHz bands are procured by telecom operators and consolidation in the Indian telecom operator will be beneficial as far as spectrum holding per operator is concerned. The Committee are hopeful that even though only 965 MHz spectrum out of 2300 MHz on offer has been acquired by TSPs after the recently held auction in 2016, with this additional 965 MHz spectrum there will definitely be an improvement in the quality of services once the equipments are deployed and spectrum is put into use. Shortage of spectrum can no more be cited by TSPs as a reason for poor quality of service. However, this is possible only when the roll-out obligations of the spectrum are adhered to by the TSPs. As per roll out obligations, operators have to roll out their services in 10 per cent of District headquarters and 90 per cent of Metros in the first year, 50 per cent of the District headquarters in the third year, and 30 per cent of Block headquarters has to be covered in five years. Considering that poor coverage may be due to non-fulfilment of roll-out obligations by TSPs in the respective service areas, the Committee recommend that the Department should take all necessary measures to ensure that all TSPs strictly adhere to the roll-out obligations so that network coverage is substantially improved in the respective service areas. The Committee also desire that the latest status of compliance/non-compliance of roll-out obligations by TSPs along with the action taken by the Department against the TSPs not meeting the roll out obligations may be furnished to them.

### Setting up of Towers in Government buildings

13. The Committee note it has been agreed in-principle that Ministry of Urban Development (MoUD) shall permit installation of mobile towers/in-building solutions in the Government buildings under their control subject to structural safety and payment of appropriate Licence fee by the TSP. Such mobile towers/in-building solution shall be a shared facility for all TSPs. In this regard, Government have taken initiatives by allowing Central Government Buildings/ Estate, NDMC Buildings/ Estate in Lutyens Zone, Delhi, as well as allowing Defence Estate and Postal Buildings for installation of mobile towers/ BTSs in order to address the issue of call drops and quality of services. Department of Defence have issued the detailed Policy Guidelines for installation of Cell-On-Wheels (CoW) in Cantonment Areas. 61 locations in Delhi Cantonment Area have been identified in the joint survey conducted by DoT/ Defence Estate/ Service providers and Defence authorities. Tender has already been opened on 04/01/2017 and under evaluation. Department of Defence have initiated a Cabinet Note for leasing out defence land for installation of mobile towers on all-India basis to improve the quality of service and address the problem of call drops. Department of Posts (DoP) have also issued Guidelines on 21.07.2016 for use of postal buildings for BTS-installations. Service providers have raised certain concerns and held a meeting on 05/01/2017 for certain modifications which are under consideration by DoP. The Committee note that setting up towers in Government buildings would definitely prove to be of considerable help in improving network performance further, as in many cities, Government buildings and Defence areas are the only places where towers can be set up. The Committee, however, note that a majority of Government Departments do not allow the installation of BTS as a matter of policy and some due to security concerns. The Committee note that achievements made so far in this regard have been negligible. The Committee are of the view that when Government Department/Agencies themselves are resisting setting up of towers in their premises or building due to various reasons, it leaves little scope by way of setting an example

for the Resident Welfare Associations to allow setting up of towers in the residential areas. The Committee note that setting up of towers in Government building helps a lot in network planning and site addition, especially in congested areas is good from EMF perspective, which eventually leads to better quality of service. The Committee recommend that the Department should urgently pursue with the Department of Defence, Department of Posts and other Ministries/Departments so as to enable the telecom operators to speedily set up towers in their buildings and areas.

#### **Shutting down of towers by Local agencies**

14. The Committee note that sealing of towers by Local/Municipal Bodies of States/UTs is acting as one of the hindrances to uninterrupted services by TSPs leading to poor network coverage and call drop in the country. Hon'ble Minister in charge of the DoT have taken up the matter with Union Urban Development Minister and all Chief Ministers of States citing "Digital India" and "m-governance" programs for providing single window clearances, space in Government buildings for mobile sites, and ensuring 24x7 power. Secretary (T) also chaired a meeting on 28.06.2016 with different Civil Agencies (in Delhi and Mumbai) which deal with grant of permission for mobile towers so that each of such Agency facilitates the augmentation of telecom infrastructure in their jurisdiction. Efforts are being made to address the issues relating to public fear due to EMF radiations, sealing of operating telecom sites by Municipal bodies and possibility of de-sealing them. The Committee also note that DoT had prescribed uniform advisory guidelines for tower installation *vide* its letter dated 1.8.2013 and Indian Telegraph Right of Way Rules, 2016 has been notified on 15.11.2016 to regulate underground infrastructure (optical fibre) and over-ground infrastructure (mobile towers) to facilitate timely permissions for installation of towers/optical fiber to enhance mobile coverage and capacity. The Committee note that TSPs are facing lot of challenges because different States have come up with their own tower policies, which are non-uniform and impose restrictions relating to the setting up of towers near schools, hospitals, colleges, jails, etc. The Committee feel

that proper implementation of DoT Uniform Advisory Guidelines for tower installation and Rules and RoW which provides for a single window and time bound clearances, by all States, Municipal Bodies and Corporations will to a great extent address the issues relating to expansion of telecom infrastructure including timely setting up of towers. The Committee recommend that the Department should constantly pursue the matter with all the states/UTs to mandatorily implement these rules by States/UTs in their respective jurisdiction so that good quality telecommunication and broadband services are provided to the public.

#### **Initiatives taken by TRAI for ensuring accuracy of metering and billing**

15. The Committee note that TRAI had prescribed the standards for metering and billing through the Quality of Service (Code of Practice for Metering and Billing Accuracy) Regulations, 2006. These regulations contain a Code of Practice for Metering and Billing Accuracy, which every service provider has to comply with. The regulations provide for Audit of the Metering and Billing system of the service providers by the service provider every year through any one of the auditors from the panel notified by TRAI. The service providers have to submit the Audit Report to TRAI by 31<sup>st</sup> July every year. Also they have to take action on the audit observations and Action Taken Report have to be submitted to TRAI by 15<sup>th</sup> November every year. The Committee note with satisfaction that the audit of metering and billing system has helped in identifying systemic issues and rectifying the problems in a timely manner. Some of the systemic issues identified in the audit report which have been addressed by TRAI are wrong configuration of tariff plans in the billing system, delay in configuration/opening of new codes and number services in the network leading to wrong charging of consumers, wrong charging of calls due to wrong configuration in the billing system of the type of calls, large instances of wrong dialing, etc. In fact, the whole issue of call drop came to fora due to the increasing complaints by consumers on mobile billing and other irregularities. However, the TRAI Act, 1997 does not envisage handling of individual complaints by TRAI, though TRAI *suo moto* looks into

issues affecting large number of consumers or practices adopted by service providers which are against the interest of consumers. With regard to method of billing viz. per minute or per second billing, the Committee have been informed that while per minute billing is the preferred mode of billing internationally due to post paid customers forming the bulk of subscribers, however, in India since majority of the customers are on prepaid platform, per second billing has become prevalent across all operators in the last four years. The Committee note that per second billing brings more transparency and customers have greater control over their spend as they have to pay for the exact duration used. TSPs resorting to over billing and other practices have been proved by the fact that during the audit of the metering and billing system of service providers during the financial 2014-15, 83 cases of overcharging involving customer base of 3704510 were detected. The amount refunded was Rs.1.53 crore (approx) and an amount of Rs.19.17 lakh which cannot be refunded to the customers was deposited in the Telecom Consumers Education and Protection Fund maintained by TRAI for educating consumers and for creating awareness about consumer issues. Since millions of people are using mobile phones, it is of utmost importance that TSPs strictly adopt accurate billing method. The Committee recommend that the Department/TRAI should ensure strict monitoring to ensure accuracy of metering and billing by the TSPs so that the service providers are forced to identify systemic issues and rectify the problems in a timely manner. This assumes importance particularly because very few avenues are available with consumers to address their grievances when it comes to billing related irregularities. The Committee also recommend that TSPs should be instructed to provide relevant information regarding billing method to subscribers at the time of giving connections itself.

### **Grievance Redressal Mechanism**

16. The Committee note that two-tier redressal mechanism has been laid down by TRAI for a comprehensive grievance redressal mechanism through its regulation "Telecom Consumer Complaint Redressal Regulation." As per this regulation the first



level of grievance redressal is at the call centre and the second level is at the Appellate Authority. In addition to the above, the consumers can also register their grievances through Centralized Public Grievances Redressal and Monitoring System (CPGRAMS) portal of Government of India. The Committee note that since TRAI Act, 1997 does not envisage handling of individual consumer complaints by TRAI, all complaints received in TRAI are forwarded to the concerned TSPs for seeking appropriate action. To strengthen the grievance redressal mechanism, the Committee have been informed that TRAI had made a recommendation for an ombudsman before 2004. Earlier, the Consumers Protection Act was applicable on telecom cases. However, Hon'ble Supreme Court decided that consumers of telecom sector will not be a part of it. The Committee note that now the Department had made a recommendation to amend the Consumer Protection Act so that telecom consumer complaints will come under it. Another suggestion is setting up of e-court for addressing consumer grievance in telecom sector which will take e-evidence and give e-judgements. The Committee are of the view that the existing telecom grievance redressal mechanism is woefully inadequate and there is an urgent need to strengthen the Consumer grievance redressal mechanism. This problem has been further compounded by the fact that consumers are not aware of the little existing grievance redressal mechanism put in place both at TSPs and at the Government levels. The Committee feel that since telecom is one of the sector having maximum customers, there is a need to set up robust mechanism to protect the interests of the consumer. The Committee recommend that urgent step should be taken to amend the Consumer Protection Act so as to bring telecom consumers complaint under Consumer Protection Act. Since telecom complaints are largely in nature of small items with large numbers, the Committee also recommend early setting up of e-courts which will not only address telecom complaints but will as well cater to large e-commerce complaints also. The Committee also recommend that telecom operators should also be made to conduct

more customers workshops and customer satisfaction surveys in every circle to effectively address customers complaints.

#### Technology to mask call drop

17. The Committee note that Radio Linked Timeout is the parameter which is set in the telecom service provider's network. It is a technical parameter that decides how long a call can last if the signal quality plunges below a certain threshold. All operators have fixed this value within the range prescribed by GSM standards *i.e.* 4-64. The Committee also note that RLT is very important in case of emergencies, such as natural calamities, that lead to massive outages in the network. In such cases, the outage of a large number of base stations hamper the consistency of radio connectivity and RLT helps to hold the calls in such difficult conditions. The Committee note that during the test by TRAI, it was observed that in some service areas the service providers had set a higher volume for RLT, because of which customers had faced bad quality of call for short duration without the call being dropped. Since there is no benchmark for the RLT volumes at present, TRAI has not taken any action against service providers in the matter. The Committee note as per submission of Department that RLT which is a useful technology at time such as emergency, can also be misused as it can 'mask' call drop by showing a call remaining 'connected' even when the network connection is lost and the caller is unable to hear the voice from the other side. Given the current situation of call drop and absence of any benchmark for RLT, the Committee are apprehensive that RLT can be a convenient tool in the hands of TSPs to manipulate it in their favour. The Committee recommend that appropriate monitoring mechanism should be put in place at the earliest so that misuse of RLT by TSPs in the name of traffic management may be checked appropriately.

### Development of Applications

18. The Committee note that TRAI has recently launched TRAI analytical portal which has three sub-portals viz. TRAI QoS Analytic Portal, TRAI Myspeed Portal and TRAI Drive Test Portal. The Portal allows a user to check the call drop rate of all the 2G networks of any particular telecom operator on all India level, service area level, district level and BTS level. The Committee also note that TRAI had also developed 'MySpeed' App, which can be downloaded from mobile sewa app store. This App allows users to measure their data speed experience and send the results to this portal. The customers can view the data experience of all TSPs from the TRAI MySpeed Portal. The Committee note that TRAI analytical portal provides useful information regarding the performance of 2G services and data speed experience of various TSPs. However, it provides little scope through which customers can engage themselves with the service providers and provide their feedback like the Grameen Vidyutikaran App developed by Ministry of Power to provide real time data on electrification of all villages in the country. Moreover, QoS Analytical Portal is limited only to 2G services and does not cover services like 3G and 4G voices. Though it is a good initiative, the TRAI analytical portal will not go far in addressing the concerns of the consumers unless the lacunae and limitations pointed out by the Committee are suitably addressed. The Committee, therefore, recommend that analytical portal developed by TRAI should be upgraded in the line of Ministry of Power which will not only provide comprehensive pictures of 2G, 3G and 4G BTS but will also feature a citizen engagement window so that consumers can engage with TRAI/TSPs through positive feedbacks.

### Introduction of Green Energy

19. The Committee note that 24/7 power backup is an essential pre-requisite for delivery of non-stop services by telecom service providers. Several feasible options are being looked into for ceaseless power supply to telecom towers. The Committee

note that solar deployment is a continuous process and wherever feasible solar deployments are done. The Committee are given to understand that Solar power generation is not a remedy for power outage at Telecom Sites. This is mainly because solar generation is possible only for about Eight hours a day which is only one third of the requirement. As per COAI, the average Solar capacity deployed in Telecom Sites (in present deployments) is about 4.5 KW, which occupies about 45 Sq.mtrs. and amount of space is available only in few Ground Based Sites and such kind of space availability is almost impossible in Roof Top Sites. About 7.4% of Sites are working with renewable hybrid systems in India and many of those Sites have Solar Plants deployed to meet partial power requirements of the Site. The Committee note that Industry has done extensive trials for generating power at Telecom Sites using other identified renewable energy sources namely Wind, Hydrogen, Methanol & Biomass and the inferences are wind power generation is location specific and unreliable and not suitable for most of the telecom Sites, Hydrogen and Methanol are renewable only when these are available as a bi-product of some other manufacturing process and there is no ecosystem existing in India for production and operation & maintenance of such Fuel Cells. Bio-Mass is very much localized. In light of the above, COAI have submitted that there is need to make Grid Power available to telecom sector on priority basis at industrial /favourable rates. Further, an exemption from scheduled power load shedding be granted to telecom sector. COAI have also submitted that grid power to Operational Telecom Sites should not be disconnected without hearing the Operator first. So far as deploying solar and other renewable resources is concerned, the availability of adequate space and techno-financial feasibility continues to be the real challenge. In view of this, TSPs have adopted state-of-art storage battery technology and energy management and monitoring system for a cleaner and greener solution for powering sites where 24x7 power availability is a challenge. The Committee note that in order to look into deployment of clean and renewable energy, TRAI has issued the consultation paper on 'Approach towards

sustainable telecommunications' on 16.01.2017. TRAI had also recommended that to address the issue of lack of space for installations of towers and supply of electricity, utilization of tower space of various power corporations for installation of antenna or BTS of the telecom operators. The Committee note with concern that no substantial progress has been made with regard to adoption of green and renewable energy and setting up of towers by using the transmission towers of various power corporations. Consequently, given the poor availability of electricity in rural areas, call drop due to lack of electricity supply in the rural areas still remains a practical reality. The Committee desire that the above submission made by COAI may be considered favourably by the Department and process of consultation through consultation paper floated by TRAI to look into introduction of Green Energy for telecom services should be expedited and completed at the earliest. The Committee also note that Blood Banks in rural areas could not be set up due to lack of adequate power supply. With availability of 24x7 electricity, the Committee are of the view that around 25,000 BSNL exchanges in rural areas which have secured facilities and air condition environments may also be operated as Blood Banks. Since lack of electricity is one of the main reasons due to which Blood Banks could not be set up in rural areas, the Committee recommend that the Department should explore this possibility which will help in saving many lives. The Committee further recommend that the issue relating to utilizing the relay towers of various power corporations may be taken up with them. The Committee are of the view that utilizing the transmission towers of the power companies will help in building more sites required for coverage and automatically improve quality of service. The Committee may be apprised of the progress made with regard to the above suggestions of the Committee.

#### **Installation of unauthorized signal boosters**

20. As per the submission of TRAI, TSPs have expressed concern regarding interference due to unauthorised installation of signal boosters by users which is also

one of the reasons for call drop. From the submission made by COAI, the Committee note that the interference from repeaters/boosters/jammers and faulty/leaky cable TV equipment have become so prominent that it prevents the licensees from providing flawless telecom services and launching of services. On the other hand, the Department are of the view that the problem is not with the boosters provided the boosters are made to operate in the correct frequency with the correct power. The Committee note that the Department are trying to encourage some of the telcos to choose their own outlets, sell authorised boosters and issue licence as an interim measure but ultimately consumer networks have to be improved especially for indoors where more boosters are used. Till there is an improvement in the telecom network, it will not be possible to completely ban the use of boosters and repeaters. However, TSPs have desired easy availability of these illegal repeaters/boosters/jammers in the local open market and online portals need to be regulated at the earliest and law enacted to make the sale, possession or use of jammers as “illegal”. They have also desired that adequate authority should also be granted to TERM/WMO wings for seizure/confiscation of illegal Repeaters, Boosters, Jammers and faulty/leaky cable TV equipment causing interference. The Committee need not emphasize that interference issues related to out of band emissions as well as illegal repeaters, boosters and jammers have increased manifold. While taking note of the submission that use of boosters cannot be stopped till the quality of services are satisfactory, the Committee feel that Department may look into the option of allowing only authorized boosters and strict action should be taken against the use of illegal repeaters, boosters and jammers so as to provide flawless services. The Committee recommend that TERM/WMO Wings of DoT should be adequately empowered and necessary authority given so as to enable them to confiscate sale or use of illegal repeaters, boosters, jammers and faulty/leaky Cable TV equipment causing interference.

### Issues relating to Points of Interconnection (PoI)

21. Reliance Jio in their submission before the Committee had expressed concern that leading operators like Vodafone, Idea and Airtel have been virtually blocking calls from Jio to their networks by denying adequate interconnection. 740 crore outgoing calls have been blocked from the Jio network. 12-15 crore calls are blocked every day. As per their submission, the problem is of alarming proportion and the total call drops due to call blocking from Jio network alone is of the order of total call drops in the country. Over 55-60 percent of calls from Jio network to Vodafone, Idea and Airtel continue to get blocked. Reliance Jio had also stated that augmentation of PoIs by Vodafone, Idea and Airtel is highly inadequate. However, all the operators have strongly countered the submission given by RJIO that call blocking is happening due to denial of adequate interconnections. Vodafone India Limited had submitted that Vodafone have provided Jio all the PoIs they have asked for and sufficient for 75mn subscribers, even when they have lesser number of subscribers. It further stated that RJio had sought 9314 E1s for Access & 2184 E1s for NLD by 21<sup>st</sup> March 2017 (*i.e.* 9 months from the date of its letter dated 21 June 2016), considering 80% of these E1s for RJio's outgoing traffic, these were provided/exceeded by 25.11.2016. These E1s were required to cater to a subscriber base of 100 million – as of date almost double the required number of E1s have been provided and the subscriber base is believed to be around 72 million. Idea Cellular Limited had also submitted that its PoI allocation to Jio is much in excess of Jio's PoI demand. Idea has provided POI E1s more than RJIO's own forecasted demand. While, RJIO had forecasted a requirement of 10,070 POIs (8,140 for Access, 1,930 for NLD) for a base of 100 million subscribers by March 2017 (as per its communication to Idea via its letter dated 21.06.2016), Idea Cellular had completely met this requirement by second week of November 2016, *i.e.* well before the RJIO projected timeline of March 2017 despite the fact that RJIO was yet to attain subscriber base of 100 million subscribers. Bharti Airtel had further submitted before the Committee that Points of interconnect they have provided is four times

ahead of comparable operators. As on 1<sup>st</sup> Feb 2017, Bharti Airtel have provided 27,719 number of E1s which is higher than RJIL demand for 100 million subscribers forecasted for 12 months and is sufficient for 190 million subscribers. These operators have gone to the extent of blaming that connectivity issue and call failures are due to Jio's own 'under-preparedness', insufficient testing efforts and acquiring a large number of customers at the pre-launch stage by Reliance Jio. However, as per TRAI it cannot be conclusively established that the Reliance Jio's network connectivity issue and call failure are due to Jio's own under-preparedness, insufficient testing efforts etc. During the meetings held by TRAI with the service providers, it was observed that most of the problems of Reliance Jio network connectivity stem from the lack of communication between the service providers. The Committee are given to understand that amidst TSPs at loggerhead and consumers hue and cry relating to quality of services, TRAI conducted several meetings with the representatives of Bharti Airtel Ltd., Vodafone India Ltd., Idea Cellular Ltd. and RJIL on 09.09.2016, 01.11.2016, 24.11.2016 and 16.12.2016 urging them to ensure that the customers should not suffer due to delay in augmentation of Pols. On 27.09.2016, TRAI issued Show Cause Notices to the concerned telecom service providers for violation of Standards of Quality of service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009, dated 20.03.2009 and the provisions of Licenses. TRAI informed the Committee that on perusal of the information furnished by Airtel, Idea and Vodafone, the Authority, *prima-facie* it was noted that in most of the licensed areas, the percentage of failed call attempts during busy hour with RJIL is exorbitantly high. Thus, these telecom service providers have failed to meet the benchmark for Pol congestion prescribed in the Standard of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 at the Pols with RJIL and relevant provisions of the license. The Authority, on examination of the reply to the Show Cause Notices and after giving sufficient time and opportunity to the above Telecom Service Providers, recommended Department



of Telecommunications (DoT) on 21.10.2016, a penal action of Rs.50 crore per licensed service areas (LSAs) against Airtel, Idea and Vodafone each, in all LSAs where PoI congestion exceeds the allowable limit of 0.5 percent. The Department have informed that a Committee set up to examine the issue has also submitted its Report which *inter-alia* included the arguments forwarded by M/s RJIO, M/s Bharti Airtel, M/s Vodaone and M/s Idea Cellular Ltd., which is under consideration. With regard to updated status on the issue the Department have informed that M/s Vodafone India Ltd. and M/s Idea Cellular Ltd. have filed a writ petition in Delhi High Court against the above said recommendations of TRAI and the matter is sub- judice. Going deep into the claims and counter claims made by the TSPs, the Committee are inclined to conclude that there are considerable policy gaps which have ultimately put consumers into tremendous hardship for no fault of their own. Consumer interest is the supreme guiding factor for any service industry. The matter has dragged on so much without any amicable resolution points to the fact that under the present circumstances no mechanism is in place by the Department/TRAI to address such impasse. Since most of the problems of Reliance Jio network connectivity stem from the lack of communication between the service providers, the Committee recommend that appropriate mechanism should be put in place for proper coordination and resolution of such issue. The Committee may be apprised of all the initiatives taken in this regard.

#### **Issues relating to Interconnection Agreement**

22. Reliance Jio, through their submission made before the Committee have alleged that in clear breach of Interconnection Agreement and sign of collusion major Telecom Service Providers Vodafone, Idea and Airtel have insisted for One-Way E1s from Jio, without traffic consideration. QoS has not improved as half of the E1s were heavily congested while the other half remained underutilized (less than 20 percent utilization) resulting in wastage of interconnect resources and, therefore, both-Way E1 is the only efficient way for resource utilization. Only Vodafone, Idea and Airtel have

both-way E1s among themselves. Barring these three operators, all other operators have only both-way E1s with Jio. Reliance Jio further submitted that they have entered into Interconnection Agreements with all the telecom licensees and as per the provision in the Interconnection Agreements parties are obligated to maintain 0.2 percent Grade of Service and 70 percent utilization of POIs. All the licensees are also obligated to meet QoS parameters specified by TRAI as per which congestion at interconnection points should not be more than 5 calls per 1,000 call attempts. Operators are required to provide both-way E1s at least for the first two years as per the Interconnection Agreement in order to ensure optimum utilization of interconnection resources. Bharti Airtel have, however, submitted that both-way TGs are mostly used in the initial stages of interconnection when the traffic is low. One-way TGs are used when traffic increases between networks, hence justifying the creation of separate trunk groups. Having separate trunk groups increases Pol efficiency and reduces the chances of call failure. Having one-way TGs is a well-established practice in the industry. In fact, more than 96% of Airtel's total working Pols with other operators have one-way trunk groups. Idea Cellular have also stated that one-way E1s would provide additional capacity to RJio, compared to the capacity offered by Two-way Pols. Idea has provided One-way E1s (for RJIO subscribers calling to Idea) more than the total RJIO demand of Two-way E1s. As per Vodafone Limited, conversion to one-way E1s are not a violation since it has been specifically provided for in the mutually agreed and executed Interconnect agreement. As per mutually agreed and executed interconnect agreement with RJio and most private operators, new operator acts as seeker and is responsible to bring transmission media and equipment set up at provider operator's location, for first 2 years from date of commercial traffic. The Committee note that in case there is a breach of Interconnection Agreement by any of the Parties to the agreement, the other party can file an application in the Telecom Dispute Settlement and Appellate Tribunal (TDSAT). As per TRAI Act, 1997, the Authority is also mandated to discharge the

functions to ensure compliance of terms and conditions of licence; fix the terms and conditions of inter-connectivity between the service providers; and ensure technical compatibility and effective inter-connection between different service providers. Accordingly, TRAI is constantly monitoring the situation of congestion on POIs and issues Show Cause Notices and Directions to the concerned service providers to protect consumer interest. TRAI have further stated that through the Telecommunication Interconnection (reference Interconnect Offer) Regulation, 2002, the Authority has mandated publishing of Reference Interconnect Offer (RIO) by the telecommunication service providers holding significant market power based on the Model RIO. The Model RIO provides a broad framework for arriving at a bilateral Interconnection Agreement. The Committee note that TRAI has undertaken a review of the present framework for interconnection by way of issuing a Consultation Paper on 'Review of Regulatory Framework for Interconnection' on 21.10.2016. The last dates for furnishing comments and counter-comments on this Consultation Paper were 12.12.2016 and 26.12.2016 respectively. The Committee observe that when Reliance Jio are demanding for more E-Is, TSPs like Idea, Vodafone and Bharti Airtel are allocating more One-way E1s on the ground that it will increase POI efficiency and reduces the chances of call failure. The Committee are of the view that some of the reasons for the contradictory views taken by the TSPs may be due to lack of well defined Interconnection Agreement. The Committee, therefore recommend that the consultation paper on 'Review of Regulatory Framework for Interconnection' should be completed at the earliest. In view of the contradictory view taken by various TSPs, the Committee would like the Department/TRAI to go into the depth of the matter and accordingly apprise the Committee of the actual reasons for POI congestion between them and the remedial measures taken thereon.

#### **Free Services and Predatory Tariff Structure**

23. As per the submission made by Idea Cellular Limited, RJIO's free pricing offer is clearly predatory and as a result of RJIO's free services, the Indian wireless sector is

facing massive revenue decline. With costs remaining largely fixed and the necessary revenues to support these costs shrinking, operators may be forced to scale back their operations /completely exit markets/curtail new investments, etc. which will render them uncompetitive in near future. The Committee have been further informed that natural outcome will be a monopolistic/oligopolistic market structure resulting in limited consumer choice. Vodafone India Limited have pleaded that free services provided by RJio is a case of IUC non-compliant tariffs, which stifles competition and will impact entire telecom industry and the IUC non-compliant tariffs of RJio has dented the growth, in terms of decrease in revenues and eventual payments of statutory levies and regulatory charges to National Exchequer. Further, the financial performance of Vodafone India Limited has significantly deteriorated since the offer of free services by RJio. Under pressure, Vodafone India Limited had to also launch competitive offers, which will further impact financial condition. The Committee also note that Vodafone India Limited are also pursuing legal recourses before Court of Law against the non-compliant tariff offers of RJio. Bharti Airtel have also submitted that RJIL has been providing free services, generating a tsunami of incoming voice traffic on Airtel's network, which has resulted in abnormal levels of asymmetric traffic, with 93% of the total traffic directed from RJIL towards Airtel. The huge asymmetry in traffic due to RJIL's free offers has led to the complete failure of the present IUC regime, which assumes nearly symmetric traffic while fixing the below cost termination charge. The present termination charge of 14 paise is already less than half of the actual cost of termination. Therefore, an asymmetry of such enormous magnitude is causing huge losses for Airtel. Further, it is submitted by Airtel that the free services provided by RJIL are predatory and in complete violation of TRAI's tariff orders, which require that their tariffs should be in compliance with the Interconnection Usage Charge (IUC) regime. However, TRAI termination charge of Re. 0.14 per minute for wireless to wireless calls on the basis of 'work-done principle' allows for recovery of full-cost to the terminating service providers. The Committee

note that this was done after following a comprehensive consultation process with stakeholders and on the basis of cost information furnished by the service providers including Idea Cellular Limited. The Committee take note of the submission of Department that free service may be benefitting the consumers, at the same time it is having worrisome impact on the industry and during the last quarter of 2016, October to December, the revenue of major service providers in the private sector is likely to fall by 7 to 8 percent. This is the first quarter when the industry revenue has declined and for the next quarter it is expected to be 10 to 12 per cent. The Committee are of the considered view that TRAI as a sectoral regulator has an important role to play in development of telecom services in the country. Apart from protecting the interest of the consumers, it is the role of TRAI to provide an eco-system/environment which is fair and transparent, encourages competition, and promotes a level playing field for all the service providers. Since declining revenue earnings of the TSPs may have serious repercussions not only for telecom industries but also financial sector as a whole, the Committee recommend that the Department/TRAI should work in tandem with the telecom service providers, consumers and industry as whole and the issues relating to pricing and tariff structure are addressed in such a way that all the stakeholders have a win-win situation and everyone reaps the benefit of telecom revolution.

New Delhi;  
10 April, 2017  

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20 Chaitra, 1939 (Saka)

Shri Anurag Singh Thakur  
Chairperson  
Standing Committee on  
Information Technology  
ANNEXURE

## QoS parameters for Basic (Wireline) services, 2G & 3G Services

### Basic (Wireline) services

Serial Number	Name of Parameter	Benchmark	Averaged over a period
(i)	Fault incidences (No. of faults/100 subscribers /month)	≤ 7	One Quarter
(ii)	Fault repair by next working day	<p><b>For urban areas:</b> By next working day: ≥ 85% and within 5 days: 100%.</p> <p><b>For rural and hilly areas:</b> By next working day: ≥ 75% and within 7 days: 100%.</p> <p><b>Rent Rebate</b> Faults pending for &gt;3 days and ≤7 days: Rent rebate for 7 days. Faults pending for &gt;7 days and ≤15 days: Rent rebate for 15 days. Faults pending for &gt;15 days: rent rebate for one month.</p>	One Quarter
(iii)	Mean Time To Repair (MTTR)	≤ 10 Hrs	One Quarter
(iv)	Point of Interconnection (POI) Congestion (on individual POI)	≤ 0.5%	One month
(vi)	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle	One Billing Cycle

(vii)	Metering and billing credibility -- pre-paid	Not more than 1 complaint per 1000 customers, i.e., 0.1% complaints for metering, charging, credit, and validity	One Quarter
(viii)	Resolution of billing/ charging complaints	100% within 6 weeks	One Quarter
(ix)	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(x)	Response Time to the customer for assistance		
	(a) Accessibility of call centre/ customer care	≥ 95%	One Quarter
	(b) Percentage of calls answered by the operators (voice to voice) within 90 seconds	≥ 95%	One Quarter
(xi)	Termination/ closure of service	≤ 7 days	One Quarter
(xii)	Time taken for refund of deposits after closures	100% within 60 days.	One Quarter

## QoS parameters 2G & 3G Services

Serial Number	Name of Parameter	Benchmark	Averaged over a period
<b>A</b>	<b>Network Service Quality Parameters:</b>		
(i)	Network Availability		
	(a) BTSs Accumulated downtime (not available for service) (2G) Node-B's Accumulated downtime (not available for service) (%age) (3G)	$\leq 2\%$	One Month
	(b) Worst affected BTSs due to downtime (2G) Worst affected Node-B's due to downtime (%age) (3G)	$\leq 2\%$	One Month
(ii)	Connection Establishment (Accessibility)		
	(a) Call Set-up Success Rate (within licensee's own network) (2G) (3G)	$\geq 95\%$	One Month
	(b) SDCCH/ Paging Channel Congestion (2G) SDCCH/Paging Channel and RRC Congestion (%age) (3G)	$\leq 1\%$	One Month
	(c) TCH Congestion (2G) TCH and Circuit Switched RAB Congestion (%age) (3G)	$\leq 2\%$	One Month
(iii)	Connection Maintenance (Retainability)		



	(a) Call Drop Rate (2G) Call Drop and Circuit Switched Voice Drop Rate: (%age) (3G)	$\leq 2\%$	One Month
	(b) Worst affected cells having more than 3% TCH drop (call drop) rate (2G) Worst affected cells having more than 3% TCH drop (call drop) and Circuit Switched Voice Drop Rate:- CBBH (3G)	$\leq 5\%$ upto 31.03.2011 $\leq 3\%$ From 01.04.2011	One Month
	(c) connections with good voice quality (2G) Connections with good voice quality and Circuit Switch Voice Quality (CSV quality) (3G)	$\geq 95\%$	One Month
(iv)	Point of Interconnection (POI) Congestion ( on individual POI) (2G) Point of Interconnection (POI) Congestion (3G)	$\leq 0.5\%$	One Month
<b>B</b>	<b>Customer Service Quality Parameters:</b>		
(v)	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle	One Billing Cycle
(vi)	Metering and billing credibility – pre-paid	Not more than 1 complaint per 1000 customers i.e. 0.1% complaints for metering, charging, credit, and validity	One Quarter

(vii)	(a) Resolution of billing/ charging complaints	98% within 4 weeks & 100% within 6 weeks	One Quarter
	(b) Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(viii)	Response Time to the customer for assistance		
	(a) Accessibility of call centre/ customer care	≥ 95%	One Quarter
	(b) Percentage of calls answered by the operators (voice to voice) within 60 seconds Percentage of calls answered by the operators (voice to voice) within 90 seconds	≥ 90% ≥ 95%	One Quarter
(ix)	Termination/ closure of service	100% within 7 days	One Quarter
(x)	Time taken for refund of deposits after closures	100% within 60 days	One Quarter

**MINUTES OF THE TENTH SITTING OF THE STANDING COMMITTEE ON  
INFORMATION TECHNOLOGY (2015-16) HELD ON 16<sup>TH</sup> JUNE, 2016**

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The Committee sat on Thursday, the 16<sup>th</sup> June, 2016 from 1050 hours to 1300 hours in Committee Room '139', First Floor, Parliament House Annexe, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur - Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Shri Prasun Banerjee
4. Dr. Sunil Baliram Gaikwad
5. Shri Hemant Tukaram Godse
6. Shri Virender Kashyap
7. Dr. (Smt.) Bhartiben Dhirubhai Shiyal
8. Shri. D.K.Suresh
9. Shri Ramdas C Tadas
10. Smt. R. Vanaroja

***Rajya Sabha***

11. Shri Salim Ansari
12. Shri Vijay Jawaharlal Darda
13. Shri Suresh Gopi
14. Shri Meghraj Jain
15. Shri Santiuse Kujur
16. Mahant Shambhuprasadji Tundiya

***SECRETARIAT***

1. Shri R.S. Kambo - Additional Secretary
2. Shri J.M. Baisakh - Director
3. Shri Shangreiso Zimik - Under Secretary

**Ministry of Communications and Information Technology**  
**(Department of Telecommunications)**

	<b>Name</b>	<b>Designation</b>
1.	Shri N.K.Yadav	Member (Technology) (Ex-officio Secretary to the Government of India)
2.	Shri Anupam Srivastava	CMD,BSNL
3.	Shri P.K. Purwar	CMD, MTNL
4.	Shri R.M. Chaturvedi	DDG
5.	Shri. Shishir Kansal	Director

**TELECOM REGULATORY AUTHORITY OF INDIA**

	<b>Name</b>	<b>Designation</b>
1.	Shri Ram Sewak Sharma	Chairman,TRAI
2.	Shri Anil Kaushal	Member, TRAI
3.	Shri Sudhir Gupta	Secretary,TRAI
4.	Shri. U.K. Srivastava	Principal Advisor (NSL)
5.	Shri S.K. Mishra	Principal Advisor (F&EA)
6.	Shri. A.Robert J.Ravi	Advisor(QoS)

2. At the outset, the Chairperson welcomed the Members and the representatives of the Ministry of Communications and Information Technology (Department of Telecommunications) and Telecom Regulatory Authority of India (TRAI) to the sitting of the Committee. The representatives of TRAI then made a power-point presentation to brief the Committee on the subject '**Issues related to quality of services and reported call drops**'. The presentation, *inter-alia*, dealt with the legal provision in the TRAI Act, basic objectives of quality of Service (QoS) Regulations, genesis of TRAI action on call drops, monitoring of Quality of services by TRAI, reasons for call drops and result of test drive conducted by TRAI, reasons cited by operators for call drops, etc.

3. The representatives of DoT/TRAI also informed the Committee regarding action taken by TRAI like floating of consultation paper on call drop and issuing of regulation for payment of compensation to consumer, Supreme Court judgment declaring the TRAI regulation as ultra vires of TRAI Act, means available with the consumers in the aftermath of SC judgment, TRAI proposal for amendments in the TRAI Act, recent policy initiatives taken by DoT, etc.

4. The Members then sought clarifications on issues to which the representatives of DoT and TRAI responded. The Chairperson requested DoT and TRAI to furnish written replies to the points which remained unanswered.

5. The Chairperson, then, thanked the representatives of DoT and TRAI for briefing the Committee.

The witnesses then withdrew.

**The Committee, then, adjourned.**

Verbatim Proceedings of the sitting has been kept on record.

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**STANDING COMMITTEE ON INFORMATION TECHNOLOGY  
(2016-17)  
MINUTES OF THE SECOND SITTING OF THE COMMITTEE**

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The Committee sat on Thursday, the 20<sup>th</sup> October, 2016, from 1130 hours to 1335 hours in Committee Room No. '139', First Floor, Parliament House Annexe, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur- Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Shri Prasun Banerjee
4. Hemant Tukaram Godse
5. Dr. Anupam Hazra
6. Dr. J. Jayavardhan
7. Shri P. Karunakaran
8. Shri Virender Kashyap
9. Shri Keshav Prasad Maurya
10. Shri Abhishek Singh
11. Shri Ramdas C. Tadas
12. Smt. R. Vanaroja

***Rajya Sabha***

13. Shri Suresh Gopi
14. Shri Santiuse Kujur
15. Smt. Kahkashan Perween
16. Dr. K.V.P. Ramachandra Rao
17. Dr. Vinay P. Sahasrabuddhe

**SECRETARIAT**

1. Shri R.S. Kambo - Additional Secretary
2. Shri Y.M. Kandpal - Director
3. Dr. Sagarika Dash - Deputy Secretary
4. Shri Shangreiso Zimik - Under Secretary

**List of Witnesses**  
**Department of Telecommunications**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri J.S. Deepak	Secretary
2.	Shri G.K. Upadhyay	Member (Technology), Telecom Commission
3.	Shri Rajnish Kumar Misra	Member (Services), Telecom Commission
4.	Shri P.K. Mittal	Sr. DDG (AS)
5.	Shri P.K. Sinha	Sr. DDG (LFPP)
6.	Shri S.K. Gupta	DDG (Task Force)
7.	Shri A.S. Verma	Director (AS-IV)
8.	Smt. Urvashi Sangwan	ADG (AS-IV)

**TELECOM REGULATORY AUTHORITY OF INDIA (TRAI)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri Ram Sewak Sharma	Chairman (TRAI)
2.	Shri Anil Kaushal	Member (TRAI)
3.	Shri Sudhir Gupta	Secretary (TRAI)
4.	Shri U.K. Srivastava	Principal Advisor (NSL)
5.	Shri S. K. Mishra	Principal Advisor (F&EA)
6.	Shri Sunil Bajpai	Principal Advisor (IT)
7.	Shri Asit Kadayan	Advisor (QoS)

2. At the outset, the Chairperson welcomed the Members and the representatives of the Ministry of Communications (Department of Telecommunications) and Telecom Regulatory Authority of India (TRAI) to the sitting of the Committee. The representatives of the Department then made a power-point presentation to brief the Committee on the subject 'Issues related to Quality of Services and reported Call Drops'.

The presentation, *inter-alia*, dealt with details of Quality of Services (QoS) Regulations, monitoring of Quality of Services and action taken for compliance, review of quality of standards, reasons for call drops, action taken by the Government to improve quality of services, activities undertaken by the TSPs to improve services, etc.

3. The representatives of TRAI also made a power-point presentation before the Committee highlighting issues, such as review of quality of service parameters, launching of MySpeed App by TRAI to measure mobile network speed from the users' devices, QoS Analysis Portal through which users can search the performance of individual or all TSPs in a particular area, launching of drive test portal, amendment to TRAI Act, 1997, etc.

4. The Members then sought clarifications on issues to which the representatives of DoT and TRAI responded.

5. The Chairperson, then, thanked the representatives of DoT and TRAI for appearing before the Committee.

The witnesses then withdrew.

**The Committee, then, adjourned.**

Verbatim Proceedings of the sitting has been kept on record.



**STANDING COMMITTEE ON INFORMATION TECHNOLOGY  
(2016-17)**

**MINUTES OF THE THIRD SITTING OF THE COMMITTEE**

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The Committee sat on Thursday, the 10<sup>th</sup> November, 2016, from 1100 hours to 1340 hours in Committee Room No. '62', First Floor, Parliament House, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur- Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Shri Prasun Banerjee
4. Shri Harish Dwivedi
5. Dr. Sunil Baliram Gaikwad
6. Dr. Anupam Hazra
7. Shri P. Karunakaran
8. Shri Virender Kashyap
9. Shri Abhishek Singh
10. Smt. R. Vanaroja

***Rajya Sabha***

11. Shri P. Bhattacharya
12. Shri Suresh Gopi
13. Shri Derek O'Brien
14. Smt. Kahkashan Perween
15. Dr. K.V.P. Ramachandra Rao
16. Dr. Vinay P. Sahasrabuddhe

**SECRETARIAT**

1. Shri R.S. Kambo - Additional Secretary
2. Shri Y.M. Kandpal - Director
3. Dr. Sagarika Dash - Deputy Secretary
4. Shri Shangreiso Zimik - Under Secretary

## **List of Witnesses**

### **Reliance Jio Infocomm Ltd. (RJIL)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri. Mahendra Nahata	Member of Board of Directors
2.	Shri. Anshuman Thakur	Sr. Vice President, Head of Strategy, RJIL
3.	Dr. Shanker Adawal	President Corporate Affairs
4.	Shri. Kapoor Singh Guliani	President Regulatory
5.	Shri Mahipal Singh	Vice President Regulatory

### **Cellular Operators Association of India (COAI)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Mr. Rajan Mathews	Director General
2.	Mr. Saurabh Puri	Director
3.	Ms Vertika Misra	Director

### **Department of Telecommunications**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri G.K. Upadhyay	Member (Technology), Telecom Commission
2.	Shri P.K. Mittal	Sr. DDG (AS)

### **Telecom Regulatory Authority of India (TRAI)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri Ram Sewak Sharma	Chairman (TRAI)
2.	Shri Anil Kaushal	Member (TRAI)
3.	Shri Sudhir Gupta	Secretary (TRAI)

2. At the outset, the Chairperson welcomed the Members and the representatives of the Reliance Jio Infocomm Limited to the sitting of the Committee. He also invited the representatives of the Ministry of Communications (Department of Telecommunications) and TRAI to the sitting of the Committee. The representatives of

Reliance Jio Infocomm Ltd., then made a power-point presentation on the subject 'Issues related to quality of services and reported call drops' which, *inter-alia*, highlighted details of investment made in the telecom sector, commitment of Reliance Jio to provide highest quality of services to customers, benefits of new technology adopted, Points of Interconnection (Pols) and requirement of Pols as per License Agreement and Interconnection Agreement, the issue of call blocking by incumbent operators, inadequate augmentation of Pols by Vodafone, Idea and Airtel, need for addressing the issue of call blocking due to Pols congestion, etc. The Members then sought clarifications on issues and the same were replied to by the witnesses.

**(The witnesses then withdrew)**

3. Thereafter, the representatives of Cellular Operators Association of India (COAI) were called in to present their views on the subject 'Issues related to quality of services and reported call drops'. The representatives of the Ministry of Communications (Department of Telecommunications) and TRAI continued to be present during the sitting of the Committee. The representatives of COAI made a power-point presentation before the Committee highlighting issues such as the role played by Indian telecom sector's in nation building, Indian telecom sector's commitment for 2020, issues related to quality of services and call drops, performance of the industry and its responsibility, reasons for call drops, action taken by operators to further address QoS and call drop issues, etc. The Members then sought clarifications on issues and the same were replied to by the witnesses.

**(The witnesses then withdrew)**

4. The Chairperson at the end of each discussion thanked the representatives of Reliance Jio and COAI for appearing before the Committee. The Chairperson requested them to furnish written replies to the points which remained unanswered.

**The Committee, then, adjourned.**

Verbatim Proceedings of the sitting has been kept on record.

**STANDING COMMITTEE ON INFORMATION TECHNOLOGY  
(2016-17)**

**MINUTES OF THE FOURTH SITTING OF THE COMMITTEE**

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The Committee sat on Monday, the 28<sup>th</sup> November, 2016, from 1600 hours to 1800 hours in Committee Room No. 'C', Ground Floor, Parliament House Annexe, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur- Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Shri Prasun Banerjee
4. Shri Harish Dwivedi
5. Dr. Sunil Baliram Gaikwad
6. Shri Hemant Tukaram Godse
7. Dr. J. Jayavardhan
8. Shri Virender Kashyap
9. Shri Keshav Prasad Maurya
10. Shri Raosaheb Danve Patil
11. Dr. (Smt.) Bhartiben Dhirubhai Shiyal
12. Shri Abhishek Singh
13. Shri D.K. Suresh
14. Smt. R. Vanaroja

***Rajya Sabha***

15. Shri P. Bhattacharya
16. Shri Derek O'Brien
17. Dr. K.V.P. Ramachandra Rao

**SECRETARIAT**

- |    |                           |   |                      |
|----|---------------------------|---|----------------------|
| 1. | Shri R.S. Kambo           | - | Additional Secretary |
| 2. | Shri Y.M. Kandpal         | - | Director             |
| 3. | Dr. Sagarika Dash         | - | Additional Director  |
| 4. | Smt. Reena Gopalakrishnan | - | Deputy Secretary     |
| 5. | Shri Shangreiso Zimik     | - | Under Secretary      |

### **List of Witnesses**

#### **Vodafone India Limited**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri P. Balaji	Director - Regulatory & External Affairs
2.	Shri Vishant Vora	Director - Technology, Network
3.	Shri Sundeep Kathuria	EVP - Policy & Regulation
4.	Shri Sanjeev Arora	AVP - Regulatory Affairs & Govt. Relations

#### **Idea Cellular Limited**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri Akshaya Moondra	Chief Financial Officer and Director
2.	Shri Anil Tandan	Chief Technology Officer
3.	Shri Rahul Vatts	Senior Vice President
4.	Shri Rajat Mukarji	Chief Corporate Affairs Officer
5.	Gagan Deep Bajaj	General Manager – Regulatory & Corporate Affairs

#### **Department of Telecommunications (DoT)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri P.K. Mittal	Sr. DDG (AS)

#### **Telecom Regulatory Authority of India (TRAI)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri U.K. Srivastava	Pr. Advisor (NSL)

2. At the outset, the Chairperson welcomed the Members and the representatives of Vodafone India Limited and Idea Cellular Limited to the sitting of the Committee. He also invited the representatives of the Ministry of Communications (Department of Telecommunications) and TRAI to the sitting and welcomed them. Taking strong objection to the absence of Heads of both the Telecom Service Providers (TSPs) from the sitting of the Committee and recalling their earlier absence also without having informed the Committee and seeking exemption, the Committee desired the representatives of both TSPs to convey their displeasure in strong words to their Heads for their absence. The Committee also desired to convey that in future such absence of Heads of Service Providers without following due procedure shall be viewed as a breach of privilege of the Committee.

3. The representatives of Vodafone India Limited, then, made a power-point presentation on the subject which, *inter-alia*, included details of National Network Performance of the Company, support provided by Government agencies for improving performance, projections of Points of Interconnection (Pols) by Reliance Jio and the status of augmentation made, Jio's requirements not conforming to Licence conditions/regulations/interconnect agreement, incorrect forecasts by Reliance Jio, delay in augmentation of Pols by Reliance Jio, issues relating to free service provided by Jio in violation of TRAI tariff orders, etc.

4. Thereafter, the representatives of Idea Cellular Limited made a power-point presentation before the Committee. The power-point presentation highlighted issues such as efforts made for network expansion, details of investment made and investment plan in the next six months, 2G and 3G national call drop trend, drive-test and optimization across 22 Circles, new projects in progress and reduction in call drops, financial performance of the Company, issues related to Reliance Jio Points of Interconnection, excess of Pol allocation made by Idea, significant delay in Pol implementation by Jio, inconsistency in Jio's traffic dimension design with its free and

unlimited voice calls, etc. The Members then sought clarifications on issues and the same were replied to by the witnesses.

5. The Chairperson thanked the representatives of Vodafone India Limited and Idea Cellular Limited for appearing before the Committee. The Chairperson also requested both the Telecom Service Providers to furnish written replies to the points which remained unanswered.

The witnesses then withdrew.

Verbatim Proceedings of the sitting has been kept on record.

**The Committee, then, adjourned.**

**STANDING COMMITTEE ON INFORMATION TECHNOLOGY  
(2016-17)**

**MINUTES OF THE SEVENTH SITTING OF THE COMMITTEE**

-----

The Committee sat on Thursday, the 19<sup>th</sup> January, 2017 from 1500 hours to 1640 hours in Committee Room No. '139', First Floor, Parliament House Annexe, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur- Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Shri Prasun Banerjee
4. Dr. Sunil Baliram Gaikwad
5. Dr. Anupam Hazra
6. Dr. J. Jayavardhan
7. Shri Virender Kashyap
8. Shri Harinder Singh Khalsa
9. Shri Abhishek Singh
10. Shri D.K. Suresh
11. Shri Ramdas C. Tadas
12. Smt. R. Vanaroja

***Rajya Sabha***

13. Shri P. Bhattacharya
14. Shri Suresh Gopi
15. Shri Santiuse Kujur
16. Dr. K.V.P. Ramachandra Rao

**SECRETARIAT**

- |    |                           |   |                      |
|----|---------------------------|---|----------------------|
| 1. | Shri R.S. Kambo           | - | Additional Secretary |
| 2. | Dr. Preeti Srivastava     | - | Joint Secretary      |
| 3. | Shri Y.M. Kandpal         | - | Director             |
| 4. | Dr. Sagarika Dash         | - | Additional Director  |
| 5. | Smt. Reena Gopalakrishnan | - | Deputy Secretary     |
| 6. | Shri Shangreiso Zimik     | - | Under Secretary      |



**List of Witnesses**

**Bharti Airtel Limited**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri Gopal Vittal	Chief Executive Office and Managing Director
2.	Shri Ravi Gandhi	Chief Regulatory Officer
3.	Shri Shyam Mardikar	Chief of Network Strategy & Architecture (Networks)
4.	Shri Tarun Chitkara	GM – Regulatory Affairs
5.	Shri Amit Kushwaha	VP- Regulatory Affairs
6.	Shri Suraj Diwedi	Manager - Regulatory

**Aircel Limited**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri Kaizad Bomi Heerjee	CEO, Aircel Group
2.	Shri Sameer Dave	CTO, Aircel Group
3.	Shri Ashok Sharma	National Head - Regulatory

**Department of Telecommunications**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri P.K. Mittal	Sr. DDG (AS)

**Telecom Regulatory Authority of India (TRAI)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri U.K. Srivastava	Principal Advisor (NSL)

2. At the outset, the Chairperson welcomed the Members and the representatives of Bharti Airtel Limited and Aircel Limited to the sitting of the Committee. He also invited the representatives of the Ministry of Communications (Department of Telecommunications) and Telecom Regulatory Authority of India (TRAI) to the sitting and welcomed them. The representatives of Bharti Airtel Limited, then, made a power-point presentation on the subject which, *inter-alia*, included present status of call drops on 3G and 2G networks, investment made in building the network, acquiring spectrum and cutting edge technology, opening up of Network Portal for customer awareness, call drop rate performance in Delhi and Mumbai and some related concerns, engagement with Government and Local Authorities for setting up of towers in Delhi; collaborative efforts made with DoT to improve performance, endeavor for continuous improvement, areas/issues where continuous support is required, etc. The representatives also highlighted the issues relating to Points of Interconnection with Reliance Jio, such as no. of interconnect capacity provided to Reliance Jio Limited compared to other operators with higher subscribers, Pols allocated *vis-à-vis* RJIL demand, incorrect and misleading data by RJIL, etc.

3. Thereafter, the representatives of Aircel Limited made a power-point presentation on the subject which, *inter-alia*, included Company's portfolio and investment made, QoS parameters and benchmark laid down by TRAI and compliance made, major reasons for QoS shortfall and call drop concerns in Delhi and Mumbai, action taken and plans to improve call drop, 2G and 3G BTS sites built in 2015-16, update on Pols congestion with Reliance Jio, support required from Government/Regulator to improve call drop, etc. The Members then sought clarifications on issues and the same were replied to by the witnesses.

4. The Chairperson thanked the representatives of Bharti Airtel Limited and Aircel Limited for appearing before the Committee. The Chairperson also requested both the Telecom Service Providers to furnish written replies to the points which remained unanswered.

The witnesses then withdrew.

Verbatim Proceedings of the sitting has been kept on record.

**The Committee, then, adjourned.**

**STANDING COMMITTEE ON INFORMATION TECHNOLOGY  
(2016-17)**

**MINUTES OF THE EIGHTH SITTING OF THE COMMITTEE**

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The Committee sat on Friday, the 27<sup>th</sup> January, 2017 from 1500 hours to 1630 hours in Committee Room No. 'G-074', Ground Floor, Parliament Library Building Annexe, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur- Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Shri Prasun Banerjee
4. Dr. Sunil Baliram Gaikwad
5. Dr. Anupam Hazra
6. Shri Virender Kashyap
7. Shri Abhishek Singh
8. Shri Ramdas C. Tadas

***Rajya Sabha***

9. Shri P. Bhattacharya
10. Shri Santiuse Kujur
11. Smt. Kahkashan Perween
12. Dr. K.V.P. Ramachandra Rao
13. Dr. Vinay P. Sahasrabuddhe

***Secretariat***

- |    |                           |   |                      |
|----|---------------------------|---|----------------------|
| 1. | Shri R.S. Kambo           | - | Additional Secretary |
| 2. | Dr. Preeti Srivastava     | - | Joint Secretary      |
| 3. | Shri Y.M. Kandpal         | - | Director             |
| 4. | Dr. Sagarika Dash         | - | Additional Director  |
| 5. | Smt. Reena Gopalakrishnan | - | Deputy Secretary     |
| 6. | Shri Shangreiso Zimik     | - | Under Secretary      |

**List of Witnesses**  
**Department of Telecommunications**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri J.S. Deepak	Secretary (Telecom)
2.	Shri G.K. Upadhyay	Member (Technology), Telecom Commission
3.	Shri P.K. Mittal	Sr. DDG (AS)
4.	Shri S.K. Gupta	DDG (Task Force)
5.	Shri A.S. Verma	Director (AS-IV)

**Telecom Regulatory Authority of India (TRAI)**

<b>Sl. No.</b>	<b>Name of Officer</b>	<b>Designation</b>
1.	Shri Ram Sewak Sharma	Chairman (TRAI)
2.	Shri Anil Kaushal	Member (TRAI)
3.	Shri Sudhir Gupta	Secretary (TRAI)
4.	Shri U.K. Srivastava	Principal Advisor (NSL)
5.	Shri S. K. Mishra	Principal Advisor (F&EA)
6.	Shri Sunil Bajpai	Principal Advisor (IT)
7.	Shri Arvind Kumar	Advisor (NSL-I)
8.	Shri Asit Kadayan	Advisor (QoS)

2. At the outset, the Chairperson welcomed the Members and the representatives of the Ministry of Communications (Department of Telecommunications) and Telecom Regulatory Authority of India (TRAI) to the sitting of the Committee. The representatives of the TRAI, then, made a power-point presentation on the subject

which, *inter-alia*, included a brief explanation of Points of Interconnection (Pols), status of one-way and both-way junctions at Pols of Reliance Jio, legal position for one way and two way junctions, Interconnection Agreement, penal provision in TRAI Act for contravention of directives of Authority, number of cases filed by TRAI under Chief Metropolitan Magistrate, progressive decay in number of Licence Area not meeting worst affecting BTS, etc.

3. The Committee, thereafter, sought clarifications on various issues related to the subject like present scenario of call drop in the country, issues relating to present method of monitoring QoS by averaging the License Service Area as a whole, lack of consumer feedback in monitoring of quality of service, call drop due to consumer's fault, need for more granular parameters, measures taken by Department/TRAI to improve call drop, health concerns relating to emission of EMF from towers, Consumer Grievance Redressal Mechanism, issues relating to spectrum, amendment of TRAI Act to empower TRAI, issues relating to Points of Interconnection, one way E1 and both way E1, Interconnection Agreement, rollout obligations, etc. The queries of the Committee related to the subject were replied to by the representatives of DoT and TRAI.

4. The Chairperson, then, thanked the representatives of DoT and TRAI for appearing before the Committee. The Chairperson also requested the representatives of DoT/TRAI to furnish written replies to the points which remained unanswered.

The witnesses then withdrew.

**The Committee, then, adjourned.**

Verbatim Proceedings of the sitting has been kept on record.

**STANDING COMMITTEE ON INFORMATION TECHNOLOGY  
(2016-17)  
MINUTES OF THE SIXTEENTH SITTING OF THE COMMITTEE**

The Committee sat on Monday, the 10<sup>th</sup> April, 2017 from 1500 hours to 1530 hours in Committee Room 'B', Ground Floor, Parliament House Annexe, New Delhi.

**PRESENT**

**Shri Anurag Singh Thakur– Chairperson**

**MEMBERS**

***Lok Sabha***

2. Shri L.K. Advani
3. Dr. Sunil Baliram Gaikwad
4. Dr. J. Jayavardhan
5. Shri Virender Kashyap
6. Shri Harinder Singh Khalsa
7. Dr. K.C. Patel
8. Shri Paresh Rawal
9. Smt.R.Vanaroja

***Rajya Sabha***

10. Smt. Jaya Bachchan
11. Shri P. Bhattacharya
12. Shri Suresh Gopi
13. Shri Santiuse Kujur
14. Smt. Kahkashan Perween
15. Dr. Vinay P. Sahasrabuddhe

***Secretariat***

- |    |                           |   |                      |
|----|---------------------------|---|----------------------|
| 1. | Shri R.S. Kambo           | - | Additional Secretary |
| 2. | Dr. Preeti Srivastava     | - | Joint Secretary      |
| 3. | Shri Y.M. Kandpal         | - | Director             |
| 4. | Dr. Sagrika Dash          | - | Additional Director  |
| 5. | Smt. Reena Gopalakrishnan |   | Deputy Secretary     |
| 6. | Shri Shangreiso Zimik     | - | Under Secretary      |

2. At the outset, the Chairperson welcomed the Members to the sitting of the Committee convened to consider and adopt Draft Report on the subject 'Issues related to Quality of Services and reported Call Drops' of the Ministry of Communications (Department of Telecommunications). Thereafter, the Chairperson gave a broad overview of the important observations/Recommendations contained in the Report.

3. The Committee, then, took up the draft Report for consideration and adoption. The Committee, thereafter, adopted the above Report without any modification.

4. The Committee, then, authorized the Chairperson to finalize the draft Report and present the same to the House during the current session of Parliament.

**The Committee, then, adjourned**

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