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EXTRAORDINARY, PART III, SECTION 4

**TELECOM REGULATORY AUTHORITY OF INDIA
NOTIFICATION**

NEW DELHI, THE 07TH MAY, 2012

**THE STANDARDS OF QUALITY OF SERVICE OF BASIC
TELEPHONE SERVICE (WIRELINE) AND CELLULAR MOBILE
TELEPHONE SERVICE (AMENDMENT) REGULATIONS, 2012
(10 OF 2012)**

F. No. 305-8/2012-QOS.--- In exercise of the powers conferred upon it under section 36, read with sub-clauses (i) and (v) of clause (b) of sub-section (1) of section 11 of the Telecom Regulatory Authority of India Act, 1997(24 of 1997), the Telecom Regulatory Authority of India hereby makes the following regulations to amend the Standards of Quality of Service of Basic Telephone Service (wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009), namely:-

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| <p>1. (1) These regulations may be called the Standards of Quality of Service of Basic Telephone Service (wireline) and Cellular Mobile Telephone Service (Amendment) Regulations, 2012.</p> |
| <p>(2) They shall come into force from the date of their publication in the Official Gazette.</p> |
| <p>2. In sub-regulation (1) of regulation 2 of the Standards of Quality of Service of Basic Telephone Service (wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7of 2009) (hereinafter referred to as the principal regulations),-----</p> <p>(a) for clause (f), the following clause shall be substituted, namely:-</p> <p>“(f) “Cellular Mobile Telephone Service” –</p> <p>(i) means telecommunication service provided by means of a telecommunication system for the conveyance of messages through the agency of wireless telegraphy where every message that is conveyed thereby has been, or is to be, conveyed by means of a telecommunication system which is designed or adapted to be capable of being used while in motion;</p> |

	<p>(ii) refers to transmission of voice or non-voice messages over Licensee's Network in real time only but service does not cover broadcasting of any messages, voice or non-voice, however, Cell Broadcast is permitted only to the subscribers of the service;</p> <p>(iii) in respect of which the subscriber (all types, pre-paid as well as post-paid) has to be registered and authenticated at the network point of registration and approved numbering plan shall be applicable;</p> <p>(iv) includes access service provided through Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA) technologies and any other technologies permitted under the CMTS or UASL licence;"</p> <p>(b) after clause (l), the following clause shall be inserted, namely:-</p> <p>"(la) "Node B" means a logical node responsible for radio transmission or reception in a cell to or from the User Equipment;"</p> <p>(c) after clause (r), the following clauses shall be inserted, namely:-</p> <p>"(ra) "Radio Access Bearer" or "RAB" means a service provided by the Access Stratum to the Non-Access Stratum for the transfer of user data between the User Equipment and the Core Network;</p> <p>(rb) "Radio interface" means the interface between User Equipment and the Universal Terrestrial Radio Access Network access point, which encompasses all the functionality required to maintain such interfaces;</p> <p>(rc) "Radio Resource Control" or "RRC" means a sub layer of radio interface Layer 3 existing in the control plane which provides information transfer service to the Non-Access Stratum and is responsible for controlling the configuration of radio interface Layers 1 and 2;"</p>
3.	<p>In sub-regulation (1) of regulation 5 of the principal regulations, in the table under the column 'Name of Parameter',.....</p> <p>(a) Against serial number A (i) below the parameter 'Network Availability',....</p> <p>(i) in item number (a), after the word "BTSs", the words "and Node Bs" shall be inserted;</p> <p>(ii) in item number (b), after the word "BTSs", the words "and Node Bs" shall be inserted;</p> <p>(b) against serial number A (ii) below the parameter 'Connection</p>

Establishment (Accessibility)',.....

- (i) in item number (b), after the words “Paging Channel”, the words “and RRC” shall be inserted;
- (ii) in item number (c), after the word “TCH” the words “and Circuit Switched RAB” shall be inserted;
- (c) against serial number A (iii) below the parameter ‘Connection Maintenance (Retainability)',.....
 - (i) in item number (a), after the word “Drop”, the words “and Circuit Switched Voice Drop” shall be inserted;
 - (ii) in item number (b), after the bracket and words “(call drop)”, the words “and Circuit Switched Voice Drop” shall be inserted;
 - (iii) in item number (c), after the word “quality”, the words “and Circuit Switched Voice Quality” shall be inserted.

(Rajeev Agrawal)
Secretary

Note 1. -- The principal regulations were published in the Gazette of India, Extraordinary, Part III, Section 4 dated the 20th March, 2009 vide notification number No. 305-25/2008-QoS dated the 20th March, 2009.

Note 2. -- The Explanatory Memorandum explains the objects and reasons of the Standards of Quality of Service of Basic Telephone Service (wireline) and Cellular Mobile Telephone Service (Amendment) Regulations, 2012.

Explanatory Memorandum

TRAI has laid down the Quality of Service Standards for Basic Telephone Service (wireline) and Cellular Mobile Telephone Service through the Standards of Quality of Service of Basic Telephone Service (wireline) and Cellular Mobile Telephone Service Regulations, 2009. These regulations contain the Quality of Service parameters for Cellular Mobile Telephone Service. These parameters were prescribed keeping in view the 2G networks deployed by the service providers. Since the service providers are also providing 3G services currently, the Authority is of the view that for voice service provided by the 3G Networks the existing network related Quality of Service parameters shall suffice, except that the nomenclature for some of the terms used in the existing regulations and the measurement methodologies need to be amended. Accordingly, the network related Quality of Service parameters specified in the Standards of Quality of Service of Basic Telephone Service (wireline) and Cellular Mobile Telephone Service Regulations, 2009 have been amended in these regulations to cater to 3G Networks. The definitions and measurement methodologies for these parameters are given below:

- (a) **BTSs and Node Bs Accumulated downtime (not available for service):** The existing parameter BTSs Accumulated downtime (not available for service) measure non availability of BTSs. In the case of 3G networks, instead of BTS the nomenclature is Node B. The measurement methodology for the parameter Node B Accumulated downtime (not available for service) will be similar to the existing parameter for BTSs Accumulated downtime (not available for service).
- (b) **Worst affected BTSs and Node Bs due to downtime:** This parameter is also similar to the existing parameter "Worst affected BTSs due to downtime". This parameter also provides for assessment of worst affected Node Bs due to downtime in 3G Networks. The same measurement methodology for measuring the parameter worst affected BTSs due to downtime shall be used for measuring worst affected Node Bs.
- (c) **Call Set-up Success Rate:** This parameter is same for 2G Networks as well as 3G Networks. However, the network elements involved in both the networks are different. Call Set-up Success Rate is defined as the ratio of Established Calls to Call Attempts. For establishing a call in 3G Networks, User Equipment (UE) accesses the Universal Terrestrial Radio Access Network (UTRAN) and establishes an RRC connection. Once RRC connection is established the Non Access Stratum (NAS) messages are exchanged between the UE and the Core Network (CN). The last step of the call setup is the establishment of a Radio Access Bearer (RAB) between the CN and the UE. However, any RAB abnormal release after RAB Assignment Response or Alerting/Connect message is to be considered as a dropped call.
- (d) **SDCCH/Paging Channel and RRC Congestion:** This is same as signaling channel congestion in 2G Networks. The existing parameter provides for

assessment of the SDCCH congestion in GSM network and Paging Channel congestion in CDMA network. This parameter has been amended to include RRC Congestion in 3G Networks.

(e) **TCH and Circuit Switched RAB Congestion:** This parameter is same as Traffic Channel congestion in 2G Networks. The existing parameter provides for assessment of Traffic Channel Congestion. Circuit Switched RAB congestion is similar to Traffic Channel Congestion. Therefore, the existing parameter has been amended to include RAB congestion in 3G Networks.

(f) **Call Drop and Circuit Switched Voice Drop Rate:** The Call Drop Rate measures the inability of Network to maintain a call and is defined as the ratio of abnormal speech disconnects with respect to all speech disconnects (both normal and abnormal). In 3G Networks, a normal disconnect is initiated from the Mobile Switching Centre (MSC) at completion of the call by a RAB Disconnect message. An abnormal RAB disconnect can be initiated by either UTRAN or CN and includes Radio Link Failures, Uplink (UL) or Downlink (DL) interference or any other reason. The Circuit Switched Voice Drop Rate (CSV Drop Rate) is given by the following equation:

CSV Drop Rate =

$$100 * \left[1 - \left(\frac{\# RAB \text{ Normal Release}(CSV)}{\# RAB \text{ Normal Release}(CSV) + \# RAB \text{ Abnormal Release}(CSV)} \right) \right]$$

The key performance indicator terms associated with CSV drop are defined in the table given below.

Key Performance Indicator Term	Definition
#RAB Normal Release(CSV)	Number of voice RAB normally released
#RAB Abnormal Release(CSV)	Number of voice RAB abnormally released

The total number of established calls shall include the number of TCH/RAB assignment in a cell for establishment of new call + number of TCH/RAB assigned for incoming handover – number of TCH/RAB made free for outgoing handovers.

(g) **Worst affected cells having more than 3% TCH drop (call drop) and Circuit Switched Voice Drop Rate:** This parameter is similar to the existing parameter for 2G networks “Worst affected cells having more than 3% TCH (call drop) Rate. The existing parameter has been amended to cover 3G Networks to assess worst affected cells having more than 3% CSV Drop Rate. The formula for calculating the Percentage of worst affected cells having more than 3% CSV Drop Rate is given by the following equation:

Percentage of worst affected cells having more than 3% CSV Drop Rate =

$$\left(\frac{\text{No. of worst affected cells having CSV drop rate } > 3\% \text{ during Cell Bouncing}}{\frac{\text{Busy Hour (CBBH) in a month}}{\text{Total No. of cells in the licensed service area}}} \right) * 100$$

(h) **Connections with good voice quality and Circuit Switch Voice Quality (CSV quality):** This parameter denotes the quality of the voice carried by the network. In 3G Networks, the voice quality could be affected due to higher than permissible block errors either in the uplink direction or in downlink direction. The dedicated radio links may be broken because of block error rate which may get reactivated after a gap of around 6 seconds because of RRC Cell Update. The experience of the customer will be based on the type of service being used. Frequent problems shall significantly influence customer satisfaction. The CSV quality is measured using the following equation:

CSV quality=100*

$$\left[1 - \left(\frac{\# \text{Faulty Transport Blocks In Uplink / downlink After SelectionCombining (Speech)}}{\# \text{Total Transport Blocks In Uplink / downlink After SelectionCombining (Speech)}} \right) \right]$$

The key performance indicator terms associated with CSV quality are defined in the table given below:

Key Performance Indicator Term	Definition
#Faulty Transport Blocks in Uplink/downlink after Selection Combining (Speech)	Number of faulty Uplink/downlink DCH transport blocks for speech after selection and combining. Sampling period shall be every 10 (ten) seconds.
#Total Transport Blocks in Uplink/downlink after Selection Combining (Speech)	Total number of Uplink/downlink DCH transport blocks for speech after selection and combining. Sampling period shall be every 10 (ten) seconds.

The key performance indicator of CSV quality shall be measured at 1% BLER operating point set in UTRAN for Voice call.

(i) **Point of Interconnection (POI) Congestion:** This parameter denotes congestion at the outgoing traffic between two networks and is equally applicable for 2G networks and 3G networks.