



**NIGERIAN COMMUNICATIONS COMMISSION**

**QUALITY OF SERVICE REGULATIONS 2011**

**NIGERIAN COMMUNICATIONS ACT 2003**  
**QUALITY OF SERVICE REGULATIONS 2011**  
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Commencement: [insert date for the Regulations taking effect]

In exercise of the powers conferred upon it by Sections 4, 70, 89, and 104 of the Nigerian Communications Act 2003 (the "Act"), and of all other powers enabling it in that behalf, the Nigerian Communications Commission (the "Commission") hereby makes the following Regulations:

**Part I – Scope and Operation**

1. These Regulations identify minimum quality of service standards, and associated measurement, reporting and record keeping tasks.

Scope of the Regulations

2. These Regulations have the following objectives:

(a) Ensuring the protection and promotion of the interests of consumers against unfair practices including but not limited to matters relating to tariffs and charges and the availability and quality of communications services, equipment and facilities

Objectives of the Regulations

(b) Improving service quality, by identifying service deficiencies and by encouraging, enforcing, or requiring appropriate changes;

(c) Maintaining service quality, while recognizing environmental and operating conditions;

(d) Making information available to help with informed Customer choice of services and Licensees;

(e) Improving the operation and performance of interconnected networks;

(f) Assisting the development of related telecommunications markets.

3. These Regulations define quality of service standards as follows:

(a) Parameters, defining the applicable quality of service standards for specific services, are identified in Parts I to VII;

Structure of Parameters

(b) The methods of taking measurements that measure service

performance against prescribed parameters are described as "Measurement Methods" in Regulation 6 of these Regulations;

(c) Any applicable targets for the prescribed parameters are identified in Schedule 1 of these Regulations.

4. The quality of service standards defined by these Regulations have been developed in accordance with the following principles:

Principles of  
the Parameters

(a) Measurements should be required for features of services that are significant, with an emphasis on services that are subject to limited competition;

(b) The Measurement Methods, and related reporting of information, should enable the Commission compare the service quality of Licensees fairly, but should not unnecessarily restrict the measurement or other quality of service monitoring practices of Licensees;

(c) Any applicable targets/KPIs, and other characteristics of the identified quality of service standards, should be appropriate to the Federal Republic of Nigeria.

## **Part II – Measurement, Reporting and Record Keeping**

Reporting  
Periods

5. Unless otherwise stated in these Regulations, the Reporting Periods, which are the periods of time over which measurements are taken and recorded, shall be one (1) month starting from the 1<sup>st</sup> day of every applicable calendar month to the last day of the month or as the Commission may from time to time determine.

6. The Commission shall in carrying out Measurement and Data Acquisition functions use such methods as: Drive test, Mobile Station Probes tests, Consumer survey, Data collection from Operators' or the Commission's Network Operating Centers (NOCs)/Network Management Centers (NMCs) etc. The Commission's NOC/NMC may rely on real-time data acquired from feeds. KPI Measurements may be carried out at all network segments including at BTS, Cell, BSC or MSc levels.

7. A Parameter shall be Reportable for a service, with the effect that measurements and related reporting of the parameter are required, if it is one of those stated in these Regulations and/or listed in the Schedule to these Regulations.

8. The Reporting Areas, which are the geographic areas for which measurements are taken and recorded, shall be, a specific geographical area, the States of the Federal Republic of Nigeria, and the Federal Capital Territory taken separately unless the prior written approval of the Commission has been obtained that two(2) or more Reporting Areas be combined into one Reporting Area for particular Licensees, parameters, services and Reporting Periods. The reporting areas must be such that performance of different clusters representing different geographic areas in the states as specified by the Commission is easily obtainable.

Reporting Areas

9. In considering whether to grant approval that two(2) or more Reporting Areas be combined into one Reporting Area under Regulation 8 the Commission shall take into account factors including but not limited to:

Factors in permitting combined Reporting Areas

(a) The value of information about variations in quality of service between separate Reporting Areas;

(b) The relationship between the network structure and corporate organisation of the relevant Licensees and the physical boundaries of the Reporting Areas; and

(c) The numbers of consumers using the relevant services in the Reporting Areas; and

(d) The difference in costs between taking measurements for separate Reporting Areas and taking measurements for combined Reporting Areas.

10. For each parameter that is Reportable for a Service, for each Reporting Area and for each Reporting Period, a Licensee shall

Measurement, reporting and record keeping tasks

perform the following measurement, reporting and record keeping tasks:

- (a) Take the measurements according to the Measurement Method defined;
- (b) Submit the measurements to the Commission within one (1) week after the end of the Reporting Period and ensure availability of real-time performance data from the performance measurement/management systems of the Licensee to the Commission via a mode specified by the Commission.
- (c) Submit any additional information requested by the Commission, including details of the times, places, Network segments, and other particulars of the measurements, within one (1) month after the end of the Reporting Period or as may be otherwise directed by the Commission;
- (d) Where specifically directed, publish the measurements within one (1) month after the end of the Reporting Period, with the content and format described in Regulation 15 or as may be otherwise directed by the Commission; and
- (e) Retain quality of service data, including all measurements and related records, for a minimum of twelve (12) months after the end of the Reporting Period or as may be otherwise directed by the Commission.

11. The Licensee shall resolve any consumer complaint within the resolution-time stated in these Regulations.

Consumer  
Complaint  
Resolution

12. Where a Licensee fails to resolve a consumer complaint in accordance with Regulation 11 above, such Licensee shall compensate the consumer in addition to paying any fines that may be imposed by the Commission.

13. A Licensee shall be sanctioned by the Commission where the rate of occurrence of a particular complaint exceeds the maximum number

stated in Table 2 of Schedule 1 of these Regulations.

**Part III – Publication**

Timing of  
Publication

14. The Commission may after due analysis, mandate or request Licensees to make necessary amendments or corrections to the measurements submitted by Licensees under Regulation 10. The Commission may publish some or all the KPI measurements within two (2) months after the end of each Reporting Period to which the measurements apply with or without additional notes or comments.

15. For each parameter that is Reportable for a service, for each Reporting Area, for each Identified network segments, and for each Reporting Period, measurements as published by the Commission under these Regulations shall be set out in tables that contain, for each Licensee:

Content and  
format of  
publication

- (a) The name of the service provided by the Licensee;
- (b) An identification of the Reporting Area or Network segments for which the measurements were taken;
- (c) The measurements collected from or submitted by the Licensee;
- (d) An indication of any target for the parameter and the service that has not been achieved by the Licensee;
- (e) Any explanatory remarks by the Licensee, accepted by the Commission, including but not limited to remarks about changes in environmental or operating conditions that could not have been reasonably foreseen by the Licensee; and
- (f) Any other information or comparison of service quality that the Commission determines to be appropriate, including but not limited to information to help the Commission and or Customers to assess the performance of competing Licensees.

16. In considering whether to approve explanatory remarks by a Licensee under Regulation 15(e), the Commission may take into account factors including but not limited to:

Factors in  
approving  
explanatory  
remarks



- (a) Any service deficiencies that arise partly or wholly from the services of another Licensee;
- (b) Any changes in environmental or operating conditions that could not have been reasonably foreseen by the Licensee; and
- (c) Any expectation about quality of service that is appropriate to the tariffs and other commercial terms for the services of the Licensee.

**Part IV – Investigation**

- 17. The Commission may audit some or all of the quality of service data acquired from the Licensee under Regulation 6, or data retained by Licensees. In doing so the Commission may vary the regularity and frequency of the audits, as well as, data-collection, the Licensees services, parameters, Reporting Areas, network segments, and Reporting Periods that require audits. The Commission may also utilize data acquired under Regulation 10(b) in its auditing processes
- 18. The Commission may investigate the quality of service measurement, reporting and record keeping procedures of a Licensee pursuant to Sections 61 and 89 of the Act. In doing so, the Commission may exercise its powers of information gathering pursuant to Sections 64-68 and Section 141 of the Act.

Auditing of Quality of Service data

Investigation of measurement, reporting and record keeping procedures

**Part V – Contravention and Enforcement**

- 19. For each parameter for a service, for each Reporting Area, for each prescribed Network Segment, and for each Reporting Period, a Licensee providing the service shall have committed a Contravention if:
  - (a) The Licensee fails to perform the measurement, reporting and record keeping tasks set out in Regulation 10.
  - (b) The Licensee fails to achieve the set target for the parameter and the service:

Contraventions

- (i) after the Commencement date of these Regulations; or
  - (ii) The date when the target was most recently specified;
  - (iii) The date when the target was changed to require a higher standard of quality than was earlier required;
- (c) The Licensee fails to submit, during a time-frame specified by the Commission, information requested by the Commission pursuant to Regulation 10 or Regulation 15;
- (d) The Licensee submits or publishes false or misleading information about quality of service; or
- (e) The Licensee obstructs or prevents an investigation or real-time collection of performance data by the Commission in respect of quality of service measurement, reporting and record keeping procedures.
20. Where a Licensee contravenes any of the parameters set out in these Regulations, the Commission may take one or more of the following enforcement measures:

Enforcement  
Measures

- (a) Require the Licensee to submit and or publish additional information about the quality of the relevant services including but not limited to its implementation of a remedial plan within a time-frame agreed with the Commission. Any information submitted may be cross-checked against the performance data collected by the Commission under Regulation 10(b);
- (b) Issue directions pursuant to Section 53 of the Act including but not limited to directing licensees to compensate subscribers/consumers for poor quality of service.
- (c) Impose a fine on licensee as determined under Schedule 3 of these Regulations or as may be amended from time-to-time.

21. In considering the application of enforcement measures under Regulation 20, the Commission may take into account factors including

Factors in  
applying  
Enforcement  
Measures

but not limited to:

- (a) The factors and considerations set out in Regulation 15 of the Nigerian Communications (Enforcement Processes etc) Regulations 2005 or any applicable section of an amendment of the said Regulations;
- (b) The time interval between a failure to perform the measurement, reporting and record keeping tasks, and due compliance;
- (c) The time interval between identification and the resolution of faults/problems inhibiting real-time data acquisition under Regulation 10(b);
- (d) The time taken to achieve targets specified by the Commission in these Regulations;
- (e) The numbers and nature of the services, Parameters, Reporting Areas, relevant Network Segment, Reporting Periods and Targets which the Licensee has contravened;
- (f) Any service credits or rebates that have been provided by the Licensee to Customers who may have been inconvenienced or otherwise affected by the Contraventions; and
- (g) The factors set out in Table 2 Schedule 1 of these Regulations where the rate of occurrence of a particular complaint exceeds the maximum number specified.

## **Part VI – Miscellaneous**

### **Definitions**

22. In these Regulations, particularly, for the purpose of measuring standards indicated or specified herein, whenever there is a difference between the definitions expressed in words and those alternative definitions expressed in mathematical terms, the meanings attributed to the latter definitions shall prevail. Mathematical definitions shall therefore supersede the definitions in words. The Licensee shall ensure that, where exact counters are not provided in its network/systems,

formulas with similar effect are used for each parameter computations.

23. In these Regulations and the Schedules thereto, terms used shall have the same meanings as in the Act, and also:

**“Access Service”** means a service that is provided for communications to or from Network Termination Points that serves End Users without making the communications pass through more than one public network;

**“Act”** means the Nigerian Communications Act, 2003;

**“Average”** or **“Mean”** means the result of dividing the sum of the numerical values in a set by the number of values in the set;

**“Broadband Internet Access Service”** means an Internet Access Service that is not a Voiceband Internet Access Service;

**“Busy Time”** means the set of the same six (6) hours in each of the same four (4) days in each of twelve (12) weeks of a Reporting Period during which the highest average traffic for a service is measured or expected on the basis of observations conducted in the preceding Reporting Period; the preceding Reporting Period;

**“Busy Hour (BH)”** means the continuous 1-hour period lying wholly in the time interval concerned for which the traffic or number of call attempts is greatest.

**“Call Attempt”** means an attempt to achieve a connection to one or more devices attached to a telecommunication network.

**“Commercial Launch Date”** means the date when a Licensee commences commercial provision of a service in a Reporting Area;

**“Commission”** means the Nigerian Communications Commission

**“Contravention”** means any failure to comply with the requirements identified in the Regulations;

**“End User”** means a Customer that is not an Interconnecting Licensee or a provider of an international route to or from the Federal Republic of Nigeria;

**“Enforcement Processes Regulations”** means the Nigerian Communications (Enforcement Processes, etc.) Regulations 2005, as may be amended from time to time;

**“Fixed Telephony Service”** means a Telephony service that is not a Mobile Telephony service;

**“Fixed Wireless Telephony Service”** means a Fixed Telephony service that requires the use of radio frequencies assigned under individual Licences to achieve communications at the Network Termination

Points of the End Users;

**"Fixed Wireline Telephony Service"** means a Fixed Telephony service that is not a Fixed Wireless Telephony service;

**"Interconnecting Licensee"** means a Licensee that has an Interconnection with another Licensee at a Network Termination Point;

**"Internet Access Service"** means an Access service that is an Internet service;

**"Internet Service"** means a service that is provided substantially for data communications to or from Network Termination Points that have IP addresses that are assigned through delegation from the Internet Assigned Numbers Authority;

**"IP"** means the Internetwork Protocol that is defined by the Internet Engineering Task Force and that is often known as the Internet Protocol;

**"Licensee"** in these Regulations means a person/incorporated company granted a communications licence by the Commission to provide fixed or mobile telephony services within Nigeria.

**"Measurement"** means a numerical value that is obtained by using a Measurement Method;

**"Measurement Method"** means a method of measuring a Parameter that is identified in Regulation 6 or in Part II and VII of these Regulations;

**"Mobile Telephony Service"** means a Telephony service that requires the use of radio frequencies assigned under individual Licences to achieve communications at the Network Termination Points of the End Users and that permits the End Users to move between different geographic locations without appearing to lose communications;

**"Network Termination Point"** means a point at which a Customer has physical access through customer equipment to a network of a Licensee;

**"Parameter"** means a measurable characterization of the quality of an aspect of a service;

**"Published Measurement"** means a Measurement that is intended for publication with content and format that is identified in Regulation 15 hereto;

**"Reporting Area"** means a geographic area for which Measurements are taken and recorded, determined in accordance with Regulation 8;

**"Reporting Period"** means the period of time over which Measurements are taken and recorded when a Licensee performs quality of service measurement, reporting and record keeping tasks once for each

Reporting Area, parameter and service, determined in accordance with Regulation 5 or as may be specified in other parts of these Regulations or as determined by the Commission from time to time;

“**Service**” means application, content, network or facilities service, or any combination of these services, that is provided substantially for communications between Network Termination Points;

“**Target or KPI**” means a value that is reached by a given parameter where the relevant service identified in these Regulations or its Schedules is satisfactory;

“**Telephony Service**” means a Service that is provided substantially for voice communications to or from Network Termination Points that has telephone numbers that are allocated according to the Numbering and electronic addressing plan; and Numbering and electronic addressing plan; and

“**Voiceband Internet Service**” means any Internet Access service that provides communications from Network Termination Points and that requires the use of a Telephony Access Service to achieve communications.

24. The Commission may from time to time review and modify these Regulations, including the Schedules, pursuant to the review processes of Section 72 of the Act. In doing so the Commission may request and receive advice from external advisory groups but shall not be bound by any such advice

Change of the Regulation

25. The Commission may from time to time issue additional rules, directions or guidelines on any aspect of these Regulations, and either of general application or specific to a Licensee.

Further Directions

26. These Regulations may be cited as the Quality of Service Regulations 2011

Short Title

Made at Abuja this \_\_\_\_\_ day of \_\_\_\_\_ 2011

DR. EUGENE JUWAH  
Executive Vice Chairman

## SCHEDULE 1 Threshold Targets/KPIs

### 1.0 Wireline Services KPIs

Table 1: Fixed Wireline Telephony Services for End Users

Parameter Name	KPI
Disconnection complaint rate	<0.002% of customers in the Reporting Period
Disconnection complaint resolution time	<1 working day for the mean
Fault report rate	<0.002% of customers in the Reporting Period
Fault repair time	<2 working days for the mean in the Reporting Period
Service supply time	<5 working days for the mean in the Reporting Period
Other Related KPIs which are not stated in this Table	Same as that stated in Section 2.0 of this Schedule

### 2.0 Wireless Services KPIs

Table 2: Account Complaints KPIs		
Ten complaints to every one million bills/accounts		
<b>2.1 Account Complaint</b>		KPI
		<i>Target Resolution time</i>
1	Charging for line rental at incorrect rate.	≤ 5 days
2	Charging for calls/SMS/MMS messages at incorrect Rates or more than once for the same call/SMS.	≤ 1 Hour ≤ 24 Hours for Roaming
3	Charging for services not rendered.	≤ 24 Hours
4	Charging for uncompleted/unsuccessful	≤ 1 Hour

	calls/SMS, or charging for access not rendered	
5	Charging for calls beyond their durations.	≤ 24 Hours
6	Failed attempts to load recharge payments.	a. ≤ 3 Hours for network related faults (NB. Except for exceptional circumstances that have been made public each time within 2 hours of occurrence of the failure in the affected area. Each failure in this category that has taken longer than 48 hours to resolve must formally and specifically be communicated to the Commission)  b. ≤ 1 Hour for software related faults
7	System failure at Contact Centers inhibiting bill payments.	≤ 30 Minutes
8	Failed attempts to check/determine the account balance.	≤ 2 Hours
9	Losing credited amounts from the account.	≤ 1 Hour
10	Miscellaneous complaint resolution time	≤ 48 Hours
11	Inability to change tariff plan for qualified subscriber	≤ 24 Hours
12	Credit deducted but not reflected in the receiving account in case of virtual top-up	≤ 1 Hour
13	Invalid system response for genuine service request	≤ 2 Hours
14	Unjustified call-barring/restriction (local, national or international)	≤ 2 Hours
15	Inability to activate offered service	≤ 2 Hours
16	Inability to access offered service by a qualified customer on an enabled device	≤ 1 Hour
17	Inability to load credit from an over-scratched card	≤ 1 Hour
18	Request for blocking of reported lost/stolen SIM card for which subscriber ownership has been confirmed	≤ 30 minutes Blocking allowed, and further usage should not be chargeable to the consumer from the moment of filing the report.
19	Request for PUK code	Should be met within 3 Hrs
20	Inability to send or receive SMS (local or international)	≤ 1 Hour
21	Inability to send or receive black berry messages	≤ 2 Hours
22	Inability to retrieve or send voice SMS	≤ 1 Hour
<b>2.2 Miscellaneous Complaints</b>		
23	Unsolicited messages	(i) The service provider must provide an option for



		<p>the subscriber to "opt out" of receiving such messages in case of messages originating from the service provider or its third party business partners.</p> <p>(ii) The service provider should make reasonable effort to identify and block or filter bulk, unsolicited and offensive messages from other sources.</p>
24	Time for recharge/bill payments to reflect on the account.	<p>≤ 10 Seconds recharge from Mobile</p> <p>≤ 5minutes recharge from Bank ATM</p> <p>≤ 1 Hour over the counter</p> <p>≤ 10 Minutes after receipt of payment confirmation, for internet-based transaction</p>
25	<p>Number of complaints upheld per day related to:</p> <ul style="list-style-type: none"> <li>i. wrongly cleared balance</li> <li>ii. wrong IVR/System response message</li> <li>iii. failed attempts to determine the account balance</li> <li>iv. failure to provide agreed content</li> </ul>	≤ 10
26	Number of complaints per month related to incorrect settings by a licensee leading to inhibition of two-way communication while roaming internationally.	≤ 10
27	Meeting advertisement Commitment	There shall be no disparity between advertised rates and that eventually received by the Consumer
28	Complaints call ID	Each complaint call must be given a unique reference number that identifies its nature/category, for follow-up and statistical analysis.
29	<p>Number of complaints per day related to any of the following</p> <ul style="list-style-type: none"> <li>a. One-way/two-way loss of audio</li> <li>b. Cross-talk</li> <li>c. Call misdirection to unintended number</li> <li>d. Voice quality</li> </ul>	≤ 50 per day
30	Number of complaints per day in respect of Network-related blocking of incoming calls	≤ 5
31	Number of complaints per day related to inability to meet SMS/MMS end-to-end delivery time threshold	≤ 10
32	Voice-mail related complaints per day	≤ 2

	33	Acknowledgement of delivery of all SMS/MMS/IMS messages sent	= 100% unless deactivated by subscriber
	34	Cost information for all completed calls or RGE via text to the consumer	= 100% within 5 minutes of hang-up unless deactivated by subscriber or deactivated at his/her behest.
	35	Promotions and games	Rules of participation must be clear and widely published, and promotions shall not lead to breach of any part of these regulations
<b>2.3 Disconnection of Subscribers</b>			
	36	Disconnection resolution time	(a) There should be (i) a text notice after reaching 75% of credit limit, (ii) On reaching 100% of credit limit a constant IVR notice of credit expiry remains ON for the next 1 week, during which the Operator is at liberty to allow/disallow outgoing calls until debt is settled.  (b) If there is dispute, resolution time ≤ 24 Hours <ul style="list-style-type: none"> <li>1/30<sup>th</sup> of average monthly spending should be allowed for out-going calls to be used by the customer within the dispute resolution time</li> </ul>
		<b>I. Post-paid</b>	
		<b>II. Pre-paid</b>	<ul style="list-style-type: none"> <li>A Subscriber line may be deactivated if it has not been used, within six (6) months, for a Revenue Generating Event (RGE). If the situation persists for another 6 months the subscriber may lose his/her number, except for Network related fault inhibiting an RGE</li> <li>Monies left in accounts on deactivation can be claimed by subscribers once proof of ownership can be established at any given time within 1 year (less any fee paid by the operator for the number within the 1-year of non-RGE)</li> <li>Deduction of Line rental-charge (if any) is regarded as an RGE.</li> <li>A Subscriber with a proof of good reason for absence is at liberty to request for line-Parking.</li> </ul>
		<b>III. Internet service</b>	To be restored within 2 hours except for service lawfully disconnected
		<b>IV. Number of complaints received by the Operator/NCC's Consumer Affairs Bureau with respect to the Operator's inability to meet I,II, and III</b>	≤ 10/1 million subscribers  ≤10 for operators with ≤1 million subscribers
	37	Credit run-out alert whilst on a call	A single short-beep to the Call initiator at (i) 2 Minutes, and at (iii) 30 Seconds to termination of the ongoing call  Low credit announcement to be played while the call is being originated in a situation where the call cannot last up to 30secs.
	38	Credit loading & balance checks	Free of Charge; operators must provide options such as by text and/or voice or other means that will support physically challenged persons.
	39	Handset/Recipient Rejected Calls	IVR must be in place to state that the Called Number does not accept call from the calling Number.

<b>Table 3: Customer Care Services KPIs</b>			
<b>3.1 Call Centre</b>			
	1	<b>Call Handling</b>	<ul style="list-style-type: none"> <li>• Maximum number of call-attempts before connecting to Customer Care Lines should not be more than three (3) times;</li> <li>• Maximum number of rings before a call is answered by either an IVR machine or a live agent should not be more than five (5); and</li> <li>• Where a customer decides to speak to a live agent, the maximum duration allowable on the queue/IVR should be 5 minutes before answer.</li> <li>• In exceptional cases where live agent may be unavailable within 5 minutes to answer the call, a customer should be given an option of hanging up to be called back within a maximum time of 30 minutes.</li> </ul>
	2	Customer care lines that can be accessible through other networks	≥ 1 free access number and if 1 number then it should accommodate multiple calls at the same time.
<b>3.2 Customer Care Centre</b>			
	1	Waiting time to be physically attended to by relevant staff at customer care centers	≤ 30 minutes. The Licensee shall provide means of measuring the waiting time, starting from time of arrival at the premises.

<b>Table 4: Network Performance KPIs</b>			
<b>4.1 Network Node Performance</b>			
	1	BH Call setup success rate	≥ 98% of attempted calls
	2	BH Call Completion rate	≥ 97% of attempted calls
	3	BH Call setup time	≤ 6 Seconds for local/national calls
	4	Location update success rate	≥ 99% of attempts
	5	Paging success rate	≥ 98% of attempts
	6	BH Dropped Calls Rate	≤ 1%
	7	BH Traffic Channel (TCH) Congestion (to be measured at BSC level)	≤ 2%
	8	BH TCH Assignment Success Rate	≥ 99%
	9	BH SDCCH Congestion (to be measured at BSC and cell levels)	≤ 0.2%
	10	BH SDCCH drop rate	≤ 0.5%
	11	BH Hand Over Success Rate at all levels	≥ 98%
	12	BH Interconnect Circuit (Po) Congestion	≤ 0.5%
	13	HLR and BH VLR, capacity utilization	≤ 70%
	14	BH BSC, MSC capacity utilization	≤ 60%
	15	BH Processor Loading	≤ 60%

		BH Erlang Utilization/BSc	
	16	No. of Interconnect points per 3 contiguous covered States (Standalone or Shared)	$\geq 1$
	17	Interference protection ratio	b. Co-channel C/I $\geq 12$ dB c. Adjacent channel C/I $\geq 12$ dB d. A Licensee must operate within its permitted Frequency band without causing harmful interference to parts of its network or network of other Licensees
	18	Upgrade/Integration/Cutover Related Errors	life-time of any: a. CIC mismatch, b. Global Cell Identity-error, c. improper Neighboring-Cell definition  Life-time of Error in: a. Neighboring MSC definition b. Roaming Number of New MSC c. Exchange Parameter Settings, including SS-Tone sending d. IN trigger Table Definition
	19	Resolution time of BTS faults impacting on traffic	$\leq 1$ Hour  $\leq 2.5$ hrs Rural $\leq 1.5$ hrs Urban Exceptional circumstances such as late night failures in difficult locations must be announced via electronic media covering such location, within 2hrs
	20	Resolution time of BSC faults impacting on traffic	$\leq 45$ minutes
	21	HLR/STP-in-pool Implementation	=100%
	22	Geographical Location of HLRs/STPs/SDPs/SCPs	$\geq 2$ Locations
	23	Resolution time of MSC faults impacting on traffic	$\leq 10$ Min
		MSC/VLR (MSS) System Availability (monthly)	$\geq 99.99\%$ of (720Hrs)
		MSC/VLR (MSS) System Down time (monthly)	$\leq 0.01\%$ of (720Hrs)
	24	Time to repair other failures that affect traffic	$\leq 1.5$ hours
	25	Service coverage received signal level	Out-door $\geq -65$ dBm In-door $\geq -70$ dBm In-vehicle $\geq -70$ dBm
	26	ASR IN/OUT(for On-net and Off-net)	Should be Equal, and $\geq 50\%$ Any variation which in the opinion of the commission is significant may lead to fines. Licensees engaged in call-gapping will be individually or collectively fined in accordance with Schedule 3 of these Regulations. Misleading ringback-tone is regarded as breach.
	27	Signaling (SS7) Utilisation	$\leq 40\%$ HSL; $\leq 30\%$ NBL
		Signaling (SS7) Link Availability	$\geq 99.99\%$

		LinkSet Unavailability	$\leq 0.01\%$
	28	Conversational voice quality on ON-NET Calls	MOS $\geq 3.6$ on the MOS scale SQI $\geq 26$
	29	Speech encoding	Use Full-Rate (FR), Enhanced FR, but, specific authorization must be obtained from the Commission to use of half-rate whether manually set or automatic through Adaptive MultiRate (AMR). For the specific period of use.
	30	BH SMS delivery success rate for enabled-handsets that are in working order, fit for purpose, ON, and in the service area, assuming sufficient account balance.	$\geq 99\%$ of attempts
	31	SMS end-to-end delivery time for enabled-handsets that are in working order, fit for purpose, ON, and in the service area, assuming sufficient account balance	$\leq 8$ seconds for MO and MT switched ON and within the service area (ON-NET) $\leq 10$ seconds for OFF-NET
	32	Minimum time for storage of SMS/MMS before deletion by the operator i.e. for SMS/MMS that are sent to mobile stations that cannot be reached.	30 Days
	33	Maximum time allowed for B-Number/Routing Table to be out-of-date, or Problem-Resolution, or inclusion of omitted numbers	$\leq 24$ hrs
<b>4.2 Transmission Path</b>			
	1	Maximum time for transmission/physical link outage	$\leq 2$ Hours
	2	Percentage of Microwave links with space as well as Frequency diversity	$\geq 60\%$
	3	BH Congestion on trunks	$\leq 0.2\%$
	4	Redundancy on transmission links	Must conveniently handle 100% of the primary link BH traffic. There should be redundancy on all critical links
	5	Compression ratio on transmission system	$\leq 1:1$ , but for any other compression ratio a specific authorization must be obtained from the Commission for the specific transmission route and for a particular period of use.
	6	Error Second Ratio (ESR)	$\leq 0.01$ ( $\leq 1 \times 10^{-4}$ for IP Traffic)
	7	Background Block Error Ratio (BBER)	$\leq 0.00005$ ( $\leq 1 \times 10^{-6}$ for IP Traffic)
	8	Severely Error Seconds (SESR)	$\leq 0.02$ ( $\leq 1 \times 10^{-5}$ for IP Traffic)
	9	Availability	$\geq 99.99\%$
	10	Delay	$\leq 50$ ms
	11	Average delay	$\leq 20$ ms
	12	Delay Variation	$\leq 5$ ms
	13	Packet Loss	$\leq 2\%$

	14	Slip	$\leq 5\%$
<b>4.3 SYNCHRONISATION NETWORK (NODE OUTPUT)</b>			
	1	Primary Reference Clock (PRC)	MTIE = $25 + 0.275\tau$ ns {T = 900s} TDEV $\leq 3$ ns
	2	Synchronization Supply Unit (SSU)	MTIE = 2000 ns TDEV $\leq 3$ ns
	3	SDH Equipment Clock (SEC)	MTIE = 250 ns TDEV $\leq 12$ ns
	4	PDH Synchronization Interface	MTIE = 2000 ns TDEV $\leq 34$ ns

<b>Table 5: Data Services KPIs</b>				
	1	Circuit Switched Data Services (CDS)	<i>Upstream data rate</i> $\geq 95\%$ of the data rate agreed with consumer, at BH <i>Downstream data rate</i> $\geq 95\%$ of the data rate agreed with consumer, at BH	
	2	Packet Switched Data Services (PDS)	<i>Upstream data rate</i> $\geq 95\%$ of the data rate agreed with consumer, at BH <i>Downstream data rate</i> $\geq 95\%$ of the data rate agreed with consumer, at BH	
	3	GPRS Attach Success Rate	$\geq 98\%$	
		PDP Context Activation Success Rate	$\geq 98\%$	
		Data Service Login success/Availability	$\geq 98\%$	
		Latency	GPRS < 500ms, EDGE < 100ms	
		Uplink/Downlink Throughput for Various evolution of Mobile Technology Standards	Must meet the Minimum speed specified in the 3GPP Standards	
	4	Meeting Advertisement Commitments	There shall be no disparity between advertised rates and that eventually received by the Consumer	
	5	Compensation for hours of data services not rendered	At least 100% of loss in supply time	
	6	Contention Ratio	Committed Rate	Must be specified in the contract
			Maximum Data Rate	Must be specified in the contract
	7	End-to-End Throughput	Must be specified in the contract	
	8	Data Rate of each link from end-to-end	Must be specified in the contract, and should make provision to enable measurement.	
	9	Data rate of slowest link (bottleneck)	Must be specified in the contract	
	10	Permissible Download data-size per billing period without additional charge on the plan	Must be specified in the contract	
	11	Response time in case of Major Faults	Must be specified in the contract	
	12	Customer details including address and log files	Must be available for NCC verification if required	
<b>Additional Thresholds for 3G Network</b>				
	13	RRC_CSSR	$\leq 98\%$	

14	RAB_SR	≤98%
15	RTWP	≤-100dBm
16	RSCP	≥-85dBm
17	E <sub>c</sub> /I <sub>0</sub>	≥-9dBm
18	I <sub>ub</sub> Congestion	≤2%
19	CS_IRAT HHO Failure	≤2%
20	PS_IRAT HHO Failure	≤2%

Definitions of these parameters can be found in Schedule 2 to these Regulations.

## SCHEDULE 2 – Definition of Terms/Parameters

The following terms shall convey the meanings ascribed to them hereunder in the context of these Regulations. Formula-based definitions can be implemented using the formula specified hereunder or formula *with similar effect* (should the counters specified not be directly available) All KPIs must be achieved by pre-and post-paid services.

### 1. Call:

A generic term related to the establishment, utilization and release of connection.

### 2. Call Attempt

An attempt to achieve a connection to one or more devices attached to a telecommunication network.

### 3. Successful Call

A call that has reached the desired number and allows conversation to proceed.

### 4. Busy Hour (BH)

The continuous 1-hour period lying wholly in the time interval concerned (usually 24hrs) for which the traffic or number of call attempts is greatest.

### 5. Call Setup Success Rate (CSSR) =

$((1 - (\text{SDCCH Congestion})) * (1 - (\text{SDCCH Drop Rate})) * (\text{TCH Assignment Success Rate}))$

OR

$100 * ((1 - ((\text{CCONGS} + \text{CCONGSSUB}) / (\text{CCALLS} + \text{CCALLSSUB}))) * (1 - ((\text{CNDROP} - (\text{CNRELCONG} + \text{CNRELCONGSUB}) / \text{CMSESTAB}))) * ((\text{TFCASSALL} + \text{TFCASSALLSUB} +$

$(\text{THCASSALL} + \text{THCASSALLSUB}) / \text{TASSALL} ) )$  [%]

**6. Call Completion Rate =**

$\text{CSSR} * (1 - \text{TCH Drop Rate})$

Where

$\text{TCH Drop Rate} = (\text{TFNDROP} + \text{TFNDROPSUB} + \text{THNDROP} + \text{THNDROPSUB}) / (\text{TFCASSALL} + \text{TFCASSALLSUB} + \text{THCASSALL} + \text{THCASSALLSUB} + (\text{SUMIHOSUCC} - \text{SUMIAWSUCC} - \text{SUMIABSUCC}) - (\text{SUMOHOSUCC} - \text{SUMOAWSUCC} - \text{SUMOABSUCC})) * 100$  [%]

**7. Handover Success Rate =**

Successful internal and External Outgoing Handovers of Total Number of Internal and External Handover Attempts

OR

$(\text{SUMOHOSUCC} + \text{SUMEHOHOSUCC}) / (\text{SUMOHOATT} + \text{SUMEHOHATT}) * 100$  [%]

**8. Location Update Success Rate (Registered and non-registered subscribers) =**

$(\text{NLOCNRGSUCC} + \text{NLOCOLDSUCC} + \text{NLOCNRG2SUCC} + \text{NLOCOLD2SUCC}) / (\text{NLOCNRGTOT} + \text{NLOCOLDTOT} + \text{NLOCNRG2TOT} + \text{NLOCOLD2TOT}) * 100$  [%]

**9. Paging Success Rate =**

$(\text{NPAG1RESUC} + \text{NPAG2RESUC}) / (\text{NPAG1LATOT} + \text{NPAG1GLTOT}) * 100$  [%]

**10. SDCCH Drop Rate =**

Dropped SDCCH Connections of the Total Number of SDCCH Connections without TCH Congestion

OR

$(\text{CNDROP} - (\text{CNRELCONG} + \text{CNRELCONGSUB}) / \text{CMSESTAB}) * 100$  [%]



**11. SDCCH Congestion =**

SDCCH Congestion of Total Number of SDCCH Seizure Attempts

OR

$$(CCONGS+CCONGSSUB)/ (CCALLS+CCALLSSUB) *100 [%]$$

**12. TCH Assignment Success Rate =**

Successful TCH Assignments of Total Number of Assignment Attempts

OR

$$((TFCASSALL + TFCASSALLSUB + THCASSALL + THCASSALLSUB) / TASSALL ) *100 [%]$$

**13. Call Setup Time (Post Dialing Delay):**

Time interval between the end of dialing by the user and the reception by him of the appropriate ring-back tone or recorded announcement, or the abandonment of the call without a tone.

**14. Call Drop Rate:**

The Call Drop Rate is the number of dropped calls divided by the total number of call attempts at busy hour expressed as a %.

Note: A dropped call is a call that is prematurely terminated before being released normally by either the caller or called party.

$$\frac{\text{Number of dropped calls}}{\text{Number of Successfully Completed Call Setups}} \times 100$$

Or

$$((TFNDROP + TFNDROPSUB + THNDROP + THNDROPSUB) / (TFCASSALL + TFCASSALLSUB + THCASSALL+THCASSALLSUB)) * 100$$

**15. Traffic Channel Congestion (TCH Cong):**

This is the percentage congestion of the traffic channel measured at busy hour.

$$\frac{\text{Number of unavailable (blocked) TCH requests at all stages}}{\text{Total Number of TCH Requests}} \times 100$$

**16. Handover:**

In a mobile systems, a system-driven change of the current association between an established connection and a channel (mobile to base station and/or base station to mobile channel) in the radio segment spanned by one cell. The change may result in an association between the connection and a new channel either in the same cell or in a different cell. The handover request may be issued due to deteriorated transmission quality of the channel as determined on the basis of a quality criterion (signal strength, carrier to interference ratio, etc.).

**17. Interconnect Circuit (PoI) Congestion:**

This is the percentage congestion of the Interconnect Circuits measured at busy hour.

$$\frac{\text{Total Number of unavailable PoI circuit requests}}{\text{Total Number of available PoI circuits}} \times 100$$

**18. Processor Load:**

This is the percentage of MSC Processor Workload measured at busy hour.

I. BH HLR, VLR, MSC Utilization:

% Capacity Utilization of HLR, VLR and MSC at busy hour.

II. Transceiver Unit (TRX) Utilization:

% Capacity Utilization of TRX at busy hour.

**19. No. of Interconnect points per zone:**

Is the existence of at least one interconnection point per zone.

**20. Interference Protection Ratio:**

Is the interference protection due to Co-Channel and Adjacent Channels.

**21. Resolution Time of CIC mismatch**

Is the time taken to resolve a CIC mismatch.

**22. Resolution time of BTS faults impacting on traffic:**

This is the time taken to resolve faults that hinder traffic flow in the BTS.

**23. Resolution time of BSC faults impacting on traffic:**

This is the time taken to resolve faults that hinder traffic flow in the BSC.

**24. Resolution time of MSC faults impacting on traffic:**

This is the time taken to resolve faults that hinder traffic flow in the MSC.

**25. Time to repair other failures that affect traffic:**

Time taken to repair other failures (not specifically captured in other parts of this document) that affect traffic.

**26. Maximum time for Transmission/Physical link outages:**

Is the Maximum time allowed for transmission/Physical link to remain in a failed state or state of operation that negatively affects services to consumers.

**27. Service Coverage in cities/towns:**

Is the measured Radio Signal Level in urban and sub-urban areas, in-door and out-door and in moving vehicles in (dBm).

**28. Percentage of Radio Links with Space and Frequency Diversity:**

Is the percentage of Microwave Transmission Links employing Space and Frequency diversity in the entire transmission network.

**29. Conversational Voice Quality:**

Is the Mean Opinion Score (MOS) of the speech quality perceived by Caller or Called party in accordance with **ITU-T P.862**.

**30. Compression Ratio:**

Is the compression ratio on the transmission network.

**31. Voice Encoding:**

Is the type of voice encoding that is used on the radio network.

**32. SMS Delivery Success Rate:**

Is the ratio of the failed SMS to the total number of delivered SMS at busy hour if the recipient is active and in coverage area.

$$\frac{\text{Number of SMS received by recipient}}{\text{Total Number of SMS sent to the recipient}} \times 100$$

**33. SMS End-to-End Delivery time:**

Is the maximum End-to-End delivery time of SMS if the recipient is active and in the coverage area.

**34. Number of Complaints per day related to:**

i. One way or both way loss of audio:

A situation whereby either caller or called party cannot hear the audio message or both could not hear each other.

ii. Cross-Talk

A situation whereby unintended conversation interferes with that of caller or called party or both.

iii. Call Misdirection to unintended number.

A situation whereby a call is terminated at unintended destination.

iv. Voice Quantity (Taken cared by Item 25):

Conversation with bad speech quality.

**35. Number of complaints per day in respect of Network blocking of incoming calls:**

Number of complaints received per day in respect of blocking of incoming calls in the network.

**36. Number of complaints per day related to inability to meet SMS/MMS End-to-End Delivery Time Threshold:**

Complaints per day received on the network related to inability to meet SMS/MMS delivery time.

**37. SMS Delivery Failure Rate:**

This is the ratio of SMS undelivered to recipient to the total number of SMS received at the Service Center for the recipient.

$$\frac{\text{Number of SMS to recipient undelivered}}{\text{Total Number of SMS received at Service Center}} \times 100$$

**38. Voice Mail related complaints per day:**

The complaints related to voice-mail received per day.

**39. Acknowledgement of delivery of SMS/MMS/IMS messages sent:**

Successful delivery acknowledgement of SMS/MMS/IMS messages sent must be received by the sender for all messages delivered.

**40. Cost information for all completed calls or Revenue Generative Events (RGE) via text to consumer:**

Charging information must be communicated to the consumer for all calls and RGEs on the network.

**41. Circuit Switched Data Services (CDS):**

Upstream/Downstream throughput of Circuit Switched Data Services. Greater or equal to 95% of the agreed data rate must be delivered to customer at busy hour.

**42. Packet Switched Data Services (PDS):**

Upstream/Downstream throughput of Packet Switched Data Services. Greater or equal to 95% of the agreed data rate must be delivered to customer at busy hour.

**43. CIC:**

Circuit Identification Code.

**44. RGE:**

Revenue Generating Event (RGE) is any action by one or more subscribers that leads to Revenue being derived directly or indirectly by one or more operators. Examples include but not limited to Sending or Receiving Calls / SMS/ MMS/ data Down-load/ Line rental Payment etc

**45. MSC/VLR, MSS System Availability/Down Time:**

Amount of time the MSC and MSC-S were in/out of service during a given period excluding planned outage. Obtainable from system logs.

**46. Signaling (SS7) Link Availability:**

Availability for ETSI SS7 signalling network, evaluated as:-

$$(ASLDUR / (ASLDUR+UNAVAILDUR)) * 100$$

**47. Signaling (SS7) LinkSet Unavailability:**

Duration of unavailability of signalling link set in seconds, evaluated from:-

STUNADURAT

**48. Answer Seizure Ratio (ASR):**

Answer/Seizure ratio (ASR) is the number of successfully answered calls divided by the total number of calls attempted (seizures) multiplied by 100. It is evaluated as follows:-

Number of B answers in the Incoming route

$$ASR\_IN = (NANSWERSI/NCALLSI)*100$$

Number of B answers in the Outgoing route

$$ASR\_OUT = (NANSWERSO/NCALLSO)*100$$

Number of calls answered (B-answer) for both outgoing and Incoming calls

$$ASR\_TOT = ((NANSWERSI+ NANSWERSO) / (NCALLSI+ NCALLSO))*100$$

**49. Background Block Error Ratio (BBER):**

The ratio of Background Block Errors (BBE) to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during Severely Error Seconds (SEs). It is expressed as:-

$$BBER = BBE/(TT-UAS-SES)$$

TT = Total Measurement Time

UAS = Unavailable Second

**50. Error Second Ratio (ESR):**

The ratio of Error Second (ES) to total seconds in available time during a fixed measurement interval. It is expressed as:-

$$ESR = [ES/(TT-UAS)]$$

## 51. Severely Error Seconds (SESR):

SESR is a one-second period that contains over 30 percent error blocks or at least one defect. SES is a subset of ES. It is expressed as:-

$$\text{SESR} = [\text{SES}/(\text{TT-UAS})]$$

### Where:

**CCONGS** - Congestion counter for underlaid subcell. Stepped per congested allocation attempt. The counter for overlaid subcell is **CCONGSSUB**

**CCALLS** - Channel allocation attempt counter (on SDCCH). The Counter for overlaid subcell is **CCALLSSUB**

**CNDROP** - The total number of dropped SDCCH channels in a cell

**CNRELCONG** - Number of released connection on SDCCH due to TCH- and transcoder congestion in underlaid and overlaid subcell. The subset for overlaid subcells is **CNRELCONGSSUB**. Note That CNDROP is stepped at the same time.

**CMSESTAB** - Successful MS channel establishments on SDCCH. This counter is a sum of both overlaid and underlaid subcells.

**TFNDROP** - The total number of dropped full-rate TCH in underlaid subcell. The identical counter for overlaid subcells, **TFNDROPSUB**. The corresponding counters for half-rate, **THNDROP** and **THNDROPSUB**, respectively.

**TFCASSALL** - Number of assignment complete messages for all MS power classes in underlaid subcell, full-rate. The identical counter for overlaid subcells, **TFCASSALLSUB**. The corresponding counters for half-rate, **THCASSALL** and **THCASSALLSUB**, respectively.

**TCASSALL**-Successful assignment attempts

**TASSALL**-Assignment attempts for all MS power classes.

**SUMOHOSUCC** Sum of Successful Internal Handovers (Outgoing Handover)

**SUMOABSUCC** Sum of Successful Internal Assignment Handovers to Better Cell (Outgoing Handover)

**SUMOAWSUCC** Sum of Successful Internal Assignment Handovers to Worse Cell (Outgoing Handover)

**SUMIHOSUCC** Sum of Successful Internal Handovers (Incoming Handover)

**SUMIABSUCC** Sum of Successful Internal Assignment Handovers to Better Cell (Incoming Handover)

**SUMIAWSUCC** Sum of Successful Internal Assignment Handovers to Worse Cell (Incoming Handover)

**SUMOHOATT** Sum of Internal Handover Attempts (Outgoing Handover)

**SUMEHOATT** Sum of External handover Attempts (Outgoing Handover)

**NPAG1LOTOT** - No. of first global page attempts over A-Interface

**NPAG2LOTOT** - No. of repeated page attempts to a location area over A-Interface

**NPAG2GLTOT** - No. of repeated global page attempts over A-Interface

**NPAG1RESUCC** - No. of page responses to first page over A- interface

**NPAG2RESUCC** - No. of page responses to repeated page over A- interface

**NLOCOLDTOT** - Total no. of location updating attempts for already registered subscribers over A-interface and Iu-interface

**NLOCNRGTOT** - Total no. of location updating attempts from non-registered subscribers (IMSI attach, normal LU or periodic LU) over A-interface and Iu-interface

**NLOCOLDSUCC** - No. of successful location updating for already registered subscribers over A-interface and Iu-interface

**NLOCNRGSUCC** - No. of successful location updating for non-registered subscribers over A-interface and Iu-interface

**NLOCNRG2TOT** - Number of location updating attempts from non-registered subscribers (IMSI attach, normal location updating, or periodic updating) over Gs-Interface

**NLOCNRG2SUCC** - Number of successful location updates for non-registered subscribers over Gs-Interface

**NLOCOLD2TOT** - Number of location updating attempts for already registered subscribers over Gs-Interface

**NLOCOLD2SUCC** - Number of successful location updates for already registered subscribers over Gs-Interface.

**ASLDUR** - Accumulated duration in seconds the link is in in-service state incremented by the duration in seconds the link is in in-service state.

**UNAVAILDUR** - Accumulated duration in seconds a link is unavailable because of any reason incremented by the duration in seconds a link is unavailable because of any reason.

**STUNADURAT** - Duration of unavailability of signaling link set, in seconds.

**NANSWERSI** - Number of B-answers in the incoming route.

**NANSWERSO** - Number of B-answers in the outgoing route.

**NCALLSI** - Number of detected seizures, (incoming route). The counter is stepped up when an accepted seizure is received.

**NCALLSO** - Number of seizure attempts (bids), outgoing route.

**GPRS\_ATTACH\_SUC** - The number of successfully performed GPRS Attach procedures within this SGSN of total number of attempts of attach procedures.

**SUCC\_PDP\_CONTEXT\_ACT** - Successful GPRS attaches is considered to be successful when 'PDP activation accept' is send from SGSN to MS.

**TDEV** - Time Deviation.



**MTIE** - Maximum Time Interval Error.

**RRC\_CSSR** –Radio Resource Call Setup Success Rate which depends on CE(Channel Element) or Transmission Resources

**RAB\_SR** –Radio Access Bearer Success Rate which depends on CE(Channel Element) or Transmission Resources

**RTWP** –Received Total Wideband Power

**RSCP** -Received Signal Code Power

**I<sub>ub</sub>** Transmission Interface

**E<sub>c</sub>/I<sub>o</sub>** -Chip Energy per Interference Spectral Density

**CS\_IRAT HHO Failure** –Circuit Switch Inter Radio Access Technology Hard Handover Failure

**PS\_IRAT HHO Failure** –Packet Switch Inter Radio Access Technology Hard Handover Failure

**Cell:** Emission coverage area of a cell site

**KPI:** Key Performance Indicator

**A CELL SITE** is a term used to describe a site where antennas and electronic communications equipment are placed, usually on a radio mast, tower or other high place, to create a cell in a cellular network

**BASE TRANSCIVER STATION (BTS)** also referred to as the *radio base station (RBS)*, *node B* (in 3G Networks), *eNB (in LTE Standard)* or, simply, the *base station (BS)* is a piece of equipment that facilitates wireless communication between user equipment (UE) and a network.

**BASE STATION CONTROLLER (BSC)** is equipment that provides the *intelligence* behind the BTSs. It has tens or even hundreds of BTSs under its control. The BSC handles allocation of radio channels, receives measurements from the mobile phones, and controls handovers from BTS to BTS.

The **MOBILE SWITCHING CENTER (MSC)** is the primary service delivery node for GSM/CDMA, responsible for routing voice calls and SMS as well as other services. It has a number of BSCs under its control. The MSC sets up and releases the end-to-end connection, handles mobility and hand-over requirements during the call and takes care of charging and real time pre-paid account monitoring.

**3G** refers to Third Generation

**LTE** refers to Long Term Evolution

**PoI:** Point of Interconnect

**GENERAL PACKET RADIO SERVICE (GPRS):** is a packet oriented mobile data service on the 2G and 3G cellular communication systems.

**ENHANCED DATA RATES FOR GSM EVOLUTION (EDGE)** (also known as **Enhanced GPRS (EGPRS)**): is a digital mobile phone technology that allows improved data transmission rates as a backward-compatible extension of (Global System for Mobile Communications (GSM).

**Network Segment:** is an identifiable part of a Telecommunications Network such as BTS, BSC, MSC, Interfaces, etc

**HIGH SPEED PACKET ACCESS (HSPA)** is an amalgamation of two mobile telephony protocols, High Speed Downlink Packet Access (HSDPA) and High Speed Uplink Packet Access (HSUPA), that extends and improves the performance of existing Wideband CDMA (WCDMA) protocols.

## SCHEDULE 3 (Fines for acts of Contravention)

Fines will be calculated on the basis of the provisions of Regulation 16 hereof for each Parameter/Key performance indicator for a service, for each Reporting Area, for each identified network segment or node, and for each Reporting Period a Licensee shall have committed a contravention as follows:

<u>Offence</u>	<u>Maximum fine per Contravention</u>
1) Failure by a Licensee to perform measurement, reporting and record keeping tasks set out in regulation 10	→ N15,000,000 for each act of contravention and N2.5,000,000 for each day that the contravention persists.
2) Failure by a Licensee to meet and maintain a Target for the Parameter and the Service.	→ N15,000,000 for each act of contravention and N2.5,000,000 for each day that the contravention persists.
3) Failure by a Licensee to submit, during a time period specified by the Commission, information requested by the Commission pursuant to regulation 10 (c) or Regulation 15.	→ N15,000,000 for each act of contravention and N2.5,000,000 for each day that the contravention persists.
4) Submission or publication of false or misleading information about quality of service by Licensee.	→ N15,000,000 for each act of contravention and N2.5,000,000 for each day that the contravention persists.
5) Obstructing or preventing an investigation by the Commission in respect of the quality of service measurement, reporting, data collection, and record keeping procedures by a Licensee, its officers, agents, servants, privies etc.	→ N15,000,000 for each act of contravention and N2.5,000,000 for each day that the contravention persists

Imposing a fine, for each Contravention, pursuant to the applicable provisions of the Nigerian Communications (Enforcement Processes etc) Regulations 2005 or any amendment thereof, or in accordance with the provisions of these Regulations, and where there is any difference or conflict between the fines specified in the Nigerian Communications (Enforcement Processes etc) Regulations 2005 or any other Regulation and those specified in these Regulations, the fines specified in the most recent of the Regulations shall prevail.