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PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN

PAKISTAN TELECOMMUNICATION AUTHORITY

NOTIFICATION

Islamabad, the 2nd December, 2010

S.R.O. 1191(I)/2010.—In exercise of the powers conferred under clause (o) of sub-section (2) of Section 5 of the Pakistan Telecommunication (Re-organization) Act, 1996 the Pakistan Telecommunication Authority hereby makes the following Regulations:

PART - I

PRELIMINARY

1. **Short title and commencement.**—(1) These Regulations shall be called 'GPRS / EDGE Service Quality of Service Standards Regulations, 2010'.

(2) These Regulations shall come into force from the date of gazette notification of these regulations.

(3983)

2. **Definitions.**—(1) In these Regulations, unless there is anything repugnant in the subject or context:

- (a) **“Act”** means the Pakistan Telecommunication (Re-organization) Act, 1996;
- (b) **“Authority”** means the Pakistan Telecommunication Authority established under section 3 of the Act;
- (c) **“DL”** means down-link;
- (d) **“EDGE”** means Enhanced Data rate for GSM Evolution;
- (e) **“GPRS”** means General Packet Radio Service;
- (f) **“Kbits/s/slot”** means kilo bits per second, per slot;
- (g) **“Kb”** means kilo bits;
- (h) **“KB”** means kilo bytes;
- (i) **“Licensee”** means an authorization to provide cellular mobile communication service granted by the Authority.
- (j) **“PDP”** means packet data protocol;
- (k) **“QoS”** means quality of service;
- (l) **“Regulation”** means all regulations issued by the Authority including these regulations;
- (m) **“UE”** means the user equipment;
- (n) **“UT”** means user terminal; and
- (o) **“UL”** means up-link.

(2) Words and expressions used herein but not defined shall have the same meaning assigned to them in the Act and Regulations.

3. **Scope and Applicability.**—These regulations shall apply to all cellular mobile Licensee(s) for the purpose of laying down quality of service parameters for GPRS/ EDGE service, to ensure consumer satisfaction in line with the criterion determined by the Authority from time to time.

PART-II

QUALITY OF SERVICE FACTORS

4. **Quality of Service Testing Factors.**—All Licensee(s) shall ensure the adoption of the following quality of service testing factors:

(a) **Availability.**—This standard shall be further classified into two parameters:

(i) **Network Availability**

This parameter shall provide verification on whether the Licensee(s) provides GPRS/EDGE coverage in the testing area. Coverage maps shall be obtained from the GPRS/ EDGE service providers before the actual on ground testing.

(ii) **Service Availability**

In the first phase of defining rating tables against service availability, the Authority will not categorize services over the time duration taken in performing these protocols. Only GPRS/ EDGE ATTACH and PDP activation success would be measured. Categorization on the basis of this standard is provided at Annex-A (*Table-1*). For all future testing, the rating tables shall be updated on the basis of time duration.

(b) **Latency.**—Latency in a packet-switched service shall be measured either *one-way* (the time from the source sending a packet to the destination receiving it), or *round-trip* (the one-way latency from source to destination plus the one-way latency from the destination back to the source). In accordance with the methodology of development of standards, only round trip Latency has been considered for standardization. Categorization on the basis of this standard is provided at Annex-A (*Table-2*).

(c) **Link Speed.**—Ratings shall be measured on the basis of this standard as provided at Annex-A (*Table-3*).

(d) **Throughput.**—The user specific standard is the overall throughput (DL /UL speed) of the GPRS/EDGE service. These have been further subdivided into 'download' and 'upload' speeds as given below. While recommending throughput speeds differentiation has also been made between urban and rural area requirements.

- (i) **Download Speed(DL).**—The standard has been categorized on the basis of the following:
- (a) **Urban Environment.**—Ratings for GPRS/EDGE DL speeds for urban environment are mentioned at Annex-A (Table 4).
 - (b) **Rural Environment.**—Ratings for GPRS/EDGE DL speeds for rural environment are mentioned at Annex-A (Table-5).
 - (c) **EDGE with Mobility.**—For EDGE download service during mobility (of over 70Km/h or as per the allowable/possible speed limits on the test field) ratings are done using Annex-A (Table-6). These are half of the average of the corresponding fixed rural and urban download speeds.
- (ii) **Upload Speed(UL).**—This standard has been categorized on the basis of following:
- (a) **Urban Environment.**—Ratings for GPRS/EDGE UL speeds for urban environments are mentioned at Annex-A (Table-7).
 - (b) **Rural Environment.**—Ratings for GPRS/EDGE UL speeds for urban environments are mentioned at Annex-A (Table-8).
 - (c) **EDGE with Mobility.**—For EDGE upload service during mobility (of over 70Km/h or as per the allowable/possible speed limits on the test field) ratings are done using Annex-A (Table-9). These are half of the average of the corresponding fixed rural and urban uploaded speeds.
 - (d) **Retainability.**—The ratings are based on 'best of three' attempts method. Performance of service shall be verified according to the thresholds laid down in Annex-A (Table-10).

PART-III**QUALITY OF SERVICE TESTING FOR GPRS/EDGE SERVICE BY CELLULAR MOBILE SERVICE PROVIDERS**

5. **Quality of Service Standards.**—(1) All Licensee(s) providing GPRS/EDGE service shall adopt the performance standards provided in Annex-A to these regulations:

Provided that the Authority may modify, delete or add standards and/or their rating tables on the basis of the extent of coverage deployments and review of new technologies, as and when required.

6. **Quality of Service Testing.**—(1) All Licensee(s) shall carry out quality of service of testing of GPRS/EDGE service in accordance with the factors prescribed in regulation 4.

(2) The tests and surveys shall be so designed to meet the following criteria:

(a) Applicability;

(b) End to End testing (non-intrusive for service under test);

(c) Ease of measurement;

(d) Ease of understanding for a field testing person; and

(e) Similar treatment of rural and urban regions in terms of service offerings.

(3) The Authority may depute its representatives to be present at the quality tests and surveys carried out by the Licensee(s).

(4) Each Licensee(s) shall maintain record of all data collected against each QoS factor as prescribed by the Authority in regulation 4.

PART-IV**GENERAL PROVISIONS**

7. **Reporting Requirements.**—(1) The data collected as per part III of this Regulation shall be submitted to the Authority every month or at such intervals as the Authority may direct in the form and manner as it may specify.

(2) These tests reports would be analyzed by the Authority through post analysis software which shall be provided by the Licensee(s). The output of each analyzer must be in a standard format.

(3) The Licensee(s) shall keep a record of the said quality tests and surveys, in such form and manner as the Authority may specify. This record shall at all times be open to inspection and audit by the Authority or representative of the Authority, with or without notice to the Licensee(s).

(4) The record of all data shall be retained and maintained in the safe custody of the Licensee(s) for a period of three (03) years.

(5) On the basis of the "consumer complaint record", coverage claim of the Licensee(s) and previous test results, the Authority may decide to provide information on the following to the Licensee(s) before conducting the test:

- (a) Frequency of the test;
- (b) Geographical routes for drive tests; and
- (c) Test timings.

8. Inspection of Quality of Service.—(1) The Authority may conduct inspections, surveys, tests or make surprise checks through its designated representative or conduct performance audit of quality of service of the Licensee(s) from time to time to ensure that users of telecommunication services get such quality of service as laid down in the license, these Regulations, claimed by the Licensee(s) or as determined by the Authority from time to time.

(2) The Licensee(s) shall extend full co-operation and provide all assistance to the representative/ inspecting officer (s) in carrying out the tests and surveys. The Authority may engage, if circumstances so require, third party/consultants to conduct quality of service audit.

(3) The inspecting officer shall prepare an inspection report of such quality of service inspections, which clearly spell out the shortfalls observed during such inspection. This report shall be provided to the Licensee(s). The Licensee(s) shall immediately take all remedial measures to remove the shortfalls identified in the report and submit compliance report within 30 days by confirming that all stated shortfalls have been removed.

9. Publication of Quality of Service Reports.—(1) The Authority may publish test and/or Survey results, and/or ratings of the Licensee(s) for information of general public.

(2) All updated test and/or survey results and ratings of the Licensee(s) shall be available for the information of the general public.

Annex-A

RATING TABLES

Tech.	Type	Pass	Fail
GPRS & Edge	Network Availability	Network Available	Network not available
	Service Availability	Time < 7 Sec	Time > 7 sec

Table-1: Network and Service Availability

Tech.	Good	Average	Poor	Unsatisfactory
GPRS	Delay < 500ms	500ms - 800ms	800ms - 1000ms	Above 1sec
EDGE	Delay < 100 ms	100ms - 200ms	200ms - 500ms	Above 500 ms

Table-2: Network Latency

Tech.	Excellent	Good	Average	Poor	Unsatisfactory
GPRS	Over 43.2kbps	Between 43.2kbps	Between 36kbps	Between 24kbps	Below 12kbps
	—	36kbps	24kbps	12kbps	
EDGE	Over 272kbps	Between 272kbps	Between 179.2kbps	Between 88.8kbps	Below 44.8 kbps
	—	179.2kbps	88.8kbps	44.8kbps	

Table-3: Link Speed

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
GPRS	Throughput	Over 6.48 kbps	Between 6.48 kbps	Between 5.4 kbps	Between 3.6 kbps	Below 1.8 kbps
		—	5.4 kbps	3.6 kbps	1.8 kbps	

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
EDGE	Throughput	Over 40.8 kbps	Between 40.8 kbps	Between 26.88 kbps	Between 13.32 kbps	Below 6.72 kbps
		—	26.88 kbps	13.32 kbps	6.72 kbps	

Table-4: Throughput - DL Urban

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
GPRS	Throughput	Over	Between	Between	Between	Below 3.6 kbps
		13 kbps	13 kbps	10.8 kbps	7.2 kbps	
EDGE	Throughput	Over	Between	Between	Between	Below 13.44 kbps
		81.6 kbps	81.6 kbps	53.8 kbps	26.64 kbps	
			53.8 kbps	26.64 kbps	13.44 kbps	

Table-5: Throughput - DL Rural

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
EDGE	Throughput	Over	Between	Between	Between	Below 5 kbps
		30.6 kbps	30.6 kbps	20.17 kbps	10 kbps	
			20.17 kbps	10 kbps	5 kbps	

Table-6: Throughput DL EDGE Mobility

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
GPRS	Throughput	Over	Between	Between	Between	Below 2.4 kbps
		4.8 kbps	4.8 kbps	4.32 kbps	3.6 kbps	
EDGE	Throughput	Over	Between	Between	Between	Below 3.5 kbps
		18 kbps	18 kbps	9 kbps	6 kbps	
			9 kbps	6 kbps	3.5 kbps	

Table-7: Throughput - UL Urban

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
GPRS	Throughput	Over	Between	Between	Between	Below 4.8 kbps
		9.6 kbps	9.6 kbps	8.64 kbps	7.2 kbps	
EDGE	Throughput	Over	Between	Between	Between	Below 5.3 kbps
		26.9 kbps	26.9 kbps	13.44 kbps	10.56 kbps	
			13.4 kbps	10.56 kbps	5.3 kbps	

Table-8: Throughput - UL Rural

Tech	Unit	Excellent	Good	Average	Poor	Unsatisfactory
EDGE	Throughput	Over	Between	Between	Between	Below 2.2 kbps
		11.22 kbps	11.22 kbps — 5.6 kbps	5.6 kbps — 4.14 kbps	4.14 kbps — 2.2 kbps	

Table-9: Throughput - UL EDGE Mobility

Tech.	Excellent	Good	Poor	Unsatisfactory
GPRS and Edge	No disconnection	1 Disconnection out of three	2 disconnections out of three	More than 2 Disconnections

Table 10: Retainability

[No. 76/Regs/PTA/2010/850.]

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