

Pursuant to Arts. 8, para. 1, item 1), 23. para. 1 and 109, and in regard to Art. 131. of the Law on Electronic Communications (*Official Gazette of RS*, no. 44/10), Art. 12, para. 1 item 1) and 16 item 4 of the Statutes of the Republic Agency for Electronic Communications (*Official Gazette of RS*, no. 59/10),

the Managing Board of the Republic Agency for Electronic Communications in its session of 28 July 2011, adopted the following

## **Rules on quality parameters for publicly available electronic communication services and monitoring of electronic communication activity**

### **I. General provisions**

#### *Content of the Rules*

#### **Article 1**

These Rules shall stipulate in detail the quality parameters for publicly available voice service, broadband service, media content distribution service, provision of information to the consumers on the quality of service offered, minimum quality of specific service provision by public communication network operators, quality parameters of electronic communication networks, control of obligations imposed on operators with significant market power, control of conditions under licences for the use of numbering, single licences for radio frequency usage and other obligations stipulated under the Law on Electronic Communications (*Official Gazette of RS*, no. 44/10, hereinafter referred to as Law) and regulations based thereon, and shall also stipulate the powers of the Republic Agency for Electronic Communications (hereinafter referred to as Agency) in the monitoring procedure of electronic communication activity.

#### *Standards*

#### **Article 2**

The basis for setting the quality parameters for publicly available electronic communication activities and monitoring of electronic communication activities shall be technical regulations, standards and technical specifications of the European Telecommunications Standards Institute (ETSI), the European Committee for Standardization (CEN), European Committee for Electrotechnical Standardization (CENELEC), Internet Engineering Task Force – Request for Comments (IETF- RFC), as well as the standards, decisions and recommendations of the International Telecommunication Union (ITU), International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) and the European Conference of Postal and Telecommunications Administrations (CEPT) (hereinafter referred to as international standards) and relevant national standards.

## **II. Quality parameters for publicly available electronic communication services**

### *Quality parameters for public voice service in public telephone network at a fixed location*

#### **Article 3**

The provision of public voice service in the public telephone network at a fixed location shall be subject to the fulfilment of basic technical requirements in line with the international standards, these Rules and relevant bylaws of the Agency.

The basic set of parameters for monitoring of the quality of service referred to in para. 1 herein is given in Table 1 in Appendix 1, which shall be printed herewith and shall be an integral part hereof.

### *Quality parameters for public services in public mobile communication network*

#### **Article 4**

The provision of public services in public mobile communication networks shall be subject to the fulfilment of basic technical requirements in line with the international standards, these Rules and relevant bylaws of the Agency.

The basic set of parameters for monitoring of the quality of service referred to in para. 1 herein is given in Table 2 in Appendix 1, which shall be printed herewith and shall be an integral part hereof.

### *Quality parameters for public voice service provided over the Internet*

#### **Article 5**

The provision of the public voice service provided over the Internet shall be subject to the fulfilment of basic technical requirements in line with the international standards, these Rules and relevant bylaws of the Agency.

The basic set of parameters for monitoring of the quality of service referred to in para. 1 herein is given in Table 3 in Appendix 1, which shall be printed herewith and shall be an integral part hereof.

### *Quality parameters for broadband access*

#### **Article 6**

The provision of broadband service shall be subject to the fulfilment of basic technical requirements in line with the international standards, these Rules and relevant bylaws of the Agency.

The basic set of parameters for monitoring of the quality of service referred to in para. 1 herein is given in Table 4 in Appendix 1, which shall be printed herewith and shall be an integral part hereof.

### *Quality parameters for media content transmission services*

#### **Article 7**

The provision of media content transmission services shall be subject to the fulfilment of basic technical requirements in line with the international standards, these Rules and relevant bylaws of the Agency.

The basic set of parameters for monitoring of the quality of service referred to in para. 1 herein, in particular for analogue television, digital television and IPTV, is given in Table 5 in Appendix 1, which shall be printed herewith and shall be an integral part hereof.

### *Consumer information provision*

#### **Article 8**

The quality of service provided to the consumer shall be clearly and unequivocally stated, made known in advance and made public in appropriate manner. The offer shall be published in all operator's retailers and on their website or information channel, depending on the type of service, while operator may also publish their offer in another way (through public media, advertising mail, etc.).

The operator shall be required to publish the quality parameters for service provision stipulated hereunder in an appropriate manner at their retailer's and on their website or information channel, depending on the type of service provided. The operator shall indicate in the general conditions pertinent to service provision the way in which the users can obtain information on quality parameters.

The operator shall indicate the data on the minimum level of quality of service provision in the user contract.

The contract between the operator and user shall stipulate the manner in which the user will be informed of any changes in the service provision quality and conditions, and/or in which they can obtain information on these changes (website, information-channel, notification accompanying the bill). The operator shall be required to inform the consumers on the forthcoming change of the service provision quality or conditions at least one month in advance.

The operator shall be responsible for the provision of updated, accurate and adequate information to users.

The operator shall be required to control the quality of service provision at least once a year, and to submit the measurement results to the Agency using the forms which are printed

herewith and are an integral part hereof (Report 1, Report 2, Report 3, Report 4, Report 5 in Appendix 1)

Reports referred to in previous paragraph shall be submitted in two copies, a written and electronic one.

The Agency shall keep records on the quality of public communication networks and services and shall publish the data on its website.

#### *Minimum quality of service*

### **Article 9**

The minimum value of the quality of service parameters, referred to in Arts. 3, 4, 5, 6 and 7 herein, that the operators of the public communication networks are required to fulfil are given in Tables 1, 2, 3, 4 and 5 in Appendix 1.

## **III. Electronic communication network quality parameters**

### **Article 10**

Electronic communication networks and accompanying facilities shall be designed, built or installed, used and maintained in accordance with Art. 42 of the Law on Electronic Communications (hereinafter referred to as Law) and general bylaws regulating in detail the performing of electronic communication activity under general authorization regime.

### **Article 11**

In addition to the obligations referred to in Art. 8 herein, an operator using radio frequencies, based on an individual licence issued upon a completed public bidding procedure, shall also be required to submit the results of the measurement of the basic set of parameters pertaining to network quality monitoring, at least once a year, using the forms which are printed herewith and are an integral part hereof (Report 1 and Report 2 in Appendix 2).

The reports referred to in the previous paragraph shall be submitted in two copies, a written and electronic one.

The basic set of quality monitoring parameters referred to in para. 1 herein is given in Appendix 2, which is printed herewith and is an integral part hereof.

## **IV. Monitoring of activity performance**

### *Control of operator practice*

#### **Article 12**

The operator shall be required to perform electronic communication activity in accordance with the Law, other regulations based thereon and these Rules.

The Agency shall be authorized to perform control of operator practice pursuant to requirements referred to in para. 1 herein. The control of operator practice shall be performed by the Agency based on the data and information received from the operator or by measurement and testing the electronic communication network operation and quality of service.

The control referred to in para. 2 herein shall be performed by the Agency based on the data submitted by the operator upon a written request from the Agency. The operator shall be required to respond to the request within the timeframe set by the Agency which may not be less than 8 days following the receipt of the request.

The control referred to in para. 2 herein may also be performed by the Agency through independent measurement performed by the Agency, in accordance with the procedures and regulations referred to in Art. 17 herein, by connecting monitoring and measurement equipment to relevant measurement points in the operator's network, remote measurement or measurement set out by the general bylaw of the Agency regulating in detail the manner of RF spectrum usage monitoring, technical inspection implementation and protection from harmful interference.

The operator shall be required to provide all necessary conditions for measurement and proceeding in terms of para. 4 herein.

The measurement and testing referred to in para. 4 herein shall be performed by the Agency through its monitoring centres and/or persons authorized to perform measurement and testing.

The Agency shall perform the control of electronic communication activity performance as part of the regular and additional control.

### *Regular control*

#### **Article 13**

Regular control of the operators shall entail relevant data and information collection, measurement and testing at least once a year.

### *Additional control*

#### **Article 14**

Additional control of the entities performing electronic communication activity shall entail relevant data and information collection, measurement and testing upon a complaint received from a user or another interested legal or natural entity.

In case the person referred to in para. 1 herein finds it justified, they can file a complaint on the work of the operator.

The complaint shall include the following basic data:

- 1) name and address of the operator;
- 2) name, surname and address and/or business name and seat of the complainant;
- 3) problem description;
- 4) description of attempt to resolve the problem directly with the operator.

The complainant may also submit the proof they hold, which they retain relevant for the complaint procedure.

The complaint that includes all necessary data referred to in para. 3 herein shall be submitted to the operator, accompanied by a request to provide statement, specifying the timeframe for providing the relevant statement.

Upon receiving the statement, if necessary, the Agency may perform an additional control of the operator's activity performance.

The Agency may also perform an additional control of the operator's activity performance without a complaint received from a person referred to in para. 1 herein, in case the work of the operator is believed not to be in line with the stipulated conditions for the performance of electronic communication activity.

*Control of quality parameters for electronic communication networks and services*

## **Article 15**

During a regular or additional control, the Agency shall perform control of quality parameters for electronic communication networks and services based on the parameters referred to in Arts. 3, 4, 5, 6, 7, 10 and 11 herein.

*Monitoring of the compliance with the technical requirements and relevant conditions*

## **Article 16**

In order to ensure the conditions for service provision of prescribed quality and unhindered work of electronic communication networks, the Agency shall perform adequate monitoring and/or controls by comparing the following:

1. technical characteristics and performances of electronic communication networks with the prescribed parameters that apply to the particular network;

2. measured and/or ascertained quality parameters pertinent to the maintenance of electronic communication networks with the prescribed parameters.

Monitoring and/or control referred to in para. 1 herein may also be performed at the request of the entity performing electronic communication activity, before launching electronic communication networks, accompanying facilities and electronic communication equipment and in other cases when considered necessary by the operator that shall submit the relevant request to the Agency.

Upon the performed monitoring referred to herein, a Report on compliance of technical requirements and other conditions shall be made, using the form which is printed herewith and is an integral part hereof (Appendix 3).

#### *Measurement procedure and methods*

### **Article 17**

Measurement and testing referred to in Art 12, para. 4 herein shall be performed in line with the international standards, national standards and/or technical specifications and other regulations harmonized with the mandatory standards and/or technical specifications of the European Union.

The Agency shall revise and extend the list of standards, recommendations and other regulations referred to in para. 1 herein and publish them on its website.

## **V. Monitoring of other obligations**

#### *Control of the conditions stipulated by the licences for the use of numbering*

### **Article 18**

The Agency shall monitor the conditions under which an operator grants the usage of assigned numbering to a third party, which intends to use it for commercial purposes and not for their own needs.

#### *Control of individual licences for radio frequency usage*

### **Article 19**

The Control of individual licences for radio frequency usage shall refer to control of compliance with the conditions and parameters stipulated under the licence, in particular if the assigned radio frequency is used, the timeframe for commencing the usage of the assigned radio frequencies, the purpose of the assigned radio frequency, location and/or coverage area, timeframe for notifying the Agency on the installed radio stations and performed technical inspection.

#### *Control of obligations imposed on operators with significant market power*

## **Article 20**

The obligations of the operators with significant market power and the control of the fulfilment of the obligations shall be regulated by separate decisions of the Agency.

### *Control of other obligations*

## **Article 21**

The Agency may also request other data and information and perform additional measurement and testing in accordance with the Law, these Rules and other Agency bylaws, if the work of the operator is suspected not to be in line with the stipulated obligations.

## **VI. Powers of the Agency in the control procedure**

### *Report on the control of operator's work*

## **Article 22**

A Report on the control of operator's work shall be made on the control procedure. The Report shall be made in accordance with the provisions of the law regulating general administration procedure.

The Report Form is given in Appendix 4, which is printed herewith and is an integral part hereof.

### *Statement request and filling a report with inspection*

## **Article 23**

If during the control procedure the operator is found not to comply with the stipulated obligations, the Agency shall inform the operator thereof and shall submit them the Report on control along with the request to provide statement thereon and to remedy the irregularities. The Agency shall indicate in the request the deadline for the operator to provide the statement and/or remedy the irregularities and inform the Agency thereon, which may not be less than eight days, except in cases where the Agency identifies a serious or repeated breach of stipulated obligations.

If the Agency finds that the operator failed to remedy the irregularities within the given deadline, it shall file a report with the inspection of the ministry responsible for electronic communication sector.

If the operator fails to provide a statement on the found irregularities within the given deadline, the Agency shall file a request for proceedings to be initiated, pursuant with the Law.



## **VII. Final provision**

### **Article 24**

These Rules shall enter into force on the eight day following the publication in the *Official Gazette of the Republic of Serbia*.

**Belgrade 28 July 2011**  
**Ref. no. 1-01-3400-14/11**

**Chairman of the Managing Board**

*Prof. Dr. Jovan Radunovic*

## APPENDIX 1

**TABLE 1 Quality parameters for public voice service in public telephone network at a fixed location**

no.	Parameter	Parameter description	Subject of measurement	Measurement method	Minimum value
1.	Service Activation Time	Service activation time refers to period between the receipt of request and the service activation	for 50 % of new connections per year (average time per connection)	Operator's report	10 days
			for 90 % of new connections per year (average time per connection)		15 days
			for 95 % of new connections per year (average time per connection)		20 days
			% of services activated within the timeframe under the contract		95 %
			Average days of service activation delay		-
			Request receipt time		-
3.	Number of Malfunctions per Access Line	Number of malfunctions per access line refers to the total number of malfunctions a year divided by the number of active lines multiplied by 100	per 100 lines per year	Operator's report	15 per 100 lines or 15% of the total number
4.	Average Repair Time	Average repair time refers to the total duration of malfunctions (period between being reported and being repaired) divided by the number of malfunctions	for 80% of quickies repairs of access lines a year	Operator's report	36 hours
			for 95% of quickies repairs of access lines a year		48 hours
			% of repairs made within 24 hours since being reported		80%
			Malfunction report time		-
5.	Average Failure Rate	Average failure rate refers to the percentage of calls made to an existing user unsuccessfully forwarded due to system failure or no capacities available	All calls	Operator's report	1%
			National calls on fixed networks within local exchange		1%

		The case where subscriber B is busy or subscriber B is not responding is not regarded as failed call. The measurement shall be performed on the biggest possible sample.	National calls on fixed networks outside local exchange		1%
			National calls from fixed network to mobile networks		1%
			National calls from fixed network to other fixed operators		1%
			International calls		1%
6.	Average Success Rate	Average success rate (ASR) refers to the percentage of calls responded to by subscriber B Measurement is applied to the largest possible sample.	All calls	Operator's report	60%
			National calls on fixed networks within local exchange		60%
			National calls on fixed networks outside local exchange		60%
			National calls from fixed network to mobile networks		60%
			National calls from fixed network to other fixed operators		60%
			International calls		60%
7.	Call Setup Time	Call setup time refers to time between dialling the last digit of the subscriber number and call test signal The measurement is conducted on the largest possible sample.	Average time for national calls	Operator's report	3s
			Average time for national calls on fixed network		3s
			Call setup time 95 % of national calls on fixed networks		3s
			National calls from fixed network to mobile networks		5s
			Call setup time for 95 % of national calls from fixed network to mobile networks		5s
			Average international call setup time		5s

			Call setup time for 95 % of international calls		5s
8.	Operator Service Response Time (9813, 977)	Response time refers to time between ringing tone and response by the operator.	Average response time per year	Operator's report	20s for 80% of calls
			% calls with response time of less than 20 seconds		80%
9.	User Directory Access Response Time (988)	Response time refers to time between ringing tone and response by the operator.	Average response time per year	Operator's report	20s for 80% of calls
			% calls with response time of less than 20 seconds		80%
10.	Bill Correctness Complaint Response Time	Response time refers to time between ringing tone and to response by the operator.	Average response time per year	Operator's report	20s for 80% of calls
			% calls with response time of less than 20 seconds		80%
11.	Bill Correctness Complaint	% of bills followed by a complaint	% of complaints followed by bill correction	Operator's report	≤ 1% per 100 bills
12.	Bill Layout Quality	Perceived quality according to questionnaire conducted among users.	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	Operator's report	-
13.	User Complaint Frequency	Quality assessment according to questionnaire conducted among users.	Number of complaints per user	Operator's report	0,5%
14.	User Complaint Resolution Time	Resolution time for 80% of complaints	for 80% of quickest resolved complaints per year	Operator's report	5 working days
15.	Relationship with users	Perceived quality according to questionnaire conducted among users.	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	Operator's report	-
16.	User Assistance Service Professionalism	Perceived quality according to questionnaire conducted among users.	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	Operator's report	-
17.	Percentage of Functioning Public Payphones	Percentage of functioning public payphones is the mean value of the functioning public payphones a year	% in one year	Operator's report	98%

MOS - Mean Opinion Score

## REPORT 1

### Report on the values of the quality parameters for public voice service in public telephone network at a fixed location

Operator's name: \_\_\_\_\_

Date of the period: \_\_\_\_\_ from \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter	Measure	Value
1.	Service Setup Time	for 50 % of new connections a year (average time per connection)	(days)
		for 90 % of new connections a year (average time per connection)	(days)
		for 95 % of new connections a year (average time per connection)	(days)
		% of services setup within the timeframe under the contract	(%)
		Average days of delay in service setup	(days)
		Request receipt time	from.....until..... workdays from..... until..... Saturdays from.... until..... Sundays
3.	Number of Access Line Malfunctions	for 100 liner per year	(%)
4.	Average Repair Time	for 80% of quickies repairs of access lines a year	(hours)
		for 95% of quickies repairs of access lines a year	(hours)
		% repairs made within 24 hours from being reported	(%)
		Malfunction report time	from.....until..... workdays from..... until..... Saturdays from.... until..... Sundays

5.	Unsuccessful Call Ratio	All calls	(%)
		National calls on fixed networks within local exchange	(%)
		National calls on fixed networks outside local exchange	(%)
		National calls from fixed network to mobile operators	(%)
		National calls from fixed network to other fixed operators	(%)
		International calls	(%)
6.	Average Success Rate	All calls	(%)
		National calls on fixed networks within local exchange	(%)
		National calls on fixed networks outside local exchange	(%)
		National calls from fixed network to mobile networks	(%)
		National calls from fixed network to other fixed operators	(%)
		International calls	(%)
7.	Call Setup Time	Average time for national calls	(seconds)
		Average time for national calls on fixed network	(seconds)
		Call setup time 95 % of national calls on fixed networks	(seconds)
		National calls from fixed network to mobile networks	(seconds)
		Call setup time for 95 % of national calls from fixed network to mobile networks	(seconds)
		Average international call setup time	(seconds)
		Call setup time for 95 % of international calls	(seconds)
8.	Operator Service Response Time (9813, 977)	Average response time per year	(seconds)
		% calls with response time of less than 20 seconds	(%)
9.	User Directory Access Response Time (988)	Average response time per year	(seconds)
		% Average response time per year	(%)
10.	Bill Correctness Complaint Response Time	Average response time per year	(seconds)
		% Average response time per year	(%)

11.	Bill Correctness Complaints	% of complaints that result in bill correction	(%)
12.	Bill Layout Quality	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	(1 – 5)
13.	User Complaint Frequency	Number of complaints per user	(number)
14.	User Complaint Resolution Time	for 80% most promptly resolved complaints per year	(days)
		for 95% most promptly resolved complaints per year	(days)
15.	Relationship with Users	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	(1 – 5)
16.	User Assistance Service Professionalism	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	(1 – 5)
17.	Percentage of Functioning Public Payphones	% per year	(%)

**Place, date**

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**Officer in Charge**

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**TABLE 2 Quality parameters for public service in public mobile communication network**

No.	Parameter	Parameter description	Measurement method	Minimum value
1.	Call/Session Success Rate Applicable for GSM and UMTS network	$CSSR = \frac{\text{successful\_call\_attempts}}{\text{all\_call\_attempts}} * 100[\%]$	End-user side according to TS 102250-2 Network side: Operator's report.*	> 98% At network level
2.	Call Drop Rate Applicable for GSM and UMTS network	$CDR = \frac{\text{unintentionally terminated telephony calls}}{\text{all successful telephony call attempts}} * 100[\%]$	End-user side according to TS 102250-2 Network side: Operator's report *	< 2% At network level
3.	Telephony Setup Time	Time between sending of complete address information and receipt of call setup notification	End-user side according to TS 102250-2 Network side: Operator's report	According to E.771, indicated in the separate 1/E.771 table
4.	DL Throughput for Packet Interactive	Advertised maximum throughput Average throughput towards user for packet r99 interactive Average throughput towards user for HS interactive	End-user side: test computer Network side: Operator's report *	> 128 Kb/s y DL > 64 Kb/s y UL
5.	Total number of complaints per 100 users	Mean value of all complaints per 100 users per year	Operator's report	-
6.	Bill Correctness Complaints	Percentage of bills followed by user complained (% of complaints that result in bill correction)	Operator's report	≤ 1% per 100 bills
7.	Response time for operator services	Response time refers to time between ringing tone and response by the operator	Operator's report Operator's report	20s in 60% of cases 60%
8.	Response time for admin/billing enquiries	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s for 80% of calls 80%

\* **Note.** Parameter value should be the average value measured for daily peak hour during 5 workdays (*Average Daily Peak Hour* according to ITU-T Recommendation E.600)



## REPORT 2

### Report on quality parameters for public service in public mobile communication network

Operator's name: \_\_\_\_\_

Data for the period: From \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter	Measurement results
1.	Call/Packet Session Setup Success Rate or Telephony Service Accessibility *	1) GSM network 2) Parameter value for each network cell in on Excel spreadsheet <i>(if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation)</i>
		1) UMTS network 2) Parameter value for each network cell in on Excel spreadsheet, in particular for: a) voice calls, b) video calls c) data transmission <i>(if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation)</i>
2.	Call Drop Rate *	1) Network level 2) Parameter value for each network cell in on Excel spreadsheet <i>(if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation)</i>
		1) Network level

		<p>2) Parameter value for each network cell in on Excel spreadsheet, in particular for:</p> <p>a) voice calls,</p> <p>b) video calls</p> <p>c) data transmission</p> <p><i>(if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation)</i></p>
3.	Telephony Setup Time *	In GSM network
		In UMTS network
4.	Advertised maximum throughput	( Kb/ s)
	Average throughput towards user for packet r99 interactive *	( Kb/ s)
	Average throughput towards user for HS interactive *	( Kb/ s)
5.	Bill Correctness Complaints	(%)
6.	Number of bill correctness complaints per 100 users	(number)
7.	Response time for operator services -average response time per year -% of calls responded to within 20s	(seconds) %
8.	Response time for admin/billing enquiries -average response time per year -% of calls responded to within 20s	s %

\* **Note.** Parameter value should be the average value measured for daily peak hour during 5 workdays (Average Daily Peak Hour according to ITU-T Recommendation E.600)

**Place, date**

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**Officer in Charge**

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**TABLE 3 Quality parameters for public voice service provided over the Internet**

No.	Parameter	Parameter description	Measurement method	Minimum value	
				Class 0	Class 1
1.	IP Packet Transfer Delay	Upper bound on the mean IPTD	Pursuant to ITU-T Y.1541 Recommendation	100 ms	400 ms
2.	IP packet Delay Variation	Upper bound on the $1 - 10^{-3}$ quantile of IPTD minus the minimum IPTD	Pursuant to ITU-T Y.1541 Recommendation	50 ms	50 ms
3.	IP packet Loss Ratio	Upper bound on the packet loss probability	Pursuant to ITU-T Y.1541 Recommendation	$1 \times 10^{-3}$	$1 \times 10^{-3}$
4.	IP packet Error Ratio	Upper bound	Pursuant to ITU-T Y.1541 Recommendation	$1 \times 10^{-4}$	
5.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	Operator's report	> 95% per 8 days	
6.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	$\leq 1\%$ per 100 bills	
7.	User Complaint Resolution Time	Resolution time for 80% and 95% of complaints from the moment of complaint submission.	Operator's report	> 80% per 24 hours > 95% per 5 days	

8.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
9.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
10.	Response time for admin/billing enquiries	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s for 80% of calls
				80%
11.	Response time for operator services	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s for 80% of calls
				80%

## REPORT 3

### Report on the values of the quality parameters for public voice service provided over the Internet

Operator's name: \_\_\_\_\_

Data for the period: from \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter	Parameter description	Value
1.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	(days)
2.	Bill Correctness Complaints	% of bills followed by user complaint	%
3.	User Complaint Resolution Time	Resolution time for 80% and 95% of complaints from the moment of complaint submission.	(days)
4.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	(average mark)
5.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	(average mark)
6.	Response time for admin/billing enquiries	-average response time per year -% of calls responded to within 20s	s %
7.	Response time for operator services	-average response time per year -% of calls responded to within 20s	s %

Place, date

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Officer in Charge

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**TABLE 4 Quality parameters for broadband services**

No.	Parameter	Parameter description	Measurement method	Minimum value
<b>General parameters</b>				
1.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	Operator's report	> 95% for 8 day
2.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	≤ 1% per 100 bills
3.	User Complaint Resolution Time	Resolution time for 80% and 95% of complaints from the moment of complaint submission.	Operator's report	> 80% for 24 hours > 95% for 5 days
4.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
5.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
6.	Response time for admin/billing enquiries	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s for 80% call
				80%

7.	Response time for operator services	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s for 80% calls
				80%
Parameters measured by an instrument				
8.	Throughput	Throughput mean value in kbit/s upload and download	Test computer (user side) – test server (provider side)	≥ 80% of throughput under contract in kbit/s(*) * except for wireless access
9.	Delay (one-way)	The delay is assessed by measuring half the time for a Echo Reply Message according to RFC 792	Test computer (user side) – test server (provider side)	Detailed values according to tables F.2 and F.3 in Annex F of ETSI EG 202 057-4
10.	Jitter	The standard deviation of the delay is a measure for the jitter	Test computer (user side) – test server (provider side)	Detailed values according to tables F.2 and F.3 in Annex F of ETSI EG 202 057-4
11.	Packet Loss	PER or BER	Test computer (user side) – test server (provider side)	Detailed values according to tables F.2 and F.3 in Annex F of ETSI EG 202 057-4

Note: Minimum broadband bitrate is 256kbit/s at least one-way

## REPORT 4

### Report on values for quality parameters for broadband services

Operator's name: \_\_\_\_\_

Data for the period: from \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter	Parameter description	Result
1.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	(days)
2.	Bill Correctness Complaints	% of bills followed by user complaint	%
3.	User Complaint Resolution Time	Resolution time for 80% and 95% of complaints from the moment of complaint submission.	(days)
4.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	(average mark)
5.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	(average mark)
6.	Response time for admin/billing enquiries	-average response time per year -% of calls responded to within 20s	s %
7.	Response time for operator services	-average response time per year -% of calls responded to within 20s	s %

**Place, date**

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**Officer in Charge**

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**TABLE 5 Quality parameters for media content transmission services****Table 5.1** Analogue and digital media content distribution

No.	Parameter	Parameter description	Measurement method	Minimum value
1.	Subjective assessment of the quality of TV signal picture and sound	Subjective assessment of TV signal quality/ quality degradation	ITU-R BT.500-12 (09/09)	4
			ITU-R BS.1770-2 (03/11)	
2.	Signal level	Signal level is the ratio of signal strength (power) to reference strength (power) expressed in dB; depends on frequency band and modulation applied	EN 60728-1	Chapter 5.4.1, Table 4, Standard EN 60728-1
3.	C/N(dB) / SD,RF/N (dB)	Minimum carrier/noise ratio, or minimum digital RG signal/noise ratio	EN 60728-1	Tables 11 and 12 defined under EN 60728-1.
4.	BER (Bit Error Rate)	The percentage of bits that have errors relative to the total number of bits transmitted (for digital transmission)	EN 60728-1	<10 <sup>-4</sup> ; 5.13.1.1 EN 60728-1
5.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	Operator's report	> 95% per 8 days
6.	QoS Complaint	Number of complaints in proportion to total number of users	Operator's report	-
7.	Average Repair Time	Average repair time refers to period between malfunction being reported and being repaired	SRPS standard	24 hours/48 hours
8.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	≤ 1% per 100 bills
9.	Bill Correctness Complaints Resolution Time	Resolution time for 95% of complaints	Operator's report	> 95% per 5 working days
10.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
11.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample	Operator's report	-

		of minimum 100 users		
12.	Response time for admin/billing enquiries	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s per 80% calls
				80%
13.	Response time for operator services	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s per 80% calls
				80%

**Table 5.2 IPTV**

<b>No.</b>	<b>Parameter</b>	<b>Parameter description</b>	<b>Measurement method</b>	<b>Minimum value</b>
1.	Average subjective assessment of the quality of video content	Perceived quality involves packet delay, delay variation, packet loss or jitter. It is expressed using a five/grade scale (1 – unacceptable quality, 5 – imperceptible loss)	ITU-R BT.500-12 (09/09)	4
2.	MDI	Media delivery index;	RFC 4445	RFC 4445
3.	Channel Zapping Time	Time to switch channel / receive the picture and sound of the desired channel	Measurement instrument	400 ms (average value)
4.	Jitter	The standard deviation of the delay is a measure for the jitter	Measurement instrument G.1081	Tendency to 0; no target value
5.	Packet Loss	Loss of one or more packets in the network	Measurement instrument G.1081	Tendency to 0; no target value
6.	Latency	Packet delay	Measurement instrument G.1081	Tendency to 0; no target value
7.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	Operator's report	> 95% per 8 days
8.	QoS Complaints	Number of complaints in proportion to total number of users	Operator's report	-
9.	Average Repair Time	Average repair time refers to period between malfunction being reported and being repaired	Operator's report	24 hours/48 hours
10.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	$\leq 1\%$ per 100 bills
11.	Bill Correctness Complaints Resolution Time	Resolution time for 95% of complaints	Operator's report	> 95% per 5 working days

12.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
13.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	Operator's report	-
12.	Response time for admin/billing enquiries	Response time refers to time between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s per 80% calls
				80%
13.	Response time for operator services	Response time refers to between ringing tone and response by the operator -average response time per year -% of calls responded to within 20s	Operator's report	20s per 80% calls
				80%

## REPORT 5

### Report on values for quality parameters for media content transmission services

Operator's name: \_\_\_\_\_

Data for the period: from \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter	Parameter description	Value
1.	Service Setup Time	Average time between sending of complete address information and receipt of service setup notification for 95% of requests	(days)
6.	QoS Complaint	Number of complaints in proportion to total number of users	%
7.	Complaint Resolution Success Rate	Number of resolved complaints in proportion to the total number of complaints	%
8.	Number of malfunctions a month	Total number of malfunctions reported during 30 days	(number)
9.	Average Repair Time	Average time between the moment QoS complaint is received and the moment malfunctions is repaired	hours/days
10.	Bill Correctness Complaints	% of bills followed by user complaint	%
11.	Bill Correctness Complaints Resolution Time	Resolution time for 95% of complaints	(days)
12.	Relationship with Users	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	(average mark)
13.	Call Centre Assistance	Assessed using 5 to 1 scale (excellent, very good, good, fair, bad) by a sample of minimum 100 users	(average mark)
14.	Response time for admin/billing enquiries	-average response time per year -% of calls responded to within 20s	s %
15.	Response time for operator services	-average response time per year -% of calls responded to within 20s	s %

Place, date

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Officer in Charge

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## APPENDIX 2

**TABLE – Quality parameters for electronic communication networks under public bidding regime**

No.	Parameter	Parameter description	Measurement method	Minimum value
1.	GSM coverage	GSM network signal coverage may be expressed as the percentage of the entire territory of the country covered, percentage of the population covered, or there may be specific requirements such as coverage of specific roads. GSM network should be regarded as a whole, and the coverage should be measured simultaneously in all frequency bands.	ECC REPORT 118	According to Licence requirements for filed level > -95 dBm
2.	UMTS coverage	UMTS network signal coverage may be expressed as the percentage of the entire territory of the country covered, percentage of the population covered, or there may be specific requirements such as coverage of specific roads.	ECC REPORT 103	According to Licence requirements for CPICH RSCP > -105 dBm
3.	Peak Hour Handover Success Rate Applicable to GSM and UMTS networks only	Percentage of successful handovers in GSM network. Percentage of successful Inter-RAT handovers UTRAN->GSM	Network side statistics, provided by the operator	>= 95%
4.	CDMA coverage	CDMA network coverage is the percentage of inhabited places in all districts covered.	ECC REPORT 103	According to Licence requirements for Rx Power Strength (Rx) > -94 dBm
5.	Rx Power Strength (Rx)	Receiving signal strength	-	For public voice service: Rx > -84 dBm and Ec/Io > -9 dBm, if used as internal antenna. If Rx < -84 dBm or Ec/Io < -9, an external antenna is required, where the sum of Rx and Ec/Io should be > -103 dBm
6.	Ec/Io	The ratio of received pilot energy to total received energy.		

## REPORT 1

### Report on quality parameters for public mobile communication network

Operator's name: \_\_\_\_\_

Data for the period: from \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter		Measurement result
1.	GSM coverage		1) Territory coverage 2) Population coverage
2.	UMTS coverage		3) Territory coverage 1) Population coverage
3.	Percentage of successful GSM network handovers in peak hour.		Network level (outgoing)
4.	Percentage of successful Inter-RAT handovers UTRAN->GSM		Network level
5.	Network load	GSM network voice traffic	Erlang/TRX (mean value and standard deviation)
6.		UMTS network voice traffic	Erlang/cell (mean value and standard deviation)
7.		GPRS traffic volume	Total data transferred (MB) within the network during 7 days of the week the report applies to
8.		UMTS traffic volume	Total data transferred (MB) within the network during 7 days of the week the report applies to

Place, date

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Officer in charge

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## REPORT 2

### Report on quality parameters for public fixed wireless telecommunications network (CDMA)

Operators operator: \_\_\_\_\_

Data for the period: from \_\_\_\_\_ until \_\_\_\_\_

No.	Parameter	Measurement result
1.	CDMA coverage	Percentage of inhabited places in all districts covered.

Place, date

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Officer in Charge

\_\_\_\_\_



### APPENDIX 3

**Ref. no.**

**Date:**

### REPORT ON TECHNICAL AND OTHER REQUIREMENTS COMPLIANCE CONTROL

1.	Name, address and company ID number	
2.	Date and place of control	
3.	Subject of control	
4.	Documentation submitted by the operator	
5.	Situation established by control	
6.	Notes, remarks and suggested measures	

**OPERATOR**

**RATEL**

STAMP

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## APPENDIX 4

Ref. no.

Date:

### REPORT ON THE CONTROL OF OPERATOR'S WORK

1.	Name, address and company ID number	
2.	Date, time and place of control	
3.	Subject of control	
4.	Name and personal ID number of officer in charge	
5.	Data on the entry of the operator in the relevant register of the Agency	
6.	Documentation submitted by the operator	
7.	Statement of the officer in charge (operator)	
8.	Measurement instrument applied	
9.	Control results	
10.	Situation established by control	
11.	suggested measures	

Officer in Charge (Operator)

Electronic Network and Services Controller

STAMP