Rulebook
on quality parameters for publicly available electronic communication services and monitoring of electronic communication activity

I. General provisions

Content of the Rulebook

Article 1

This Rulebook 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, this Rulebook 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, this Rulebook 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, this Rulebook 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, this Rulebook 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, this Rulebook 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 info-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 art 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 this Rulebook.

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 through independent measurements 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 measurements or measurements 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 measurements and proceeding in terms of para. 4 herein.

The measurements and testing referred to in para. 4 herein shall be performed by the Agency through its monitoring centres and/or persons authorized to perform measurements 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 about 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 consider relevant for the complaint procedure.

The Agency shall submit the complaint that includes all necessary data referred to in para. 3 herein 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 Monitoring 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 measurements and testing in accordance with the Law, this Rulebook 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 filing 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 to the Law.

VII. Final provision

Article 24

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

Chairman of the Managing Board

Prof. Dr. Jovan Radunovic

APPENDIX 1

TABLE 1 Quality parameters for public voice service provided by public telephone network at a fixed location

no.	Parameter	Parameter description	Subject of measurement	Measurement method	Minimum value
1.	Supply time for fixed network access, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use.	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		-
2.	Fault report rate per fixed access lines	The number of fault reports per fixed access line refers to the total number of fault reports 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
3.	Fault repair time	The average duration from the instant a fault report has been made to the instant when the service element or service has been restored to normal working order.	the time by which the fastest 80 % of valid faults on access lines are repaired a year	Operator's report	36 hours
			the time by which the fastest 95 % of valid		48 hours

			faults on access lines are repaired		
			% of repairs made within 24 hours since being reported		80%
			Fault report time		-
4.	Unsuccessful call ratio	Unsuccessful call ratio is defined as the ratio of unsuccessful calls to the total number of call attempts in a specified time period. An unsuccessful call is a call attempt to a valid number, properly dialled following dial tone, which failed due to system failure or no capacities available. The case where the called party (B-Number) is busy or not responding is not regarded as a failed call. The measurement shall be performed on the biggest possible sample.	All calls	Operator's report	1%
			National calls on fixed network within local exchange		1%
			National calls on fixed network 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%
5.	Answer Seizure Ratio (ASR)	Answer Seizure Ratio (ASR) refers to the percentage of calls responded to by the called party (B-Number) Measurement is applied to the largest possible sample.	All calls	Operator's report	60%
			National calls on fixed network within local exchange		60%
			National calls on fixed network 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%
6.	Call Setup Time	The call set up time is the period starting when the address information	Average time for national calls	Operator's report	3s

		required for setting up a call is received by the network and finishing when the called party busy tone or ringing tone or answer signal is received by the calling party. The measurement is conducted on the largest possible sample.	Average time for national calls on fixed network		3s
			Time in which 95 % of national calls on fixed networks are setup		3s
			National calls from fixed network to mobile networks		5s
			Time in which 95 % of national calls from fixed network to mobile networks are setup		5s
			Average international call setup time		5s
			Time in which 95 % of international calls are setup		5s
7.	Response time for operator services	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to provide the service requested.	Average response time per year	Operator's report	20s for 60% of calls
			% calls with response time of less than 20 seconds		60%
8.	Response time for directory enquiry services	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator or an equivalent voice-activated response system answers the calling user to provide the number information requested.	Average response time per year	Operator's report	20s for 60% of calls
			% calls with response time of less than 20 seconds		60%
9.	Bill Correctness Complaint	% of bills followed by a complaint	% of complaints followed by bill correction	Operator's report	≤ 1% per
10.	Bill presentation	Perceived quality according to	MOS (based on the	Operator's report	-

	quality	questionnaire conducted among users.	survey of 1% of users, with maximum sample of 1000 users)		
11.	Frequency of customer complaints	Total number of complaints per total number of users, per year.	Number of complaints per user	Operator's report	0,5%
12.	Customer complaints resolution time	Resolution time for 80% of complaints	for 80% of the fastest resolved complaints per year	Operator's report	10 working days
13.	Customer relations	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	-
14.	Professionalism of help line	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	-
15.	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 provided by public telephone network at a fixed location

Operator's name**:**_____

Date of the period: from_____ until _____

No.	Parameter	Measure	Value
1.	Supply time for fixed network access, if technically feasible	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
2.	Fault report rate per fixed access lines	for 100 liner per year	(%)
3.	Fault 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	(%)
		Fault report time	from..…until..….. workdays from..…. until..….. Saturdays from.… until...…. Sundays
4.	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	(%)
5.	Answer Seizure Ratio (ASR)	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	(%)
6.	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)
7.	Response time for operator services	Average response time per year	(seconds)
		% calls with response time of less than 20 seconds	(%)
8.	Response time for directory enquiry services	Average response time per year	(seconds)
		% calls with response time of less than 20 seconds	(%)
9.	Bill Correctness Complaint	% of complaints that result in bill correction	(%)
10.	Bill presentation quality	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	(1 – 5)
11.	Frequency of customer complaints	Number of complaints per user	
12.	Customer complaints resolution time	for 80% most promptly resolved complaints per year	(days)
		for 95% most promptly resolved complaints per year	(days)
13.	Customer relations	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	(1 – 5)

14.	Professionalism of help line	MOS (based on the survey of 1% of users, with maximum sample of 1000 users)	(1 – 5)
15.	Percentage of Functioning Public Payphones	% per year	(%)

Notes:

Place, date

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Officer in Charge

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TABLE 2 Quality parameters for public service provided by public mobile communication network

No.	Parameter	Parameter description	Measurement method	Minimum value
1.	Call/Packet Session Success Rate Applicable for GSM and UMTS network	$CSSR = \frac{successful\ call\_attempts}{all\_call\_attempts} * 100[\%]$	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	$CDR = \frac{unintentionally\ terminated\ telephony\ calls}{all\ successful\ telephony\ call\ attempts} * 100[\%]$	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 Throughout for Packet Interactive	Advertised maximum throughput	End-user side: test computer Network side: Operator's report *	> 128 Kb/s DL > 64 Kb/s UL
		Average throughput towards user for packet r99 interactive		
		Average throughput towards user for HS interactive		
5.	Frequency of customer complaints	Mean value of all complaints per 100 users per year	Operator's report	-
6.	Bill Correctness Complaints	Percentage of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	≤ 1%
7.	Customer relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.		
8.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.		
9.	Response time for operator services	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to handle the	Operator's report	20s in 60% of cases
			Operator's report	60%

		enquiry -average response time per year -% of calls responded to within 20s		

* ***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 *	1) GSM network 2) Parameter value for each cell in the network in the form of Excel spreadsheet (*if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation*)
		1) UMTS network 2) Parameter value for each cell in the network in the form of Excel spreadsheet, in particular for: a) voice calls, b) video calls c) data transmission (*if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation*)
2.	Call Drop Rate *	1) Network level 2) Parameter value for each cell in the network in the form of Excel spreadsheet (*if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation*)
3.		1) Network level 2) Parameter value for each cell in the network in the form of Excel spreadsheet, in particular for: a) voice calls, b) video calls c) data transmission (*if a cell has a considerably lower performance in respect to others due to reasonable cause, provide an explanation*)
4.	Telephony Setup Time *	In GSM network
		In UMTS network
5.	Advertised maximum throughput	(Kb/s) (Mb/s)
	Average throughput towards user for packet r99 interactive *	(Kb/s) (Mb/s)
	Average throughput towards user for HS interactive *	(Kb/ s)

6.	Frequency of customer complaints per 100 users	(number)
7.	Bill Correctness Complaints	(%)
8.	Frequency of customer complaints	(number)
9.	Customer relations	Average rating

* **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)

Note:

Place, date **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	1×10^{-3}	1×10^{-3}
4.	IP packet Error Ratio	Upper bound	Pursuant to ITU-T Y.1541 Recommendation	1×10^{-4}	
5.	Service Supply Time, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use for 95% of requests	Operator's report	> 95% per 8 days	
6.	Frequency of customer complaints	Number of all complaints per 100 users per year	Operator's report	-	
7.	Bill Correctness Complaints	% of bills followed by user complaint	Operator's report	≤ 1%	

		(% of complaints that result in bill correction)		
8.	Customer Complaints 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
9.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
10.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
11.	Response time for admin/billing enquiries	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to handle the enquiry. -average response time per year -% of calls responded to within 20s	Operator's report	20s for 60% of calls 60%

12.	Response time for operator services	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to provide the service requested. -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 Supply Time, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use for 95% of requests	(days)
2.	Frequency of customer complaints	Number of all complaints per 100 users per year	(number)
3.	Bill Correctness Complaints	% of bills followed by user complaint	%
4.	Customer Complaints Resolution Time	Resolution time for 80% and 95% of complaints from the moment of complaint submission.	(days)
5.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	(average mark)
6.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	(average mark)
7.	Response time for operator services	-average response time per year -% of calls responded to within 20s	s %

Notes:

Place, date **Officer in Charge**

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TABLE 4 Quality parameters for broadband services

No.	Parameter	Parameter description	Measurement method	Minimum value
	General parameters			
1.	Service Supply Time, if technically feasible	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.	Frequency of customer complaints	Number of all complaints per 100 users per year	Operator's report	-
3.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	≤ 1%
4.	Customer Complaints 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
5.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
6.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
7.	Response time for operator services	The duration from the instant when the address information required for setting up a call is received	Operator's report	20s for 60% calls

		by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to provide the service requested. -average response time per year -% of calls responded to within 20s		60%
	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 ICMP Echo Request/Reply message pair to be sent/received to/from a particular IP address 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

Notes:

- Minimum broadband bitrate is 256kbit/s at least one-way
- parameters listed in this table do not apply to the Internet access via mobile communication network

REPORT 4

Report on values of quality parameters for broadband services

Operator's name: _____

Data for the period: from_____ until _____

No.	Parameter	Parameter description	Result
1.	Service Supply Time, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use for 95% of requests	(days)
2.	Frequency of customer complaints	Mean value of all complaints per 100 users per year	(number)
3.	Bill Correctness Complaints	% of bills followed by user complaint	%
4.	Customer Complaints Resolution Time	Resolution time for 80% and 95% of complaints from the moment of complaint submission.	(days)
5.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	(average mark)
6.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	(average mark)
7.	Response time for operator services	-average response time per year -% of calls responded to within 20s	s %

Notes:

Place, date **Officer in Charge**

_____ _____

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 RF 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─'4; 5.13.1.1 EN 60728-1
5.	Service Supply Time, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use 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.	Fault Repair Time	Average repair time refers to period between malfunction being reported and being repaired	SRPS standard	48 hours
8.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	≤ 1%
9.	Bill Correctness Complaints Resolution Time	Resolution time for 95% of complaints	Operator's report	> 95% per 5 working days
10.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
11.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-

12.	Response time for operator services	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to provide the service requested -average response time per year -% of calls responded to within 20s	Operator's report	20s per 60% calls 60%

Table 5.2 IPTV

No.	Parameter	Parameter description	Measurement method	Minimum value
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 Supply Time, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use 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.	Fault Repair Time	Average repair time refers to period between fault being reported and being repaired	Operator's report	48 hours
10.	Bill Correctness Complaints	% of bills followed by user complaint (% of complaints that result in bill correction)	Operator's report	≤ 1%

11.	Bill Correctness Complaints Resolution Time	Resolution time for 95% of complaints	Operator's report	> 95% per 5 working days
12.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
13.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	Operator's report	-
14.	Response time for operator services	The duration from the instant when the address information required for setting up a call is received by the network (e.g. recognized on the calling user's access line) to the instant the human operator answers the calling user to provide the service requested -average response time per year -% of calls responded to within 20s	Operator's report	20s per 60% calls 60%

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 Supply Time, if technically feasible	The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use for 95% of requests.	(days)
2.	QoS Complaint	Number of complaints in proportion to total number of users	%
3.	Complaint Resolution Success Rate	Number of resolved complaints in proportion to the total number of complaints	%
4.	Number of malfunctions a month	Total number of malfunctions reported during 30 days	(number)
5.	Fault Repair Time	Average time between the moment QoS complaint is received and the moment fault is repaired	hours/days
6.	Bill Correctness Complaints	% of bills followed by user complaint	%
7.	Bill Correctness Complaints Resolution Time	Resolution time for 95% of complaints	(days)
8.	Customer Relations	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	(average mark)
9.	Professionalism of help line	Assessed using a 5 to 1 quality scale (excellent, good, fair, poor, bad). The sample size should be at least 100 responses.	(average mark)
10.	Response time for operator services	-average response time per year -% of calls responded to within 20s	s %

Notes:

Place, date **Officer in Charge**

_____ _____

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.	EC REPORT 118	According to Licence requirements for RxLev > -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.	EC 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) > -95 dBm
5.	Rx Power Strength (Rx)	Received 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		1) Territory coverage 2) 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

Notes:

Place, date **Officer in charge**

_____ _____

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.

Notes:

Place, date **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**

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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 instruments applied	
9.	Control results	
10.	Situation established by control	
11.	Suggested measures	

Officer in Charge (Operator) Electronic Network and Services Controller

STAMP

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