



**ORDER OF THE REGULATOR No. 2023/T03**

**QUALITY OF SERVICE**

**Whereas:**

1. The Regulator endeavors to:
  - (a) acquire objective assessments of the quality of service of certain telecommunications services in Samoa, specifically cellular mobile telephony services and broadband internet access services (both fixed and mobile);
  - (b) assist consumers in understanding quality of service differences that may exist between different service providers so that consumers may make better informed choices;
  - (c) establish a common set of quality-of-service parameters and measurement arrangements;
  - (d) establish baseline data on the current quality of service of cellular mobile telephony services and broadband retail internet services before determining whether, and, if so, what mandatory minimum standards for any of the quality criteria need to be specified.
2. Vodafone Samoa Limited (“Vodafone”) and Digicel (Samoa) Limited (“Digicel”) are currently subject to license conditions that relate to reliability criteria, namely:
  - (a) a call success rate of at least 95% for cellular mobile telephony within the licensee's entire service coverage area; and
  - (b) a dropped call rate of not more than 3% for cellular mobile telephony within the licensee's entire service coverage area;
3. All suppliers of retail Internet services are currently subject to a license condition that relates to the availability criterion, namely an overall availability rate of at least 99.5%;
4. One or more of the telecommunications licenses mentioned above may, upon request, be replaced with a new type of Individual License in the near future if the Regulator makes the proposed new Telecommunications (Licensing) Rules;

**Orders**

Pursuant to subsections 8(1)(r) of the Act the Regulator makes the following Orders:

1. A licensee that supplies a cellular mobile telephony service shall measure and report quarterly to the Regulator on the quality of service parameters specified in Schedule

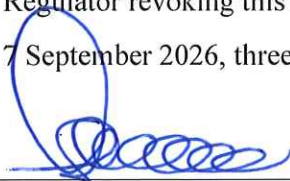
A, using the reporting template in Schedule A. The Licensee shall also complete and submit the form in Schedule B about their support of voice codecs.

2. A licensee that supplies a broadband retail Internet service via a cellular mobile network shall measure and report quarterly to the Regulator on the quality of service parameters and information specified in Schedule C using the form in Schedule D.
3. A licensee that supplies a retail Internet service via a fixed network shall measure and report quarterly to the Regulator on the quality of service parameters and information specified in Schedule C using the form in Schedule D.
4. Each licensee that supplies a retail Internet service via a cellular mobile network or a fixed network shall undertake a measurement process starting in September 2023 on the quality of the Internet service provided by their networks. Schedule E gives an outline of what the measurement process should include. Each licensee may undertake the measurement process individually or in cooperation with other relevant licensees and in each case shall submit to the Regulator details of the measurement process by 30<sup>th</sup> September 2023 and shall make any modifications that the Regulator requires. Each licensee shall repeat the measurement process each half year unless the Regulator waives this requirement.
5. Quality of service reports shall be given to the Office of the Regulator electronically within 20 calendar days of the end of the reporting period.
6. For the avoidance of doubt, the quality of service reports are being required by and provided to the Regulator under this Order and not under section 57 of the Act.
7. The Regulator may impose sanctions for failure to meet the standards set out in this Order before 31 October 2023, for failure to provide information in the formats outlined in the schedules to this Order by the deadlines set out above.

### **Expiry of this Order**

This Order shall expire upon the earlier of the:

1. Regulator revoking this Order; or
2. 7 September 2026, three years from the Effective Date of this Order.



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Lematua Gisa Fuatai Purcell  
**REGULATOR**

Dated this **7 September 2023** (also the Effective Date of the Order)

**SCHEDULE A: QOS STANDARDS FOR MOBILE TELEPHONY SERVICES**

Item	Criterion	Parameter	Definition and measurement	Measurement method	Reporting
A.1	Call set up time (Successful calls only)	Telephony set up time [s]	ITU-T E.804 (02/2014) cl.7.3.6.2 (GSM & UMTS)	Network internal counters	Times of the fastest 95% and 99%. 1) Record the set-up times; 2) Make a numbered list of the times with the shortest time being #1, the second shortest being #2, etc., with the longest being #N; 3) Record and report the time of the entry closest to 95% of #N and of the entry closest to 99% of #N.
A.2	Reliability	Unsuccessful call ratio	ETSI EG 202 057-2 cl.5.1	Network internal counters	<5%* Average availability over the whole reporting period.  Number of instances where the time between successive successful call attempts that are separated by unsuccessful ones exceeds 1 minute. (Measures outages)  The sum of the times between successive successful call attempts that are separated by unsuccessful ones
A.3	Reliability	Dropped call ratio	E.804 cl. 7.3.6.5	Network internal counters	<3%*

\* As per licence condition

Explanatory Note: For unsuccessful call ratio, it is important to measure not only the average over the reporting period but also to assess the occurrence of outages.

Reporting Form

Licensee:

Report for the 3-month period:

Report prepared by: (Name in capitals and signature)

Report authorized by: (Name in capitals and signature)

Date:

Parameter	Detail	% of maximum possible number of instances on which the result is calculated	Result
A.1: Telephony set up time	Time of the fastest 95% of successful call setups	(eg 100%)	(Time in seconds to one decimal place)
	Time of the fastest 99% of successful call setups		(Time in seconds to one decimal place)
A.2: Unsuccessful call ratio and outages	Average unavailability over the whole reporting period - Number of unsuccessful call attempts divided by total number of call attempts		(% to one decimal place)
	Number of instances where the time between successive successful call attempts that are separated by unsuccessful ones exceeds 1 minute.		(Integer number of instances)
	Number of instances where the time between successive Successful call attempts that are separated by unsuccessful ones exceeds 20 minutes.		(Integer number of instances)
A.3: Dropped call ratio	The number of successful call attempts ended by a cause other than the intentional termination by A- or B-party, divided by the total number of successful call attempts.		(% to one decimal place)

Reasons why any results are calculated on less than the maximum possible number of instances:

Actions taken or planned to include 100% of instances in the calculations:

## SCHEDULE B: VOICE QUALITY (CODEC) CAPABILITIES FOR MOBILE TELEPHONY SERVICES

**Reporting Form**

Licensee:

Report for the 3 month period:

Report prepared by: (Name in capitals and signature)

Report authorized by: (Name in capitals and signature)

Date:

For each codec type in the following table, please enter "Supported", "Supported only in part of the network" or "Not Supported" at the end of the reporting period.

A list of codec specifications is included at Schedule F to this Order

Network type	Codec type	Codec configuration	Support
GSM (2G)	FR		
	HR		
	EFR		
	AMR-NB		
	AMR-WB	Configuration A	
UMTS (3G)	FR		
	HR		
	EFR		
	AMR-NB		
	AMR-WB	Configuration A	
		Configuration B	
		Configuration C	
	EVS	Narrowband (NB)	
		Wideband (WB)	
LTE (4G)	AMR-NB		
	AMR-WB	Configuration A	
		Configuration B	
		Configuration C	
	EVS	Narrowband (NB)	
		Wideband (WB)	
		Super-wideband (SWB)	
		Fullband (FB)	

## SCHEDULE C: QOS PERFORMANCE AND INFORMATION FOR INTERNET SERVICES

### Information required:

1. List of periods of more than 1 minute duration when the Internet network access system handling the control of access to the Internet and the allocation of dynamic IP addresses was not fully operational to the extent that user access was affected, together with the cause of the problem. Scheduled outages are to be included.
2. Total active international transmission capacity for Internet traffic contracted at the start and end of the reporting period.
3. List of periods of more than 10 minutes duration when the available international transmission capacity for Internet traffic was lower than 80% of the capacity contracted.
4. A description of the caching arrangements and capacity for caching international Internet traffic showing information for HTTP and streaming services separately.
5. The busy hour times for traffic handled by local servers and for international internet traffic, given separately for each month.

**SCHEDULE D: REPORTING FORM FOR INTERNET SERVICES**

Reporting Form

Licensee:

Report for the 3 month period:

Report prepared by: (Name in capitals and signature)

Report authorized by: (Name in capitals and signature)

Date:

list of periods of more than 1 minute duration when the Internet access system was **not fully operational**

Date	Time of start	Duration	Extent of network affected	Cause

" This may be measured in terms of the sites affected or by the services affected (as a % of the subscriber base) and the basis of measurement should be stated in the completed Reporting Form.

**Total active international transmission capacity for Internet** traffic contracted at the start and end of the reporting

Date	Capacity

Where capacity is contracted on a statistical basis (e.g. a certain amount guaranteed and an additional amount available if not used for other purposes, then the guaranteed amount and the possible maximum should be shown separately.

List of periods of more than 10 minutes duration when the available international transmission capacity for Internet traffic was lower than 80% of the capacity contracted.

Date	Time of start	Duration	Approximate % of total capacity still available	Cause

**Description of the caching arrangements and capacity for caching international Internet traffic**

No format is specified, but the regulator may impose a format at a later date.

Busy hour times

Month	National traffic - See Note	International traffic

Note: If it is not practicable to distinguish national and international traffic then the busy hour can be specified for combined traffic.

## **SCHEDULE E: REQUIREMENTS FOR A COMPARATIVE SURVEY OF THE PERFORMANCE OF INTERNET SERVICES**

The following outlines what the Regulator expects such a survey to include.

The survey should use special purpose commercial software capable of running clients on an Android smartphone that interacts with a host located in Samoa running on a PC, and also with a host located in a major international centre outside Samoa (e.g. Singapore or London). The host software will participate in the tests by responding to the client software and will collect and assemble results into a form that can be understood by non-experts.

The operation of the tests, visiting different locations and running tests, should be carried out by people based in Samoa. This should be a comparatively simple activity and cost effective activity.

The tests should, if possible include http and ftp upload and download, web browsing, video streaming, and UDP, but it is more important to make a reasonable and cost effective first campaign than to wait until additional capabilities become available.

Measurements should be made daily over two separate periods of 7 days including two weekends and should each day include the period 0900-2200 with tests running continuously for one hour each in the period 0900-1300, 1300-2200 and the busy hour for the location of the test..

Measurements should be made at a list of 10 locations. In the case of the cellular operators the Regulator will specify the locations on the day before the tests are to be made.

Measurements of the two cellular networks will be made at the same time and place using separate identical smartphones.

Note: The operators are free to choose the software to be used but should inform the Regulator about their choice. Focus Infocom in Darnstadt Germany (<http://focus-infocom.de/>) provides software that could be used.



## Schedule F: List of Codecs and their **Specification Numbers**

List of voice codecs used for voice telephony in mobile networks:

### European Telecommunications Standards Institute (3GPP)

#### Global System for Mobile Communications (GSM)

- Full Rate (FR, 3GPP TS 06.10, 13 kbit/s)
- Half Rate (HR, 3GPP TS 06.20, 5.6 Mbit/s)
- Enhanced Full Rate (EFR, 3GPP TS 06.60, 12.2 kbit/s compatible with AMR 12.20)

### 3rd Generation Partnership Project (3GPP)

#### Adaptive Multi-Rate (AMR)

- AMR-NB (3GPP TS 26.073)
  - o 12.2, 10.2, 7.95, 7.40, 6.70, 5.90, 5.1s and 4.75 kbit/s
- AMR-WB (3GPP TS 26.173)
  - o Configuration A (Config-WB-Code 0): 6.6, 8.85, and 12.65 kbit/s (Mandatory multi-rate configuration)
  - o Configuration B (Config-WB-Code 2): 6.6, 8.85, 12.65, and 15.85 kbit/s
  - o Configuration C (Config-WB-Code 4): 6.6, 8.85, 12.65, and 23.85 kbit/s

#### Enhanced Voice Services (EVS) (3GPP TS.26.443)

- o Narrowband (NB): 5.9, 7.2, 8, 9.6, 13.2, 16.4, 24.4 kbit/s
- o Wideband (WB): 5.9, 7.2, 8, 9.6, 13.2, 16.4, 24.4, 32, 48, 64, 96, 128 kbit/s
- a Super-wideband (SWB): 9.6, 13.2, 13.2, 16.4, 24.4, 32, 48, 64, 96, 128 kbit/s
- o Fullband (FB): 16.4, 24.4, 32, 48, 64, 96, 128 kbit/s

see also:

3GPP TS 26.103 "Speech codec list for GSM and UMTS"