POTRAZ Responses to OPERATORS on QoS Regulations

Received comments and questions on the proposed QoS Regulations from NetOne, Econet Wireless, Telecel, Aptics and some individuals.

Some of the Reference documents used to come up with POTRAZ QoS regulations:

- ☑ **ITU-T REC. E.771 - TELEPHONE NETWORK AND ISDN** - Quality of service, network management and traffic engineering – Traffic engineering – Mobile network traffic engineering
- ☑ **ITU-T REC. E.800** - Quality of telecommunication services: concepts, models, objectives and dependability planning – Terms and definitions related to the quality of telecommunication services
- ☑ **ITU-T REC. E.802** - Framework and methodologies for the determination and application of QoS Parameters
- ☑ **ITU-T Rec.G1000** – QOS and Performance : Transmission Systems And Media, Digital Systems And Networks
- ☑ **ETSI EG 202 057-3 V1.1.1 (2005-04**) - Speech Processing, Transmission and Quality Aspects - Use of QoS parameter Definitions and Measurements - PLMN
- ☑ **ETSI TS 102 250-5 V2.2.1 (2011-04)** - Speech and multimedia transmission Quality (STQ); QoS aspects for popular services in mobile networks; Part 5: Definition of typical measurement profiles
- ☑ **ETSI TS 132 410 V10.0.0 (2011-04)** - Telecommunication management; Key Performance Indicators (KPI) for UMTS and GSM
- ☑ **3GPP TS 32.410 V9.0.0 (2009-09)** – 3GPP; Technical Specification Group Services and System Aspects; Telecommunication management; Key Performance Indicators (KPI) for UMTS and GSM (Release 9)
- ☑ **QoS Regulations From Regional Regulators** – Tanzania, Kenya, Nigeria, Ghana etc

NETONE

NetOne	POTRAZ Response
Section 7	
1. Statistics storage issues will also have to be considered as the volume of data will be large.	Section 7 Clause (iv) Requires Operators to "Retain the Quality of Service raw data for a minimum of six (6) months after the end of the reporting period" This is very important in case of reconciliation and comparison purposes in case the result is QoS results are in dispute. POTRAZ will also store data for the same period.
Section 11	
1. There needs to be an explanation on how compensation would be calculated.	Compensation will be covered in Penalties Schedules.
2. There needs to be more specifics on levels of fines and when they will kick in, this also will become very expensive if fines are given out based on cell level assessment.	POTRAZ is going to review the Penalties Schedule which will have the exact levels of fines to be imposed. All fines will be reasonable.
Section 12	
1. Service activation time: We need clarification - is it 5 seconds upon receiving request and configuration or is it auto-configuration.	Service activation time has been split into 2- ☑ Service Activation Time (New Service) – 24 Hrs ☑ Service Activation Time (Existing Service) - 1 Hr

	The duration from the instant a valid service order (application) is received by a Licensee to the instant a working service is made available to the User.
2. Call Success Rate, The established calls need to be defined if it includes all ringing calls, busy calls, answered calls and unreachable calls.	Established calls include all ringing calls, Calls to busy Number, answered calls and unreachable calls.
3. Call setup Success Rate, Define successfully setup calls if they include all the ringing, answered, busy and unreachable calls. It is to be noted that the count of those wrongly dialled numbers are then counted in the denominator, i.e. Total Call Attempts	Successfully setup calls include all the ringing, answered, busy and unreachable calls. Total Call Attempts are calls with correct addressing messages that have been dialled.
4. Call Completion Rate, Confirm if the rate is the average of both originating and terminating call completion rates or they are required as separate. Also the measure against Total Call Attempts may need to be re-visited since some calls would not have proceeded to call connection due to several reasons, e.g. Incorrect Number Length.	Call Completion Rate is the percentage of calls that have been successfully setup, maintained and terminated normally by the calling or called party to the total number of call attempts in a specific time period. Includes both originating and terminating.
5. 99.9% Network availability may be difficult to achieve considering the erratic power supply in the country. The measurement period is not stated i.e. is it per year, per month or per quarter.	Noted
6. CSSR and CSR have both been set at same value 95% - We suggest CSR should be lower than CSSR	Noted

<table>
<tr><td>say by 2%, or by at least 2%</td><td></td></tr>
<tr><td>7. Congestion levels of less than 2% might be difficult to achieve especially during promotions and in rural areas where inter-site distance is large, we suggest a waiver be given, or rather look at clusters of networks i.e. rural and urban.</td><td>Best practice is less than 2%

Currently the regulations do not look at clusters but the whole country as a unit.</td></tr>
<tr><td>8. SDCCH congestion rate should be 2%</td><td>Noted</td></tr>
<tr><td>9. Mobile data and internet KPI's data service availability cannot be the same for all layers</td><td></td></tr>
<tr><td>10. Mobile data and internet KPI's, referring to 3GPP speeds, I think it would be better that they be specific. But it should also be noted that in Zimbabwe we do not charge for data differently for 2G and 3G hence if one is not being charged extra for the better speed the Operator should not be fined if one fails to achieve a certain data speed</td><td>
<table>
<tr><th>Generation</th><th>Standard</th><th>Downlink Speed</th><th>Uplink Speed</th></tr>
<tr><td>2G</td><td>GSM</td><td>9.6kbps</td><td>9.6kbps</td></tr>
<tr><td>2G</td><td>GSM -GPRS</td><td>Up to 80 Kbps</td><td>Up to 20 Kbps</td></tr>
<tr><td>2G</td><td>GSM-EDGE</td><td>Up to 236.8 Kbps</td><td>Up to 59.2 Kbps</td></tr>
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</table>
</td></tr>
<tr><td>11. Latency. Definition is too broad; the nodes should be specified as from NodeB to transmission system this could be considered as one node to another. At the same time the latency for 2G, 3G & 4G will all be</td><td>NOTED

– In determining latency POTRAZ shall consider latency between two nodes within on Operator network.</td></tr>
</table>

different.	
12. For Network availability there needs to be an accommodation for the impact of ZESA load shedding and faults. There is also need for an understanding on the increased costs that would be incurred to achieve this and they would then be passed on to the subscribers.	Section 12: Considerations for assessing Quality of Service – Clause (ii) Any extreme service deficiencies that arise partly or wholly from the services of other Licensees not regulated by the Authority which deficiencies are beyond the Licensee's control; and. This includes impact of adverse ZESA load-shading.
13. On-net SMS Delivery. There are many issues to be considered here: Availability of subscribers on network, i.e switched off or out of coverage and subscriber status, i.e. barred, suspended. Clarification is also required on the 2 minutes measuring period.	The KPI will be changed to SMS Delivery Success Rate. The KPIs on SMS/MMS will be applied to devices that are switched on and are available on the network. SMSes that come after 2 minutes will not be considered for the Success rate KPI.
14. SMS Delivery Failure Rate. It will be difficult for the systems to determine that the message was not delivered to a recipient who was available in the first place. Clarification is also required on the 2 minutes measuring period.	SMS Delivery Failure Rate will be applied to devices that are switched on and are available on the network. SMSes that come after 2 minutes will not be considered as failed.
15. END to END SMS delivery. It has to be noted that there is a dependency that needs to be factored in for SMS's terminating or Originating from other networks as QOS in their interworks would impact overall performance.	For the SMS/MMS KPIs the proposal is to test for SMS/MMS originating and terminating in the same network. (on-net)

16. Minimum time for storage of SMS/MMS if recipient is unreachable. 48 hrs periods may lead to clogging of the storage space on the SMSCs and introduce delays in processing other SMS requests. Expanding the storage & processing capacity would lead to higher costs that would then increase the cost of the service.	NOTED
Section 15	
1. QOS for interconnection, number of instances of less than one per year that means if it occurs even once operators would have failed to meet target, this does not seem reasonable.	The idea is to have high availability on interconnections and Operators are encouraged to have alternative routing on international routes. There should be no instances when an operator fails to have international traffic.
2. QOS for interconnection, interconnection route fault down time, due to interconnection medium being leased from other providers penalising operators without setting conditions for carrier of carriers that are more stringent than these makes it impractical	POTRAZ will consider reasons for failure and when it is proved that the fault is outside the operator network, the operator will not be penalised.
3. QOS for interconnection, Interconnection Gateway down time - this would be impacted by what type of fault occurring. For example if an interconnection fibre fault occurs time must be given for fault resolution - 2 hours would be more reasonable	Interconnection Gateway is a critical component for international connectivity and as such high level availability is also critical

Section 17	
1. Inability to send or receive SMS. Where international destination/source is involved there are a lot of dependencies which are beyond our control.	For the SMS/MMS KPIs the proposal is to test for SMS/MMS originating and terminating in the same network. (on-net)
2. Time for recharge/bill payments to reflect on the account - This depends on third party business partners & network availability.	Operators are accountable to their partners.
General Overview	
1. From previous presentation made by POTRAZ, their analysis will be at cell level. We believe analysis should be done at network level as cell level statistics will be impacted by a sudden influx of people attending certain functions, e.g. at funerals, weddings rallies, etc. Which are beyond the control of the network operator? It will be acceptable if the network operator is required to meet network level targets. Cell level statistics will at times be distorted, for example a rural cell where there are only 4 calls happening in an hour .If any of those calls drop that will give a 25% call drop rate!	Quality of Service KPIs will be at the VENDOR level for most KPIs and also at Network Level for other KPIs such as voice quality and SMS. However POTRAZ resolved to base the penalties on number of faulty cells. “Faulty cell” - means a cell that fails to meet the Quality of Service target value or a cell that triggers any of the Severity alarms- Warning alarms are triggered if the cell is faulty for 2 consecutive months (60 days) Faulty Alarms are triggered if the cell is faulty for 3 consecutive months (90 days). POTRAZ considers the time adequate for operators to attend

	to cells before triggering Faulty Alarms.
2. There is no section outlining QOS for Internet Service Providers (ISP's) and carrier of carriers. Without these, it becomes unfair to penalise a network operator that depends on ISP's and carrier of carriers when the problems might be originating from them. There should be QOS standards set out from the onset for carrier of carriers and ISP's.	In terms of the POSTAL and Telecommunications Act all ISPs buy Internet Bandwidth from Licenced IAPs and are not allowed having Access Network. IAP will be accountable for QoS for Internet provided by their ISPs.

ECONET

ECONET	POTRAZ Response
1. At which point(s) in the network will these KPIs be measured? 2. Kindly provide Formulae for all KPis and the point of measurement of each counter.	1. QoS measurement is End-to-End measurements, originating and terminating in the RAN. As such most (QoS) most of the KPIs are measured and collected from the Radio Access Network. [OMC-R] 2. The QoS Regulations will only state the standard to be achieved and will not provide formulae for each KPI. 3. The formulae for each KPI for each vendor have already been submitted to Econet – Ref – Meeting held between Econet Engineers and POTRAZ. During the meeting the counters were discussed and minutes distributed by Econet.

	3GPP TR 32.814 V7.0.0 (2007-03)
3. Econet seeks clarity on the fairness on how the penalties will be applied per KPI as different vendors have different metrics to come up with KPis across the MNOs.	POTRAZ will amend the Penalties Schedules to include QoS penalties. The penalties Schedule will spell out how the penalties are applied. With regards to matrices, POTRAZ will use the standardised matrices provided by vendor in line with international ETSI Standards.
4. Regulator to share documentation used for KPI reference i.e. ITU-T standards to be shared.	Noted and have already given key operator personnel the documentation for Performance Management (PM) Files for each Vendor and the Formulae used to calculate each KPI.
5. Accessibility, Retainability and Availability KPis need to be looked at in terms of their geographical area i.e. to split between Rural and Urban targets.	This may be considered, but all customers have the same rights to good QoS regardless of Geographical locations. In terms of tariffs all USERS have the same tariffs regardless of Geographical locations.
6. Availability: should not be looked at as a standalone KPI as its effect is already captured in other QoS KPI such as CSSR, CDR, etc., hence this will result in multi- penalisation.	Noted however for penalties POTRAZ will consider a few critical KPIs which will not result in multi-penalisation of operators.
7. Some KPis that entail capacity challenges have CAPEX & OPEX requirements which normally take a year to plan and deploy. These will not be resolved during the Grace period.	Noted
8. In the meeting held on the 8th of July 2015 between Technical and POTRAZ, Mr Marufu pointed out that the Regulator is no longer going to publish the QOS results for all the Mobile Network Operators (MNO). This is contrary to section 9 of Publication of Quality of	The position is that POTRAZ will submit QoS reports of each operator to the respective operator. POTRAZ will not submit benchmark QoS reports to MNOs with results of others however has the right to publish the benchmark QoS reports.

service Reports. What will be the criteria of publishing the survey results to the public? This may work against the Operator's image.	Centrally to your perception, the publication of QoS Reports may improve the Operator's image is the results are good.

Network Availabilities KPI

ECONET	POTRAZ Response
1. Availability target of 2: 99.99% is unachievable considering the intensity of commercial power cuts and cost of fuelling generators on all sites. The target is meant for first world countries with stable grid power, in Zimbabwe this is not sustainable and can only lead to increase in OPEX as the networks will be run on generators most of the times. It costs 12 times more to run the network on generators than on commercial power. We carried out some exercises to prove this issue. Econet therefore proposes a phased approach of monitoring the KPI by starting with 95% and increasing it to 99.99% over a three year period to allow the power situation to improve or as we rollout more efficient technologies to curtail the power challenges.	This has been noted and POTRAZ will adjust the target on a glide path taking into account international standards. Year 1 — 95 % Year 2 — 97.5 % Year 3 — 99 %
2. Interconnection Gateway Route Downtime and Repair time is set at 1 Hr which is contrary to our SLA with external parties which is 4Hrs. Anything less than 4 hrs requires Business Continuity Management System (BCMS) which entails duplication of central nodes and increased support fees, thus CAPEX & OPEX	NOTED – This may be beyond your control 4 Hrs will be acceptable as per Business Continuity Management System (BCMS)

requirements. The target is unachievable because this depends on the type of fault and the fact that we work with external parties.	

Network Voice KPIs

ECONET	POTRAZ Response
1. Post dialling delay: will not necessarily affect QoS, if it does this will reflect in call KPis - double penalty.	The KPI is simply a standard required, but will not be used for penalties.
2. Call success rate: 95% is too high considering that B-Party may be absent or may simply not answer calls.	Noted- Suggested changes in the ALL OPERATOR RESPONSE MATRIX
3. Call setup success rate: need to consider that B-Party may be absent.	Noted
4. Call completion rate: need to consider that B-Party may be absent.	Noted
5. Call Drop Rate, the denominator is wrong. It is supposed to be the total number of established calls not attempts.	Noted
6. SDCCH congestion formula is labelled SDCCH drop.	Thanks. Will correct accordingly

SMS & MMS KPIs

ECONET	POTRAZ Response
1. On-net SMS delivery success rate: terminating SMS	Noted and the Target remains the same.

originating on-net cannot be distinguished from those originating off-net or from application servers.	
2. The Regulator is interchanging the KPI naming for On-net SMS delivery success rate and SMS Delivery Success Rate which mean the same; hence we propose to use SMS Delivery Success Rate.	The KPI should be **SMS Delivery Success Rate** and on net should be in brackets ( ) to emphasise that this KPI is based on SMS originating and terminating in the same Network.
3. On-net SMS delivery success rate : the delivery success rate is too high as it assumes that the subscriber is attached to the network when we attempt to deliver and this is difficult in a multi-SIM environment	Noted will accept suggestions.
4. SMS delivery failure rate: must exclude user reasons (Handset memory full, handset switched off, etc.).	Yes
5. Currently, we only store messages for a period of 24 hours before we delete if a subscriber is not reachable. Storing it for a period of 48 Hrs will result in need to expand storage and it might not really be meaningful for most subscribers as a message not delivered within 24 Hrs might not be relevant later.	POTRAZ will maintain the 48 Hrs target.
6. MMS delivery failure rate: must exclude user reasons.	Yes
7. MMS delivery failure rate is and inverse of MMS Delivery Success Rate: this is double penalty. We propose MMS Delivery Success Rate.	This is just a Standard and no Penalties discussed yet. POTRAZ will only consider a few critical KPI for penalties.
8. Minimum storage time of 5 years for SMS CDR's	The KPI is very clear- Its **SMS CDR** not content

before deletion by operator is acceptable. However, the Regulator must clarify if this is referring to CDR's and or SMS Contents. If it is SMS content, Econet proposes 25 Days as this requires deployment of more storage hardware capacity.	

Mobile Data

ECONET	POTRAZ Response
1. Data service availability: must exclude user reasons (GPRS service not allowed).	Noted
2. PDP context success rate: must exclude user reasons (requested service option not subscribed).	Noted
3. May the Regulator specify the actual downlink and uplink throughputs per technology to avoid assumptions? These should also supply the specific 3GPP standards document for reference for the 2G and 3G throughput thresholds.	Noted

Generation	Standard	Downlink Speed	Uplink Speed
2G	GSM	9.6kbps	9.6kbps
2G	GSM -GPRS	Up to 80 Kbps	Up to 20 Kbps
2G	GSM-EDGE	Up to 236.8 Kbps	Up to 59.2 Kbps
3G	UMTS - WCDMA	Up to 384 Kbps	Up to 384 Kbps
3G	UMTS-HSPA	Up to 14.4 Mbps	Up to 5.76 Mbps
3G	UMTS-HSPA+	Up to 42 Mbps	Up to 11.5 Mbps

4. Latency: there is need for clarity on the issue of which nodes are considered as this is an end to end measure including nodes beyond the operator network. *This KPI cannot be used for penalising Econet alone*.	Latency may be an issue when testing sites that are outside the operator's control. However for testing purposes a site directly linked to each operator shall be used.

B: Fourth Schedule section 15

1. 1. Econet proposes to increase the Utilisation of Interconnect Transmission Capacity to: 95% as this involves SLA with the other operator who also is obliged to avail transmission capacity.	Noted – will consolidate with inputs from other Operators.

TELECEL RESPONSES

<table>
<tr><td>1. Clarification for each KPI on the actual mechanism/process-flow used to determine whether there has been a violation of the QoS regulation indicating the calculation method for the applicable fines/compensation which is due. This should indicate where is this is applied Network wide /Cell / Interconnect/ SMSC/ Data. Further need to weighting of violations in terms of severity as compared to applicable penalties.</td><td colspan="3">For clarity these are QoS Regulations and only specify the minimum QoS thresholds that the Operators needs to achieve. POTRAZ is going to amend the Penalty Schedule which will specify whether there has been a violation of the QoS regulation and the applicable fines or compensation which is due. The penalty schedules will indicate the type of offence and how the penalty is applied either at Network wide /Cell / Interconnect/ SMSC or Data level.</td></tr>
<tr><td>2. Clarification is required on the weighting and severity of the different KPIs and how they are aggregated to determine whether a cell is considered a faulty cell or not</td><td colspan="3">A cell is considered faulty when it fails to meet minimum requirements for more than 50% of time per month for three consecutive months. 90days.</td></tr>
<tr><td>3. Clarification is required on the tolerance/accuracy level, which tools will used to perform the test and what are the acceptable variances (%) between the values obtained by the operator’s measurement tools and regulators measurement tools. Clarification would be required on what steps would be take identify and eliminate file handling errors which may be introduced as performance files are transferred from the operator networks to regulator equipment</td><td colspan="3">POTRAZ resolved to use a very high accuracy system and operators are allowed to present their own results for the same period if the variance is greater that a pre-determined variance POTRAZ extract file from the Operator FTP server and will not be responsible for errors by the operator. POTRAZ requires Operators to Retain the Quality of Service raw data for a minimum of six (6) months after the end of the reporting period for review in case of serious discrepancies.
POTRAZ will also keep the same data for 6 months for future HASH values verification if need be.</td></tr>
<tr><td rowspan="3">4. Clarification is required on what are the signal strength figures being considered as the acceptable level for the “Coverage Area” specified in the QoS regulation and the percentage (%) of time within a</td><td>Coverage</td><td>GSM</td><td>WCDMA</td></tr>
<tr><td>Good</td><td>RxLev ≥ - 85 dBm</td><td>≥ - 95 dBm</td></tr>
<tr><td>Acceptable</td><td>- 95 dBm ≤ RxLev < - 85 dBm</td><td>- 105dBm ≤ RxLev < - 95 dBm</td></tr>
</table>

month these signals would need to be achieved.	Bad	- 110dBm ≤ RxLev < - 95 dBm	- 115 dBm ≤ RxLev < - 105 dBm
	No Coverage	RXlev less than -110 dBm	RXlev less than -115 dBm

5. Clarification on the percentage (%) of time within a Month which the Cell must fail to achieve to meet the Quality of Service target value for it to be classified as a “Faulty cell” as specified in the regulation.	A cell is considered faulty if it does not meet required QoS KPIs for 50 % of time per month (15/30 days). ❑ 2 Consecutive months = Warning ❑ 3 consecutive Months = Penalty
6. Clarification on the “Measurement Methodology” as specified in the QoS regulation, for each of the KPIs there need to understand which type of system/tool is being used for each KPI, the measurement point within the network and the time of day and duration of each measurement. In addition how many samples are being considered how and what mechanism is in place to ensure the accuracy of each sample. In addition what steps would take to check and eliminate errors (if any) introduced by the measuring tools/devices.	Basically there are 2 different “Measurement Methodology” to be used by POTRAZ, However a standard is a standard regardless of methodology. ❑ OMC-R Data analysis for Network Performance KPIs ❑ Test Calls for other KPIs such as SMS, Voice Quality, Billing Integrity etc However please note that for Penalty purposes, POTRAZ is not taking samples, but actually considering all the network elements under consideration
7. Clarification on the methodology used to determine the acceptance voice quality “Voice Quality”, the duration of the tests, the time of test. In addition how and what percentage of the calls should , within a given day meet the MOS KPI target as specified in the regulation	For the Voice Quality POTRAZ will use the SITE System and use the Recommendation ITU-T P.862: Perceptual evaluation of speech quality (PESQ): An objective method for end-to-end speech quality assessment

8. Clarification if there will be an acceptance testing of the QoS measurement by benchmarking it with NMS/OSS tools existing within operator environment to ensure the integrity of the data and measurement points.	Currently QoS Regulations are based on OMC-R data and Test Calls (E2E) for the QoS measurement and benchmarking, however NMS/OSS tools may be considered in future. For integrity of the data and measurement we may compare the test results for different test points.

CHARGING ACCURACY (CA) or BILLING INTEGRITY	
Percentage of incorrect credit balance As per our discussion we need clarity on the definition of the terms used in the table below highlighted in yellow:	Definition of credit balance Credit Balance is the total value of money that an operator owes users after successfully recharging account with airtime vouchers. *The monetary value of the amount of Airtime that a user of telecommunications services has in his or her account. Airtime being the actual time, spent on an active mobile phone connection, including, messages, e-mails, faxes, etc.* *POTRAZ Agreed to change the KPI to:* Percentage of Incorrect Account Balance Enquiries