REPUBLIC OF IRAQ

COMMUNICATIONS AND MEDIA COMMISSION

QUALITY OF SERVICE CONSULTATION

JUNE 2016

Contents

Note

In its major review of the regulatory framework for telecommunications, the Communications and Media Commission has examined the quality of service requirements in Iraq and has engaged consultants to prepare drafts of the *Quality Of Service Policy*, *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation.*

The Commission now invites stakeholders such as the general public, Service Providers and other interested organisations to comment on these documents. Any comments should be made in writing to

Iraq, Baghdad, Al-Masbah/Babel Neighbourhood, District 929, Street 32, Building 18

or

consultation@cmc.iq

within four (4) weeks after publication..

In the interests of transparency, the Commission expects to publish submissions. Stakeholders should indicate clearly any parts of their submissions which they would not wish to be included in published versions, explaining why these parts should be treated as confidential.

The Commission and the consultants will also be happy to discuss the documents orally with stakeholders during the consultation period. Stakeholders wishing to take up this opportunity should alert the above contact points as soon as possible.

In making its decisions the Commission will take into account, but will not be bound by, all of the comments on the documents.

Early in the review, Service Providers were invited to describe how they performed quality of service monitoring. The descriptions received were taken into account in the drafts, although to preserve possible confidentiality their influence is not highlighted.

This document provides explanatory background material for the drafts of the *Quality Of Service Policy*, *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation*, which are themselves attached as annexes. The explanatory background material and the drafts have the same structure as each other, for simplicity and clarity. The draft of the *Quality Of Service Policy* is intended to be self-contained. The drafts of the *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation* add details for Retail Services and Wholesale Services respectively. The explanatory background material is intended to expose some features of the drafts without having further legal force; it is not intended to be self-contained.

Also appended to this document is a supplement containing four lists on which the Commission would welcome comments. These are:

- The current quality of service indicators in the 2G Licences.
- Some possible quality of service indicators for the 3G Services.
- A list labelled ‘Clarifications’.
- A list labelled ‘Additions’.

The apparent overlaps between these lists have been kept in case respondents to this consultation have different interpretations of the same terms.

The explanatory background material includes some specific questions, but comments are invited on all parts of the document, regardless of whether there are specific questions. In particular, comments are invited about Indicators, Targets, Measurement Results, and Measurement Methods.

1. Scope

1. The Service Providers provide copious information to the Commission every month. However, the information is not necessarily comparable between Service Providers or verifiable by the Commission, because many of the quality of service commitments in the Licences are poorly defined. Moreover, the information is, in many cases, more useful to network designers than to Customers: Customers are not interested whether channels are congested, for example, but in whether calls succeed.
2. The *Retail Quality Of Service Regulation* provides adequate definitions of quality of service requirements that are important to Customers of Retail Services, with the intention that variations in implementation will be small enough not to matter to Customers. Of course these new definitions might prevent new measurements from being directly comparable with earlier ones, but Service Providers should not be held to account for this.
3. The *Wholesale Quality Of Service Regulation* covers the features shared by Wholesale Services (which might range from dark fibre provision to call centre operation) and sets out how Service Providers may introduce quality of service requirements that are specific to particular Wholesale Services. in these respects it places interconnection agreements and reference interconnection offers in the broader context of Service Agreements and Reference Service Offers.

2. Interpretation

4. The *Quality of Service Policy* sets out principles for Regulatory Requirements. The *Retail Quality Of Service Regulation* and *Wholesale Quality of Service Regulation* extend it by adding details. All three of the documents have legal force, but the *Retail Quality Of Service Regulation* and *Wholesale Quality of Service Regulation* are the more specific and definitive of them. Because they extend the *Quality Of Service Policy*, they adopt the same interpretations of terms as the *Quality Of Service Policy*.
5. Defined terms have initial capital letters, following widespread practice.
6. The crucial definitions are those of “Indicator” and “Target”. Indicators are quantities that can be measured to assess the quality of aspects of Services. Targets are values of Indicators that are regarded as satisfactory for some purposes. In other documents *t*here are alternative words for “indicator” and “target”, such as “parameter” (for “indicator”) and “benchmark”, “threshold” or “objective” (for “target”).
7. Measurements are made for an indicator in accordance with the Measurement Method prescribed for the Indicator. When Measurements are made for an Indicator they are combined to form a Measurement Result, which is a value of the Indicator that can be reported.
8. Different Services might be so similar to each other that the same value of an Indicator can be used when assessing quality for all of them; in that case they are in the same Measurement Domain.
9. Wireless local loop access is classified as Fixed Access, not Mobile Access, and the technologies used for it (cdmaone, CDMA2000 and WiMax) are not distinguished from each other or listed among the Access Technologies identified for Mobile Access in Iraq. It is therefore not regarded as suited to drive and walk tests. In fact for WiMax only one drive and walk test is available in the measurement application acquired by the Commission.

3. Motivation

10. By providing QOS information the Commission can help Customers to choose between Service Providers. This information needs to concentrate on the aspects of Services that have important consequences for Customers and that can be perceived directly by Customers.

11. If there are few Service Providers then Customers might be unable to make choices effectively. By setting Targets in this case the Commission will not be limiting the choice between quality and price unnecessarily and can reduce the likelihood that quality will fall towards levels that are widely agreed to be unsatisfactory.

12. By obtaining and providing QOS information the Commission can help the government to determine whether the networks collectively meet national needs.

4. Application

13. When there is a single Service Provider, regulation can protect Customers against high prices and low quality and can protect potential competitors against unfair practices by that Service Provider. Such protection remains a major justification for QOS requirements in many countries.

14. In many markets there are multiple Service Providers offering multiple Services over their own networks. In some cases these Service Providers serve largely different areas, so the protection needed is the same as that for when there is only a single Service Provider. In other cases Customers can choose their Service Providers; regulation is then needed at least to protect them against false advertisements and unnecessary ties to particular Service Providers.

15. In other markets there are multiple Service Providers offering multiple Services over networks that they do not control. With broadband and smart phones, Customers can choose their Service Providers separately from their network providers. For instance, instead of using the switches in a Telephony network to make calls they can use the routers in a Broadband network in conjunction with an Over-The-Top (OTT) Service. Such a Service needs the internet infrastructure of the network but avoids as far as possible the application systems in the network.

16. OTT Service Providers do not encourage expectations of high quality (because they do not control the infrastructure that they use); often they do not charge users for their services. In these circumstances QOS requirements are not needed for consumer protection. In addition, QOS requirements could not be enforced, as OTT Service Providers do not currently hold Licences and often have no physical presence in Iraq. However, in future they might want Licences, to gain the rights of licensees (such as holding phone numbers or radio frequencies, or having symmetric interconnection agreements). In acquiring the rights of licensees they would also acquire the responsibilities of licensees. Typically they will need Licences if they charge for their Services, because they will need to gain the rights of licensees, and charging for their Services will make QOS requirements and other consumer protection rules applicable.

17. As far as possible, QOS requirements should avoid impeding competition between Service Providers that charge and other Service Providers. If QOS requirements are very stringent, then OTT Service Providers might have unreasonable competitive advantages over other Service Providers and might be reluctant to extend their Services by obtaining Licences. However, the QOS requirements in the *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation* are largely matters of good husbandry that many Service Providers already observe; consequently, OTT Service Providers might volunteer to observe them (for publicity purposes, for example). Such volunteers, along with the Service Providers that hold Licences (and that are therefore obliged to observe the QOS requirements), constitute the Participating Providers.

18. This Explanatory Memorandum refers to "Service Providers", not "Participating Providers" to avoid unfamiliar terms, but the *Quality of Service Policy*, *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation* are more precise.

19. Service Providers are responsible for the quality experienced by Customers who pay them for communication paths. For instance, a Service Provider that offers calls from end points on the internet to conventional phones having phone numbers will recover its interconnection costs by charging for the calls and will need to observe the QOS requirements over the end-to-end paths. However, QOS requirements are not appropriate if Customers do not need to pay: the quality might be low, but the prices are, too.

5. Measurements

20. The expectations of users limit the Indicators that can be said to be important to Customers of Retail Services. The Indicators required for Wholesale Services are not limited in quite this way: for instance, different rules about the severity of faults (when they are classified as critical, major, minor or insignificant) might be appropriate in different circumstances and are present in various proposed or actual interconnection agreements in Iraq. Moreover, Wholesale Services cover wide ranges of possibilities, from dark fibre provision through mobile service resale to call centre operation. For these reasons the Indicators required for Wholesale Services are refined in the Service Agreements, with the approval of the Commission. Nonetheless the basic principles of measurement, reporting and auditing are appropriate to Wholesale Services as well as to Retail Services.

21. Measurements are made by performing Field Tests or by collecting System Readings, depending on the Measurement Method. Field Tests can be performed at particular times and places that might be those of users, but need the co-operation of the users if those places are in houses and offices. System Readings covering all times can be collected inside a network without special tests, but might not count deficiencies in Services occurring in the places where users might be.

22. Campaign Tests are Field Tests that require actions by, or on behalf of, Service Providers or the Commission planned for particular times and places: test equipment is connected to the networks using the sort of wired or wireless access that a Customer would need. Campaign Tests for Mobile Access are often drive and walk tests, with assumptions about extending the results from publicly accessible places such as malls into houses and offices; Campaign Tests for Fixed Access are often performed in the buildings or cabinets of the Service Providers, to avoid needing access to houses and offices.

23. Campaign Tests for Mobile Access might be performed by a Measurement Agent that tests the Services of all of the Service Providers at the same times and places; measurements would thereby become cheaper to make and easier to compare. A Measurement Agent should make its capabilities available without discrimination between Service Providers, so that all of them can benefit from economies of scale and scope. Different Service Providers might appoint different Measurement Agents but the greatest economies would be obtained from joint appointments.

24. The Commission can encourage Service Providers to appoint jointly a Measurement Agent, by offering to be a Measurement Agent itself, convening meetings of the Service Providers, proposing ways of cost sharing (according to the quantities of measurements performed on behalf of each Service Provider, for example), and ensuring that the joint appointment does not involve collusion or the unfair exclusion of other Service Providers.

    What should be done to encourage the joint appointment of a Measurement Agent?

25. Crowd Tests, using "crowd sourcing" techniques, are Field Tests that can be alternatives to Campaign Tests: the terminals of users, or test equipment distributed to users, make measurements that collectively are indicative of user experience. Such tests do not involve Measurement Agents and are not matched for different Service Providers: they are done whenever and wherever the terminals are present, and they might or might not be initiated by the users. They require the users to permit, or even welcome, measurements, so they capture the experience of only some, slightly specialised, users. Crowd Tests for Mobile Access require smart phones; Crowd Tests for Fixed Access require test equipment, unless Fixed Access connections through smart phones become commonplace.

26. The Commission can encourage users to install Crowd Test programs, by first ensuring that its employees do so and then requesting government agencies, at both national and local levels, to ensure that their employees do so. If necessary users could be given incentives, such as payments to cover data allowances, or cheap smart phones.

    What should be done to encourage the installation of Crowd Test programs?

27. In Iraq there are already extensive Field Tests for Mobile Access, so the *Retail Quality Of Service Regulation* formalises their use and, to avoid confusion, does not introduce the use of System Readings alongside them. It also provides Field Tests for Fixed Access, for comparison purposes.

28. Whether made by performing Field Tests or by collecting System Readings, Measurements for different Service Providers should be comparable with each other. Field Tests for different Service Providers should be matched, so that they are performed at similar (or, better, the same) times and places. System Readings for different Service Providers should be analysed to ensure that the calculations using data from different systems, possibly from different vendors, produce equivalent results.

29. The quality of a Service should be assessed in each Reporting Area at least annually, by obtaining new Measurement Results. The Measurement Results obtained during each Reporting Period should be passed to the Commission and published. Supplementary information provided with the Measurement Results could be useful in audits but might not be published because it is not very useful to the general public.

6. Reporting Periods

30. Improvements in services often require improvements in networks. Consequently they need to be assessed only on a timescale like that for bringing about improvements in networks; more frequent reporting could place unnecessary reporting burdens on Service Providers and unnecessary auditing burdens on the Commission. Conversely, though some improvements might depend on budgetary cycles and equipment deliveries that take many months, other improvements can be made fairly rapidly. Overall a Reporting Period of three (3) months between reports by the Service Providers seems appropriate in Iraq, as in many other countries.

31. The reporting and auditing burdens can be spread more evenly by considering Fixed Access and Mobile Access in different months, instead of in the same month. However, to simplify the task of keeping values of Indicators comparable with one another, Service Providers should report results about similar Services at the same times as one another.

32. Regulators that make measurements tend to do so on a yearly cycle. For the Commission this might entail having a rolling programme that covered the entire country annually and also allowed especially important or problematic areas to be investigated in particular detail.

7. Reporting Areas

33. Improvements in networks might affect one location more than another; the significant differences in quality between locations could be within governorates as well as between governorates. These differences could depend on population densities and, for Mobile Access, road traffic rates. Moreover some particular locations, such as refugee camps, seasonal routes or busy road junctions, might deserve particular QOS monitoring and especially rapid efforts to improve services. QOS monitoring could also be needed to assess demand and supply under the universal service scheme.

34. There are limits, though, to the detail that can be acquired cost-effectively in tests. The *Retail Quality Of Service Regulation* distinguishes simply between rural and urban portions of governorates (and roads in governorates, for Mobile Access). A finer distinction would be better, but it would be difficult to define and apply precisely without excessive effort. In particular, no further distinction (between, say, “central” and “peripheral” parts of urban areas) appears to be available from the Ministry of Planning Central Statistical Organisation.

35. In their assessments of coverage, different Service Providers have used slightly different lists of roads. The *Retail Quality Of Service Regulation* specifies the list using the classification by the Ministry of Construction and Housing Roads and Bridges Directorate but allows the Commission to approve omissions. The list of roads should then be as comprehensive as possible and be the same for all of the Service Providers.

36. The operations systems of Service Providers are assumed to identify the governorates (and urban portions and rural portions) in which nodes are located but might have no information about how much traffic through a node at the edge of a governorate is generated in other, nearby, governorates. In that case the node would need to be regarded in Measurements as if it served only that governorate occupied by the highest proportion of its users.

8. Representative Samples

37. Whether made by performing Field Tests or by collecting System Readings, Measurement Results that depend on sampling data should use Representative Samples.

38. All of the working day should be covered in a Representative Sample. Also, as far as possible all of the districts (in rural areas), the quarters (in urban areas) or the roads should be covered in a Representative Sample, but the Commission may approve omissions.

39. The minimum size of a Representative Sample discriminates between Measurement Results that differ by one (1) percentage point when the better of them could be regarded as having five (5) stars (or being "excellent") and between Measurement Results that differ by four (4) percentage points when the better of them could be regarded as having two (2) stars (or being "poor"). It also lets drive and walk tests for all of the Service Providers cover the country on a yearly cycle.

40. On recent estimates, Representative Samples having the minimum size could represent every district and quarter if each such district or quarter had between 800 and 18,200 inhabitants (or 4,200 inhabitants except for Baghdad), depending on the governorate. However, some figures suggest that there could be between 16,000 and 20,000 villages, and over 200,000 permanent residents in over 1,000 small remote settlements, so Representative Samples could still leave coverage untested in many settlements. The Commission might need to investigate these settlements in its own programme.

    What should be done to test coverage in small settlements cost-effectively?

41. According to official figures, the expressways, highways and arterial roads have a total length of about 12,000 km, so they could be traversed every three (3) months, with drive tests throughout the working day at intervals of ten (10) minutes or five (5) km. Nonetheless, the *Retail Quality Of Service Regulation* only requires them all to be traversed annually and individual governorates to be traversed completely in three (3) months.

9. Cost recovery

42. The simplest cost recovery mechanism lets Service Providers deal with their own costs. These costs could bear heavily on small Service Providers, so though small Service Providers are not exempt from QOS requirements they might be treated with some lenience.

10. Governance

43. Working groups can be useful for resolving problems, clarifying details and harmonising procedures (such as those in measurement application control scripts). However, in other countries they have sometimes delayed the effective introduction of regulatory measures when they have been left to themselves. Hence the Commission will take into account the opinions expressed in working groups but will remain responsible for determining QOS requirements.

11. Dispute resolution

44. In other countries disputes about QOS have arisen when one Service Provider has made claims about its QOS that another Service Provider does not regarded as justifiable. To some extent such disputes can be mitigated by requiring that published Measurement Results have at most two significant figures and are accompanied only by remarks approved by the Commission. If nonetheless the Service Providers enter into disputes the Commission will investigate complaints.

    What else would help to avoid disputes between Service Providers about QOS requirements?

12. Customer awareness

45. To help customers to make informed choices QOS information should be published. The most satisfactory approach at the moment seems to be that the Service Providers publish on their web sites the most recently approved values of Indicators, in formats agreed by the Commission. By doing this, Service Providers can promote awareness of QOS requirements.

46. In addition the Commission should publish its own test results, and publicise through the press and broadcasters any especially striking conclusions.

47. Of course Customers are likely to be interested in particular parts of the QOS information, not all of it. For instance, one might be interested in call setup success on roads throughout Iraq, while another was interested in speech quality in the rural areas of one governorate. The information would need to be presented along with adequate cross-references.

13. Sanctions

48. Sanctions will be graduated. Simply publishing comparative values of Indicators might stimulate improvements. Failing that, requiring the implementation of improvement plans might do so. However, if a Service Provider has Significant Market Power, then competition could be insufficient to stimulate improvements and further sanctions might be needed.

49. The Commission is likely to take into account the financial and operating circumstances of Service Providers when applying sanctions. In principle an internet café, for example, could be a Service Provider, but the Commission will usually forbear from applying sanctions to it. The conditions in which forbearance is desirable could be formalised somewhat (by restricting the size or nature of the Service Provider). However, this would make the *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation* less flexible.

Should the conditions in which forbearance is desirable be formalised?

14. Indicators and Targets

50. For every Indicator in the *Retail Quality Of Service Regulation* and *Wholesale Quality Of Service Regulation* there are descriptions of the Target (if there is one), the Measurement Result and the Measurement Method. The description of the Measurement Method includes most of the following, in order:

    - The identification of any related international standard.
    - The identification of the Measurement Domains, for each of which the Indicator is measured separately.
    - The identification of the Reporting Areas, in each of which the Indicator is measured separately.
    - A description of the aspect of a Service that has its quality characterised by the Indicator (for example, fault reports).
    - A mention of any restrictions of the aspect of the Service needed to make the Measurements practicable (for example, requiring fault reports to be relevant).
    - A statement of whether the Measurements are made by performing Field Tests or by collecting System Readings.
    - A formula (in English) for the Measurement Result.

- A statement of which supplementary information is reported along with the Measurement Result (for example, the number of Customers).
- Any further specification needed of how the Measurements are made (for example, counting single fault reports about multiple paths as multiple fault reports).

Should there be any other information for each Indicator?

51. Indicators should differentiate between Services provided by the same Service Provider if the qualities of the aspects that they characterise are likely to differ perceptibly between the Services. Otherwise, the Services can be treated the same as each other for the purposes of quality of service monitoring: for each of the Indicators one Measurement Result can be enough and all of the Services can be in one Measurement Domain.

52. Indicators should be presented clearly and exactly enough to let Customers compare different Services fairly. In particular, different legitimate interpretations of a Measurement Method, and different measured values that are not perceptibly different to Customers, should not produce different presentations of Measurement Results. To assist with this, the Measurement Results might be expressed to at most two significant figures (because any more figures could bewilder and would wrongly suggest high precision). The might also be written in such a way that "good" values have low percentages or times (because people perceive the difference between "1%" and "2%" more readily than the difference between "99%" and "98%").

What else should be considered for presenting the information to Customers?

53. For Fixed Access the most basic problems concern supply and restoration of Services. These can have Indicators specified for them, with Measurement Methods using System Readings. These Indicators could also be specified for Mobile Access, though arguably they are less important in that case.

Should the Indicators about supply and restoration of Services be extended to Mobile Access?

54. The Indicators for Telephony in the *Retail Quality Of Service Regulation* relate to end-to-end paths that can traverse more than one network. This is appropriate, as Customers are paying to make use of such paths. There is a case for having in addition Indicators that relate to on-net calls only; however, having these extra Indicators would double the number of test calls needed, when the Measurements are made by performing Field Tests. There have also been suggestions that the calls to residential destinations should be counted separately from calls to large business (private exchange) destinations, which, again, would double the number of test calls. There is also a view that there should be Indicators that separate the core from the access; however, those Indicators would not relate directly to Customer experience (because Customers are interested in calls, not access and core measurements), and lead to confusion with the Indicators in service level agreements for Wholesale Services.

Should the Indicators about call setup and call continuation be multiplied, to assess on-net calls separately from off-net ones, calls to residential destinations separately from calls to large business (private exchange) destinations, or quality levels in the access network separately from quality levels in the core network?

55. The speech quality measurement tool for Mobile Access in the *Retail Quality Of Service Regulation* is PESQ (with the "double-ended" procedures of ITU P.862), because PESQ is standardised, available on 3G and 4G (unlike SQI), calibrated against various languages (but not Arabic, unfortunately) and supported by Ascom, Pioneer and Nemo (for example). However, a Measurement Method for Fixed Access would require the Service Providers to acquire a new speech quality application (for the "single-ended" procedures of ITU P.563), and would produce less accurate results than PESQ.

    Should the speech quality Indicator be extended to Fixed Access?

56. The Indicators for Broadband in the *Retail Quality Of Service Regulation* are limited to those found in almost all measurement applications. They characterise quite well the quality of several internet functions (such as file transfer, video streaming, messaging and gaming). Indicators could be devised for particular functions, but there might need to be many Indicators to maintain a consistent depth of treatment across all the functions. For instance, there are two sets of functions for video streaming, and each might need its own Indicators. In general, internet functions continue to proliferate, and this proliferation could lead to a proliferation of Indicators, when experience suggests that users consider very few.

    Should the Indicators for Broadband be augmented with ones for other internet functions?

57. Even with limited Indicators for Broadband, variations in the treatment of throughput are possible. The Indicator in the draft Regulations requires reports of the mean speeds attained in of the tests; the tests are of downloads from, and uploads to, two international end points but could obviously be extended to downloads from, and uploads to, a national end point. An alternative Indicator would require reports the lowest speeds attained in the best 90% of the tests; it could be extended to deal with "up from" speeds as well as "up to" speeds by adding requirements to report the highest speeds attained in the worst 10% of the tests. Such an extend Indicators might be more helpful to users.

    Which Indicators about throughput should be adopted?

58. Whether different Services are regarded by Customers as different can affect whether the Measurements made for them should be different. For instance, if Customers differentiate between Access Technologies (such as GSM and UMTS) or between different variants of one Access Technology (such as WCDMA and HSPA), then the successful call setups for each Access Technology or variant might be counted separately. Thus Services are put in the same Measurement Domain for an Indicator unless they are widely regarded as different or produce perceptibly different Measurement Results. Currently Fixed Access Services and Mobile Access Services are put in different Measurement Domains for many Indicators.

    Which Indicators should pay attention to distinctions between circuit-switching and packet-switching, between different Access Technologies or between different variants of Access Technologies?

59. Various potential Indicators have been devised for specific Access Technologies. For instance, for UMTS (with its variants WCDMA and HSPA) there are indicators about the establishment of radio resource control connections, radio access bearers, circuit-switched video calls, multi-media messages and wireless application protocol sessions, some of which have no exact counterparts for GSM (with its variants GPRS and EDGE). Several of these matter to network designers but not to users; others relate to Services that have largely been superseded through the evolution of OTT and other applications that use the internet.

    WhIch Indicators should be provided that are specific to particular Access Technologies?

60. Certain quantities needed when making Measurements, such as the protocols for data transfers, are given default values in the Regulations but can be changed by the Commission without consultation thereafter (if the changes do not alter substantially the costs of complying with the Regulations and the Licences). The intention is to simplify a shift from Campaign Tests (in which typically the Commission could specify these quantities) to Crowd Tests (in which typically the supplier of the Crowd Test program would specify these quantities).

    Which quantities should be open to change by the Commission without formal public consultation?

61. Coverage is assessed annually by Field Tests, not from planning tools. Planning tools differ in vendor, configuration and assumptions (about the propagation model, cell utilisation, population distribution and terrain, for example); usually they do not capture local variations realistically, even if they are updated according to Service Provider inspections. For instance, in the UK, where the regulator lays down several assumptions for the planning tools, in a test of one area the signal strength measured in Field Tests was sometimes higher and sometimes lower than that predicted by planning tools by up to 39 dB.

    How could planning tools, with their inspection and update processes, be adapted to provide results that were comparable between Service Providers and close to those of Field Tests?

62. Coverage is assessed in terms of signal strengths, which are characterised by making measurements of quantities specific to particular Access Technologies. The thresholds proposed for signal strengths are related to those in other countries, but evidence in future might let them be adjusted to suit the particular conditions of Iraq. They intended to let moderately good support be provided to call setup, call continuation and data transfer. They are in effect raised by 10 dB for locations that are outdoor and stationary, because such locations are taken to be substitutes in tests for locations that are indoor or moving, where the received signal can be attenuated by 10 dBm.

    What evidence is available about the signal strengths suitable for ensuring successful voice calls and data transfers, both outdoors and indoors, at urban and rural locations in Iraq?

63. Because of co-channel interference and congestion, high signal strengths do not guarantee successful voice calls and data transfers. Coverage might therefore be assessed not in terms of signal strengths but instead by reference to aspects of Services directly perceptible to users, such as the percentage of locations where, irrespective of the signal bars displayed by the phone, voice calls are set up and maintained for two (2) minutes or data transfers incur at most 1% packet loss. Indicators of such aspects might have Measurement Results that vary with the level of congestion (for Access Technologies such as CDM2000 and UMTS that entail “cell breathing”). Moreover, they are not always available in measurement applications (especially Crowd Test programs).

    Should the land coverage Indicator be defined by reference to aspects of Services directly perceptible to users instead of by reference to signal strengths?

64. Observing trends in utilisation can help to forestall shortages of capacity. There are various Measurements of utilisation that can be made. For Telephony Services, the utilisation in each Reporting Area can be regarded as the proportion of traffic channels occupied by calls at peak use or during the busy hour. For Broadband Services, the utilisation is not so readily defined, and different Service Providers might be using different Measurements.

    How should utilisation be measured and associated with Targets that would point to potential shortages of capacity?

65. Particularly important or widespread topics of service complaints are counted separately. The ones in the *Retail Quality Of Service Regulation* are those that some Service Providers already count separately. However, the Commission distinguishes between fifteen classes of service complaint made to it. For instance, the Commission separates out complaints about calling cards, but Service Providers might class them as being about "money owed or paid by Customers" or "the provision or withdrawal of Services to particular Customers".

    Which service complaints should be counted separately?

REPUBLIC OF IRAQ

COMMUNICATIONS AND MEDIA COMMISSION

QUALITY OF SERVICE POLICY

JUNE 2016

Contents

1. Scope

1. Under its founding law, *Order 65*, the Communications and Media Commission (the Commission) is solely responsible for licensing and regulating telecommunications, broadcasting, information services and other media in Iraq, and among its functions is the drafting and implementing of standards and rules for quality of service offered by licensed entities. The intention is to "foster plurality of and competition among Iraq's communications and media services, thereby promoting an informed and culturally diverse citizenship that derives maximum benefit in terms of choice, price and quality".
2. This Policy sets out the principles that the Commission will adopt in drafting and implementing standards and rules for Quality Of Service (QOS). It is especially relevant to Service Providers that are paid for their Services, regardless of whether they operate their own networks and have Licences containing stipulations about QOS.

2. Interpretation

3. In this Policy:

Commission means the Communications and Media Commission.

Customer means an individual or entity that is provided a Service by a Service Provider.

Field Test means a test of access to communications initiated at a time and a place that might be those of a Customer using a Service.

Fixed Access means the class of Services that are not designed to let Customers continue perceptible access to communications while moving within the area for which the Service Provider holds a Licence.

Indicator means a measurable characterisation of the quality of an aspect of a Service.

Licence means a document issued by the Commission to authorise the provision of a Service by a Service Provider.

Measurement means a measurement of an Indicator made according to a Measurement Method for the Indicator.

Measurement Agent means an agent appointed to make Measurements on behalf of Service Providers or the Commission.

Measurement Domain means a class of Services such that the quality of a particular aspect of the Services is not likely to differ perceptibly between the Services.

Measurement Method means a method prescribed by the Commission for measuring an Indicator.

Measurement Result means the value of an Indicator obtained by making Measurements.

Mobile Access means the class of Services that are designed to let Customers continue perceptible access to communications while moving within the area for which the Service Provider holds a Licence.

Participating Provider means a Service Provider that undertakes to comply with, or is obliged to comply with, Regulatory Requirements.

Regulatory Requirement means a requirement identified in a Regulation made under this Policy or imposed by the Commission in accordance with a Regulation made under this Policy.

Reporting Area means an area for which the Commission requires a Participating Provider to report Measurement Results.

Reporting Period means a period of time for which the Commission requires a Participating Provider to report Measurement Results.

Representative Sample means a collection of Measurements that the Commission requires to be made at different times and places in order to represent a period of time and an area adequately.

Retail Service means a Service provided by a Service Provider to the general public.

Service means a telecommunications service in Iraq.

Service Provider means an entity that provides a Service to the general public or to other Service Providers.

Significant Market Power means economic strength such that a Service Provider can behave to an appreciable extent independently of competitors, Customers and end users.

System Reading means a reading obtained from data accumulated in the network or support systems of a Service Provider without special tests.

Target means a value of an Indicator that signifies a satisfactory level for the quality of the aspect of a Service characterised by the Indicator.

Wholesale Service means a Service provided by a Service Provider to other Service Providers.

4. In this Policy:

   OTT abbreviates Over-The-Top.

   QOS abbreviates Quality Of Service.

3. Motivation

5. The *Consumer Protection Law* (number 1 of 2010) contains prohibitions of "Marketing in any kind of media, publication or advertising of a product or service that does not fulfil the criteria of applicable local or international standards" and "Cheating, misleading or concealing the facts of the composition of all goods and services". Regulatory Requirements can make these prohibitions specific to particular markets.
6. The quality of Services should be consistent with the prices charged by Service Providers, as well as with the claims made by Service Providers. Regulatory Requirements should not prevent Customers from exercising their preferences, which might be to have low prices with low quality or high quality with high prices.
7. Customers might be unable to exercise their preferences if there are few Service Providers. In such situations Regulatory Requirements can help to ensure sufficiently high quality and sufficiently low prices to satisfy Customers.
8. The quality of Services is important to Iraq, as well as to individual Customers. The networks should be capable collectively of meeting national needs for emergency support, along with education and other development priorities.

4. Application

9. Every Service Provider that holds a Licence should be a Participating Provider in respect of the Services for which there are Regulatory Requirements.

10. Every Service Provider is responsible for the quality experienced by Customers who pay it for communication paths. This is so even if the paths have end points in different networks or are partly Over-The-Top (OTT), in that segments of them use only the internet infrastructure. Every such Service Providers should comply with the relevant Regulatory Requirements over complete communication paths. However, Customers who do not need to pay do not need the protection offered by Regulatory Requirements (though they might still need other consumer protection rules, on personal data, for example).

11. Every Service Provider should ensure consistency between the quality provided by the Wholesale Services which it procures and the quality required for its Retail Services.

12. Regulatory Requirements should avoid, as far as possible, impeding competition between Participating Providers and entities that are not Participating Providers.

5. Measurements

13. Every Participating Provider should report to the Commission for every Reporting Area its Measurement Results for every Reporting Period, with formats approved by the Commission and with any supplementary information required by the Commission. It should also report its Measurement Results to its Customers, in ways approved by the Commission.

14. Every Participating Provider is responsible for the accuracy and adequacy of its Measurements. The Commission may check the Measurements by considering the Field Tests performed and the System Readings collected.

15. The Commission will try to arrange that, as far as possible, the Measurements by, or on behalf of, different Participating Providers competing in the same Reporting Areas are comparable with one another, in that they are made at similar times and places.

6. Reporting Periods

16. Reporting Periods should be long enough to avoid placing excessive burdens on Participating Providers or the Commission and to let improvements in networks manifest themselves in improvements in Services.

7. Reporting Areas

17. Reporting Areas should cover all of the administrative divisions of Iraq that are controlled by the legitimate government. For this purpose the administrative divisions should be districts in rural areas and quarters in urban areas.

18. Reporting Areas should be different in locations where the Services offered are very different. In particular, for Retail Services areas where both Fixed Access and Mobile Access are available should be distinguished from roads where only Mobile Access is available.

19. Reporting Areas should be different in locations where the levels of quality might be very different. In particular, for Retail Services rural areas should be distinguished from urban areas.

20. Reporting Areas should be different in locations where the prices charged by the same Participating Provider for the same Service are very different. Typically for Retail Services these are governorates.

8. Representative Samples

21. Representative Samples should be provided for Measurement Results that depend on sampling data.
22. Representative Samples should be small enough to permit the Indicators to be measured in every Reporting Area in at least one (1) of every four (4) successive Reporting Periods.
23. Representative Samples should be large enough to detect, with good confidence, important differences in quality that can be perceived directly by Customers.
24. Every Representative Sample should be formed from all of the Measurements that are made in the relevant Reporting Period and Reporting Area, except for any omissions approved by the Commission.

9. Cost recovery

25. Every Participating Provider should cover its own costs of complying with Regulatory Requirements.

10. Governance

26. The Commission may establish and chair working groups to discuss details of Regulatory Requirements, such as implications of Measurement Methods. All of the Participating Providers would be able to take part in such working groups.
27. The Commission will consult the public about any proposal that is accepted by such working groups and that would affect substantially the costs to the Participating Providers of complying with Regulatory Requirements.

11. Dispute resolution

28. Participating Providers and Measurement Agents should usually resolve any disputes among themselves without recourse to external intervention. However, any of them may make a complaint, accompanied by evidence, in writing to the Commission, and the Commission will duly investigate and take actions to resolve the problem.
29. Every party to a dispute should co-operate with the Commission so that the Commission may resolve the dispute in a fair and efficient manner, in accordance with the rules and procedures of the Commission as set out in other regulations. In particular it should provide in a timely manner any information required by the Commission.

12. Customer awareness

30. The Commission will promote awareness among Customers of the Indicators and Targets. Participating Providers should do so, too.

31. The Commission may facilitate comparisons between Participating Providers by drawing attention to its own Measurement Results, the Measurement Results of Participating Providers or the proportions of Customers that complain to it about particular Services and Participating Providers. Its comments will be based on evidence and will not mention Participating Providers that have not had opportunities to suggest changes to them.

13. Sanctions

32. The Commission will seek to bring about improvements in Services through constructive engagement with Participating Providers.

33. The Commission will apply further sanctions if it considers that a Participating Provider is not implementing agreed improvements or is letting quality fall towards levels that are widely agreed to be unsatisfactory.

14. Indicators and Targets

34. Indicators should characterise the qualities of aspects of Services that have important consequences for Customers and that can be perceived directly by Customers.

35. Indicators should differentiate between Services provided by the same Participating Provider if the qualities of the aspects that they characterise are likely to differ perceptibly between the Services. Otherwise, for each of the Indicators one Measurement Result can be enough and one Measurement Domain can contain all of the Services.

36. Indicators should be presented clearly and exactly enough to let Customers compare different Services fairly.

37. Indicators should be measured at times and places that match user experience as far as possible.

38. Indicators and Targets should be relevant to end-to-end communications if Customers are paying for such communications, even when Participating Providers do not own the complete communication paths. In particular, Indicators that related only to paths to on-net destinations would be uninformative to Customers and inapplicable to OTT Service Providers.

39. Indicators and Targets could be appropriate to customer care, in the absence of general legal requirements relating to customer care. They would be the same for all Services where they were independent of the natures of the Services.

40. Targets should relate to the quality that satisfies Customers and that meets national needs. In particular, they should not limit choices between quality and price unnecessarily.

41. Targets should be applied to Participating Providers that have been designated by the Commission as having Significant Market Power in the market for the relevant Services. Without Targets such Participating Providers might let quality fall consistently to levels that are generally agreed to be unsatisfactory.

42. Targets should signify satisfactory levels of quality at all times and places that the Services are expected to be used, even if the Indicators can be measured only at some times and places.

REPUBLIC OF IRAQ

COMMUNICATIONS AND MEDIA COMMISSION

RETAIL QUALITY OF SERVICE REGULATION

JUNE 2016

Contents

1. Scope

1. Under its founding law, *Order 65*, the Communications and Media Commission (the Commission) is solely responsible for licensing and regulating telecommunications, broadcasting, information services and other media in Iraq, and among its functions is the drafting and implementing of standards and rules for quality of service offered by licensed entities. The intention is to "foster plurality of and competition among Iraq's communications and media services, thereby promoting an informed and culturally diverse citizenship that derives maximum benefit in terms of choice, price and quality".
2. This Regulation adds details to the *Quality Of Service Policy* by defining specific Indicators for Services provided by Service Providers to the general public.
3. The Licences of some Service Providers contain quality of service requirements. They also provide that they may be modified or amended by the Commission, in order to harmonise them with rules and regulations promulgated by the Commission. This Regulation is promulgated in accordance with that provision.
4. The Licences of some Service Providers express roll-out commitments in terms of coverage and describe coverage by reference to quality of service requirements in the Licences. However, they do not state how coverage is to be measured. This Regulation clarifies the roll-out commitments by stating how coverage is to be measured, but it does not invalidate the roll-out commitments.

2. Interpretation

5. In any conflict between the *Quality Of Service Policy* and this Regulation this Regulation shall take precedence.
6. The meanings of terms and abbreviations for terms laid down in the *Quality Of Service Policy* apply also in this Regulation.
7. In this Regulation:

Access Technology means a class of closely related transmission techniques; the classes are GSM (with its variants GPRS and EDGE), UMTS (with its variants WCDMA and HSPA) and LTE (with its variants LTE-A and LTE-U).

Broadband means the class of Services in which a Service Provider, in return for payment, supports data transfers between the terminals or premises of Customers and a public network at a speed for transfers from the public network that is advertised to be 512,000 bits per second or more in some conditions.

Campaign Test means a Field Test performed by, on or behalf of, the Commission or a Service Provider at a time and a place determined in outline by a plan.

Crowd Test means a Field Test performed with the aid of the equipment of a Customer at a time and a place matching those of the equipment.

Data Transfer Rate means the speed at which data is transferred, as calculated by dividing the quantity of data transferred by the time taken to transfer the data.

Downlink means the direction in which data is transferred to the equipment of a Customer.

Leased Line Transmission means the class of Services in which a Service Provider, in return for payment, supports transmissions between the terminals or premises of Customers and other such terminals or premises of Customers.

Rural Portion means the portion of a governorate comprising all of the rural areas identified by the Ministry of Planning Central Statistical Organisation.

Telephony means the class of Services in which a Service Provider, in return for payment, supports voice calls between the terminals or premises of Customers and a public network.

Transport Portion means the portion of a governorate comprising all of the expressways, highways and arterial roads classified by the Ministry of Construction and Housing Roads and Bridges Directorate.

Uplink means the direction in which data is transferred from the equipment of a Customer.

Urban Portion means the portion of a governorate comprising all of the urban areas identified by the Ministry of Planning Central Statistical Organisation.

8. In this Regulation:

CDMA2000 abbreviates Code Division Multiple Access two thousand.

cdmaOne abbreviates Code Division Multiple Access One.

dBm abbreviates decibel milliwatt.

Ec abbreviates Energy per chip.

EDGE abbreviates Enhanced Data rates for GSM Evolution.

ETSI abbreviates European Telecommunications Standards Institute.

EVDO abbreviates EVolution Data Optimised.

GPRS abbreviates General Packet Radio Service.

GSM abbreviates Global System for Mobile communications.

HSPA abbreviates High Speed Packet Access.

HTTP abbreviates HyperText Transfer Protocol.

ICMP abbreviates Internet Control Message Protocol.

LTE abbreviates Long Term Evolution.

MOS abbreviates Mean Opinion Score.

PESQ abbreviates Perceptual Evaluation of Speech Quality.

RSCP abbreviates Received Signal Code Power.

RSRP abbreviates Reference Signal Receive Power.

RSSI abbreviates Received Signal Strength Indicator.

RTT abbreviates Radio Transmission Technology.

FTCP abbreviates Transmission Control Protocol.

UDP abbreviates Unit Datagram Protocol.

UMTS abbreviates Universal Mobile Telecommunication Service.

WCDMA abbreviates Wideband Code Division Multiple Access.

WiFi abbreviates Wireless Fidelity.

WiMax abbreviates Worldwide interoperability for Microwave access.

3. Motivation

9. In accordance with its founding law, the Commission intends QOS regulation to improve the choice, price or quality of Services. Specific concerns are to provide information about quality that will help Customers to make choices and to maintain quality when there are too few choices available.

4. Application

10. This Regulation shall come into effect on its date of issue.

5. Measurements

11. From six (6) months after this Regulation comes into effect, in at least one (1) of every four (4) successive Reporting Periods every Participating Provider shall ensure that Measurements are made for each of its Retail Services available in a Reporting Area. The Participating Provider shall also make such Measurements for a Reporting Area if it considers that new Measurement Results could differ by one (1) part in ten (10) from the Measurement Results obtained most recently for that Reporting Area.

12. Every Participating Provider shall ensure that each of its Measurement Results is formed from all of the Measurements made for that Measurement Result in one (1) Measurement Domain, one (1) Reporting Period and one (1) Reporting Area, unless the Commission approves omissions on the grounds of inaccuracy, irrelevance or obsolescence.

13. Every Participating Provider shall ensure that if a Measurement Result depends on sampling data, then the corresponding Measurements form a Representative Sample, unless the Commission approves shortcomings on the grounds of practicality.

14. Every Participating Provider shall use Campaign Tests for any required Field Tests, unless the Commission approves instead the use of Crowd Tests executed by Crowd Test programs recommended by the Commission.

15. The Commission may recommend, and encourage the use of, particular Crowd Test programs.

16. Every Participating Provider shall promote the use by its current and prospective Customers of Crowd Test programs recommended by the Commission.

17. Before the beginning of every Reporting Period every Participating Provider shall submit to the Commission the plan of approximately when and where it expects its Measurements to be made. The Commission may request revisions to the times and places of the Measurements to make them more directly comparable with those of other Participating Providers or make them more adequately representative of expected user experience.

18. Within one (1) month after the end of every Reporting Period every Participating Provider shall report to the Commission for every Reporting Area its Measurement Results for that Reporting Period, with formats approved by the Commission and with any supplementary information required by the Commission.

19. Every Participating Provider shall make a senior manager responsible for validating, and holding records about, its Measurements. The records shall be held for at least twelve (12) months after the Reporting Period to which they apply and shall include details of the observations and calculations, and any fault reports or service complaints, on which the Measurements depend. The Commission may inspect the records to audit the Measurement Results or refine the Measurement Methods.

20. Participating Providers may appoint jointly a Measurement Agent to perform Campaign Tests for Mobile Access on their behalf. That agent shall have identical fair and non-discriminatory service level agreements with them and shall be willing to offer such agreements to other Participating Providers on the same terms.

21. The Commission will encourage the Participating Providers to appoint jointly a Measurement Agent that will ensure that the Campaign Tests for Mobile Access are comparable between the Participating Providers.

22. The Commission may perform Campaign Tests for Mobile Access or appoint a Measurement Agent to perform Campaign Tests for Mobile Access on its behalf, so that it can audit the Measurement Results reported by the Participating Providers or investigate quality at particular times and places.

23. The Commission may undertake to be a Measurement Agent at the request of a Participating Provider. Any Measurements made by the Commission on behalf of a Participating Provider shall be free of charge and shall not be omitted from the relevant Measurement Results without the approval of the Commission.

6. Reporting Periods

24. Every Reporting Period shall last three (3) months, from the first day of the first month to the last day of the third month, unless the Commission determines otherwise. The Commission may make Reporting Periods be smaller than this if it considers that quality is likely to differ significantly over smaller periods. It may make Reporting Periods be larger than this if it considers that quality is unlikely to differ significantly over larger periods.

25. Two Services shall have Reporting Periods that start in the same months if both of them are classified as Mobile Access or Fixed Access.

7. Reporting Areas

26. Every Reporting Area shall comprise a governorate, the Rural Portion of a governorate, the Urban Portion of a governorate or, for Services that use Mobile Access, the Transport Portion of a governorate, unless the Commission determines otherwise. The Commission may make Reporting Areas be smaller than these if it considers that quality is likely to differ significantly over smaller areas. It may make Reporting Areas be larger than these if it considers that quality is unlikely to differ significantly over larger areas.

27. For the purpose of collecting System Readings every node in the network of a Participating Provider shall be assigned to the Reporting Area where the Participating Provider expects that most of the users served directly by that node will be. The Participating Provider shall inform the Commission if that Reporting Area is not the one where the node is located.

8. Representative Samples

28. Every Representative Sample shall include Measurements made in every hour of the working day but at most 20% of the Measurements shall be made in any one (1) hour and at most 20% of the Measurements shall be made on any one (1) working day.

29. Every Representative Sample shall include Measurements made in all of the relevant localities in the Reporting Area, except for any omissions approved by the Commission, but at most 50% of the Measurements shall be made in any one (1) locality. The relevant localities are the identified districts in the Rural Portion of a governorate, the identified quarters in an Urban Portion of a governorate or the classified expressways, highways and arterial roads in the Transport Portion of a governorate.

30. Every Representative Sample shall be formed from all of the Measurements that are made in the relevant Reporting Period and Reporting Area, except for any omissions approved by the Commission.

31. The size of a Representative Sample shall be at least 384. For each Indicator defined as a percentage in this Regulation there is then (in certain conditions) a confidence level of 95%, amounting to nineteen (19) chances out of twenty (20), that the true value of the Indicator can be approximated by Measurement Results, in the sense that:

    - The true value of the Indicator is within 1% of Measurement Results that lie between 0% and 1% (or 99% and 100%).
    - The true value of the Indicator is within 2% of Measurement Results that lie between 1% and 4% (or 96% and 99%).
    - The true value of the Indicator is within 3% of Measurement Results that lie between 4% and 10% (or 90% and 96%).
    - The true value of the Indicator is within 4% of Measurement Results that lie between 10% and 20% (or 80% and 90%).
    - The true value of the Indicator is within 5% of Measurement Results that lie between 20% and 50% (or 50% and 80%).

9. Cost recovery

32. Every Participating Provider shall cover its own costs of complying with Regulatory Requirements.

10. Governance

33. Every Participating Provider shall take part actively and constructively in working groups to discuss quality of service requirements, if requested to do so by the Commission.

11. Dispute resolution

34. Every Participating Provider shall make its best endeavours to avoid and resolve any disputes with other Participating Providers and any Measurement Agent.

35. A Participating Provider, or a Measurement Agent, may ask the Commission to investigate and take actions to resolve disputes.

12. Customer awareness

36. Every Participating Provider shall promote awareness among its current and prospective Customers of the Indicators and Targets and of any constraints on the. In addition, for each of its Broadband Services it shall identify either a pair of Downlink and Uplink Data Transfer Rates or an Access Technology, along with any likely constraints on the applicability of the Service.

37. Every Participating Provider shall display in a prominent position on its web site its recent Measurement Results, and any explanatory remarks, with contents and formats approved by the Commission. It shall mark as obsolete any Measurement Results that have been superseded but are still displayed. The subjects of the explanatory remarks may include, but are not limited to:

    - Failures to reach Targets.
    - Deficiencies in Services that are due wholly or partly to other Service Providers.
    - Changes in environmental, financial or operating circumstances that could not have been reasonably foreseen.
    - The times and places where the Measurements were made.
    - Expectations about quality that are appropriate to the pricing of the Services.

38. The Commission may conduct surveys of Customers and reviews of complaints by Customers to investigate how Services are perceived and consider whether quality of service requirements should be changed.

39. The Commission may display in a prominent position on its web site, and publicise through the press and broadcasters, its own Measurement Results, the Measurement Results of Participating Providers, or the outcomes of its surveys and reviews of complaints.

13. Sanctions

40. The Commission may apply the following sanctions if a Participating Provider fails to comply with Regulatory Requirements:

    - Requiring the publication of information about quality with contents and formats determined by the Commission.
    - Requiring the submission and implementation of plans to improve Services.
    - Requiring the payment of credits or rebates to Customers.
    - Any remedial or enforcement measures identified in the relevant Licence.

41. When applying sanctions to a Participating Provider that fails to comply with Regulatory Requirements the Commission will take into account the following factors:

    - The extent to which the sanctions can be expected to improve the choice, price or quality of Services.
    - The numbers and natures of the Services, Reporting Periods, Reporting Areas, Indicators and Targets for which there are failings.
    - Any effects of the failings on Customers or other Participating Providers.
    - The extent to which the failings are due wholly or partly to other Service Providers.
    - The environmental, financial and operating circumstances of the Participating Provider.
    - The extent of competition with the Participating Provider.
    - Any credits or rebates that have been provided by the Participating Provider to Customers in compensation for the failings.
    - The extent to which the Participating Provider has complied with Regulatory Requirements in the past.

- Whether the Participating Provider has been designated by the Commission as having Significant Market Power in the market for the relevant Services.
- The numbers and natures of the sanctions that the Commission applied on earlier occasions when there were failings.

42. The Commission will not apply sanctions to a Participating Provider in any of the following circumstances:
    - The Participating Provider fails to comply with Regulatory Requirements owing to events that it could not control and could not have reasonably foreseen.
    - The Participating Provider fails to reach Targets but has not been designated by the Commission as having Significant Market Power in the market for the relevant Retail Services.
    - The Participating Provider fails to make Measurements that the Commission had undertaken to make on its behalf.
    - The Participating Provider fails to meet roll-out commitments before this Regulation comes into force but the failings are apparent only because of statements in this Regulation about how coverage is to be measured.

14. Indicators and Targets

Indicator	Target	Measurement Result	Measurement Method
Service supply time		The percentage of relevant service orders fulfilled in 20 working days	This is related closely to ETSI EG 202 057-1§5.1. It is applicable to Fixed Access. The following Measurement Domains are distinguished from each other: • Telephony. • Broadband. • Leased Line Transmission. The Reporting Areas are the Rural Portion and the Urban Portion of the individual governorates. A service order may be submitted in writing, by phone or at a customer service centre. It is relevant unless the Service Provider does not supply the Service in the locality of the Customer. The time taken to fulfil a relevant service order is measured from when the service order is accepted by the Service Provider to when the Service is available in normal working order for use by the Customer. The service orders contributing to the Measurement Result are those relevant ones that according to System Readings are fulfilled in the Reporting Area during the Reporting Period. The Measurement Result is the number of such service orders that are fulfilled in at most 20 working days each divided by the number of relevant service orders. It, and the number of relevant service orders, are reported separately for each Measurement Domain in each Reporting Area. Service orders that are to be fulfilled at multiple times or places are counted as multiple service orders.

Indicator	Target	Measurement Result	Measurement Method
Fault report ratio	<5% per quarter	The percentage of relevant fault reports submitted per Customer	This is related closely to ETSI EG 202 057-1§5.4. It is applicable to Fixed Access. The following Measurement Domains are distinguished from each other: • Telephony. • Broadband. • Leased line transmission. The Reporting Areas are the Rural Portion and the Urban Portion of the individual governorates. A fault report may be submitted in writing, by phone or at a customer service centre. It is relevant unless at least one of the following holds: • It is really a service order. • It is really a service complaint. • It is solely about faults that have been reported already by the same Customer. • It is solely about faults that are not found when tested. • It is solely about equipment that is not supplied, connected or maintained by the Service Provider. • It is solely about faults that have arisen during, and because of, maintenance operations about which the Customer has been given due notice. • It is solely about faults that have arisen because of a duly declared state of emergency. The fault reports contributing to the Measurement Result are those relevant ones that according to System Readings are submitted in the Reporting Area during the Reporting Period. The Measurement Result is the number of such fault reports divided by the number of Customers in the Reporting Area at the end of the Reporting Period. It, and the number of Customers in the Reporting Area at the end of the Reporting Period, are reported separately for each Measurement Domain in each Reporting Area. Fault reports about multiple paths are counted as multiple fault reports.

Indicator	Target	Measurement Result	Measurement Method
Fault repair time		The percentage of faults cleared in 24 hours	This is related closely to ETSI EG 202 057-1§5.5. It is applicable to Fixed Access. The following Measurement Domains are distinguished from each other: • Telephony. • Broadband. • Leased line transmission. The Reporting Areas are the Rural Portion and the Urban Portion of the individual governorates. The time taken to clear a fault is measured from when the fault is recognised to exist by the Service Provider to when the Service is restored to normal working order for use by the Customer. The faults contributing to the Measurement Result are those relevant ones that according to System Readings are cleared in the Reporting Area during the Reporting Period. The Measurement Result is the number of such faults that are cleared in at most 24 hours each divided by the number of faults. It, and the number of faults, are reported separately for each Measurement Domain in each Reporting Area.

Indicator	Target	Measurement Result	Measurement Method
Land coverage		The percentage of locations where the received signal is strong enough to provide moderately good support to call setup, call continuation and data transfer	This is applicable to Mobile Access. For each Access Technology there is one Measurement Domain, comprising the Services supported by that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. The Commission may change the definition of 'strong enough'. Unless the Commission does this, a received signal is strong enough at a point where a Measurement of the received signal is made if at least one of the following holds: • The Access Technology is GSM (with its variants GPRS and EDGE) and (a) RSSI>-80 dBm or (b) RSSI>-90 dBm and the point is indoors or (c) RSSI>-90 dBm and the point is moving with a speed of at least 10 km/hour. • The Access Technology is UMTS (with its variants WCDMA and HSPA) and (a) RSCP>-85 dBm or (b) RSCP>-95 dBm and the point is indoors or (c) RSCP>-95 dBm and the point is moving with a speed of at least 10 km/hour. • The Access Technology is LTE (with its variants LTE-A and LTE-U) and (a) RSRP>-95 dBm or (b) RSRP>-105 dBm and the point is indoors or (c) RSRP>-105 dBm and the point is moving with a speed of at least 10 km/hour. The locations contributing to the Measurement Result are all of those where according to Field Tests in the Reporting Area during the Reporting Period the received signal is strong enough. The Measurement Result is the number of such locations divided by the number of locations where Measurements of the received signal are made. It, and the times and places of the Measurements, are reported separately for each Measurement Domain in each Reporting Area.

Indicator	Target	Measurement Result	Measurement Method
Population coverage		The percentage of the population resident in locations where the received signal is strong enough to provide moderately good support to call setup, call continuation and data transfer	This is applicable to Mobile Access. For each Access Technology there is one Measurement Domain, comprising the Services supported by that Access Technology. The Reporting Areas are the Rural Portion and the Urban Portion of the individual governorates. The Measurement Result is the Land Coverage for the Reporting Area multiplied by the proportion of the population resident in that Reporting Area according to the most recent estimates available from the Ministry of Planning Central Statistical Organisation. It is reported separately for each Measurement Domain in each Reporting Area.
Accumulated downtime		The percentage of the Reporting Period in which traffic is affected by unplanned outages in one or more local areas for one or more hours	This is applicable to Mobile Access. For each Access Technology there is one Measurement Domain, comprising the Services supported by that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. An outage is unplanned if it occurs except during, and directly because of, maintenance operations about which there has been due notice. The outages contributing to the Measurement Result are the unplanned ones that according to System Readings could affect traffic to or from at least 500 Customers or 1 base station (whichever is worse) in the Reporting Area for at least 1 continuous hour during the Reporting Period. The Measurement Result is the sum of the times taken by such outages during the Reporting Period divided by the length of the Reporting Period (and truncated to be at most that length). It, and the number of such outages, are reported separately for each Measurement Domain in each Reporting Area. Outages that take overlapping times but affect traffic to or from different groups of Customers or base stations are counted as separate outages, with separate times taken.

Indicator	Target	Measurement Result	Measurement Method
Unsuccessful call setup ratio	<1%	The percentage of attempted calls not set up successfully	This is related closely to ETSI EG 202 057-3§6.4.1. It is applicable to Mobile Access. For each Access Technology there is one Measurement Domain, comprising the Telephony Services supported by that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. A call setup is unsuccessful if, though a valid number is properly dialled following dial tone, the calling user does not receive the called user busy tone, ringing tone or answer signal. The unsuccessful call setups contributing to the Measurement Result are all of those that according to Field Tests in the Reporting Area during the Reporting Period do not succeed within 40 seconds from when the network receives their complete dialled numbers. The Measurement Result is the number of such unsuccessful call setups divided by the number of attempted call setups. It, and the times and places of the Measurements, are reported separately for each Measurement Domain in each Reporting Area. The proportion of test calls directed off-net should be approximately the proportion of “live” traffic going off-net.

Indicator	Target	Measurement Result	Measurement Method
Dropped call ratio	<1%	The percentage of successful calls not continued until ended by a user	This is related closely to ETSI EG 202 057-3§6.4.2. It is applicable to Mobile Access. For each Access Technology there is one Measurement Domain, comprising the Telephony Services supported by that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. A dropped call is a call that after successful setup does not continue until it is ended by a user. The dropped calls contributing to the Measurement Result are all of those that according to Field Tests in the Reporting Area during the Reporting Period do not continue for 120 seconds after successful setup. The Measurement Result is the number of such dropped calls divided by the number of successful call setups. It, and the times and places of the Measurements, are reported separately for each Measurement Domain in each Reporting Area. The proportion of test calls directed off-net should be approximately the proportion of “live” traffic going off-net.
Speech quality	>3.0	The Mean Opinion Score for objective listening quality	This is related closely to ETSI EG 202 057-2§5.3. It is applicable to Mobile Access. For each Access Technology there is one Measurement Domain, comprising the Telephony Services supported by that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. The MOS is estimated from Field Tests performed according to the “double-ended” procedures of ITU P.862 (PESQ) applied in the Reporting Area. The Measurement Result is the MOS. It, and the times and places of the Measurements from which it is constructed, are reported separately for each Measurement Domain in each Reporting Area. The proportion of test calls directed off-net should be approximately the proportion of “live” traffic going off-net.

Indicator	Target	Measurement Result	Measurement Method
Latency	<200 milli-seconds	The mean time in milliseconds taken to complete successful round-trip data transfers, for each remote end point	This is related closely to ETSI TS 102 250-2§6.3.1. It is applicable to Fixed Access and Mobile Access. For each of them and for each pair of Downlink and Uplink Data Transfer Rates or each Access Technology there is one Measurement Domain, comprising the Broadband Services advertised with that pair of Data Transfer Rates or that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. Separate Measurement Results are provided for two remote end points outside Iraq; the choice of remote end points needs to be approved by the Commission. The successful data transfers contributing to the Measurement Result (for a given remote end point) are all of those that according to Field Tests in the Reporting Area during the Reporting Period are completed without error in a certain time period. The Commission may change the time period, the protocol for the data transfer and the payload size for the data packets. Unless the Commission does this, the time period is 2 seconds for a round trip, the protocol is ICMP and the payload size is 32 bytes. The Measurement Result is the sum of the times taken to complete such successful transfers divided by the number of such transfers. It, and the times and places of the Measurements, are reported separately for each remote end point for each Measurement Domain in each Reporting Area.

Indicator	Target	Measurement Result	Measurement Method
Packet loss ratio	<1%	The percentage of round-trip data transfers not completed successfully, for each remote end point	This is applicable to Fixed Access and Mobile Access. For each of them and for each pair of Downlink and Uplink Data Transfer Rates or each Access Technology there is one Measurement Domain, comprising the Broadband Services advertised with that pair of Data Transfer Rates or that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. Separate Measurement Results are provided for two remote end points outside Iraq; the choice of remote end points needs to be approved by the Commission. The unsuccessful data transfers contributing to the Measurement Result (for a given remote end point) are all of those that according to Field Tests in the Reporting Area during the Reporting Period are not completed without error in a certain time period. The Commission may change the time period, the protocol for the data transfer and the payload size for the data packets. Unless the Commission does this, the time period is 2 seconds for a round trip, the protocol is ICMP and the payload size is 32 bytes. The Measurement Result is the number of such unsuccessful data transfers divided by the number of attempted data transfers. It, and the times and places of the Measurements, are reported separately for each remote end point for each Measurement Domain in each Reporting Area.

Indicator	Target	Measurement Result	Measurement Method
Throughput		The mean Downlink and Uplink Data Transfer Rates, for each remote end point	This is related distantly to ETSI TS 102 250-2§6.8.7. It is applicable to Fixed Access and Mobile Access. For each of them and for each pair of Downlink and Uplink Data Transfer Rates or each Access Technology there is one Measurement Domain, comprising the Broadband Services advertised with that pair of Data Transfer Rates or that Access Technology. The Reporting Areas are the Rural Portion, the Urban Portion and the Transport Portion of the individual governorates. Separate Measurement Results are provided for two remote end points outside Iraq; the choice of remote end points needs to be approved by the Commission. The file downloads or uploads contributing to the Measurement Result (for a given remote end point) are all of those that according to Field Tests in the Reporting Area during the Reporting Period are completed without error in a certain time period. The Commission may change the time period, the protocol for the file downloads or uploads and the file sizes. Unless the Commission does this, the time period is 120 seconds, the protocol is HTTP over single TCP connections and the file size is 512,000 bytes. The files are downloaded to check an advertised Downlink Data Transfer Rate and are uploaded to check an advertised Uplink Data Transfer Rate. The Measurement Result is the sum of the sizes of the files downloaded or uploaded divided by the sum of the times taken to download or upload the files. It, and the sum of the times taken to download or upload the files, are reported separately for the Downlink and Uplink for each remote end point for each Measurement Domain in each Reporting Area.

Indicator	Target	Measurement Result	Measurement Method
Service complaint ratio	<1% per quarter for each topic of service complaints	The percentage of relevant service complaints submitted per Customer, for each topic of service complaints	This is related closely to ETSI EG 202 057-1§5.9, ETSI EG 202 057-1§5.11 and ETSI EG 202 057-1§5.12. It is applicable to Fixed Access and Mobile Access. For each of them the following Measurement Domains are distinguished from each other: • Telephony. • Broadband. • Leased Line Transmission. The Reporting Areas are the individual governorates. For each Measurement Domain the following topics of service complaints are distinguished from each other: • Money owed or paid by Customers. • The provision or withdrawal of Services to particular Customers. • The availability of Services at particular times and places. • Other. A service complaint may be submitted in writing, by phone or at a customer service centre. It is relevant unless at least one of the following holds: • It is solely a service order about Services that have not been ordered already. • It is solely a fault report about faults that have not been reported already by the same Customer. • It is solely a request for information. • It is solely a request to end Services. • It is solely about Services of other Service Providers. The service complaints contributing to the Measurement Result for a given topic of service complaints are the relevant ones that according to System Readings are submitted in the Reporting Area during the Reporting Period. The Measurement Result is the number of such service complaints divided by the number of Customers in the Reporting Area at the end of the Reporting Period. It, and the number of Customers in the Reporting Area at the end of the Reporting Period, are reported separately for each topic of service complaints for each Measurement Domain in each Reporting Area. Service complaints about multiple topics are counted as multiple service complaints.

Indicator	Target	Measurement Result	Measurement Method
Service complaint resolution time	>98% for each topic of service complaints	The percentage of relevant service complaints resolved in 20 working days, for each topic of service complaints	This is related closely to ETSI EG 202 057-1§5.10. It is applicable to Fixed Access and Mobile Access. For each of them the following Measurement Domains are distinguished from each other: • Telephony. • Broadband. • Leased Line Transmission. The Reporting Areas are the individual governorates. For each Measurement Domain the following topics of service complaints are distinguished from each other: • Money owed or paid by Customers. • The provision or withdrawal of Services to particular Customers. • The availability of Services at particular times and places. • Other. The time taken to resolve a relevant service complaint is measured from when the service complaint is received by a Service Provider to when the Customer is satisfied with the outcome. The service complaints contributing to the Measurement Result for a given topic of service complaints are the relevant ones that according to System Readings are resolved in the Reporting Area during the Reporting Period. The Measurement Result is the number of such service complaints that are resolved in at most 20 working days divided by the number of relevant service complaints. It, and the number of relevant service complaints, are reported separately for each topic of service complaints for each Measurement Domain for each Reporting Area. Service complaints about multiple topics are counted as multiple service complaints.

REPUBLIC OF IRAQ

COMMUNICATIONS AND MEDIA COMMISSION

WHOLESALE QUALITY OF SERVICE REGULATION

JUNE 2016

Contents

1. Scope

1. Under its founding law, *Order 65*, the Communications and Media Commission (the Commission) is solely responsible for licensing and regulating telecommunications, broadcasting, information services and other media in Iraq, and among its functions is the drafting and implementing of standards and rules for quality of service offered by licensed entities. The intention is to "foster plurality of and competition among Iraq's communications and media services, thereby promoting an informed and culturally diverse citizenship that derives maximum benefit in terms of choice, price and quality".
2. This Regulation adds details to the *Quality Of Service Policy* by defining specific Indicators for Services provided by Service Providers to other Service Providers.

2. Interpretation

3. In any conflict between the *Quality Of Service Policy* and this Regulation this Regulation shall take precedence.
4. In any conflict between the *Interconnection Regulation*, a Reference Service Offer or a Service Agreement and this Regulation this Regulation shall take precedence.
5. The meanings of terms and abbreviations for terms laid down in the *Quality Of Service Policy* apply also in this Regulation.
6. In this Regulation:

   Reference Service Offer means a document in the form of a Service Agreement available as a model approved and published by the Commission.

   Service Agreement means a legal agreement made between Service Providers in order that some of the parties can procure Wholesale Services from others of the parties.

3. Motivation

7. In accordance with its founding law, the Commission intends QOS regulation to improve the choice, price or quality of Services. Specific concerns are to provide information about quality that will help Customers to make choices and to maintain quality when there are too few choices available.
8. Though the primary concerns of QOS regulation relate to Retail Services there are implications for Wholesale Services. Every Service Provider that supports its Retail Services by procuring Wholesale Services, whether for interconnection or for other purposes, shall as far as possible ensure that the quality provided by those Wholesale Services is consistent with the quality required for its Retail Services.
9. The Wholesale Services procured by a Service Provider to support its Retail Services can vary greatly. This Regulation aims not to constrain network design or product development but rather to lay down a framework in which without collusion Service Providers can agree requirements and report failures to meet requirements.

4. Application

10. This Regulation shall come into effect on its date of issue.

5. Measurements

11. Every Participating Provider that seeks to procure Wholesale Services shall:
    - Submit a written request for a Service Agreement to a potential supplier of the Wholesale Services.
    - Copy the written request for a Service Agreement to the Commission.
12. Every Participating Provider that is procuring Wholesale Services shall ensure that the relevant Service Agreement defines:
    - Indicators for the Wholesale Services that enable monitoring of the effects of the Wholesale Services on the values of the Indicators required for its Retail Services.
    - Different Measurement Domains for different Wholesale Services that are likely to have significantly different effects on the values of the Indicators required for its Retail Services.
    - The severities of service degradation that are applicable in the Measurement Domains and that take into account any Targets required for its Retail Services.
13. Every Participating Provider that is procuring Wholesale Services shall send the relevant Service Agreement to the Commission within fourteen (14) calendar days of agreement or any subsequent amendment. The Commission may require revisions to the Service Agreement to ensure compliance with laws and regulations. If it does not require revisions within twenty-one (21) calendar days of receiving the Service Agreement, it is deemed to have approved the Service Agreement.
14. The Commission may require revisions to a Service Agreement to reflect changes in laws and regulations. It will consult the relevant Participating Providers about any proposal for such revisions.
15. From six (6) months after this Regulation comes into effect, in every successive Reporting Period every Participating Provider shall make Measurements of the Indicators for each of its Wholesale Services supplied under a Service Agreement.
16. Every Participating Provider shall ensure that each of its Measurement Results is formed from all of the Measurements made for that Measurement Result in one (1) Measurement Domain, one (1) Reporting Period and one (1) Reporting Area, unless the Commission approves omissions on the grounds of inaccuracy, irrelevance or obsolescence.
17. Every Participating Provider shall ensure that if a Measurement Result depends on sampling data, then the corresponding Measurements form a Representative Sample, unless the Commission approves shortcomings on the grounds of practicality.
18. Within one (1) month after the end of every Reporting Period every Participating Provider shall report to the Commission for every Reporting Area its Measurement Results for that Reporting Period.
19. Every Participating Provider shall make a senior manager responsible for validating, and holding records about, its Measurements. The records shall be held for at least twelve (12) months after the Reporting Period to which they apply and shall include details of the observations and calculations, and any fault reports or service complaints, on which the Measurements depend. The Commission may inspect the records to resolve disputes between Service Providers.

6. Reporting Periods

20. Every Reporting Period shall last three (3) months, from the first day of the first month to the last day of the third month.

7. Reporting Areas

21. Every Reporting Area shall comprise Iraq.

8. Representative Samples

22. Every Representative Sample shall include Measurements made in every hour of the working day but at most 20% of the Measurements shall be made in any one (1) hour and at most 20% of the Measurements shall be made on any one (1) working day.

23. Every Representative Sample shall be formed from all of the Measurements that are made in the relevant Reporting Period and Reporting Area, except for any omissions approved by the Commission.

24. The size of a Representative Sample shall be at least 384. For each Indicator defined as a percentage in this Regulation there is then (in certain conditions) a confidence level of 95%, amounting to nineteen (19) chances out of twenty (20), that the true value of the Indicator can be approximated by Measurement Results, in the sense that:

    - The true value of the Indicator is within 1% of Measurement Results that lie between 0% and 1% (or 99% and 100%).
    - The true value of the Indicator is within 2% of Measurement Results that lie between 1% and 4% (or 96% and 99%).
    - The true value of the Indicator is within 3% of Measurement Results that lie between 4% and 10% (or 90% and 96%).
    - The true value of the Indicator is within 4% of Measurement Results that lie between 10% and 20% (or 80% and 90%).
    - The true value of the Indicator is within 5% of Measurement Results that lie between 20% and 50% (or 50% and 80%).

9. Cost recovery

25. Every Participating Provider shall cover its own costs of complying with Regulatory Requirements.

10. Governance

26. Every Participating Provider shall take part actively and constructively in working groups to discuss quality of service requirements, if requested to do so by the Commission.

11. Dispute resolution

27. A Service Provider may refer a dispute with another Service Provider to the Commission for arbitration, mediation or resolution. The subjects of a dispute may include, but are not limited to:

- Failing to agree a Service Agreement involving a Service Provider that has been designated by the Commission as having Significant Market Power in the market for the relevant Wholesale Services.
- Failing to comply with Regulatory Requirements, the *Interconnection Regulation* or a Service Agreement.

28. Every Service Provider that refers a dispute to the Commission shall have completed beforehand any dispute resolution procedures already in any relevant Service Agreement that has been agreed.

12. Customer awareness

29. The Commission may draw public attention to the Service Agreements that have been agreed. In doing this it may disclose any reported Measurement Results, as well as the contents of the Service Agreements other than pricing information.

13. Sanctions

30. The Commission may apply the following sanctions if a Participating Provider fails to comply with Regulatory Requirements:
    - Requiring the publication of information about quality with contents and formats determined by the Commission.
    - Requiring the submission and implementation of plans to improve Services.
    - Requiring the payment of credits or rebates to Customers.
    - Any remedial or enforcement measures identified in the relevant Licence.
31. When applying sanctions to a Participating Provider that fails to comply with Regulatory Requirements the Commission will take into account the following factors:
    - The extent to which the sanctions can be expected to improve the choice, price or quality of Services.
    - The numbers and natures of the Services, Reporting Periods, Reporting Areas, Indicators and Targets for which there are failings.
    - Any effects of the failings on Customers or other Participating Providers.
    - The extent to which the failings are due wholly or partly to other Service Providers.
    - The financial and operating circumstances of the Participating Provider.
    - The extent of competition with the Participating Provider.
    - Any credits or rebates that have been provided by the Participating Provider to Customers in compensation for the failings.
    - The extent to which the Participating Provider has complied with Regulatory Requirements in the past.
    - Whether the Participating Provider has been designated by the Commission as having Significant Market Power in the market for the relevant Services.
    - The numbers and natures of the sanctions that the Commission applied on earlier occasions when there were failings.

32. The Commission will not apply sanctions to a Participating Provider in any of the following circumstances:

    - The Participating Provider fails to comply with Regulatory Requirements owing to events that it could not control and could not have reasonably foreseen.
    - The Participating Provider fails to reach Targets but has not been designated by the Commission as having Significant Market Power in the market for the relevant Services.

14. Indicators and Targets

Indicator	Target	Measurement Result	Measurement Method
Service supply time	<25 working days for supply needing new physical infrastructure <5 working days for supply not needing new physical infrastructure	The maximum time in working days taken to fulfil service orders, for each variety of service order	This is applicable to all Wholesale Services. The Measurement Domains, which put the Services into classes, are defined in the relevant Service Agreement. The Reporting Area is Iraq. For each Measurement Domain the following varieties of service order are distinguished from each other: • Supply needing new physical infrastructure. • Supply not needing new physical infrastructure. A service order may be submitted in writing. The time taken to fulfil a service order is measured from when the service order is accepted by one Service Provider to when the Service is available in normal working order to the other Service Provider. The Service Provider to whom the service is made available may need to perform acceptance testing. If the service is found not to be in normal working order in the course of that testing the order is regarded as not having been fulfilled. The service orders contributing to the Measurement Result for a given variety of service order are those that according to System Readings are fulfilled during the Reporting Period. The Measurement Result is the maximum time taken to make a fulfil a service order. It, and the number of service orders that are fulfilled, are reported separately for each variety of service order for each Measurement Domain. Service orders that are to be fulfilled at multiple times or places are counted as multiple service orders.

Indicator	Target	Measurement Result	Measurement Method
Feasibility study response time	<15 working days	The maximum time in working days taken to provide considered responses to requests about the feasibility of fulfilling potential service orders	This is applicable to all Wholesale Services, which for its purposes are classed together in one Measurement Domain. The Reporting Area is Iraq. A feasibility study request may be submitted in writing. The time taken to make a considered response to a feasibility study request is measured from when the feasibility study request is made by one Service Provider to when the considered response is issued to the other Service Provider. The feasibility study requests contributing to the Measurement Result are those that according to System Readings receive considered responses during the Reporting Period. The Measurement Result is the maximum time taken to make a considered response to a feasibility study request. It, and the number of feasibility study requests that receive considered responses, are reported separately for each Measurement Domain.
Fault repair time		The maximum time in hours taken to clear faults, for each severity of service degradation	This is applicable to all Wholesale Services. The Measurement Domains, which put the Services into classes, are defined in the relevant Service Agreement. The Reporting Area is Iraq. The severities of service degradation are defined in the relevant Service Agreement. The time taken to clear a fault is measured from when the fault is recognised to exist by the Service Provider providing the Service to when the Service is accepted as being in normal working order by the Service Provider receiving the Service. The faults contributing to the Measurement Result are those that according to System Readings are cleared during the Reporting Period. The Measurement Result is the number of such faults for a given severity of service degradation that are cleared in at most 24 hours each divided by the number of relevant faults. It, and the number of faults, are reported separately for each severity of service degradation for each Measurement Domain.

Indicator	Target	Measurement Result	Measurement Method
Limited availability		The percentage of the Reporting Period in which service is degraded, for each severity of service degradation	This is applicable to all Wholesale Services. The Measurement Domains, which put the Services into classes, are defined in the relevant Service Agreement. The Reporting Area is Iraq. The severities of service degradation are defined in the relevant Service Agreement. The service degradations contributing to the Measurement Result for a given severity of service degradation are those that according to System Readings are apparent during the Reporting Period. The Measurement Result is the sum of the times taken by such service degradations during the Reporting Period divided by the length of the Reporting Period (and truncated to be at most that length). It, and the number of such faults, are reported separately for each severity of service degradation for each Measurement Domain.

REPUBLIC OF IRAQ

COMMUNICATIONS AND MEDIA COMMISSION

QUALITY OF SERVICE SUPPLEMENT

JUNE 2016

1. The current indicators in the 2G Licences:

Indicator	Target	Measurement Result	Measurement Method
Percentage of calls dropped:			
• Coverage			
• Signalling			
Interference			
Percentage of calls blocked due to network congestion:			
TCH			
BCCH/SDCCH			
Call setup success rate (within own network)			
Duration of interruption due to handover			
Paging/ Alerting delay:			
• First page			
• Final attempt			
Billing complaints per 1000 bills issued			

Indicator	Target	Measurement Result	Measurement Method
Percentage of billing complaints resolved within 30 days			
Service Features			
Number of Subscribers	Which is more accurate No. Of active subscribers or No. Of registered HLR?		
Subscribers growth rate			
Subscribers Targets			
Percentage of Subscribers targets achieved			
Mobile phone density per 100 population			
Average Revenue per Subscriber :			
• National Calls			
• Internation al Calls			
Traffic- Cellular to PSTN			
Busy Hour traffic in erlangs			
Average Traffic per Subscriber			

Indicator	Target	Measurement Result	Measurement Method
Traffic- PSTN to Cellular			
Busy Hour traffic in erlangs			
Average Traffic per Subscriber			
Traffic- Cellular to Cellular (In service area)			
Busy Hour traffic in erlangs			
Average Traffic per Subscriber			
Traffic-Cellular to Cellular (between two network)			
Busy Hour traffic in erlangs			
Average Traffic per Subscriber			
Average Airtime usage per subscriber in seconds:			
• For O/G calls			
• For I/C calls			

Indicator	Target	Measurement Result	Measurement Method
Average Call Holding Time in seconds			
For O/G calls			
For I/C calls			
Servability (client's Viewpoint)			
Service Access Delay			
Call Setup Time:			
• Mobile On-Net			
• Mobile Off-Net			
• Mobile-PSTN			
Time to invoke or change a supplementary service			
Hand over success rate:			
• Percentage HO failure coverage related			
• Percentage HO failure quality related			

Indicator	Target	Measurement Result	Measurement Method
• Percentage HO signaling related			
Mobile to Mobile Call Completion Ratio			
• On-Net			
• Off-Net			
Land to Mobile Call Completion Ratio			
Cellular To Land Call Completion Ratio			
Service Retainability			
Number of incidents of service failures affecting one or more Local Areas			
Accumulated down time of service failures			
Intra-network congestion Voice quality:			

Indicator	Target	Measurement Result	Measurement Method
• One way Transmission			
• Faint Transmission			
• Clipping Speech			
• Noisy			
Service Support			
Customer Waiting list, if any			
Longest Waiting Period			
Percentage of complaints received for provision/ withdrawal of telecom services			
Percentage of complaints redressed within 3 days			
Billing Performance			
Collections Center Distance Urban areas (km)			
Collections Center Distance Rural areas (km)			

Indicator	Target	Measurement Result	Measurement Method
Period of restoration of disconnection after resolution of complaint cause			
Period of all refunds/ payments to customers from the date of decision			
Grant of appointments within 3 days			
Customer Grievances Redress Mechanism			
Customer Service Centers:			
• Number per City			
• Number per Governorate			
Total Number of cases received in the Customer Service Centers			

Indicator	Target	Measurement Result	Measurement Method
Percentage age of cases resolved within one month			
Service Performance			
Cases referred to court or CMC authority			
Efficiency rate of Customer services			
Access to information:			
• Bills			
• Commercial services			
• Complaints			
• General queries			
Maintainability Mean Time to Reconnect (Resume Service):			
• MTTR (Urban)			
• MTTR (Rural)			

Indicator	Target	Measurement Result	Measurement Method
• Faults cleared within 24 hours			
• Faults not cleared beyond 3 days			

2. Some possible indicators for the 3G Services:

Indicator	Target	Measurement Result	Measurement Method
Call Setup Success Rate, CS			
Call Setup Success Rate, PS (R99)			
Call Setup Success Rate, PS (HSPA)			
Video Call Success Rate, CS			
Drop Call Rate, CS			
Drop Call Rate, PS (R99)			

Indicator	Target	Measurement Result	Measurement Method
Drop Call Rate, PS (HSPA)			
Video Drop Call Rate, CS			
Ho Success Rate (3G to 2G) / Inter RAT, CS			
Ho Success Rate (3G to 2G) / Inter RAT, PS			
Ho Success Rate (2G to 3G)			
Soft Handover Success Rate			
RRC Establishment Success Rate			
RAB Establishment Success Rate, CS			
RAB Establishment Success Rate, PS			

Indicator	Target	Measurement Result	Measurement Method
RRC Congestion Rate			
RAB Congestion Rate, CS			
RAB Congestion Rate, PS			
Multi RAB Performance			
DL WCDMA Throughput / User			
UL WCDMA Throughput / User			
DL HSDPA Throughput / User			
UL HSDPA Throughput / User			
DL HSUPA Throughput / User			
UL HSUPA Throughput / User			
MMS Success Rate			

Indicator	Target	Measurement Result	Measurement Method
MMS delivery time <40 seconds			
WAP Failure Rate			
WAP Session Establishment Elapsed Time <13 seconds			

3. KPIs for Core Network Design:

Indicator	Target	Measurement Result	Measurement Method
Erlangs Per Subscriber			
Average Call Holding Time			
Mobile Originated (MO) traffic percentage			
Mobile Terminated (MT) traffic percentage			
Mobile to Mobile (MMO) traffic percentage within own network			
Traffic from Mobile to the PSTN			
Traffic from Mobile to other PLMN			
Traffic from Mobile to PABX			
SMS incoming per Subscriber			
SMS outgoing per Subscriber			
Successful call percentage (completed calls)			
Answered Origination			
Answered Termination			
Answered International			
Prepaid Percentage			
Location updates per Subscriber			

Handovers per Subscriber			
Active subscribers			
Blocking			
Availability			
Grade of service			
Service life of equipment			
Bit error ratio (data, bits and elements transfer)			
Bit rate (data, bits and elements transfer)			
Downtime / Time out of service			
Call completion ratio			
Average call length			
Analysis of ASR routes			
Network traffic congestion			
Idle time on network			
Dropped calls			