

Reference Interconnection Offer

OSERVICE SCHEDULES

Schedule	Interconnection Service
1	General – Interconnection Links and Co-location for Point of Interconnection
1A	In-Span Interconnection
1B	Customer-Sited Interconnection
1C	Co-location for Point of Interconnection
2	Mobile Services (Voice, SMS)
3	Fixed Voice Termination
4	Emergency and Special Call

Schedule 2

Mobile Voice and SMS



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Service Description

1.1 General

This Schedule 2 is a reciprocal Schedule and describes mutual Services. In this Schedule 2, the **Supplier** means the Party supplying a Service, and the **Acquirer** means the Party acquiring a Service. For the avoidance of doubt, in this Schedule 2, MPT shall be in the position of the Supplier for Services provided to the Requesting Licensee and shall be in the position of the Acquirer for Services acquired from the Requesting Licensee and the Requesting Licensee shall be in the position of the Supplier for Services provided to MPT and shall be in the position of the Acquirer for Services acquired from MPT. This section provides a detailed description of the Mobile Voice, SMS and MMS Interconnection services provided by the Supplier:

- a) Mobile Voice: Termination Service
- b) Mobile Voice: Transit Service (only for redundancy)
- c) Mobile SMS: Termination Service

1.2 Mobile Voice Termination Service

- a) Mobile Voice Termination Service refers to the conveyance of a Voice Call from the Acquirer's Mobile Network, through a Supplier Mobile Switching Centre for termination of the Call at a Subscriber directly connected to the Supplier's Mobile Network (Called Party).
- b) The service is limited to conveyance of Traffic that both originates and terminates in Myanmar.

1.3 Mobile Voice Transit Service (only for redundancy)

- a) Mobile Voice Service Transit Service refers to the conveyance of a Voice Call from the Acquirer's Mobile Network to Third Party Networks which are interconnected to the Supplier's Mobile Network, and vice-versa.
- b) Although direct interconnection among operators is expected, however for redundancy purposes, mobile transit service can be implemented, provided that traffic load is manageable.



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- c) The Acquirer and Third Party are expected to have formed a separate agreement between them. The Supplier does not execute any mediation or billing of termination fees, but invoices only the transit fee to the Operator. The Service does not include the termination charges incurred by the Third Operator.

1.4 SMS Termination Service

- a) Mobile SMS Termination Service refers to the conveyance of an SMS handed over from the Acquirer's Mobile Network for delivery to the termination of the SMS, at a Subscriber directly connected to the Supplier's Mobile Network.
- b) The Supplier and the Acquirer shall connect and maintain the connection of their Networks to each other for the purpose of sending and receiving SMS.
- c) The Supplier is willing to ensure that adequate signalling capacity is provisioned to accommodate the SMS traffic.



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2. TERMS AND CONDITIONS – MOBILE VOICE TERMINATION AND TRANSIT

2.1 Handover of Calls

- a) Calls or SMS handed over from the Acquirer Mobile Network designated to be terminated at a Mobile Network Termination Point in the Supplier Network shall be handed over at the POI closest to where the Call is originated.
- b) The Party from which Network the Call originates (Originating Party) must transmit the line, information and/or control signals in the appropriate format that relates to the establishment of the Call to the Network of the other Party (Terminating Party).
- c) The Originating Party will ensure the transparent communication of all signalling (including CLI-related) information to the Terminating Party. MPT will establish within two years after signing this Reference Interconnection Offer the technical capabilities to ensure the transparent communication of all signalling.
- d) During the term of this RIO Agreement, the parties shall cooperate to investigate any suspected actual or threatened illegal use by an End User of any technical measure that prevents the Supplier from identifying that a Call terminated on the Supplier's Network originated from a Network other than the Supplier's Network (e.g., a 'SIM box' or similar device). Following these investigations, if the parties identify that there has been an actual or threatened illegal use by an End User of such a device, the parties shall use their reasonable efforts to prevent or terminate that illegal use or future illegal uses of that device.

2.2 Numbering

- a) The Acquirer shall ensure that sufficient and correct numbering information is sent from one Network to the other for correct delivery of an Interconnected Call by the Supplier.
- b) The Acquirer shall convey to the Supplier telephone numbers in the national and international formats as contained in the National Numbering Plan issued by the Supplier and as specified in ITU-T Recommendation E.164.

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- c) The Acquirer shall adopt and comply with the numbering system and number format as specified in the Supplier's National Numbering Plan, available to the Acquirer upon Request.

2.3 Provision of Tones and Network announcements

- a) In a manner and timetable agreed between the parties, each party will support signalling (the delivery of which is free of charge) to terminate the relevant call at the signalling level. The content of the release signal should wherever possible indicate the accurate reason for the termination.
- b) If, notwithstanding the availability of signalling to terminate the relevant call, the Acquirer may still request the Supplier to divert the call to tones or announcements and the Supplier may agree if it chooses and is able to do so.

2.4 Echo control

Echo control will be provided in accordance with the agreed procedure.

2.5 Signalling Interconnection

- a) The signalling systems interconnection between the Supplier and the Acquirer shall be based, where relevant, on the ITU-T SS7 protocols, ISUP or other protocols to be agreed upon between the Acquirer and the Supplier.
- b) The Telephone Calls will be handed over to the Supplier at the relevant Point of Interconnection with information signals provided in the associated signalling system.
- c) IP interconnection is to be discussed and agreed between the parties.

2.6 Provision of CLI

- a) The Call Line Identification (CLI) shall be passed between the Supplier and the Acquirer's Networks for all Calls for which the Mobile Voice Termination Services are provided.
- b) If either the Supplier or the Acquirer's Network requests CLI from the other Party, the Originating Network shall generate and convey CLI to the extent that it has such capability.

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- c) Calls with incorrect or altered CLI may be rejected by either party.

2.7 Nature of Switch ports

- a) Telephone Calls will be delivered to the Supplier via a Path connected to Ports at a Point of Interconnection.
- b) The Switch ports will operate in accordance with the agreed technical specifications and procedures.

2.8 Send and receive speech level

The send and receive levels for speech will be in accordance with those agreed by the Parties.

2.9 Calling number display

The parties will comply with the provisions relating to calling number display as agreed upon.

2.10 Interconnection using IP

Any technical specification, detail or procedure on interconnection using IP, including testing procedures, must be agreed by both parties and included in the Network Plan.

2.11 Customer Registration, Billing and Debt

- a) The Acquirer is responsible for customer registration, customer billing and collection of bad debts from customers in respect of the provision of telecommunications services to its customers using the Call Transit and Termination services.
- b) Both Parties are to look at the downstream billing requirements to cater for the settlement between the Parties. Both Parties have to ensure that the agreed arrangements for Customer and operator Billing and settlement can be implemented and establish timetables for their implementation.

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3. TERMS AND CONDITIONS – SMS TERMINATION

3.1 Service Limitations

- a) The SMS Terminating Access Service is limited to a message length of 160 characters.
- b) In the case of SMS Messages exchanged between GSM Networks, MAP version 2 and above protocol must be supported. Higher versions of the MAP protocol will require an update to this Service Description.
- c) In the case of SMS Messages to be exchanged between:
 - i) a GSM Network and a Mobile Network which is not a GSM Network; and
 - ii) two Mobile Networks both of which are not GSM Networks,
 - iii) the parties shall agree on the appropriate technical standards, having regard to relevant international standards
- d) SMS Messages must be sent from the Messaging Party's SMS controller to allow party billing.
- e) The Supplier may review and amend this Service Description prior to the introduction of mobile number portability.

3.2 Numbering

The SMS Terminating Access Service requires that the address of both the Messaging Party and the Messaged Party are within the agreed number ranges.

3.3 Signalling

Where SMS Terminating Access Service is provided, the transfer of signals to support the establishment and maintenance of the SMS Message will be via GSM MAP using CCS7 signalling protocol, or MAP phase 2+, or other agreed standard.

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3.4 Maximum SMS Traffic Flow

The Acquirer must give the Supplier at least one (1) month before the start of each calendar quarter, a forecast on a month by month basis of its expected requirements for SMS, subject to the following conditions:

- a) unless otherwise agreed as part of settling a Forecast, the maximum SMS capacity being sent by the Acquirer using the Terminating Access Service (the Maximum Capacity) shall be as described in the Network Plan.
- b) If the traffic level exceeds the Maximum Capacity, the SMS Terminating Access Service may be managed by the Supplier at the level of the Maximum Capacity until the source of excess traffic has been reduced or other arrangements are put in place to manage the overload traffic.

3.5 Unsolicited SMS

- a) The parties acknowledge that spamming and other unsolicited SMS Messages sent by the Acquirer Customers may cause disruptions to the services provided to and received by the Supplier Customers.
- b) Each party agrees to liaise with the other party in good faith in order to manage such disruptions where commercially and technically feasible.

3.6 Priority and Retry

- a) Each party shall deliver SMS Messages from the other party's SMS controllers with equal priority and urgency as those originating from within its own network.
- b) Each party shall use the same retry algorithms as are used for SMS Messages which originate and terminate within its own network. Further technical details on retry algorithms may be described in the Network Plan.

3.7 Reply Path

Each party must ensure that replies to SMS Messages are sent via the replying customer's default SMS controller rather than the originating customer's SMS controller. This can be achieved by ensuring the TP-RP bit is cleared in the SMS message sent to the Messaged Party's mobile handset.

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3.8 Protocol upgrades

Before a party upgrades to a later version of the GSM MAP CCS7 signalling protocol, the party seeking the upgrade must:

- a) give not less than sixty (60) Business Days prior written notice (or such other period of time as may be agreed between the parties in writing) of that upgrade to the other party;
- b) arrange and complete testing of the upgrade with the other party to ensure interconnect compatibility no less than thirty (30) days before the upgrade is implemented; and
- c) ensure that all software associated with the upgrade is compatible with the existing version of the CCS7 signalling protocol.

3.9 Interconnection using IP

As soon as practicable after the SMS Interconnect System between the parties has been upgraded to exchange SMS by means of each party's Signal Transfer Point (STP), each party shall test the capacity at its end in accordance with agreed procedures and shall provide the other party with a copy of the results to show that its parts of the SMS Interconnect System comply with agreed Interconnect Specifications.

3.10 Any technical specification, detail or procedure on interconnection using IP, including testing procedures, must be discussed and agreed by both parties. Customer billing

- a) The Acquirer is responsible for billing the Messaging Party from whom a SMS Message originates, for the end-to-end SMS Message Delivered provided utilising the SMS Terminating Service.
- b) Charging arrangements shall be agreed by the Joint Interconnection Committee and included in the Network Plan for SMS messages delivered under a roaming arrangement both to end-users within Myanmar and to those receiving service in other countries.



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4. TECHNICAL SPECIFICATIONS

Technical specifications will be set out in the Network Plan

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5. OPERATING PROCEDURES – MOBILE VOICE

5.1 Number level activation

To prepare for new number level activation, the following activities will be performed in the following order:

	Activity	Details
1	Notify the Supplier	<ul style="list-style-type: none"> The Acquirer informs the Supplier two (2) weeks in advance of any new Number Level Activations, including information such as numbers to be activated, date of activation and routing plan
2	Arrange for number level activation to occur	<ul style="list-style-type: none"> If number level activation cannot be performed on requested date, the Supplier will inform other operator within five (5) Business Days, indicating the reason and will suggest an alternative date on which the activation will occur

5.2 New Call Type

a) To prepare for new call type, the following activities will be performed in the following order:

	Activity	Details
1	Notify the Supplier	<ul style="list-style-type: none"> The Acquirer informs the Supplier of its request to extend the use of the Call Termination Service to a particular Call Type
2	Assess request	<ul style="list-style-type: none"> The Supplier shall assess that request and notify the Acquirer within five (5) Business Days
3	Negotiate requirements and timetable	<ul style="list-style-type: none"> If implementation of the request involves only Network Conditioning in the Supplier's Network, Negotiation Period shall be fifteen (15) Business Days (exclude negotiation time with PTD); or If implementation of the request involves work in addition to or as an alternative to Network Conditioning in the Supplier's Network, in which case the Negotiation Period shall be sixty (60) Business Days (exclude negotiation time with PTD)
4	Implement	<ul style="list-style-type: none"> The Acquirer shall be liable for the costs incurred by the Supplier in processing and implementing the Acquirer's request to extend the use of the Call Termination Service to a particular Call Type If additional cost beyond normal cost incurred in provisioning of termination service, the Supplier shall notify the other operator within 5 Business Days and seek agreement to continue. (The Acquirer will be liable for all additional cost)



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- b) A draft form for call type request is attached in Annex.

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6. OPERATING PROCEDURES – SMS

To handle the SMS delivery, the following activities will be performed in the following order:

	Activity
1	The Acquirer to send forecast to the Supplier at least one month before the start of each calendar quarter, a forecast on a month by month basis of its expected requirements for SMS
2	SMS Messages originating from the Messaging Party will be received by the Acquirer's designated SMS controller
3	The Acquirer's SMS controller queries the Supplier's home location register (HLR), via CCS7 MAP
4	The Acquirer's SMS controller forwards the SMS Message, via CCS7 MAP and over the SMS Interconnect Link, to the Supplier's mobile switching centre visitor location register (VLR);
5	The Supplier's mobile switching centre VLR delivers the SMS Message to the mobile handset used by the Supplier's Customer.
6	Develop and document a SMS signalling traffic management and control plan

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7. COMMERCIAL TERMS AND CHARGES

7.1 Charging Principle

- a) All operators shall adhere to symmetric rates / principle between operators for mobile termination rate, mobile transit rate and SMS termination rate. Tariffs set out in this schedule should also be the tariffs that other telecoms operators must offer to MPT.
- b) Charging principles for SMS is also based on uniform rate which is easy to implement.
- c) Charging principles for Mobile Voice termination and transit is also based on differentiating between Peak and Off-peak hours. Differentiating between peak and off-peak hours can help to relieve congestion during peak hours. Peak hours are from 8am until 6pm; Off-peak hours are from 6pm until 8am.

7.2 Charges (Recurring)

Table A: Mobile Voice Termination Charges

- a) Charges are stated in minutes, however, actual charges will be on per 6 seconds basis. The parties shall bill on a per 1 second basis by the end of the period that is 2 years after the date of this RIO Agreement.
- b) Charges on per 6 seconds basis will be round to nearest whole number. Rounding to the nearest whole number shall be done at the time of issuing a monthly invoice and not on a per call basis.

Type of Charge	(Tariffs) MMK		
	2014	2015	2016
Peak hours (Per Minute)	20	20	20
Off – Peak hours (Per Minute)	15	15	15

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Table B: Mobile Voice Transit Charges

- a) Charges are stated in minutes, however, actual charges will be on per 6 seconds basis. The parties shall bill on a per 1 second basis by the end of the period that is 2 years after the date of this RIO Agreement.
- b) Charges on per 6 seconds basis will be round to nearest whole number. Rounding to the nearest whole number shall be done at the time of issuing a monthly invoice and not on a per call basis.

Type of Charge	(Tariffs) MMK		
	2014	2015	2016
Peak hours (Per Minute)	11	11	10
Off – Peak hours (Per Minute)	9	9	8

Table C: Mobile SMS Termination Charges

Type of Charge	Tariffs (MMK)		
	2014	2015	2016
SMS Termination (Per SMS)	7	7	7

7.3 Billing Calculations

- a) The agreed unit for calculating the charges is stated in the respective table.
- b) The per-minute rate for Call charges for Mobile Voice Services is based on the duration of use of the circuit or use of IP resources in the case of SIP calls. The Call Duration in terms of the of use of the circuit or resources starts at the time the circuit used for the Mobile Voice Call is seized, or at the time the ANM (Answer) SIP message is sent by the called network, and ends at the time the circuit is released, or when the BYE (Goodbye) SIP message is sent by the calling or called network. All Mobile Voice Calls



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that are successfully connected are chargeable. Mobile Voice Calls that are not successfully connected shall not be chargeable.

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8. SERVICE LEVELS

8.1 Service Criteria – Call Availability

Service level for Mobile Voice Termination Service will be based on Call Availability per month as follows:

Measurement And Frequency Of Measurement
<p>Call Availability = ((Total Call Attempts – Total Call Releases With Causes Marked As Network Fault) / Total Call Attempts) * 100%</p> <p>Where Release causes marked as network faults are the following causes specified in ITU-T rec. Q.850:</p> <ul style="list-style-type: none"> a) * no circuit/channel available b) * network out of order c) * temporary failure d) * switching equipment congestion e) * access information discarded f) * requested circuit/channel not available g) * resource unavailable, unspecified h) * bearer capability not presently available i) * protocol error, unspecified j) * interworking, unspecified. <p>Excluding downtime in any month during which the Service is not available due to any of the following:</p> <ul style="list-style-type: none"> a) Force Majeure b) Failure of the Acquirer’s equipment c) Act or omission of the Acquirer d) Planned maintenance e) Permitted suspension by the Supplier of the Service

8.2 Service Level Target

The Supplier shall target Call Availability Service Level for Mobile Voice Termination Service according to the following table. Call Availability Service Level Targets shall reflect QoS regulation as directed by the PTD.

Applicable service level	From date of this RIO Agreement until the end of one year after the date of this RIO Agreement (Service Level Year 1)	For one year from end of Service Level Year 1 (Service Level Year 2)	For one year from the end of Service Level Year 2
Call Availability	80%	85%	90%



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8.3 Rebate for Service Level Failure

Where the Supplier fails to achieve the Service Levels specified above in any month of the term, the Acquirer shall be entitled to a refund of 50,000,000 MMK of the applicable fee in this month.

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9. ANNEX – CALL TYPE REQUEST FORM

The form below is to be modified for use between the Supplier and the Acquirer

1. GENERAL

1.1 Call Type Name and Description

The Acquirer is to provide a general description of Call Type.

1.2 Date to be Introduced (Proposal)

The Acquirer is to indicate the preferred implementation date for access to be available.

2. CALL ORIGINS

The Acquirer is to indicate which Call origins (e.g. types of Calling subscribers) from its Network the Call Type is required from and which origins from its Network the Call Type is not required from (e.g. Acquirer international incoming Calls, Acquirer operator Calls; Acquirer PSTN/ISDN Calls).

3. NETWORK CONFIGURATION

3.1 Network Configuration/Routing Information

The Acquirer is to indicate the Network configuration (with a diagram) through which the Call Type is to be conveyed.

3.2 Trunk Group (Circuit Assignment)

The Acquirer is to indicate how traffic to the Call Type will be routed, as well as which Trunk Groups are to be used at the IGSs and SGSs.

3.3 Other Engineering Requirements

The Acquirer may list down other requirements required for the Call Type, such as routing of traffic to mass Calls on choked circuits.

4. SIGNALING

The Acquirer is to provide details on the signaling requirements upon which Call Type is to be delivered in line with the conditions of the RIO.

5. TESTING

Testing requirements are to be defined in line with the RIO.

6. BILLING AND CHARGING REQUIREMENT

Billing and charging requirements are to be defined in line with the RIO

6.1 Customer Billing

The Acquirer is to specify which Party is to bill the customer and how settlement is to occur.

6.2 Operator Billing

The Acquirer is to indicate how inter-operator Billing and settlement is to occur.



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7. OTHER REQUIREMENTS

The Acquirer may state requests for any other requirements for Call Type to be delivered.



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