

 Eskom	Standard	Technology
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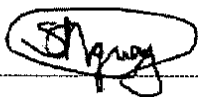
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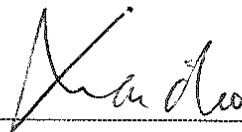


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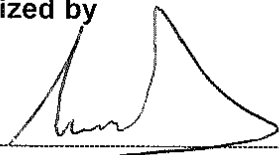


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1. Introduction

It has been determined by the Eskom national blackout workgroup that it is necessary for Eskom to deploy a backup communications system to mitigate the risk involved with the current terrestrial network, during a disaster situation. The backup communication system cannot rely on the current Eskom Telecommunications (ET) infrastructure or any terrestrial network devices, and hence a requirement for a satellite communication system for voice and data has been raised.

The satellite voice communication system shall provide communication from any location in the country to any other Eskom sites required in an emergency situation. This specification is meant for tendering for telephony services to facilitate emergency preparedness only, as discussed in 240-81329052 Eskom Voice and Videocon Communication Services Classification Standard.

2. Supporting clauses

2.1 Scope

This document contains the functional specification for a satellite system that can provide a permanent means of communication for Eskom's emergency and disaster recovery responders, and field staff between each other as well as to Eskom's control centres using public or private satellite networks. This specification covers the functional, operational and performance requirements of the required solution, as well as the environmental conditions in which it is required to perform.

2.1.1 Purpose

The purpose of this specification is to provide the requirements for the supply of a satellite-based communication solution for communication between emergency responders and field staff, as well as Eskom control centres.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions.

2.2 Normative/informative references

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] 240-81329052 Eskom Voice and Videocon Communication Services Classification Standard.
- [2] 240-135089195 Generic Technical Requirements for Eskom Telecoms Contracts

2.2.2 Informative

- [3] 240-55863502 Cybersecurity Standard for Operational Technology.

2.3 Definitions

2.3.1 General

Definition	Description
Availability	Availability refers to the percentage of time, measured over a predefined period (e.g. one month), that the telecommunications system reliably transmits and receives information. Information is deemed to be reliability transmitted when predetermined error performance objectives, such as BER are exceeded. Mathematically, availability can be expressed as Service uptime/ Reporting period x 100%
Bit Error Rate (BER)	A telecoms performance parameter that indicates the number of erroneous bits in a data transmission as a ratio to the total number of data bits transmitted or received. BER is usually expressed as a coefficient and a power of 10, e.g. 1 error in 1000 bits is expressed as 1×10^{-3} .
Latency	The delay experienced between, when an audio signal enters and when it emerges from a system.
Mean Opinion Score	Used in telephony networks to obtain the users view of the quality of the network and is rated on a scale from 1-5, where 5 provides excellent quality.
Site	A site is a location where Eskom conducts its business from, dispersed across the country in the form of offices, boardrooms, control rooms, substations etc.
Transceiver	A transceiver is a combination of a transmitter/receiver in a single package. The term applies to wireless communications devices.

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Description
ATP	Acceptance Test Procedure
BER	Bit Error Rate
ERCC	Emergency Response Command Centre
ET	Eskom Telecommunications
ICASA	Independent Communications Authority of South Africa
IP	Internet Protocol
MTBF	Mean Time Between Failures
OEM	Original Equipment Manufacturer
PSTN	Public Switched Telephone Network
RF	Radio Frequency
SMS	Short Message Service
SADC	South African Development Community
VoIP	Voice Over Internet Protocol

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2.5 Roles and responsibilities

Not Applicable

2.6 Process for monitoring

Not Applicable

2.7 Related/supporting documents

Not applicable

3. Requirements

3.1 System Requirements

This document details the system requirements of the emergency satellite communications system for Eskom, required for Emergency Response Command Centre (ERCC) declared emergencies and disasters as discussed in 240-81329052 Eskom Voice and Videocon Communication Services Classification Standard. This communication is required between identified Eskom sites, with a capability of breaking out to the Public Switched Telephone Network (PSTN) and cellular networks, using a satellite hub located outside the borders of South African Development Community (SADC).

The satellite communication system must take on the high-level architecture shown in Figure 1 below. In addition to this specification, the supplier is required to comply with requirements stated in 240-135089195 Generic Technical Requirements for Eskom Telecoms Contracts.

3.1.1 Minimum System Requirements

- a) The system is required to support a maximum of 200 sites. Supplier to state limitations. (M)
- b) The system is required to support up to 8 handsets per site. Supplier to state limitations. (M)
- c) The system is required to support up to 8 simultaneous voice connections per site. Supplier to state limitations. (M)
- d) The system is required to support up to 8 simultaneous data connections per site. Supplier to state limitations. (I)

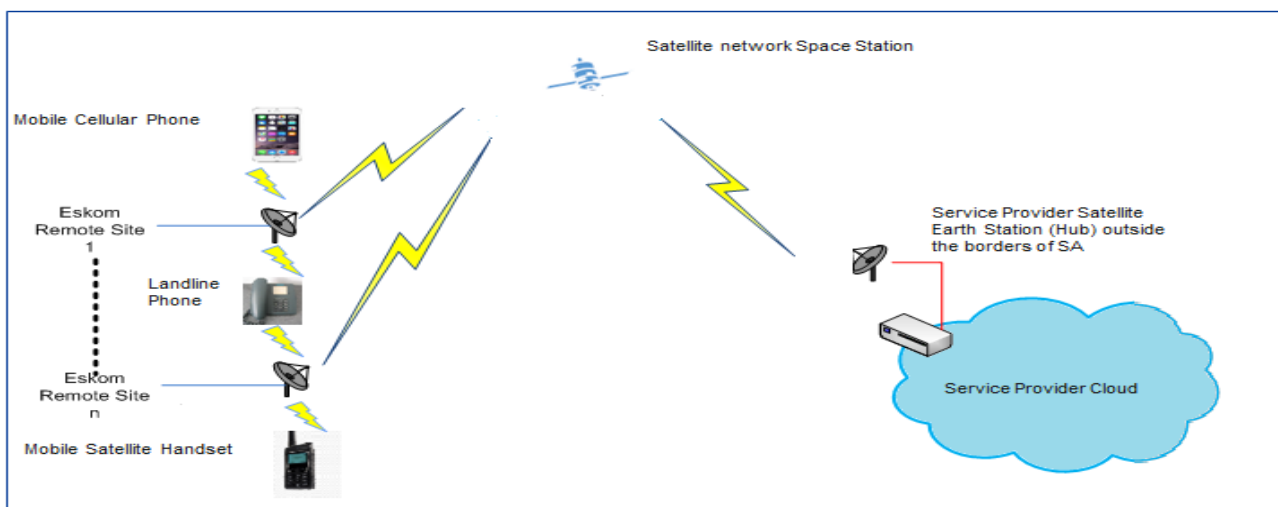


Figure 1: Emergency Satellite Communication Architecture

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The general requirements of the satellite communication system are detailed below.

3.1.2 Generic Functional Requirements

- a) The system shall provide standalone communication independent of the ET network and any other terrestrial based infrastructure within South African Development Community (SADC). (M)
- b) The system must support voice and data communications. Supplier to state voice capabilities (e.g. VOIP/analogue interface etc. (M)
- c) The system must support two way communications between local mobile cellular networks, public switched telephone networks (PSTN) and other satellite networks. (M)
- d) The supplier shall state which cellular services are supported (e.g. GPRS, 3G, LTE etc). (M)
- e) The satellite system must support both indoor and outdoor communications. Supplier shall state any limitations and/or measures required to facilitate this. (M)
- f) The supplier shall specify voice services available with the system. As a minimum, technical details shall be provided for:
 - 1) Calling ID, Caller ID and suppression of Caller ID (M)
 - 2) Call Waiting (M)
 - 3) Call Divert/Transfer (M)
 - 4) Call Holding (M)
 - 5) Call barring based on SA PSTN number plan (M)
 - 6) Speed Dialling (M)
 - 7) Fixed Number Dialling (M)
 - 8) Conferencing- Specify number of parties that can be accommodated (M)
- g) The system shall support text to text short messaging services (SMS), the supplier to state maximum character limits. (M)
- h) The system shall support text to email services, the supplier to state maximum character limits. (M)
- i) Eskom requires the ability to continuously monitor the state of the satellite system. The supplier shall state any available monitoring capability and methodology. (M).
- j) The system shall breakout to other terrestrial networks using a satellite hub(s) located outside the borders of SADC. (M)
- k) The supplier to state the locations of the satellite earth stations and hubs as well as breakout points supporting the offered service. (M)
- l) The satellite system shall provide coverage throughout South Africa (All nine provinces). (M)
- m) The supplier shall provide a high level end-to-end architecture of the communications system. (M)

3.1.3 System Performance

The satellite communication system shall meet the following performance criteria:

- a) System availability: The telecommunications system (i.e. between the communications equipment at Eskom's sites) shall have a monthly availability that exceeds 99.0%. This means that the system will not be down/out of service for more than 7 hours and 12 minutes per month. (M)

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- b) MOS: The voice quality shall be fair (3) for outdoor usage and good (4) for indoor usage at all times. Supplier to state limitations. (M)
- c) Call setup time: The connection establishment (Handshaking and signalling) time when making a call, shall be minimal. The supplier shall provide full details and shall indicate how the connection time could be kept to a minimum. (M)
- d) Latency: A latency of better than 600ms is preferred. The supplier shall supply full details and shall indicate how latency could be minimised. (M)
- e) BER: The BER shall be better than 1×10^{-6} in each second. If the BER is a function of satellite signal strength, then the supplier shall specify the Bit Error Rates which can be achieved for various different signal levels, and by means of a map indicate where the different signal levels could be expected over South Africa. (M)
- f) The supplier shall provide the reliability and availability in an emergency situation (e.g. during a natural disaster), risks associated with using the system as a backup system and disclose any exclusions or limitations. (M)

Furthermore, the supplier shall:

- g) State minimum requirements necessary to install all the hardware components of the system, as well as the software. (M)
- h) Make recommendations about future migration options or steps. (M)
- i) The risks associated with using this system as a backup system. (M)

3.2 Customer Premises Equipment and Mobile Handsets

3.2.1 Physical Characteristics

- a) The Supplier shall list all the components of the satellite system that will facilitate communications at the customer premises, with all associated dimensions. (M)
- b) The supplier shall specify all essential accessories to be supplied along with the main equipment. (M)
- c) The supplier shall specify details of any other recommended additional accessories. (M)
- d) The equipment offered shall not be approaching end of life or obsolete for the next 60 months. (M)

3.2.2 Outdoor equipment

If the satellite terminal requires an antenna, the antenna will need to be supplied with the necessary co-axial cable and connectors by Eskom. These shall meet the following requirements:

- a) The antenna shall be supplied with the necessary mounting brackets to mount it on any surface. The supplier is to indicate the supported mounting options. (M)
- b) The antenna should last for a minimum of 10 years while exposed to direct sunlight, wind, and pollution and air with a high salt content. (M)
- c) The supplier shall provide details about the minimum, maximum and typical size of satellite antennas typically used, as well as the signal strength ranges in which the performance is guaranteed. The antenna shall be the smallest possible size which ensures that the performance criteria of the system are met. (M)
- d) The antenna system must be mounted externally and the indoor unit must be able to be mounted remotely from the desktop telephone (POTS). (M)

-
- e) Supplier to provide details of IP phone capability. Supplier to provide details of supported OEMs (M)
 - f) Supplier to recommend low loss co-axial cable(s) and connector(s) type as well as state the maximum distance between the transceiver and the satellite dish to guarantee sufficient signal per cable type. (M)
 - g) The baseband output circuitry shall be protected against inadvertent open or short circuiting of the antenna or co-axial cable, and shall be of the self-restoring type. (M)
 - h) The antennas and all other outdoor components offered shall not be approaching end of life or obsolete for the next 60 months. (M)

3.2.3 Environment

The system and all its components shall operate without malfunction and shall meet all the required specifications within the following environmental limits:

- a) Altitude: 0 to 3500m above sea level. (M)
- b) Ambient temperature: -10 °C to +60 °C (M)
- c) Humidity (maximum)
 - 1) 10% at -10 °C (M)
 - 2) 95% at +20 °C (M)
 - 3) 75% at +60 °C (M)
- d) All outdoor components shall be IP64 waterproof and dustproof. (M)

3.2.4 System components

The satellite components shall meet the following requirements.

- a) All Radio Frequency (RF) transmitting devices shall be type approved for use in South Africa by ICASA. Supplier to provide type approval certificate(s). (M)
- b) The supplier shall list all transceivers offered in the available range. (M)
- c) The supplier is to specify the operating frequency band of the satellite system. (M)
- d) Transmitter parameters: The supplier is to specify technical parameters like power output, modulation, uplink band/frequency and information. (M)
- e) Receiver parameters: The supplier is to specify technical parameters like sensitivity, audio output, downlink band/frequency and information rate. (M)
- f) The supplier shall provide information on different component models and options (M)

3.2.5 Firmware

- a) The firmware of the satellite transceiver/handset and/or ancillary equipment shall be stored in non-volatile Flash memory. (M)
- b) Firmware shall be remotely upgradeable via the satellite or other network by Eskom field staff or the supplier. Full details on how this will be achieved shall be provided. (M)
- c) The supplier shall provide a detailed firmware revision history every time a new release is made. Any modifications and enhancements shall be clearly specified and the impact explained. (M)
- d) Any firmware bug fixes shall be made available free of charge within a period of 8 weeks after the problem has been formally communicated to the supplier. Any bugs discovered in a firmware version used by Eskom, by either the supplier, or other customers, shall be brought under Eskom's immediate attention. (M)

- e) Future revisions: Future revisions of firmware shall be made available on the Internet, or via electronic mail at no additional cost. (M)
- f) Version control: The supplier shall specify how version control of firmware will be handled over a period of at least 10 years. (M)

3.2.6 Power Supply

- a) The supplier shall state the mechanism used as a power source for the satellite system. (M)

If using AC:

- b) The system shall operate from a 220V AC 50Hz supply. (M)

If using DC (battery)

- c) All batteries must be rechargeable. (M)
- d) Charger must operate from 220V AC 50Hz supply (M)
- e) The supplier shall specify the type of battery, commercial availability, power supply requirement and charging time for one full charge. (M)
- f) The supplier is to specify maximum talk time on a single full charge. (M)
- g) The supplier is to specify maximum standby time on fully charged battery. (M)
- h) The supplier is to specify battery storage life/shelf life. (M)
- i) The supplier shall specify the operation of any other power saving techniques or modes, and the consumption savings achieved by such. (M)
- j) The supplier shall specify how the power saving mode affects the transmission and reception of calls, and the typical delay when changing from power save mode to normal operating mode. (M)
- k) The supplier shall make a recommendation on measures to be taken in order to preserve battery lifespan. (M)

3.2.7 Markings

- a) Identification markings: The model and serial number of the components shall be clearly and permanently marked on it. (M)
- b) Indication markings: All external connectors, test points, switches and status indications shall be clearly and permanently marked. (M)

3.2.8 Docking system requirements

Where an indoor docking system is utilised to facilitate indoor use, the supplier shall meet the following requirements:

- a) The supplier shall state any indoor docking options available
 - 1) Supplier to state minimum requirements necessary to install the system (M)
 - 2) Make recommendations about future migration options or steps (M)
- b) Full details shall be provided about the voltage ranges that the dock and associated equipment can operate from. (M)
- c) The system shall be capable of running on backup power supplies. The supplier is to provide full details on what is supported by the dock and associated equipment. (M)
- d) It is required that power consumption of the dock be as low as possible. Full details shall be provided about the average and maximum instantaneous power consumption (voltage and current) that could be expected during each of the following modes of operation.
 - 1) Standby/Idle mode. (M)

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- | | | |
|----|----------------|-----|
| 2) | Receive mode. | (M) |
| 3) | Transmit mode. | (M) |

3.3 Technical information to be supplied

The supplier shall provide the following information:

3.3.1 Satellite system

- a) The name of the satellite system that will be used e.g. Iridium, Inmarsat BGAN etc. (M)
- b) The expected lifespan of the satellite equipment that will be used. (M)
- c) The supplier to state if the satellite communication system is restricted to a particular satellite network service provider. (M)
- d) Implications to the equipment supplied in the event of a change of satellite network service provider. (M)

3.3.2 System security

- a) The supplier shall provide information on the standard security features to prevent unauthorised access/use. (M)
- b) The supplier shall provide information on any additional cybersecurity measures that could be implemented. (I)

3.3.3 Value added services

- a) The Supplier shall provide full details about any value added services that can be offered to Eskom, including, but not limited to: (I)
 - 1) Monthly performance and statistical reports on usage.
 - 2) Incident reports per satellite transceiver/handset (date and time of incident, duration etc.).
 - 3) Security management.
 - 4) Any other services, e.g. call barring, multiple users on a single handset with unique identifiers.
 - 5) Alarm
 - 6) Calendar
 - 7) In call Alert
 - 8) Microphone muting
 - 9) Speaker phone option
 - 10) GPS location data
 - 11) Calculator
 - 12) Other (Please specify)

3.4 Additional information to be supplied

The following information shall also be provided:

3.4.1 Billing information

The method of billing shall be specified, indicating whether it is based on the time of usage or any other means.

- a) The tariff per minute or per kilobyte of data shall be specified. All parameters that could influence the tariff shall be specified e.g. bandwidth, contention ratio, conference calling, call waiting etc. (M)
- b) Monthly statements shall reflect the total cost of voice transmission and/or data per handset. (M)
- c) Detailed call billing information per handset (number dialled, duration, date, time) (M)

3.4.2 Company information

3.4.2.1 Company information:

- a) Name of the company. (M)
- b) Company address. (M)
- c) Date of establishment of the company. (M)

3.4.2.2 Company structure: The Company's staff complement in the following departments:

- a) Management. (M)
- b) Administrative. (M)
- c) Hardware design and development. (M)
- d) Production. (M)
- e) Inspection and quality assurance. (M)
- f) Technical support (number of people trained on the proposed equipment and the escalation procedures). (M)
- g) South African resources: The nature of resources in South Africa in terms of workshops, test facilities, national distribution centres etc. shall be stated. (M)

3.4.3 Product information

- a) Equipment range: A brief summary of the company's present range of equipment. (M)
- b) Equipment warranty: Details of the warranty policy for the equipment offered to Eskom. (M)
- c) Equipment reliability: Expected Mean Time Between Failures (MTBF) of all equipment based on historical performance. (M)
- d) Equipment maintenance contract: Details of whether the supplier is willing to offer a fixed priced maintenance contract for the repair and/or replacement of faulty equipment after the expiry of the warranty period. (M)

3.4.4 References

- a) Customer references: Details shall be provided of products and/or systems supplied to local and/or international public utilities. (M)

4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Barry Clayton	Chief Engineer- Tx Secondary Plant, Work Planning and Centralized Services
Cornelius Naidoo	CoE Design Engineering Manager
Isabel Fick	Senior Manager – Eskom Telecommunications
Lenah Mothata	Senior Manager-Grids

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Name and surname	Designation
Lloyd Chego	Senior Manager- Group Security
Maureen Mokone	Senior Manager - GIT
Prudence Madiba	Senior Manager- Generation

5. Revisions

Date	Rev	Compiler	Remarks
Jan 2020	2	SO Ngwenya	Review Changed title to "Emergency Satellite Voice Communications Specification"
Aug 2016	1	SO Ngwenya	First issue

6. Development team

The following people were involved in the development of this document:

- Oscar Ngwenya
- Jacques Schutte

7. Acknowledgements

Not applicable.

Annex A – Schedule of technical compliance

Schedule A and Schedule B provide technical details against tendered equipment/Tenderer's statement of compliance or non-compliance. Some of the information requested in this schedule may be provided on separate sheets of paper; and reference to those sheets should be made in Schedule B.

Table A.1: Schedule of technical compliance

Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
1	Error! Reference source not found.		
1.1	Error! Reference source not found.		
1.1.1	Minimum System Requirements		
a)	The system is required to support a maximum of 200 sites. Supplier to state limitations	Compliance required	
b)	The system is required to support up to 8 handsets per site. Supplier to state limitations.	Compliance required	
c)	The system is required to support up to 8 simultaneous voice connections per site. Supplier to state limitations	Compliance required	
d)	The system is required to support up to 8 simultaneous data connections per site. Supplier to state limitations	Information required	
1.1.2	Error! Reference source not found.		
	The general requirements of the satellite communication system are detailed below.		
a)	The system shall provide standalone communication independent of the ET network and any other terrestrial based infrastructure within South African Development Community (SADC).	Compliance required	
b)	The system must support voice and data communications. Supplier to state voice capabilities (e.g. VOIP/analogue interface etc.	Compliance required	
c)	The system must support two way communications between local mobile cellular networks, public switched telephone networks (PSTN) and other satellite networks.	Compliance required	
d)	The supplier shall state which cellular services are supported (e.g. GPRS, 3G, LTE etc).	Compliance required	
e)	The satellite system must support both indoor and outdoor communications. Supplier shall state any limitations and/or measures required to facilitate this.	Compliance required	

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
f)	The supplier shall specify voice services available with the system. As a minimum, technical details shall be provided for:		
1.	Calling ID, Caller ID and suppression of Caller ID	Compliance required	
2.	Call Waiting	Compliance required	
3.	Call Divert/Transfer	Compliance required	
4.	Call Holding	Compliance required	
5.	Call barring based on SA PSTN number plan	Compliance required	
6.	Speed Dialling	Compliance required	
7.	Fixed Number Dialling	Compliance required	
8.	Conferencing- Specify number of parties that can be accommodated	Compliance required	
g)	The system shall support text to text short messaging services (SMS), the supplier to state maximum character limits.	Compliance required	
h)	The system shall support text to email services, the supplier to state maximum character limits.	Compliance required	
i)	Eskom requires the ability to continuously monitor the state of the satellite system. The supplier shall state any available monitoring capability and methodology.	Compliance required	
j)	The system shall breakout to other terrestrial networks using a satellite hub(s) located outside the borders of SADC.	Compliance required	
k)	The supplier to state the locations of the satellite earth stations and hubs as well as breakout points supporting the offered service.	Compliance required	
l)	The satellite system shall provide coverage throughout South Africa (All nine provinces).	Compliance required	
m)	The supplier shall provide a high level end-to-end architecture of the communications system.	Compliance required	
1.1.3	System Performance		
	The satellite communication system shall meet the following performance criteria:		

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
a)	System availability: The telecommunications system (i.e. between the communications equipment at Eskom's sites) shall have a monthly availability that exceeds 99.0%. This means that the system will not be down/out of service for more than 7 hours and 12 minutes per month.	Compliance required	
b)	MOS: The voice quality shall be fair (3) for outdoor usage and good (4) for indoor usage at all times. Supplier to state limitations.	Compliance required	
c)	Call setup time: The connection establishment (Handshaking and signalling) time when making a call, shall be minimal. The supplier shall provide full details and shall indicate how the connection time could be kept to a minimum.	Compliance required	
d)	Latency: A latency of better than 600ms is preferred. The supplier shall supply full details and shall indicate how latency could be minimised.	Compliance required	
e)	BER: The BER shall be better than 1×10^{-6} in each second. If the BER is a function of satellite signal strength, then the supplier shall specify the Bit Error Rates which can be achieved for various different signal levels, and by means of a map indicate where the different signal levels could be expected over South Africa.	Compliance required	
f)	The supplier shall provide the dependability, reliability and availability in an emergency situation (e.g. during a natural disaster), risks associated with using the system as a backup system and disclose any exclusions or limitations.	Compliance required	
	Furthermore, the supplier shall:		
g)	State minimum requirements necessary to install all the hardware components of the system, as well as the software.	Compliance required	
h)	Make recommendations about future migration options or steps.	Compliance required	
i)	The risks associated with using this system as a backup system.	Compliance required	
1.2	Customer Premises equipment and Mobile Handsets		
1.2.1	Physical Characteristics		
a)	The Supplier shall list all the components of the satellite system that will facilitate communications at the customer premises, with all associated dimensions.	Compliance required	
b)	The supplier shall specify all essential accessories to be supplied along with the main equipment.	Compliance required	

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
c)	The supplier shall specify details of any other recommended additional accessories.	Compliance required	
d)	The equipment offered shall not be approaching end of life or obsolete for the next 60 months.	Compliance required	
1.2.2	Outdoor equipment		
	If the satellite terminal requires an antenna, the antenna will need to be supplied with the necessary co-axial cable and connectors by Eskom. These shall meet the following requirements:		
a)	The antenna shall be supplied with the necessary mounting brackets to mount it on any surface. The supplier is to indicate the supported mounting options.	Compliance required	
b)	The antenna should last for a minimum of 10 years while exposed to direct sunlight, wind, and pollution and air with a high salt content.	Compliance required	
c)	The supplier shall provide details about the minimum, maximum and typical size of satellite antennas typically used, as well as the signal strength ranges in which the performance is guaranteed. The antenna shall be the smallest possible size which ensures that the performance criteria of the system are met.	Compliance required	
d)	The antenna system must be mounted externally and the indoor unit must be able to be mounted remotely from the desktop telephone (POTS).	Compliance required	
e)	Supplier to provide details of IP phone capability. Supplier to provide details of supported OEMs	Compliance required	
f)	Supplier to recommend low loss co-axial cable(s) and connector(s) type as well as state the maximum distance between the transceiver and the satellite dish to guarantee sufficient signal per cable type.	Compliance required	
g)	The baseband output circuitry shall be protected against inadvertent open or short circuiting of the antenna or co-axial, and shall be of the self-restoring type.	Compliance required	
h)	The antennas offered shall not be approaching end of life or obsolete for the next 60 months.	Compliance required	
1.2.3	Environment		
	The system and all its components shall operate without malfunction and shall meet all the required specifications within the following environmental limits:		
a)	Altitude: 0 to 3500m above sea level.	Compliance required	
b)	Ambient temperature: -10 °C to +60 °C	Compliance required	

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
c)	Humidity (maximum)		
1.	10% at -10 °C	Compliance required	
2.	95% at +20 °C	Compliance required	
3.	75% at +60 °C	Compliance required	
4.	All outdoor components shall be IP64 waterproof and dustproof.	Compliance required	
1.2.4	System components		
	The satellite components shall meet the following requirements.		
a)	All Radio Frequency (RF) transmitting devices shall be type approved for use in South Africa by ICASA. Supplier to provide type approval certificate(s).	Compliance required	
b)	The supplier shall list all transceivers offered in the available range.	Compliance required	
c)	The supplier is to specify the operating frequency band of the satellite system.	Compliance required	
d)	Transmitter parameters: The supplier is to specify technical parameters like power output, modulation, uplink band/frequency and information.	Compliance required	
e)	Receiver parameters: The supplier is to specify technical parameters like sensitivity, audio output, downlink band/frequency and information rate.	Compliance required	
f)	The supplier shall provide information on different component models and options	Compliance required	
1.2.5	Firmware		
a)	The firmware of the satellite transceiver/handset and/or ancillary equipment shall be stored in non-volatile Flash memory.	Compliance required	
b)	Firmware shall be remotely upgradeable via the satellite or other network by Eskom field staff or the supplier. Full details on how this will be achieved shall be provided.	Compliance required	
c)	The supplier shall provide a detailed firmware revision history every time a new release is made. Any modifications and enhancements shall be clearly specified and the impact explained.	Compliance required	

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
d)	Any firmware bug fixes shall be made available free of charge within a period of 8 weeks after the problem has been formally communicated to the supplier. Any bugs discovered in a firmware version used by Eskom, by either the supplier, or other customers, shall be brought under Eskom's immediate attention.	Compliance required	
e)	Future revisions: Future revisions of firmware shall be made available on the Internet, or via electronic mail at no additional cost.	Compliance required	
f)	Version control: The supplier shall specify how version control of firmware will be handled over a period of at least 10 years.	Compliance required	
1.2.6	Power Supply		
a)	The supplier shall state the mechanism used as a power source for the satellite system.	Compliance required	
	If using AC:		
b)	The system shall operate from a 220V AC 50Hz supply.	Compliance required	
	If using DC (battery)		
c)	All batteries must be rechargeable.	Compliance required	
d)	Charger must operate from 220V AC 50Hz supply	Compliance required	
e)	The supplier shall specify the type of battery, commercial availability, power supply requirement and charging time for one full charge.	Compliance required	
f)	The supplier is to specify maximum talk time on a single full charge.	Compliance required	
g)	The supplier is to specify maximum standby time on fully charged battery.	Compliance required	
h)	The supplier is to specify battery storage life/shelf life.	Compliance required	
i)	The supplier shall specify the operation of any other power saving techniques or modes, and the consumption savings achieved by such.	Compliance required	
j)	The supplier shall specify how the power saving mode affects the transmission and reception of calls, and the typical delay when changing from power save mode to normal operating mode.	Compliance required	

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
k)	The supplier shall make a recommendation on measures to be taken in order to preserve battery lifespan.	Compliance required	
1.2.7	Markings		
a)	Identification markings: The model and serial number of the components shall be clearly and permanently marked on it.	Compliance required	
b)	Indication markings: All external connectors, test points, switches and status indications shall be clearly and permanently marked.	Compliance required	
1.2.8	Docking system requirements		
	Where an indoor docking system is utilised to facilitate indoor use, the supplier shall meet the following requirements:		
a)	The supplier shall state any indoor docking options available		
1.	Supplier to state minimum requirements necessary to install the system	Compliance required	
2.	Make recommendations about future migration options or steps	Compliance required	
b)	Full details shall be provided about the voltage ranges that the dock and associated equipment can operate from.	Compliance required	
c)	The system shall be capable of running on backup power supplies. The supplier is to provide full details on what is supported by the dock and associated equipment.	Compliance required	
d)	It is required that power consumption of the dock be as low as possible. Full details shall be provided about the average and maximum instantaneous power consumption (voltage and current) that could be expected during each of the following modes of operation.		
1.	Standby/Idle mode.	Compliance required	
2.	Receive mode.	Compliance required	
3.	Transmit mode.	Compliance required	
1.3	Technical information to be supplied		
	The supplier shall provide the following information:		

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
1.3.1	Satellite system		
a)	The name of the satellite system that will be used e.g. Iridium, Inmarsat BGAN etc.	Compliance required	
b)	The expected lifespan of the satellite equipment that will be used.	Compliance required	
c)	The supplier to state if the satellite communication system is restricted to a particular satellite network service provider.	Compliance required	
d)	Implications to the equipment supplied in the event of a change of satellite network service provider.	Compliance required	
1.3.2	System security		
a)	The supplier shall provide information on the standard security features to prevent unauthorised access/use.	Compliance required	
b)	The supplier shall provide information on any additional cybersecurity measures that could be implemented.	Information required	
1.3.3	Value added services		
a)	The Supplier shall provide full details about any value added services that can be offered to Eskom, including, but not limited to:	Information Required	
1.	Monthly performance and statistical reports on usage.		
2.	Incident reports per satellite transceiver/handset (date and time of incident, duration etc.).		
3.	Security management.		
4.	Any other services, e.g. call barring, multiple users on a single handset with unique identifiers.		
5.	Alarm		
6.	Calendar		
7.	In call Alert		
8.	Microphone muting		
9.	Speaker phone option		
10.	GPS location data		

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
11.	Calculator		
12.	Other (Please specify)		
1.4	Additional information to be supplied		
	The following information shall also be provided:		
1.4.1	Billing information		
	The method of billing shall be specified, indicating whether it is based on the time of usage or any other means.		
a)	The tariff per minute or per kilobyte of data shall be specified. All parameters that could influence the tariff shall be specified e.g. bandwidth, contention ratio, conference calling, call waiting etc.	Compliance required	
b)	Monthly statements shall reflect the total cost of voice transmission and/or data per handset.	Compliance required	
c)	Detailed call billing information per handset (number dialled, duration, date, time)	Compliance required	
1.4.2	Company information		
1.4.2.1	Company information:		
a)	Name of the company.	Compliance required	
b)	Company address.	Compliance required	
c)	Date of establishment of the company.	Compliance required	
1.4.2.2	Company structure: The Company's staff complement in the following departments:		
a)	Management.	Compliance required	
b)	Administrative.	Compliance required	
c)	Hardware design and development.	Compliance required	
d)	Production.	Compliance required	
e)	Inspection and quality assurance.	Compliance required	

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Spec. clause number	Description	Schedule A: Eskom's minimum technical requirements	Schedule B: Supplier's statements of compliance
f)	Technical support (number of people trained on the proposed equipment and the escalation procedures).	Compliance required	
g)	South African resources: The nature of resources in South Africa in terms of workshops, test facilities, national distribution centres etc. shall be stated.	Compliance required	
1.4.3	Product information		
a)	Equipment range: A brief summary of the company's present range of equipment.	Compliance required	
b)	Equipment warranty: Details of the warranty policy for the equipment offered to Eskom.	Compliance required	
c)	Equipment reliability: Expected Mean Time Between Failures (MTBF) of all equipment based on historical performance.	Compliance required	
d)	Equipment maintenance contract: Details of whether the supplier is willing to offer a fixed priced maintenance contract for the repair and/or replacement of faulty equipment after the expiry of the warranty period.	Compliance required	
1.4.4	References		
a)	Customer references: Details shall be provided of products and/or systems supplied to local and/or international public utilities.	Compliance required	

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