

 Eskom	Standard	Technology
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Title: **EMERGENCY PREPAREDNESS
PUBLIC ADDRESS SYSTEM –
FOR LARGE AREA
DEPLOYMENT**

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Area of Applicability: **Engineering**

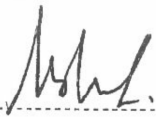
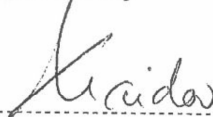
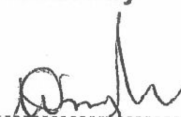
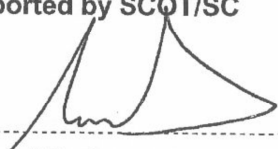
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1. Introduction

Eskom has harnessed the culture of safety as being the number 1 priority in the organisation and as such needs systems to promote and manage safety within its workplaces which are spread nation-wide. Over the years Eskom has experienced numerous unforeseen safety incidents in various sites and this trend continues. Investigations conducted after each such incident has revealed that proper / adequate Emergency Preparedness / Public Address systems are not in place to post manage such incidents.

The purpose of an Emergency Preparedness / Public Address system is not meant to prevent an incident but to enable the management of an incident effectively and prevent further injury to personnel or loss of life. This document is limited to the EP / PA systems and does not include Fire and / or Gas Detection systems which are independent systems due to the manner in which they are configured. However, EP / PA systems under discussion in this document must be able to accept and react to outputs from Fire / Gas Detection systems and sound the appropriate warnings of existing hazards.

One way of reducing the cost of implementing fully compliant EP/PA systems at Eskom sites is to standardise on the system being deployed. This ensures that out technicians need training on fewer systems and can better maintain the systems. This has also been a request from Eskom CIO.

The introduction of scalable, modular systems allows for unlimited expansion of the system. Introduction of remote monitoring of all new systems also ensures that the system availability is increased.

1.1 Key Indicators

Throughout this standard specification, some clauses are marked by a letter indicating Eskom's expected response to the stated requirement from potential suppliers in cases where this specification is used in an enquiry process.

The words "shall", "will", and "may" are used to indicate the following:

- **Shall** – Whenever it is necessary to express a provision which is mandatory.
- **Should / May** – Whenever it is necessary to express non-mandatory provisions.
- **Will** – Used to express a declaration on the part of Eskom Telecommunications.

Furthermore, each paragraph / line shall be marked by a letter indicating a particular expression as follows:

- **G** – General information; to be noted by tenderers and accepted or rejected.
- **M** – Mandatory requirement. 100% compliance required. Tenderers to issue a statement of compliance, non-compliance, or a degree of compliance.
- **I** – Information; Suppliers to give actual values, quantities, or other specific details called for. Provision of requested information is mandatory and failure to provide it will lead to suppliers being ruled non-compliant on the requirement.
- **D** – Description; Suppliers to give a description of the functions or features requested. Provision of a requested description is mandatory and failure to provide it may lead to disqualification from the evaluation.

Requirements that are not marked by any of the letter indications are general and a certain level of non-compliance with them may be tolerated. Suppliers shall state compliance, non-compliance or a degree of compliance in response to these requirements.

2. Supporting clauses

2.1 Scope

2.1.1 Purpose

This document covers the functional, technical, operational and performance specifications, as well as environmental conditions in which the Emergency Preparedness Public Address system equipment is required to perform. To minimise downtime, the scope provides for remote management of sites where such systems are installed.

Some of the after sales service requirements for the equipment are also specified. These include amongst others, equipment repair and training of Eskom Telecommunications technicians.

The purpose of this specification is to ensure that all Emergency Preparedness Public Address systems supplied to Eskom Telecommunications meet the minimum requirements as well as conformity with specific requirements of Eskom Telecommunications. This specification is to be used for the issuing of an enquiry with the aim of entering into an enabling contract for purposes of standardisation and ease of procurement. Nothing in this specification shall lessen the tender's obligations, detailed in any other document forming part of the contract.

2.1.2 Applicability

This document shall apply throughout Eskom Holding Limited, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

2.1.3 Audience

The intended audience of this document includes Eskom Telecommunications' voice & data network planners; communications service providers, technology decision makers, network operators, and all the other relevant stakeholders. This document is also intended as a reference for any other persons or groups at Eskom Holdings Limited requiring an understanding of Emergency Preparedness Public Address systems for large-scale deployments.

2.1.4 Assumptions and restrictions

It is assumed that readers are familiar with the technology concepts discussed in this document.

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] ISO 9001 Quality Management Systems.
- [2] EN54-4 European Norm: Voice Alarm Power Supply Equipment
- [3] EN54-16 European Norm: Voice Alarm and Indicating Equipment
- [4] EN54-24 European Norm: Loudspeaker Equipment
- [5] BS-5839-8 British Standard: Emergency Voice Communication Systems
- [6] ISO 7240 Voice Alarm Standards
- [7] SANS 60849 South African National Standard for Voice Alarm Systems
- [8] ESG 32-1200 Eskom telecommunications' technology strategy
- [9] ESP 32-1203 Eskom telecommunications' user requirements

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[10] ETSP0337 Eskom Telecommunications' Generic Requirements Specification

2.2.2 Informative

[11] 32-9: Definition of Eskom documents.

[12] 32-644: Eskom documentation management standard.

[13] 474-65: Operating Manual of the Steering Committee of Wires Technologies (SCOWT)

2.3 Definitions

2.3.1 General

Definition	Description
Directive	<p>A document which sets out a management objective, the appropriate policy if deemed necessary, as well as the functional accountability for activities to achieve that objective and the interface between functions affected by, or responsible for the execution of, such activities.</p> <p>Note: Other documentation, legal, statutory or regulatory relevant to a directive shall be referenced in the directive. Compliance with a directive is mandatory in the area of its applicability.</p>
Policy	<p>A document which sets out a management objective in the form of a policy statement and, where appropriate, the strategy to be followed to achieve that objective. In addition, the document may also outline the various functional responsibilities and accountabilities.</p>
Standard	<p>A document established by consensus that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.</p> <p>Note: Compliance with a standard is mandatory in the area of its applicability.</p>
Procedure	<p>A document which sets out the description of the purposes, scope and sequence of activities, control points and responsibilities required to perform a task and how it shall be recorded.</p> <p>Note: Other documentation, legal, statutory or regulatory documents relevant to a procedure and the directive upon which the procedure is based shall be referenced in the procedure. Compliance with a procedure is mandatory in the area of its applicability.</p>
Regulations	<p>A document which sets out the legislative, regulatory or administrative rules adopted and published by the authority empowered to enforce them, either internal or external to Eskom.</p> <p>Note: Compliance with a regulation is mandatory in the area of its applicability.</p>
Specification	<p>A document, which prescribes technical requirements, regarding performance or characteristics of plant, equipment, products or services that shall be met at every application.</p>
Instruction	<p>The detailed sequence of steps required achieving a stipulated result.</p> <p>Note: Compliance with an instruction is mandatory in the area of its applicability.</p>

Definition	Description
Guide	A document explaining the use of equipment, methods, techniques, controls, approach, etc. or giving recommendations or guidance in a specific area. Note: Compliance is optional as a guide is advisory.
Attachments	Documents used to further clarify or show examples of information described in the procedures and work instructions.
Forms	Documents used to make a record of completing all or part of the process described in procedures and work instructions.
Records	Completed forms or information generated as a result of the process described in a document and retained as indicated in the Records Management Procedure.
Templates	Electronic documents used to create Eskom documentation.
References	External and/or internal documents or sources of information used in preparing documentation and completing work.
Related Documents	Other documents that may need to be altered if the current document is revised or changed.
Eskom wide	Documents that are applicable throughout Eskom and that have been numbered and registered, (Document ID), by Eskom Documentation Centre e.g. with the prefix "ESK".
Eskom	Eskom Holdings Limited, its divisions and wholly owned subsidiaries.
Eskom Telecommunications (Pty) Ltd	A division of Eskom Holdings.
Notified Body	A notified body is an independent body appointed by an agency within the European Union, and is accredited as being capable of performing the duties of testing, inspection, and certification as defined by the directives.

2.3.2 Disclosure classification

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

2.4 Abbreviations

Abbreviation	Description
AC	Alternating Current
BMS	Building Management System
CCT	Circuit
CD	Compact Disc

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Abbreviation	Description
CIE	Control and Indicating Equipment
CIO	Chief Information Officer
CPD	Construction Product Directive
CF	Compact Flash
CPU	Central Processing Unit
dBm / dBmw	Power Ratio in decibels (dB) of the measured power referenced to 1 milliwatt (mW)
DC	Direct Current
DIN	Dual In-line
DVD	Digital Versatile Disc
ECC	European Economic Community
EN	European Norm
IP	Internet Protocol
ISO	International Organisation for Standardisation
HTML	HyperText Markup Language
kW	Kilowatt
LAN	Local Area Network
LED	Light Emitting Diode
PC	Personal Computer
SABS	South African Bureau of Standards
SANS	South African National Standards
SLA	Service Level Agreement
SPL	Sound Pressure Level
TCP/IP	Transmission Control Protocol/Internet Protocol
UL	Underwriters Laboratories
VACIE	Voice Alarm Control and Indicating Equipment

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Abbreviation	Description
VAS	Voice Alarm System
VPN	Virtual Private Network
VRLA	Vent Regulated Lead Acid
UPS	Uninterruptable Power Supply
W	Watt

2.5 Roles and responsibilities

Eskom Technical Evaluation & Technical Review Committees to implement this standard when evaluating site specific proposals submitted by tenderers.

2.6 Process for monitoring

This document will be reviewed as per the next review date or earlier if warranted.

2.7 Related/supporting documents

All supporting reference / standards documents may be obtained from the relevant Eskom Document Centre.

3. Requirements

3.1 Technical Standards / Compliance

3.1.1 All equipment shall comply with the following EN54 Standard family parts:

3.1.1.1 EN54 Part 4 (EN54-4) - Voice Alarm Power Supply Equipment [M]

3.1.1.2 EN54 Part 16 (EN54-16) - Voice Alarm and Indicating equipment [M]

3.1.1.3 EN54 Part 24 (EN54-24) - Voice Alarm Loudspeakers [M]

3.1.1.4 ISO7240 Part 19 (7240-19) - Design, Installation, Commissioning, and Maintenance of Sound Systems for Emergency purposes. [M]

3.1.2 Speakers may also conform to ISO 7240-24 and / or BS-5839-8 standards. [M]

3.1.3 Only equipment certified under EN54 Standard by an authorized certification body may be proposed where applicable. [M]

3.2 Type Approval

3.2.1 All modems, routers, switches, patch panels, and external media inputs shall be ICASA approved where applicable. [M]

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3.3 Equipment Housing

- 3.3.1** All system equipment shall be housed in 600mm x 600mm floor-standing cabinets. [M]
- 3.3.2** The housing shall be constructed of steel and be powder coated. [M]
- 3.3.3** The housing shall include the option of castors with braking mechanisms on all wheels. [I]
- 3.3.4** Housing shall have a smoked glass door in front and a steel access door at the rear. [M]
- 3.3.5** Both, front and rear access doors must be lockable and be supplied with spare keys. [M]
- 3.3.6** Housing shall have a 4-WAY fan tray on the inside of the roof of the housing. [M]
- 3.3.7** The height of the equipment housing shall be adequate to ensure that there is a minimum ventilation space of 1U between the components housed in it. [M]

3.4 System Architecture

- 3.4.1** System shall be scalable allowing for de-centralised components in different locations under a centralised control over a packet-based network backbone. [M]
- 3.4.2** The system components shall provide network redundancy by doubling on the TCP/IP Ethernet interfaces, supplying two ports for audio and data control transmission on each decentralised device. [M]
- 3.4.3** The system shall support an additional analogue audio reserve path to allow for an all-call paging in case of a network failure or CPU failure, as well as signal path line faults anywhere between microphone(s) and amplifier(s). [M]
- 3.4.4** The de-centralised zones shall have their local audio output / inputs, battery surveillance capability, battery charging capability, and speaker line surveillance capabilities. [M]
- 3.4.5** The system manager shall be capable of monitoring all de-centralised zones centrally and logging all events. [M]
- 3.4.6** All system components shall be modular and of the 19" rack-mount type. [M]
- 3.4.7** All components of the system except for multi-media inputs, recording/playback devices, batteries, and network connectivity switches shall be from the same manufacturer's stable. [M]
- 3.4.8** Control of the entire system must be software-driven using the Microsoft Windows™ 7 operating system. [M]
- 3.4.9** The system shall not be part of any other system such as a fire control system but be capable of integration with other stand-alone systems such as Fire control panels. [M]

3.4.10	Operational tasks must be performed by menu buttons with visible LCD displays and LED statuses.	[M]
3.4.11	The system shall cater for an initial of 2 microphone and / or external line-level inputs which can be expandable to a minimum of 64 such inputs.	[M]
3.4.12	The system shall cater for an initial minimum of 8 amplifier outputs which can be expandable up to 256 such outputs.	[M]
3.4.13	The system shall cater for a minimum of 16 audio channels for general broadcasts (paging, announcements, BGM, etc.) and 4 audio channels for emergency broadcasts which can be processed simultaneously.	[M]
3.4.14	The system shall provide for a minimum of 256 levels of priority settings. This is to assign different levels of management of the system.	[M]
3.4.15	The system shall be capable of accommodating A-B speaker wiring configuration.	[M]
3.4.16	The system shall be capable of handling of emergency broadcasts, background music and paging announcements, simultaneously in different zones. However emergency conditions "all-call" takes priority over all broadcasts.	[M]
3.4.17	The system shall be capable of broadcasting up to four different emergency messages (alert & evacuation) simultaneously into individual zones or groups of zones, in order to avoid unnecessary evacuations in non-affected areas thereby avoiding a state of panic.	[M]
3.4.18	The system shall provide programming of four 3-phase alarm sequences. The phases shall be triggered automatically by a programmable timer, or externally by the fire detection system or the emergency microphone panel. The number of phases can be matched to the requirements.	[M]
3.4.19	The system shall be capable of controlling up to 1416 control inputs and 1416 control outputs.	[M]
3.5	Zones	
3.5.1	The system must be supplied with a minimum of 8 zones with the option to increase this to a maximum of 256 zones with the addition of output modules.	[M]
3.5.2	The system must be programmable to select individual zones, or groups of zones, as well as all call paging.	[M]
3.6	Back –Ground Music (BGM)	
3.6.1	The system must be able to play back-ground music from any media player input.	[M]
3.6.2	The back-ground music shall be selectable to play on any designated zones, group of zones, or all zones.	[M]
3.6.3	The BGM shall be programmable to select volume settings individually from the front control panel of the Audio Output module or by programmable software.	[M]

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- | | | |
|-------|---|-----|
| 3.6.4 | The system must be able to over-ride any BGM broadcast during emergency & general paging. | [M] |
|-------|---|-----|

3.7 Tones – Pre-recorded Messages

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|-------|---|-----|
| 3.7.1 | The system shall accommodate for a minimum of 32 tones and / or pre-recorded messages or a combination thereof. | [M] |
| 3.7.2 | The tones / pre-recorded messages shall not be stored on a rotary disc. | [M] |

3.8 Microphones

- | | | |
|-------|---|-----|
| 3.8.1 | The system shall be able to accommodate for remote microphones as well as a Fireman's microphone. | [M] |
| 3.8.2 | The remote microphones must provide for a minimum of 10 selectable buttons that can be programmable by the system to select features such as zone select, alert signals, volume settings, custom functions, and any other input sources and must also be expandable to cater for a minimum of 80 zones. | [M] |
| 3.8.3 | The Fireman's microphone shall have a priority status and be capable of over-riding any other broadcast. | [M] |
| 3.8.4 | The Fireman's microphone shall also have a functionality of being able to effect an all call broadcast in the event of the failure of the system manager. | [M] |
| 3.8.5 | All microphone unit(s) shall also have the capability of receiving fault indications in the form of flashing LEDs and buzzer feature(s) and allow for such faults to be acknowledged on the microphone unit. | [M] |
| 3.8.6 | All microphone unit(s) shall also be capable of acknowledging any emergency broadcasts. | [M] |
| 3.8.7 | Each microphone must be able to be assigned a different priority level by the system. | [M] |
| 3.8.8 | Any remote microphone shall be capable of being programmed to work as a Fireman's microphone. | [M] |

3.9 Critical Signal Path Monitoring & Fault Detection / Indication

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|---------|---|-----|
| 3.9.1 | The system shall be capable of monitoring all speaker lines via the microphone unit by means of impedance monitoring. | [M] |
| 3.9.2 | The monitoring shall include open CCTs, short CCTs, and earth leakage (ground) faults on speaker lines. | [M] |
| 3.9.3 | The sensitivity of the speaker line monitoring shall be adjustable to prevent any false indications. | [M] |
| 3.9.4 | The following faults are also to be indicated on the microphone unit(s) as General Faults: | |
| 3.9.4.1 | CPU Failure | [M] |
| 3.9.4.2 | Mains supply | [M] |

3.9.4.3	Stand-by batteries and charger	[M]
3.9.4.4	Stand-by amplifiers	[M]
3.9.4.5	All protective devices such as fuses	[M]
3.9.4.6	The fire-alarm broadcast initiation point(s)	[M]
3.9.4.7	Emergency messages	[M]
3.9.4.8	Interlinks between different components	[M]
3.9.4.9	Battery Fault	[M]
3.9.5	The indication of faults should be announced within 100 seconds of occurrence of the fault.	[M]

3.10 Basic System Software / Software Licenses

3.10.1	The system shall be provided with all necessary software and licensing.	[M]
3.10.2	Indicate whether there is any need for periodic license renewal and associated firmware upgrade costs.	[I]

3.11 Power Supply & Stand-by Batteries

3.11.1	The system shall be equipped with EN54 compliant stand-by batteries to cater for a minimum stand-by period of 24 hours and a continuous broadcast of 30 minutes at full power.	[M]
3.11.2	The system shall be powered by 24VDC via power supply modules working off 220VAC and must be capable of a seamless transition between AC and DC.	[M]
3.11.3	Stand-by batteries shall be of the sealed Vent regulated Lead Acid (VRLA), flame retardant variety and maintenance free.	[M]
3.11.4	Stand-by batteries shall comply with EN50272 and EN60896-2 standards.	[M]
3.11.5	The minimum life-span of the batteries shall be 10 years.	[M]
3.11.6	The system must be capable of discharging and re-charging each battery at a pre-determined interval for purposes of keeping each battery in optimal condition.	[M]

3.12 Redundancy

3.12.1	The system shall allow for redundancy on both, fibre & copper concurrently.	[M]
3.12.2	Redundancy for audio broadcasts shall be provided over copper via analogue link ports.	[M]
3.12.3	The system shall allow for all call broadcasts even during failure of the system manager CPU.	[M]
3.12.4	A stand-by amplifier which is equal to or higher in capacity than the capacity of any other amplifier in the same rack, shall be installed for every 10 amplifiers in a zone.	[M]

3.12.5	The stand-by amplifier must be able to take over the load of any amplifier that has failed, without the need for any human interface.	[M]
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3.12.6	The system must be powered by a dual power supply (excluding stand-by batteries)	[M]
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3.13 Interfaces

3.13.1	The system shall be capable of accommodating any external inputs from stand-alone panels such as fire detection and access control panels.	[M]
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3.13.2	The system shall also be capable of providing outputs to trigger indicating equipment such as buzzers and lights.	[M]
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3.13.3	The system shall have an Ethernet port for the purposes of connecting a service terminal as well as connection to a LAN port for remote access.	[M]
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3.14 System Event Log

3.14.1	The system shall be capable of logging a minimum of 10 000 event logs on a CF card in text format which can be accessed even after a total system failure.	[M]
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3.14.2	The system event log must be accessible remotely.	[M]
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3.14.3	The log format must be able to be exported into MS® Excel as well as PDF formats.	[M]
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3.15 Speakers / Speaker Cabling

3.15.1	All fire-rated speaker equipment must comply with EN54-54 specifications.	[M]
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3.15.2	Speakers complying to ISO 7240-24 or BS 5839-8 are also acceptable and must be identified as such.	[I]
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3.15.3	The SPL of speakers shall be rated to allow them to fall into the category of Green products.	[M]
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3.15.4	The minimum SPL of speakers shall be as follows to reduce the required consumption wattage:	
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3.15.4.1	Ceiling-mount & Wall-mount speakers: 90dB - 94dB @ 1w @ 1m	[M]
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3.15.4.2	Projection speakers: 91dB - 97dB @ 1w @ 1m	[M]
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3.15.4.3	Horn Speakers: 109dB @ 1w @ 1m	[M]
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3.15.5	Speakers should have ceramic terminal blocks, thermal fuses, and metal fire-dome where applicable.	[I]
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3.15.6	Speaker cabling shall be a minimum PH120 class as per EN50200/SANS10139.	[M]
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- 3.15.7** Cabling may be of the indoor and outdoor use application and must have a minimum cross-sectional core of 1.5mm. [M]

3.16 On-site Management Requirements

- 3.16.1** On-site management of the EP/PA system will be via human interface through a computerised system. [M]

- 3.16.2** Hardware:
Management platform shall comprise of a desktop computer and minimum 17" Flat Screen monitor to support rapid execution of maintenance and reporting routines. [M]

- 3.16.3** Software:
Management / Administrative software and licensing shall execute maintenance routines of the entire system, monitor the operational status of all components of the system (including speakers), and changing the configuration parameters of the system both on site and remotely by way of Eskom LAN or Internet access. [M]

- 3.16.4** Event log database capable of recording all system faults as well as all controls effected through human interface. [M]

- 3.16.5** The system must be capable of accommodating an external voice activated recording device to record all announcements made via each of the microphones. [M]

- 3.16.6** The recorder should be a capable of recording in multiple formats onto compact disc/s and/or high capacity SD card/s. All recorded data must contain date & time stamp information during recording & playback. [M]

- 3.16.7** Access to on-site management system service terminal must be password protected. [M]

3.17 Remote Management System Requirements

- 3.17.1** The medium of access into the remote system and/or on-site management system shall be via the Eskom Intranet and / or the internet. [M]

- 3.17.2** The remote management must not require any specialised remote management platform to access the installed location/s remotely. [M]

- 3.17.3** Stipulate the licensing terms and conditions applicable to the Remote Management Platform. [I]

- 3.17.4** List all the functionalities provided over remote access configuration. [I]

- 3.17.5** The Remote Management System shall generate status reports concerning all aspects of the respective EP/PA system and its components. Such reports shall be capable of being exported and transmitted electronically. [M]

3.17.6 Remote access to any of the installed sites must be password protected. [M]

3.18 System Set-up, Configuration, & Commissioning

3.18.1 All components of the system must be installed and wired by the supplier in each equipment rack. [M]

3.18.2 The system shall also be configured as per end-user requirements and commissioned. [M]

3.18.3 The supplier shall have the capability of configuring the software interface to integrate the voice alarm system into a Building Management System (BMS). [M]

3.19 Factory Acceptance Testing (FAT)

3.19.1 The supplier shall configure and rig the system in their premises for Factory Acceptance Testing by Eskom and the end-user prior to deployment to the installation site. [M]

3.20 Installation & Site Acceptance Testing (SAT)

3.20.1 The supplier shall install the system on site (excluding speakers, speaker cabling, and backbone cabling) inclusive of all interconnections between the de-centralised zones. [M]

3.20.2 The supplier shall avail themselves for Site Acceptance Testing at site after installation. [M]

3.21 System Manual(s) Documentation / Certificates

3.21.1 Multiple copies of the system design & architecture, system components, User Manuals, and all other Data Sheets are to be supplied with the system. [M]

3.21.2 All components and equipment must be supplied with their CPD certification documents. [M]

3.21.3 Only CPD certificates issued by a registered "Notified Body" under ECC will be valid. [M]

3.21.4 The manuals, documentation, and certificates must be made available in both, hard and soft copy formats. [M]

3.21.5 The initial fingerprint of the system stored in the CF card must also be provided as a soft copy. [M]

3.22 System Life Cycle

- 3.22.1** The minimum system life-cycle of the proposed product must be 10 years. [M]
- 3.22.2** The life-cycle of the product must be further supported in terms of spares availability for a minimum period of 7 years after discontinuation of the product. [M]

3.23 Warranty & Support

- 3.23.1** The system shall carry a minimum local (South African) warranty of 36 months with on-site as well as telephonic support from date of the system being commissioned. Eskom shall thereafter have the option to access on-going support in terms of a subsequent agreement. [M]
- 3.23.2** The supplier must have a technician on call on a 24-hour basis for purposes of telephonic support. [M]
- 3.23.3** Supplier spares holding should include minimum replacement spares to restore service of the system in its entirety within 8 working hours. [M]
- 3.23.4** All support shall also include all firmware upgrades of the initial system version installed over the operational life of the system. [M]
- 3.23.5** The support shall include First Line Level maintenance training including remote management system training as well as periodic refresher training for Eskom Telecommunications' maintenance technicians. [M]
- 3.23.6** The supplier shall also provide Operator training on site to the End-User. [M]
- 3.23.7** The supplier shall be available on a consultative basis to assist in providing a solution to Eskom Telecommunications for their clients. [M]
- 3.23.8** Product support must include national as well as international support through the local branch. [M]
- 3.23.9** The supplier shall be willing to enter into a SLA with Eskom Telecommunications for ad-hoc support. [M]
- 3.23.10** The supplier shall be the OEM or the exclusively appointed agent / distributor of the OEM in South Africa and may not be a reseller of the exclusively appointed agent / distributor of the OEM. Non-OEM supplier acceptance will be subject to Evaluation Committee approval. [M]
- 3.23.11** The supplier should have history of supplying products of this nature in South Africa for at least a minimum period of 10 years. [I]
- 3.23.12** Supplier to provide list of reference sites where the product on offer has been installed and the year of implementation. [D]
- 3.23.13** Supplier should have a local technician available not more than 500km from any Eskom site in South Africa for purposes of on-site support. [M]

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4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Prince Moyo	Power Delivery Engineering GM
Marius v Rensburg	Tx Snr. Manager - GRIDS
Paul Grobler	Tx – Chief Engineer - Electrical
Sikelela Mkhabela	Dx – Snr Manager – Maintenance & Operations Management
Prudence Madiba	Gx – Snr. Manager – Engineering and C&I
Corrie Vermeulen	Eskom Telecommunications Manager
Vusi Monyeni	Group IT
Alex Stramrood	Snr. Manager – Safety Risk Management
Danie Odendaal	General Manager: Plant Engineering

5. Revisions

Date	Rev.	Compiler	Remarks
Nov 2014	1	N Keshav	First issue

6. Development team

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

- Nitheen Keshav Frans Jooste
- Renier Joubert Eric Mabotja
- Pascal Motsoasele Tejin Gosai
- David Pfuluwani Netshitungulu Eddie Langford
- Dante Matlou Daryl Naidoo
- Bongani Shezi Elicia Naidu
- Ziyaad Gydien Ayanda Ndlebe

7. Acknowledgements

None

Annex A – Impact Assessment

(Normative)

Impact assessment form to be completed for all documents.

A1 Guidelines

- All comments must be completed.
- Motivate why items are N/A (not applicable)
- Indicate actions to be taken, persons or organisations responsible for actions and deadline for action.
- Change control committees to discuss the impact assessment, and if necessary give feedback to the compiler of any omissions or errors.

A2 Critical points

A2.1 Importance of this document. E.g. is implementation required due to safety deficiencies, statutory requirements, technology changes, document revisions, improved service quality, improved service performance, optimised costs.

Comment: This document is important to standardise of Emergency Preparedness Public Address system equipment which meet the minimum requirements as well as conformity with specific requirements of Eskom Telecommunications

A2.2 If the document to be released impacts on statutory or legal compliance - this need to be very clearly stated and so highlighted.

Comment: No impact on statutory or legal compliance

A2.3 Impact on stock holding and depletion of existing stock prior to switch over.

Comment: No impact

A2.4 When will new stock be available?

Article I. Comment: An enabling contract will be established to purchase the equipment on an as and when required basis.

A2.5 Has the interchangeability of the product or item been verified - i.e. when it fails is a straight swap possible with a competitor's product?

Comment: Speaker equipment is controlled by open standards and can easily be swapped providing it meets the compliancy requirements.

A2.6 Identify and provide details of other critical (items required for the successful implementation of this document) points to be considered in the implementation of this document.

Comment: Enabling Contract needs to be established with the compliant equipment supplier.

A2.7 Provide details of any comments made by the Regions regarding the implementation of this document.

Article II. Comment: This will happen during the commenting phase. All comments received during formulation of last revision have been considered and appropriate changes have been effected in this document.

A3 Implementation timeframe

A3.1 Time period for implementation of requirements.

Comment: To be implemented for the total duration of the contract.

A3.2 Deadline for changeover to new item and personnel to be informed of DX wide change-over.

Comment: On an ad-hoc basis once the contract is established.

A4 Buyers Guide and Power Office

A4.1 Does the Buyers Guide or Buyers List need updating?

Comment: Only after the establishment of contract with the qualifying supplier

A4.2 What Buyer's Guides or items have been created?

Comment: Public Address equipment item list to be created when the supplier is selected.

A4.3 List all assembly drawing changes that have been revised in conjunction with this document.

Comment: N/A

A4.4 If the implementation of this document requires assessment by CAP, provide details under 5

A4.5 Which Power Office packages have been created, modified or removed?

Comment: N/A

A5 CAP / LAP Pre-Qualification Process related impacts

A5.1 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?

Comment: Performance will be monitored after contract award.

A5.2 If NO, provide motivation for issuing this specification before Acceptance Cycle Expiry date.

Comment: N/A

A5.3 Are ALL suppliers (currently accepted per LAP), aware of the nature of changes contained in this document?

Comment: Not applicable at this stage.

A5.4 Is implementation of the provisions of this document required during the current supplier qualification period?

Comment: Only after the contract award

A5.5 If Yes to 5.4, what date has been set for all currently accepted suppliers to comply fully?

Comment: N/A

A5.6 If Yes to 5.4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

Comment: N/A

A5.7 Can the changes made, potentially impact upon the purchase price of the material/equipment?

Comment: N/A

A5.8 Material group(s) affected by specification: (Refer to Pre-Qualification invitation schedule for list of material groups)

Comment: N/A

A6 Training or communication

A6.1 Is training required?

Comment: Yes, the contract with the supplier will include training)

A6.2 State the level of training required to implement this document. (E.g. awareness training, practical / on job, module, etc.)

Comment: Design, planning, configuration, and maintenance.

A6.3 State designations of personnel that will require training.

Comment: Planning, Project Implementation and Maintenance.

A6.4 Is the training material available? Identify person responsible for the development of training material.

Comment: To be included in the contract.

A6.5 If applicable, provide details of training that will take place. (E.G. sponsor, costs, trainer, schedule of training, course material availability, training in erection / use of new equipment, maintenance training, etc).

Article III. Comment: Formal and informal training.

A6.6 Was Technical Training Section consulted w.r.t module development process?

Comment: Not applicable at this stage, but Supplier Development and Localization (SD&L) will be part of contract establishment.

A6.7 State communications channels to be used to inform target audience.

Comment: Document to be published through SCOT.

A7 Special tools, equipment, software

A7.1 What special tools, equipment, software, etc will need to be purchased by the Region to effectively implement?

Comment: All will be included in the contract.

A7.2 Are there stock numbers available for the new equipment?

Comment: Not at this stage.

A7.3 What will be the costs of these special tools, equipment, software?

Comment: All will be included in the contract

A8 Finances

A8.1 What total costs would the Regions be required to incur in implementing this document? Identify all cost activities associated with implementation, e.g. labour, training, tooling, stock, obsolescence

Comment: All equipment will be drawn from a contract on an as and when required basis.

.....
.....
.....

Impact assessment completed by:

Name: Nitheen Keshav

Designation: Project Engineer / Manager Turnkey Projects

Annex B – Schedule A: Schedule of technical compliance

Schedule A provides 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.

Table 1: Schedule of technical compliance

Specification clause number	Description	Eskom's minimum technical requirements	Supplier's statements of compliance and supporting reference
3.1	TECHNICAL STANDARDS / COMPLIANCE		
3.1.1	All equipment shall comply with the following EN54 Standard family parts:		
3.1.1.1	EN54 Part 4 (EN54-4) - Voice Alarm Power Supply Equipment	[M] - Compliance Required	
3.1.1.2	EN54 Part 16 (EN54-16) - Voice Alarm and Indicating equipment	[M] - Compliance Required	
3.1.1.3	EN54 Part 24 (EN54-24) - Voice Alarm Loudspeakers	[M] - Compliance Required	
3.1.1.4	ISO7240 Part 19 (7240-19) - Design, Installation, Commissioning, and Maintenance of Sound Systems for Emergency purposes.	[M] - Compliance Required	
3.1.2	Speakers may also conform to ISO 7240-24 and / or BS-5839-8 standards.	[M] - Compliance Required	
3.1.3	Only equipment certified under EN54 Standard by an authorized certification body may be proposed where applicable.	[M] - Compliance Required	

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3.2	TYPE APPROVAL		
3.2.1	All modems, routers, switches, patch panels, and external media inputs shall be ICASA approved where applicable.	[M] - Compliance Required	
3.3	EQUIPMENT HOUSING		
3.3.1	All system equipment shall be housed in 600mm x 600mm floor-standing cabinets.	[M] - Compliance Required	
3.3.2	The housing shall be constructed of steel and be powder coated.	[M] - Compliance Required	
3.3.3	The housing shall include the option of castors with braking mechanisms on all wheels.	[I] - Information Required	
3.3.4	Housing shall have a smoked glass door in front and a steel access door at the rear.	[M] - Compliance Required	
3.3.5	Both, front and rear access doors must be lockable and be supplied with spare keys.	[M] - Compliance Required	
3.3.6	Housing shall have a 4-WAY fan tray on the inside of the roof of the housing.	[M] - Compliance Required	
3.3.7	The height of the equipment housing shall be adequate to ensure that there is a minimum ventilation space of 1U between the components housed in it.	[M] - Compliance Required	
3.4	SYSTEM ARCHITECTURE		
3.4.1	System shall be scalable allowing for de-centralised components in different locations under a centralised control over a packet-based network backbone.	[M] - Compliance Required	
3.4.2	The system components shall provide network redundancy by doubling on the TCP/IP Ethernet interfaces, supplying two ports for audio and data control transmission on each decentralised device.	[M] - Compliance Required	

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3.4.3	The system shall support an additional analogue audio reserve path to allow for an all-call paging in case of a network failure or CPU failure, as well as signal path line faults anywhere between microphone(s) and amplifier(s).	[M] - Compliance Required	
3.4.4	The de-centralised zones shall have their local audio output / inputs, battery surveillance capability, battery charging capability, and speaker line surveillance capabilities.	[M] - Compliance Required	
3.4.5	The system manager shall be capable of monitoring all de-centralised zones centrally and logging all events.	[M] - Compliance Required	
3.4.6	All system components shall be modular and of the 19" rack-mount type.	[M] - Compliance Required	
3.4.7	All components of the system except for multi-media inputs, recording/playback devices, batteries, and network connectivity switches shall be from the same manufacturer's stable.	[M] - Compliance Required	
3.4.8	Control of the entire system must be software-driven using the Microsoft Windows™ 7 operating system.	[M] - Compliance Required	
3.4.9	The system shall not be part of any other system such as a fire control system but be capable of integration with other stand-alone systems such as Fire control panels.	[M] - Compliance Required	
3.4.10	Operational tasks must be performed by menu buttons with visible LCD displays and LED statuses.	[M] - Compliance Required	
3.4.11	The system shall cater for an initial of 2 microphone and / or external line-level inputs which can be expandable to a minimum of 64 such inputs.	[M] - Compliance Required	
3.4.12	The system shall cater for an initial minimum of 8 amplifier outputs which can be expandable up to 256 such outputs.	[M] - Compliance Required	

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3.4.13	The system shall cater for a minimum of 16 audio channels for general broadcasts (paging, announcements, BGM, etc.) and 4 audio channels for emergency broadcasts which can be processed simultaneously.	[M] - Compliance Required	
3.4.14	The system shall provide for a minimum of 256 levels of priority settings. This is to assign different levels of management of the system.	[M] - Compliance Required	
3.4.15	The system shall be capable of accommodating A-B speaker wiring configuration.	[M] - Compliance Required	
3.4.16	The system shall be capable of handling of emergency broadcasts, background music and paging announcements, simultaneously in different zones. However emergency conditions “all-call” takes priority over all broadcasts.	[M] - Compliance Required	
3.4.17	The system shall be capable of broadcasting up to four different emergency messages (alert & evacuation) simultaneously into individual zones or groups of zones, in order to avoid unnecessary evacuations in non-affected areas thereby avoiding a state of panic.	[M] - Compliance Required	
3.4.18	The system shall provide programming of four 3-phase alarm sequences. The phases shall be triggered automatically by a programmable timer, or externally by the fire detection system or the emergency microphone panel. The number of phases can be matched to the requirements.	[M] - Compliance Required	
3.4.19	The system shall be capable of controlling up to 1416 control inputs and 1416 control outputs.	[M] - Compliance Required	

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3.5	ZONES		
3.5.1	The system must be supplied with a minimum of 8 zones with the option to increase this to a maximum of 256 zones with the addition of output modules.	[M] - Compliance Required	
3.5.2	The system must be programmable to select individual zones, or groups of zones, as well as all call paging.	[M] - Compliance Required	

3.6 BACK-GROUND MUSIC (BGM)

3.6.1	The system must be able to play back-ground music from any media player input.	[M] - Compliance Required	
3.6.2	The back-ground music shall be selectable to play on any designated zones, group of zones, or all zones.	[M] - Compliance Required	
3.6.3	The BGM shall be programmable to select volume settings individually from the front control panel of the Audio Output module or by programmable software.	[M] - Compliance Required	
3.6.4	The system must be able to over-ride any BGM broadcast during emergency & general paging.	[M] - Compliance Required	

3.7 TONES / PRE-RECORDED MESSAGES

3.7.1	The system shall accommodate for a minimum of 32 tones and / or pre-recorded messages or a combination thereof.	[M] - Compliance Required	
3.7.2	The tones / pre-recorded messages shall not be stored on a rotary disc.	[M] - Compliance Required	

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3.8	MICROPHONES		
3.8.1	The system shall be able to accommodate for remote microphones as well as a Fireman's microphone.	[M] - Compliance Required	
3.8.2	The remote microphones must provide for a minimum of 10 selectable buttons that can be programmable by the system to select features such as zone select, alert signals, volume settings, custom functions, and any other input sources and must also be expandable to cater for a minimum of 80 zones. .	[M] - Compliance Required	
3.8.3	The Fireman's microphone shall have a priority status and be capable of over-riding any other broadcast.	[M] - Compliance Required	
3.8.4	The Fireman's microphone shall also have a functionality of being able to effect an all call broadcast in the event of the failure of the system manager.	[M] - Compliance Required	
3.8.5	All microphone unit(s) shall also have the capability of receiving fault indications in the form of flashing LEDs and buzzer feature(s) and allow for such faults to be acknowledged on the microphone unit.	[M] - Compliance Required	
3.8.6	All microphone unit(s) shall also be capable of acknowledging any emergency broadcasts.	[M] - Compliance Required	
3.8.7	Each microphone must be able to be assigned a different priority level by the system.	[M] - Compliance Required	
3.8.8	Any remote microphone shall be capable of being programmed to work as a Fireman's microphone.	[M] - Compliance Required	

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3.9	CRITICAL SIGNAL PATH MONITORING & FAULT DETECTION / INDICATION		
3.9.1	The system shall be capable of monitoring all speaker lines via the microphone unit by means of impedance monitoring.	[M] - Compliance Required	
3.9.2	The monitoring shall include open CCTs, short CCTs, and earth leakage (ground) faults on speaker lines.	[M] - Compliance Required	
3.9.3	The sensitivity of the speaker line monitoring shall be adjustable to prevent any false indications.	[M] - Compliance Required	
3.9.4	The following faults are also to be indicated on the microphone unit(s) as General Faults:		
3.9.4.1	CPU Failure	[M] - Compliance Required	
3.9.4.2	Mains supply	[M] - Compliance Required	
3.9.4.3	Stand-by batteries and charger	[M] - Compliance Required	
3.9.4.4	Stand-by amplifiers	[M] - Compliance Required	
3.9.4.5	All protective devices such as fuses	[M] - Compliance Required	
3.9.4.6	The fire-alarm broadcast initiation point(s)	[M] - Compliance Required	
3.9.4.7	Emergency messages	[M] - Compliance Required	
3.9.4.8	Interlinks between different components	[M] - Compliance Required	
3.9.4.9	Battery Fault	[M] - Compliance Required	
3.9.5	The indication of faults should be announced within 100 seconds of occurrence of the fault.	[M] - Compliance Required	
3.10	BASIC SYSTEM SOFTWARE / SOFTWARE LICENSES		
3.10.1	The system shall be provided with all necessary software and licensing.	[M] - Compliance Required	
3.10.2	Indicate whether there is any need for periodic license renewal and associated firmware upgrade costs.	[I] - Information Required	

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3.11	POWER SUPPLY & STAND-BY BATTERIES		
3.11.1	The system shall be equipped with EN54 compliant stand-by batteries to cater for a minimum stand-by period of 24 hours and a continuous broadcast of 30 minutes at full power.	[M] - Compliance Required	
3.11.2	The system shall be powered by 24VDC via power supply modules working off 220VAC and must be capable of a seamless transition between AC and DC.	[M] - Compliance Required	
3.11.3	Stand-by batteries shall be of the sealed Vent regulated Lead Acid (VRLA), flame retardant variety and maintenance free.	[M] - Compliance Required	
3.11.4	Stand-by batteries shall comply with EN50272 and EN60896-2 standards.	[M] - Compliance Required	
3.11.5	The minimum life-span of the batteries shall be 10 years.	[M] - Compliance Required	
3.11.6	The system must be capable of discharging and re-charging each battery at a pre-determined interval for purposes of keeping each battery in optimal condition.	[M] - Compliance Required	

3.12 REDUNDANCY

3.12.1	The system shall allow for redundancy on both, fibre & copper concurrently.	[M] - Compliance Required	
3.12.2	Redundancy for audio broadcasts shall be provided over copper via analogue link ports.	[M] - Compliance Required	
3.12.3	The system shall allow for all call broadcasts even during failure of the system manager CPU.	[M] - Compliance Required	

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3.12.4	A stand-by amplifier which is equal to or higher in capacity than the capacity of any other amplifier in the same rack, shall be installed for every 10 amplifiers in a zone.	[M] - Compliance Required	
3.12.5	The stand-by amplifier must be able to take over the load of any amplifier that has failed, without the need for any human interface.	[M] - Compliance Required	
3.12.6	The system must be powered by a dual power supply (excluding stand-by batteries)	[M] - Compliance Required	

3.13 INTERFACES

3.13.1	The system shall be capable of accommodating any external inputs from stand-alone panels such as fire detection and access control panels.	[M] - Compliance Required	
3.13.2	The system shall also be capable of providing outputs to trigger indicating equipment such as buzzers and lights.	[M] - Compliance Required	
3.13.3	The system shall have an Ethernet port for the purposes of connecting a service terminal as well as connection to a LAN port for remote access.	[M] - Compliance Required	

3.14 SYSTEM EVENT LOG

3.14.1	The system shall be capable of logging a minimum of 10 000 event logs on a CF card in text format which can be accessed even after a total system failure.	[M] - Compliance Required	
3.14.2	The system event log must be accessible remotely.	[M] - Compliance Required	
3.14.3	The log format must be able to be exported into MS® Excel as well as PDF formats.	[M] - Compliance Required	

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3.15	SPEAKERS / SPEAKER CABLING		
3.15.1	All fire-rated speaker equipment must comply with EN54-54 specifications.	[M] - Compliance Required	
3.15.2	Speakers complying to ISO 7240-24 or BS 5839-8 are also acceptable and must be identified as such.	[I] - Information Required	
3.15.3	The SPL of speakers shall be rated to allow them to fall into the category of Green products.	[M] - Compliance Required	
3.15.4	The minimum SPL of speakers shall be as follows to reduce the required consumption wattage:		
3.15.4.1	Ceiling-mount & Wall-mount speakers: 90dB - 94dB @ 1w @ 1m	[M] - Compliance Required	
3.15.4.2	Projection speakers: 91dB - 97dB @ 1w @ 1m	[M] - Compliance Required	
3.15.4.3	Horn Speakers: 109dB @ 1w @ 1m	[M] - Compliance Required	
3.15.5	Speakers should have ceramic terminal blocks, thermal fuses, and metal fire-dome where applicable.	[I] - Information Required	
3.15.6	Speaker cabling shall be a minimum PH120 class as per EN50200/SANS10139.	[M] - Compliance Required	
3.15.7	Cabling may be of the indoor and outdoor use application and must have a minimum cross-sectional core of 1.5mm.	[M] - Compliance Required	

3.16 ON-SITE MANGEMENT REQUIREMENTS

3.16.1	On-site management of the EP/PA system will be via human interface through a computerised system.	[M] - Compliance Required	
3.16.2	Hardware: Management platform shall comprise of a desktop computer and minimum 17" Flat Screen monitor to support rapid execution of maintenance and reporting routines.	[M] - Compliance Required	

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3.16.3	Software: Management / Administrative software and licensing shall execute maintenance routines of the entire system, monitor the operational status of all components of the system (including speakers), and changing the configuration parameters of the system both on site and remotely by way of Eskom LAN or Internet access.	[M] - Compliance Required	
3.16.4	Event log database capable of recording all system faults as well as all controls effected through human interface.	[M] - Compliance Required	
3.16.5	The system must be capable of accommodating an external voice activated recording device to record all announcements made via each of the microphones.	[M] – Compliance Required	
3.16.6	The recorder should be a capable of recording in multiple formats onto compact disc/s and/or high capacity SD card/s. All recorded data must contain date & time stamp information during recording & playback.	[M] – Compliance Required	
3.16.7	Access to on-site management system service terminal must be password protected.	[M] - Compliance Required	

3.17 REMOTE MANAGEMENT SYSTEM REQUIREMENTS

3.17.1	The medium of access into the remote system and/or on-site management system shall be via the Eskom Intranet and / or the internet.	[M] - Compliance Required	
3.17.2	The remote management must not require any specialised remote management platform to access the installed location/s remotely.	[M] - Compliance Required	
3.17.3	Stipulate the licensing terms and conditions applicable to the Remote Management Platform.	[I] - Information Required	

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3.17.4	List all the functionalities provided over remote access configuration.	[I] - Information Required	
3.17.5	The Remote Management System shall generate status reports concerning all aspects of the respective EP/PA system and its components. Such reports shall be capable of being exported and transmitted electronically.	[M] - Compliance Required	
3.17.6	Remote access to any of the installed sites must be password protected.	[M] - Compliance Required	
3.18 SYSTEM SET-UP, CONFIGURATION, & COMMISSIONING			
3.18.1	All components of the system must be installed and wired by the supplier in each equipment rack.	[M] - Compliance Required	
3.18.2	The system shall also be configured as per end-user requirements and commissioned.	[M] - Compliance Required	
3.18.3	The supplier shall have the capability of configuring the software interface to integrate the voice alarm system into a Building Management System (BMS).	[M] - Compliance Required	
3.19 FACTORY ACCEPTANCE TESTING (FAT)			
3.19.1	The supplier shall configure and rig the system in their premises for Factory Acceptance Testing by Eskom and the end-user prior to deployment to the installation site.	[M] - Compliance Required	

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3.20	INSTALLATION & SITE ACCEPTANCE TESTING (SAT)		
3.2.1	The supplier shall install the system on site (excluding speakers, speaker cabling, and backbone cabling) inclusive of all interconnections between the de-centralised zones.	[M] - Compliance Required	
3.2.2	The supplier shall avail themselves for Site Acceptance Testing at site after installation.	[M] - Compliance Required	

3.21 SYSTEM MANUAL(S) / DOCUMENTATION / CERTIFICATES

3.21.1	Multiple copies of the system design & architecture, system components, User Manuals, and all other Data Sheets are to be supplied with the system.	[M] - Compliance Required	
3.21.2	All components and equipment must be supplied with their CPD certification documents.	[M] - Compliance Required	
3.21.3	Only CPD certificates issued by a registered "Notified Body" under ECC will be valid.	[M] - Compliance Required	
3.21.4	The manuals, documentation, and certificates must be made available in both, hard and soft copy formats.	[M] - Compliance Required	
3.21.5	The initial fingerprint of the system stored in the CF card must also be provided as a soft copy.	[M] - Compliance Required	

3.22 SYSTEM LIFE-CYCLE

3.22.1	The minimum system life-cycle of the proposed product must be 10 years.	[M] - Compliance Required	
3.22.2	The life-cycle of the product must be further supported in terms of spares availability for a minimum period of 7 years after discontinuation of the product.	[M] - Compliance Required	

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3.23	WARRANTY & SUPPORT		
3.23.1	The system shall carry a minimum local (South African) warranty of 36 months with on-site as well as telephonic support from date of the system being commissioned. Eskom shall thereafter have the option to access on-going support in terms of a subsequent agreement.	[M] - Compliance Required	
3.23.2	The supplier must have a technician on call on a 24-hour basis for purposes of telephonic support.	[M] - Compliance Required	
3.23.3	Supplier spares holding should include minimum replacement spares to restore service of the system in its entirety within 8 working hours.	[M] - Compliance Required	
3.23.4	All support shall also include all firmware upgrades of the initial system version installed over the operational life of the system.	[M] - Compliance Required	
3.23.5	The support shall include First Line Level maintenance training including remote management system training as well as periodic refresher training for Eskom Telecommunications' maintenance technicians.	[M] - Compliance Required	
3.23.6	The supplier shall also provide Operator training on site to the End-User.	[M] - Compliance Required	
3.23.7	The supplier shall be available on a consultative basis to assist in providing a solution to Eskom Telecommunications for their clients.	[M] - Compliance Required	
3.23.8	Product support must include national as well as international support through the local branch.	[M] - Compliance Required	
3.23.9	The supplier shall be willing to enter into a SLA with Eskom Telecommunications for ad-hoc support.	[M] - Compliance Required	

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3.23.10	The supplier shall be the OEM or the exclusively appointed agent / distributor of the OEM in South Africa and may not be a reseller of the exclusively appointed agent / distributor of the OEM. Non-OEM supplier acceptance will be subject to Evaluation Committee approval.	[M] - Compliance Required	
3.23.11	The supplier should have history of supplying products of this nature in South Africa for at least a minimum period of 10 years.	[I] - Information required	
3.23.12	Supplier to provide list of reference sites where the product on offer has been installed and the year of implementation.	[D] - Detail Required	
3.23.13	Supplier should have a local technician available not more than 500km from any Eskom site in South Africa for purposes of on-site support.	[M] - Compliance Required	

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