Eskom	SCOPE OF WORK	Technology

Title: **Duvha Power Station Maintenance Contract Scope of work for Fire Detection System**

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1. MAINTANANCE AND SERVICE OF DUVHA FIRE DETECTION SYSTEM

1.1 DESCRIPTION OF SERVICES

Fire detection equipment not only provides early occupant warning, but is also used for actuating fire protection systems. This requires a high level of reliability for the operation of fire detection equipment.

This document establishes the minimum requirements and scope of work for the inspection, testing and maintenance of Duvha Power Station fire detection and alarm systems, including systems designed to provide early warning or to control the actuation of automatic fire suppression systems.

Duvha Fire Detection system has installed Aritech Fire Detection Panels (2X-F2-S-99). Each unit has 2 Fire Detection panels, all field detectors connected to them. Admin Building and HMD main workshop also has 2 panels each. In total Duvha have 16 Aritech panels, 1 global repeater panels (to be installed at unit 3 EOD) and 2 gas control units (Archive room and IT room). HMI screens will be installed at EOD, Electrical Workshop at unit 6 and Fire Station Department office.

1.2 SCOPE OF WORK

This Scope of work involves maintaining, service, repair, and statutory testing of fire detection system at Duvha Power Station this include fire detection system at Duvha Village.

Maintenance and Service of fire detection system should be done as per Duvha Fire Detection System Work Instructions.

- Daily Plant Operation Checks (3T24647-LEI1605 REV2).
- Annual Function Checks.
- 36 Monthly test of Admin IT-room and Archive CO^2/Energen systems.
- 36 Monthly Statutory pressures testing of CO^2/Energen cylinders. (43 CO^2 & 3 Energen).

Maintenance and Service of Fire Detection System involves the following:

- All alarms, faults and conditions displayed on Fire Panels should be investigated, repaired and faults cleared – special care should be taken for the same alarms, faults & conditions not re-appear within 48 hours.
- Repair field faults and replace faulty equipment as required, including the Fire Damper equipment like Actuators, IO Modules and 24 Volt Power Supplies to the Fire Dampers.
- Repair faulty field wiring and faults that are logged on the Fire Panels, including Fibre Optic cables and Fibre-to-copper convertors and all related equipment.
- Installation, Commissioning and testing of all wiring, Field Equipment, Detectors, Fire Dampers and Fire panels when required.
- Install / replace Fire Prevention Cushions / Seal bags in cable tunnel cable cavities as required. Inspect all the cable entries and Fire Cushions on yearly basis or as and when required.
- Do all other required maintenance on the Fire Detection System as required and notified.
- Re-route or move Field Wiring, Equipment and Fire Panels as and when required.
- Programming and updating of software versions on Fire Panels for existing and new equipment to be done as and when required. Upgrading or changing Equipment addresses and descriptions on Fire Panels and drawings when required.

- Fire Dampers and related Field Equipment and Power Supply Units must be maintained and tested to ensure that they are active and enabled on the Fire Panels. Activation of Fire dampers need to be investigated to distinguish between real or false alarms. Fire Dampers must be opened /closed manually or reset via the Fire Panels on request or as and when required. EMD Air-condition department need to be informed about closed Fire dampers and dampers need to be opened/closed as and when required.
- A communication Link must be established and maintained between the Fire Detection System and the air-condition Building Management System (BMS). Care must be taken that any Fire damper activation info must be correctly signalled / communicated to the BMS to ensure that the correct air condition system is switched off or restarted when Fire alarm is cleared and the Fire dampers opened.
- Monitor, reset and repair alarms due to the activation of Fire Deluge valves on site.
- Testing and installation of pressure switches on the fire protection systems.
- Spares and materials will be supplied by Eskom, unless otherwise specified. Contract Controller need to be informed timeously about any spare and material requirements.
- Report all true Fire Conditions & Alarms, False Alarms, damaged and disabled Fire Detection Equipment timeously to the Contract Controller. There will never be a situation where the Contract Controller is unaware of certain Fire System Conditions / limitations / damaged equipment or disabled equipment – the Fire Detection Contractor will be held responsible in such instances.
- Investigations and Alarm printouts will be made in case of any Fire- or explosion conditions to prove that the Fire Detection System operated correctly or not. Comprehensive reports will be compiled within the shortest possible time frame. The Contractor will provide all possible expertise needed to do these investigations and will assist Eskom with insurance claims that might arise from such an incident.
- Provided training to Eskom personnel to operate the Fire Panels and other Fire Detection Equipment when required
- Update drawings and manuals to as-build on site and provide Eskom with latest updated master copy of all programming on Hard copies, CD-ROM and/or USB Flash drive. Two hard copies of all drawings must up be neatly filed and kept on site. Drawings must be updated and kept current at all times.
- Passwords to all Fire Panels will be provided to the Contract Controller.
- Service Team should be on site from 07H00 to 16H15, 5 day a week.
- Servicing Team reports to the Contract Controller, Selobalobane Riba, of Duvha Power Station @ (013) 690 0684 on arrival and before leaving site.
- Comprehensive maintenance & fault reports / PM's (Plant Maintenance), Notifications and Statutory Shop papers / Job cards need to be signed off timeously or on request for work done and faults repaired daily. All Reports and paper work will be compiled and handed over to the Contract Controller for signature before Technician leave site.
- Function Testing of the complete Fire Detection System on yearly basis (Annual Function check as 1.2.2), where all detectors are tested as well as proven that the Double-knock will activate the correct Fire Dampers. Ensuring that all the Fire dampers are proven to open and/or close correctly and relevant Fire Alarms are displayed correctly on the Fire Panels. Any faults that are detected during these Function tests need to be rectified immediately.
- Function Testing of Fire Suppression Systems and Extraction Fans in Archives and IT rooms. At all times prevent the accidental release of gas.(As in 1.2.2)
- Three yearly pressures testing of Fire Suppression System CO^2 / Energen cylinders.(As in 1.2.3)

1.2.1 Daily Plant Operation Checks

Daily plant operation checks involve the following action or services:

- Check on the control panel display if any fire alarm exists.
- Obtain feedback if there are complaints about the Fire detection system.
- Reset panel if required or acknowledge alarms.
- List all plant problems or alarms.
- Do plant walk down and reset detectors
- Replace faulty detectors
- Record faulty detectors if replaced.
- Make notes of plant or fire detection equipment that might need attention in the near future.
- List all defects that were observed and repaired during plant walk down.
- Ensure all alarms are cleared on the Fire Panel when work is completed.

1.2.2 Annual Function Checks

Annual function checks involve the following action or services:

- Check the Condition of Fire Detection System
- Examine log book.
- Check building for structural or occupancy changes.
- Manual Call Points not obstructed.
- Storage encroaches within 300 mm from ceiling.
- A clear space of 500 mm is maintained.
- Record false alarms since the last inspection permit.
- Batteries to be disconnected and full load alarm simulated.
- Test load on battery by disconnecting mains check condition of batteries.
- Test fire alarm devices.
- Clean Smoke and Heat detectors
- Test all controls and indicators on panel.
- Test remote alarm signalling.
- Test ancillary functions operate (shut downs)
- Test fault indicators work by simulating fault conditions.
- Test operation of all MCP's
- Test physical and operational status of all fire detectors.
- Check analogue levels, on addressable systems, are still within range.

- Check fire detection layout in accordance with SANS10139 and note any none compliances.

On completion of testing the fire detection system a work job card will be filled in with all the relevant information regarding the status of each fire control panel and system. A report should be generated indicating the condition of the system.

Special Tools/Equipment to be used

- Solo Test Aerosol test spray
- Solo Smoke detector test tool
- Solo Detector Extract tool
- Solo 1.3m Extension pole
- Solo 4.5m Extension pole
- Solo Heat detector test tool
- Step Ladder where necessary
- Air blower to clean devices

1.2.3 Pressure Test IT & Archive Fire Protection Cylinders

The work for Pressure Testing IT & Archive Fire Protection Cylinders includes the following:

- Check or inspect the condition of fire protection gas cylinders.
- Remove the fire protection gas cylinders.
- Refill and pressurize the cylinders
- Return and install fire protection gas cylinders as it was.
- List all defects that were observed and repaired during plant inspection.
- Ensure all alarms are cleared on the fire detection panel when work it's completed.
- Pressure Test certificate should be provided after the test.
- Report all abnormalities on the system

1.3 APPLICABLE SPECIFICATIONS AND STANDARDS

1.3.1 General specification:

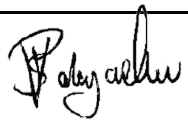
- 240-56737448 Eskom Fire Detection and Life Safety Design Standard
- 240-56737654 Eskom Inspection, Testing and Maintenance of Fire Detection Standard
- SANS 10139 Fire Detection and Alarm System for Buildings- System for Buildings- System Design, Installation and Servicing.

1.3.2 Quality Control

- Occupational Health and Safety Act No. 85 of 1993,
- ISO 9001 Quality Management Systems.

- 32-727 - Eskom Safety, Health, Environment and Quality (SHEQ) Policy.
- Inspection, testing and maintenance measures detailed in this document are to be performed by competent personnel only. Competent personnel are to ensure that they fully comply with the Plant Safety Regulations.

2. AUTHORIZATION

Name & Surname	Designation	Signature & Date
Selobalobane Riba	Contract Controller (Duvha EMD)	 17/01/2024
Vish Padayachee	EMD Contract Supervisor	 18/01/2024