Eskom	Report	Kriel Power Station

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EXECUTIVE SUMMARY

The *Contractor* Designs, Engineers, Installs and Commissions the expansion of the fire detection system for Kriel Power Station. The following high level areas are to be covered: Battery rooms, CW pump houses, Auxiliary plant switchgear rooms, Outside plant control room, outside plant workshops including Rotek building, Soweto Building and surrounding Park homes, conveyor boards substations, ash handling system, Water treatment plant auxiliaries and Kwanala boards switchgear rooms. The high-level scope of the *works* includes:

- Engineering,
- Design,
- Procurement,
- Factory acceptance testing,
- Delivery and off-loading at site,
- Site acceptance testing, storage,
- Installation,
- Testing,
- Commissioning,
- Decommissioning where necessary,
- Optimisation and
- As-built documentation for Kriel Power Station's Fire Detection System areas as mentioned above most of who are on the auxiliary plants.

The Fire Detection System is used for the monitoring and detection of any fire occurring within the specified Eskom Kriel Power Station premises.

The *Contractor* provides software licensing required for the *works.* This includes licensing requirements for all software forming part of installed system.

The *Contractor* provides for software installations and ensures all systems are updated to the latest version at completion including hardware.

All equipment and documentation forming part of the *works* are codified and plant equipment is labelled according to the requirements specified.

The *Employer* can use the *Contractors* design of the *works* at any given point in time, its information, design, for the purpose of construction and modification throughout the life of the plant.

The *Contractor* provides and performs all the *works* necessary for making the site ready for the new installation. The *works* includes all the activities but are not limited to the following, decommissioning, removal, and packaging, storing and transporting and sealing all the cable entries ways, which is affected by this *works*.

The Employer will provide scaffolding.
The *Contractor* provides all the necessary tools and equipment, which are required to perform the *works.*
The *Contractor* provides training to all the Staff as indicated by the *Employer's* as part of this *works.*

1. INTRODUCTION

Kriel Power Station is a coal-fired power station built in 1979 and is situated in Mpumalanga. It has 6 units, each capable of providing 500 MW sent out to the Eskom grid. It is a base-load power plant with a total station capacity of 3000 MW's. The Common Plant is responsible for all auxiliaries required by the units such as water supply, and coal, dust and ash handling. On the Common Plant, the FDS was never installed; as such, this was an audit finding because there is high likelihood of fire. The coverage in these areas will form part of the expansion of the existing FDS with the monitoring remaining at EOD.

2. SUPPORTING CLAUSES

2.1 SCOPE

The scope of work includes the following:

(1) Software engineering Design for fire detection system, planning, drawings, spec. etc. for acceptance by Client.
(2) FAT
(3) Installation of Sigmasys-Sinteso FDS hardware (Field components, Control panels, modules, etc.)Including all wiring terminations.
(4) Upload of software.
(5) Site acceptance testing
(6) Interfacing of the new installation onto the existing FDS and establishment of communication to the management PC
(7) Commissioning of the FDS
(8) Supply of labels for all new equipment and cables installed
(9) Training of operating, maintenance and engineering personnel
(10) Supply of documentation (drawings, cable and instrument schedules, training manuals, maintenance manuals, and operating manuals) for all equipment installed.

2.1.1 Electrical & mechanical engineering works

A Power supply of 220V is required in each battery room for the Sirens and strobe lights that is required in these areas.

- The 220V AC power supply will be provided for from the 380V Essential Board A, 220V spare circuits at every unit.
- The Contractor shall provide, install, terminate, test and connect the cabling from the essential boards to the small DB for the supply to the FDS.
- The small DB will also be designed (aligned with power requirements specified in the contractors detailed design), manufactured and tested, provided and installed by the contractor.
- The cabling from the small DB to supply all FDS equipment will be provided, installed, terminated, tested and connected by the contractors.
- As built drawings for new installation interfacing with the existing installation will be required.

The standard to be complied is:

- SANS 10142

- Drawings standard 240-86973501
- LV Power and Control Cables 240-56063805
- Earthing and Lightning Protection Standard 240-56356396
- MV and LV Protection Standard 240-56357424

2.1.2 Defects

- No Fire Detection System in the Common Plant Control Room and associated facilities
- No fire detection in the unit battery rooms
- No fire detection in the cable tunnels
- All areas occupied by employees are not covered by the Fire Detection System

2.1.3 Drawings

It is a requirement of this project that all drawings, be produced by the Tenderer on a CAD system, the preferred system being Microstation (*.DGN) or AutoCAD (*.dwg or *.dxf).

2.1.4 As-Built Plant & Control Room Drawings

All the documents which will be affected by this project will be updated by the *Contractor*:

- Rack Layout Drawing;
- Cable schedules for routing and racking Information;
- Termination Diagrams; and
- Implemented software and hardware design.

2.1.5 Manuals

The following manuals are submitted by the *Contractor* to the *Employer* (both in electronic and hardcopy form) as a minimum:

- Operating Manuals;
- Maintenance Manuals;
- Technical Manuals;
- Training Manuals; and
- Detail design drawings.

2.1.6 Plant Codification

Kriel Power Station Plant coding shall conform to AKZ-KKS Plant Codification Standard – ECM0005. Plant Labelling shall conform to Plant Labelling Standard – ECM0004.

The Contractor shall provide codification for all the equipment supplied (with guidance from Design and Specification) as part of works and submits to the Employer for approval.

All labels are made from anodised aluminium and are pop riveted in place.

All cable labels are made as per the Kriel Labelling Specification – ECM0004 and AKZ-KKS Plant Codification Standard – ECM0005.

2.1.7 Purpose

Purpose of this document is to outline the scope of work for the Expansion of the Fire Detection System at Kriel Power Station.

2.1.8 Applicability

This document shall apply to the Fire Detection system at Kriel Power Station.

2.2 NORMATIVE/INFORMATIVE REFERENCES

2.2.1 Normative

[1] ISO 9001 Quality Management System

[2] ECI0310-2 SRD for Fire Detection System Expansion

[3] 377-KRL-AABZ4-AS0000-1 Fire Assessment Report

[4] SAP QIM 100021831 Insurance Audit Report

[5] 377-KRL-AABZ4-AS0000-1 LV Switchgear Fire Assessment Report

2.2.2 Informative

[1] 377-KRL-AABZ4-AS0000-1 Kriel Power Station LV Common Plant Switchgear Upgrade Project Fire Protection Detection Assessment

[2] 240-53113685 Design review procedure

[3] 240-56737448 Fire Detection and Life Safety Design Standard

[4] SANS 10142

[5] Drawings standard 240-86973501

[6] LV Power and Control Cables 240-56063805

[7] Earthing and Lightning Protection Standard 240-56356396

[8] MV and LV Protection Standard 240-56357424

2.2.3 Disclosure Classification

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

2.3 ABBREVIATIONS

Abbreviation	Description
C&I	Control and Instrumentation
COE	Centre of Excellence
EOD	Electrical Operating Desk
ROC	Required Operational Capability
SHE	Safety, Health & Environmental

2.4 ROLES AND RESPONSIBILITIES

- C&I Engineering is responsible for compiling the scope

2.5 PROCESS FOR MONITORING

The monitoring of the execution of the Scope will be performed by the Project Manager and discussed in progress meetings.

2.6 RELATED/SUPPORTING DOCUMENTS

Bill of quantities.

3. AUTHORISATION

This document has been seen and accepted by:

Name & Surname	Designation

4. REVISIONS

Date	Rev.	Compiler	Remarks

5. DEVELOPMENT TEAM

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

6. ACKNOWLEDGEMENTS