Eskom	Scope of Works	Engineering

Title **Scope of Works for Partial Load Losses (PLL) and Trip reduction at Kriel Power Station**

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1. Introduction

This document outlines the scope of works for the reduction of partial load losses (PLL) and trips at Kriel Power Station The service provider identifies causes of partial load losses (PLL) and trips through the investigations and development, commissioning, and application of a thermo-hydraulic model tailored to reflect the operating characteristics and unique performance profile of each generating unit

The scope includes a comprehensive assessment of the entire power station plant performance with a focus on trips and load losses, including auxiliary systems, and the implementation of process optimization measures based on real-time analysis and simulation

1.1 Scope

The scope of works aims to improve Kriel Power Station plant overall plant efficiency by identifying the root causes of thermal and operational underperformance, including system-level inefficiencies and frequent unplanned trips Emphasis will be placed on optimizing performance through real-time data analytics, advanced simulation, and actionable engineering insights and achieve the following

- Reduction of Partial Load Losses (PLL) across generating units
- Minimizing the frequency of unplanned boiler and turbine trips
- Improve the thermal efficiency and operational reliability of the station
- Facilitate knowledge transfer and build internal capability through collaboration with station personnel

1.1.1 Purpose

The purpose of this document is to outline the scope of works for the reduction of partial load losses (PLL) and trips at Kriel Power Station

1.1.2 Applicability

This document shall apply throughout Eskom Kriel Power Station

1.2 Normative/Informative References

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

1.2.1 Normative

[1] ISO 9001 Quality Management Systems

[2] Occupational Health and Safety Act (OHSACT)

1.2.2 Informative

[3] N/A

[illegible]

1.3 Definitions

N/A

1.4 Abbreviations

Abbreviation	Explanation
OHSACT	Occupational Health and Safety Act
SANS	South African National Standards
PPE	Personal Protective Equipment

1.5 Roles and Responsibilities

N/A

1.6 Process for Monitoring

N/A

1.7 Related/Supporting Documents

N/A

[illegible]

2. Description of Works

2.1 Scope of Work

2.1.1 Develop a Thermo-Hydraulic Digital Twin Model

Design, calibrate, and validate a digital twin model of a selected unit to accurately reflect current plant conditions

Ensure the model integrates with existing data acquisition and monitoring systems to allow real-time simulation and analytics

2.1.2 Comprehensive Plant Performance Assessment

Conduct a detailed assessment of station-wide plant performance, including major systems (boiler, turbine, feedwater, condensate) and auxiliary subsystems

Analyse historical and real-time data to quantify PLL trends and identify key loss contributors

2.1.3 Root Cause Analysis and Optimization

Identify and diagnose plant issues contributing to process inefficiencies, low thermal performance, and unstable operations

Investigate causes of boiler and turbine trips and propose effective, practical mitigation strategies

Recommend and prioritize process optimization interventions aimed at reducing PLL and improving reliability

2.1.4 Implementation Support and Advisory Services

Provide hands-on assistance and technical advisory support during the implementation of action plans

Collaborate with Eskom engineering and operations teams to ensure proper execution and change management

Support the refinement of operational practices, control strategies, and maintenance planning

2.2 Project Execution Approach

2.2.1 On-Site Presence

A dedicated project team will be deployed on-site at Kriel Power Station for a period of 12 months The team will work in close collaboration with station personnel to ensure seamless integration, knowledge sharing, and effective execution

2.2.2 Digital Twin Commissioning Period

A dedicated period of two (2) months at the start of the contract will be allocated for the development, commissioning, and testing of the thermo-hydraulic digital twin platform

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2.2.3 Reporting and Governance

Bi-weekly progress meetings will be held with Eskom stakeholders to review performance, address challenges, and refine focus areas

Formal progress reports will be submitted every two weeks, detailing activities undertaken, key findings, and measurable improvements, including quantified reductions in Partial Load Losses (PLL)

A final project report will be required at the end of the contract, summarizing overall impact, lessons learned, and sustainability recommendations

2.3 Employer limits of responsibility for this scope of works

The *Employer* must

- Provide induction and safety orientation
- Provide access Permits to Kriel Power Station
- Provide work Permits

2.4 Contractor limits of responsibility for this scope of works

The *Contractor* is required to

- Ensure that staff always work in teams and do not work alone during any activity
- Conduct a thorough risk assessment and provide all staff with health and safety checklists and instructions before commencing any work on site
- Promptly escalate any Environmental and Health issues to higher levels of management, with the Employer initiating investigations upon becoming aware of the situation
- Notify staff in advance about the necessity of wearing appropriate Personal Protective Equipment (PPE), including protective gloves, sensible outdoor clothing such as trousers, and warm clothing when necessary
- Provide all necessary PPE to its employees
- Notify the Contract Manager to cancel activities in case of extreme weather conditions (e g , high winds, rain, snow, etc)
- Comply with Eskom vehicle safety procedures

2.5 Documentation

- The Contractor submits all documentation on a formal transmittal form to the Employers Representative
- All documentation shall be presented in British English in both software and hardware
- All Communications will be filed and kept on site at all times as it is crucial to have the correct communication structures

CONTROLLED DISCLOSURE

3. Acceptance

This document has been seen and accepted by

Name	Designation
[redacted]	C&I Engineering Manager
[redacted]	Engineering Manager
[redacted]	Process Engineering Manager (Acting)
[redacted]	P&T Manager

4. Revisions

Date	Rev.	Compiler	Remarks
June 2025	1	[redacted]	New Document

5. Development Team

The following people were involved in the development of this document

- [redacted]

6. Acknowledgements

None

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