Eskom	Strategy	Engineering

Title: **Kriel Power Station Chemical Supply for Cooling Water and Ash Water Return/Supply Systems Technical Evaluation Strategy**

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Compiled by	Functional Responsibility	Authorised by
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Kriel Power Station	**Kriel Power Station**	**Kriel Power Station**
Date: 2024-11-12	Date: 2024-11-12	Date: 2024/11/18

Supported by

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Auxiliary Engineering Manager

Kriel Power Station

Date: 2024/11/13

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TABLES

1. INTRODUCTION

Kriel Power Station (PS) is situated in Kriel, Mpumalanga. It comprises of six (6) five hundred (500) megawatt (MW) units. The station uses primary inputs of coal and water to produce electricity for supply to the country. It is a wet-cooled station, in that the primary means of condensing low-pressure steam from the low-pressure turbine uses water, which is cooled, in an open evaporative natural draft-cooling tower.

Kriel PS utilises lime softening for hardness removal. The lime softening is conducted on a side-stream treatment, meaning approximately 10% of the total volume of the CW system is treated through the process on a continuous basis. The CW system is split into two operating systems, one servicing Units 1-3 termed the South side and the other servicing Units 4-6 termed the North side. The cooling water circuits operate independently of each other with their own treatment systems.

The lime treatment systems on each CW circuit include the lime treatment plant that was originally installed with the power station and a new lime treatment plant which was installed in 2019. There are currently challenges that are experienced on both the original and the new lime treatment plants, which affects availability of the lime treatment plants. In addition, chemicals are dosed to control microbiological growth and scale formation in the system, and there are no long-term contracts in place to manage the consistent supply of these chemicals. This results in inadequate control of microbiological growth and scale within the system.

All the impacts explained in the previous paragraph results in reducing the efficiency of the condenser, which results in load losses experienced on the station.

Kriel PS also operates a wet ashing system where the ash is disposed off in a slurry on ash dams. Once the ash has settled in the dam, the ash water (supernatant) is decanted via penstocks in the ash dam and pumped back to the power station to be reused to slurry the ash from the boilers. The ash water that is returned (termed ash water return) is highly scaling. Chemicals are dosed to prevent the scaling of these ash water return lines.

2. SUPPORTING CLAUSES

2.1 SCOPE

This document provides the tender technical evaluation strategy for all the activities necessary for the provision of a fully functional chemical dosing regimen that meets the Employer's requirements.

2.1.1 Purpose

The purpose of this tender technical evaluation strategy is to define the Mandatory Evaluation Criteria, Qualitative Evaluation Criteria and Technical Evaluation Team (TET) member responsibilities for tender technical evaluation. The technical evaluation strategy serves as basis for the tender technical evaluation process.

2.1.2 Applicability

This document shall apply to Kriel Power Station.

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] 240-48929482: Tender Technical Evaluation Procedure

[2] 32-1034: Eskom Procurement Policy

[3] 555-EAP2341: Kriel Power Station Chemical Supply for Cooling Water and Ash Water Return/Supply Systems Scope of Work

2.2.2 Informative

2.3 DEFINITIONS

2.3.1 Classification

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

2.4 ABBREVIATIONS

Abbreviation	Description
ECSA	Engineering Council of South Africa
LPS	Low Pressure Services
COC	Cycles of Concentration
CW	Cooling Water
CFU	Colony Forming Unit
Ml	Megalitre
m^3/s	Meter cubed per second
PS	Power Station

2.5 ROLES AND RESPONSIBILITIES

As per 240-48929482: Tender Technical Evaluation Procedure

2.6 PROCESS FOR MONITORING

Not applicable.

2.7 RELATED/SUPPORTING DOCUMENTS

Not applicable.

3. TENDER TECHNICAL EVALUATION STRATEGY

3.1 TECHNICAL EVALUATION THRESHOLD

The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is 70%.

3.2 TET MEMBERS

Table 1: TET Members

TET number	TET Member Name	Designation
TET 1	Jerushan Pillay	Senior Engineer
TET 2	Enock Dube	Senior Supervisor
TET 3	Nqobile Kolobe	Acting Manager Chemical Services

3.3 MANDATORY TECHNICAL EVALUATION CRITERIA

There are no mandatory technical evaluation criteria.

3.4 QUALITATIVE TECHNICAL EVALUATION CRITERIA SCORING MATRIX

The qualitative criteria will be scored according to the scoring matrix set out in the Tender Engineering Evaluation Procedure [1].

Table 2 shows the scoring matrix that will be used.

Table 2: Qualitative Technical Evaluation Criteria Scoring Matrix

Score	%	Definition
5	**100**	**COMPLIANT** • Meet technical requirement(s) AND; • No foreseen technical risk(s) in meeting technical requirements.
4	**80**	**COMPLIANT WITH ASSOCIATED QUALIFICATIONS** • Meet technical requirement(s) with; • Acceptable technical risk(s) AND/OR; • Acceptable exceptions AND/OR; • Acceptable conditions.
2	**40**	**NON-COMPLIANT** • Does not meet technical requirement(s) AND/OR; • Unacceptable technical risk(s) AND/OR; • Unacceptable exceptions AND/OR; • Unacceptable conditions.
0	**0**	**TOTALLY DEFICIENT OR NON-RESPONSIVE**
Note 1: The scoring table does not allow for scoring of 1 and 3.		

3.5 QUALITATIVE TECHNICAL EVALUATION CRITERIA

Table 3: Qualitative Technical Evaluation Criteria

	Requirement	Reference to Technical Specification / Tender Returnable	Criteria Weighting (%)	Evaluation Scoring Breakdown			
				0	2	4	5
1	The tenderer to indicate their level of experience in CW systems and system modelling. Tenderer to submit three (3) verifiable references of similar projects to indicate their relevant experience with chemical supply and one (1) verifiable reference with CW system modelling including the following: 1. Name and contact details of person at the company for the previous work submitted 2. High-level scope of work performed for the previous work submitted	NEC document Part 3: Scope of Work, Section 3	20	No submission or Insufficient Information	Tenderer submits one (2) verifiable reference for chemical supply	Tenderer submits two (3) verifiable references for chemical supply and one (1) verifiable reference for CW system modelling	Tenderer submits three (4) verifiable references for chemical supply and one (1) verifiable reference for CW system modelling
2	The tenderer to submit a report indicating the CW system modelling as per the NEC	NEC document Part 3: Scope of Work, Section 3	20	No submission or Insufficient Information			Tenderer submits the following: 1. COC and blowdown calculations with sensitivity analysis 2. Scale formation within the system, based on COC. 3. Microbiological formation within the system based on provided information
3	The tenderer to submit a report regarding the dosing regimen proposed, based on modelling the system as per the information provided in the NEC. It shall include the following fields: 1. Chemicals proposed, dosage rates and flows	NEC document Part 3: Scope of Work, Section 3	20	No submission or Insufficient Information	Tenderers submission includes the following fields: 1. Chemicals proposed, dosage rates and flows for CW and	Tenderers submission includes the following fields: 1. Chemicals proposed, dosage rates and flows for CW and AWR/AWS dosing. 2. Chemical material incompatibilities for	Tenderers submission includes the following fields: 1. Chemicals proposed, dosage rates and flows for CW and AWR/AWS dosing. 2. Chemical material incompatibilities for

	for CW and AWR/AWS dosing. 2. Chemical material incompatibilities for CW and AWR/AWS systems 3. Layout and design of the corrosion/fouling/scaling monitoring systems for the CW and AWR/AWS systems 4. Layout and design of the dosing system for CW and AWR/AWS systems				AWR/AWS dosing. 2. Chemical material incompatibilities for CW and AWR/AWS systems	CW and AWR/AWS systems 3. Layout and design of the corrosion/fouling/scaling monitoring systems for the CW and AWR/AWS systems	CW and AWR/AWS systems 3. Layout and design of the corrosion/fouling/scaling monitoring systems for the CW and AWR/AWS systems 4. Layout and design of the dosing system for CW and AWR/AWS systems
4	The tenderer submits a draft report to show how information is to be presented. The following fields will be included: 1. Chemical dosing system compliance to KPIs 2. Trending on CW parameters and discussion 3. Chemical consumption actuals compared with forecasted values, with discussion on deviations. 4. Defects noted on system and discussion	NEC document Part 3: Scope of Work, Section 3	20	No submission or Insufficient Information	Tenderers submission includes the following fields: 1. Chemical dosing system compliance to KPIs 2. Trending on CW parameters and discussion	Tenderers submission includes the following fields: 1. Chemical dosing system compliance to KPIs 2. Trending on CW parameters and discussion 3. Chemical consumption actuals compared with forecasted values, with discussion on deviations.	Tenderers submission includes the following fields: 1. Chemical dosing system compliance to KPIs 2. Trending on CW parameters and discussion 3. Chemical consumption actuals compared with forecasted values, with discussion on deviations. 4. Defects noted on system and discussion
5	The tenderer must supply a method statement and proof of SANAS accreditation regarding the sampling and monitoring of chemical parameters	NEC document Part 3: Scope of Work, Section 3	10	No submission or Insufficient Information	Tenderer supplies the following: 1. Proof of SANAS accreditation for microbiological methods as per KPIs in NEC	Tenderer supplies the following: 1. Proof of SANAS accreditation for microbiological methods as per KPIs in NEC 2. Method statement indicating sampling and monitoring of microbiological parameters	Tenderer supplies the following: 1. Proof of SANAS accreditation for microbiological methods as per KPIs in NEC 2. Method statement indicating sampling and monitoring of microbiological parameters. 3. Method statement indicating sampling and monitoring of all chemical parameters as per the KPIs on CW

							and AWR/AWS systems
6	The tenderer must supply the SDS as per Global Harmonised System of Classification and Labelling (GHS) requirements	NEC document Part 3: Scope of Work, Section 3	10	No submission or Insufficient Information	Tenderer supplies SDS for the following: 1. Biocide for CW 2. Biodispersant CW 3. Antiscalant for CW	Tenderer supplies SDS for the following: 1. Biocide for CW 2. Biodispersant CW 3. Antiscalant for CW 4. Oil dispersant for CW	Tenderer supplies SDS for the following: 1. Biocide for CW 2. Biodispersant CW 3. Antiscalant for CW 4. Oil dispersant for CW 5. Antiscalant for AWR/AWS systems

3.6 TET MEMBER RESPONSIBILITIES

Table 4: TET Member Responsibilities for the Qualitative Evaluation Stage

Qualitative Criteria Number	TET 1 - JP	TET 2 - ED	TET 3 - NK
1	X	X	X
2	X	X	X
3	X	X	X
4	X	X	X
5	X	X	X
6	X	X	X

3.7 FORESEEN ACCEPTABLE / UNACCEPTABLE QUALIFICATIONS

3.7.1 Risks

Table 5: Acceptable Technical Risks

Risk	Description
1.	None.

Table 6: Unacceptable Technical Risks

Risk	Description
1.	Non-compliance with KPIs as per NEC
2.	Chemical incompatibility with CW system materials

3.	Chemical dosing regimen proposed without CW system modelling

3.7.2 Exceptions / Conditions

Table 7: Acceptable Technical Exceptions / Conditions

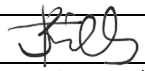
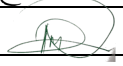
Risk	Description
1.	None.

Table 8: Unacceptable Technical Exceptions / Conditions

Risk	Description
1.	None.

4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation	Signature
Jerushan Pillay	Senior Engineer	
Enock Dube	Senior Supervisor	
Nqobile Kolobe	Acting Chemical Services Manager	

5. REVISIONS

Date	Rev.	Compiler	Remarks
April 2024	0.1	J Pillay	Draft Document
November 2024	1	J Pillay	Final Document for authorisation

6. DEVELOPMENT TEAM

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

- Jerushan Pillay
- Enock Dube
- Nqobile Kolobe

7. ACKNOWLEDGEMENTS

- Dheneshree Lalla
- Kelley Reynolds-Klaasen