

Title: **Technical Strategy:
Refurbishment of Reheat
safety and HP Bypass
valves, including its
associated HP Bypass
spraywater valves during
outages at Kriel Power
Station.**

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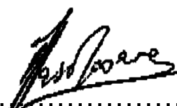
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CONTENTS

	Page
1. INTRODUCTION	3
1.1 SCOPE	3
1.1.1 Items to be supplied and refurbished	5
1.1.2 Applicability.....	5
1.2 NORMATIVE/INFORMATIVE REFERENCES.....	5
1.2.1 Normative	5
1.2.2 Informative	5
1.3 DEFINITIONS.....	6
1.4 ABBREVIATIONS.....	6
2. AUTHORISATION	6
3. REVISIONS	6
4. DEVELOPMENT TEAM	6
5. ACKNOWLEDGEMENTS	6

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1. INTRODUCTION

Kriel Power Station is situated approximately 10 kilometres from the town of Kriel in Mpumalanga. Access to the station is by road.

The purpose of this scope is to briefly outline the refurbishment (servicing) of Sulzer/CCI Valves at Kriel Power Station, on an as and when required basis. This will ensure quality and sustainable maintenance basis for all plant work required to provide optimal plant performance at the lowest cost possibly. The original equipment manufacturer, Sulzer/CCI holds the specifications of these valves. These valves are required to be serviced on as when required basis during "Outages and Maintenance" and must be accompanied with the required servicing data packs or documents for technical data/ information, equipment dimensions and drawings and most important, as per the Eskom approved valve repair standard.

1.1 SCOPE

The primary instructions to the service provider includes but not limited to:

Repair, replacement, component re-instatement and general mechanical components/fittings refurbishment as stipulated on the sub instructions below:

- 1) The Service provider should develop and submit QCP for approval by the end user – System Engineer prior to commence of any activities.
- 2) Visual Inspection (internal and external valve body and components) to be carried out together with Eskom and contractor Quality Inspectors. *Take photos if necessary*. The inspection sheet is to be completed for each valve.
- 3) Valves to be inspected (NDT or Visual) must first be released by Eskom's Quality Inspector. **NDT service provider will be the responsibility of Eskom**. This includes providing both NDT and Visual Inspection request and reports.
- 4) Spindle or Valve Stem to be inspected for scoring, pitting and erosion and surface crack tested (NDT) and conduct dimensional checks. Perform spindle run out test. Spindle to be repaired or replaced if defects are noted or the spindle is found to be deformed; the spindles are supplied through a sole source and also made stock items.
- 5) All gland retaining washers, studs and nuts to be removed and inspected. All washers, studs and nuts to be of same dimension with respect to the valve.
- 6) Gland stuffing boxes to be cleaned and inspected and conducts dimensional checks, Wall thickness analysis.
- 7) Worn press-in neck rings in stuffing boxes are to be replaced.
- 8) Ensure that the density of the required packing graphite rings is within the required rating or specification of the originally used packing and also the graphite rings are to be used on all valves (as per the OEM specification), and the material and specification defining certificates to be made available.
- 9) Valve bonnet retaining nuts and studs are to be removed and inspected for damage to threads, corrosion and stretching of studs. Replace damaged or out of specification nuts, washers and studs.

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- 10) Studs holes to be inspected for thread damage and repaired as required. All nuts to be free and not seized on studs. When a valve is assembled, ensure that washers are in place (at least 3-4 the thread pitch is exposed on the studs when nuts are tightened).
- 11) Special attention to be prioritised or given to gasket sealing areas. Gaskets are to be checked to conform to the recommended material with respect to temperature and pressure rating per valve.
- 12) Ensure that correct gasket dimensions by verifying with the specification and the contractor will be liable for the installation of lower rating gasket when higher rating gasket is required.
- 13) Proper or Gasket installation or torque procedure to be applied fitting the gasket, to ensure that there are no premature failures.
- 14) Valves fitted with the required pressure seals to be inspected for wear of retaining segments and segment location areas. Plug jacking screws to be inspected for thread damage and should not be seized.
- 15) All heads to be inspected for stretching, pitting or oversize. Replace retaining screws as required. Pressure seals to be replaced, ensuring correct size and density. Plug size and body size to be checked to ensure tolerances are correct to avoid extrusions of pressure seal. The material and specification defining certificates to be made available.
- 16) All open valves, pipes, to be closed by the contractor to avoid ingress of debris. Covers to be constructed as to prevent persons from removing them. Plastic will not be acceptable for this purpose
- 17) Mechanical artisans and Fitters to be available to carry out any necessary rework, and to assist with commissioning of valves with actuators
- 18) Magnetic particle testing or suitable NDE (e.g. UT or Replication (remnant life monitoring (Eskom Standard GST 36-702)) will be carried out on valves and may necessitate in situ repairs or replacing valve bodies and jet cages on all the valves to be services.
- 19) Due to loss of components on previous General Overhauls the contractor will be responsible for storage of all valves components. In the event of components being misplaced because of poor housekeeping or security, the contractor will be responsible to replace any items, at his own cost.
- 20) QCP showing all witness, inspection and hold points to be provided by the contractor with tender and approved by Eskom before any work commences.
- 21) Contractor to have his/her staff available during pressure test and unit commissioning to fix any defects that might arise during test since the valves are part of the valves examination or test plan.
- 22) The contractor shall provide a technical report of the inspection findings and repairs conducted on every valve. The report should as a minimum include the following:
 - The initial condition of the valve after stripping – report on debris, wear, and defects noted on the valves and associated components.
 - The repairs/replacements conducted to restore the valves mechanical integrity.
 - Measured dimensions vs. allowable tolerances.
 - List of recommended actions and/or spares for the next overhaul.
 - Photographs of all notable defects.

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1.1.1 Items to be supplied and refurbished

QUANTITY	APPLICATION	PRESS (Bar)	TEMP (°C)	NB (mm)	TYPE
4	Boiler Reheat Safety Valves	50	516	350	Special Globe
4	Boiler HP Bypass Valves	195	516	200	Special Globe
4	HP Bypass Spraywater regulating Valves	395	190	50	Globe
4	HP Bypass Spraywater Stop/ Isolating Valves	395	190	50	Globe
1	HP Bypass Spraywater main Isolating Valves	395	190	125	Globe

1.1.2 Applicability

This document is applicable to 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] 240-128557196 Procurement Standard of High Pressure and High Temperature Valves in Eskom Coal Fired Stations.
- [2] 240-142257054-Standard Capability Assessment of Providers for Refurbishment of Valves and Fittings Eskom Coal Fired Stations.

1.2.2 Informative

N/A

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1.3 DEFINITIONS

Definition	Description
Pipework	Pipes and fittings are used for the conveyance of steam, water, gases or other fluids.
Valve	A device for shutting-off or controlling the flow of a fluid through a pipe or duct.
Actuator	A device that produces a motion by converting energy and signals going into the system.

1.4 ABBREVIATIONS

Definition	Description
HP	High Pressure
QCP	Quality Control Plan
UT	Ultrasonic Testing
NDT	Non-Destructive Testing

2. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
Mthobisi Dlamini	Engineer, Boiler valves and Pressure Parts
Sinki Seloana	SME – Kriel Boiler Valve System

3. REVISIONS

Date	Rev.	Compiler	Remarks
June 2025	0.1	MJ Dlamini	Draft
June 2025	1	MJ .Dlamini and Sinki Seloana	Reviews and comments

4. DEVELOPMENT TEAM

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

- Mthobisi Dlamini
- Lloyd Sindane
- Sinki Seloana

5. ACKNOWLEDGEMENTS

- N/A

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