Eskom	Scope of Work	Generation

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CONTENTS

1. INTRODUCTION

Kriel Power Station makes use of various valves for operation of the Boiler and Turbine plants, for all 6 units. These valves are of different types and operate at different pressures and temperatures. The strategy for the Turbine and Boiler plant valves at Kriel Power Station (normal maintenance and planned outages) includes stripping of various valves and conducting inspections. Following these inspection, various defects are identified which result in these valves requiring repairs. One of the major defects identified during these inspections is the stellite being damaged.

Kriel Power Station currently does not have a contract in place to carry out the required repairs, which is causing problems in terms of time and budget during maintenance periods. This document will identify the details of all valves that will form part of the scope to be addressed by this contract.

2. SUPPORTING CLAUSES

2.1 SCOPE

The document outlines requirements for stellite repair on valves at Kriel Power Station.

2.1.1 Purpose

The purpose of the document is to define the technical information for all valves that require stellite repairs at Kriel Power Station.

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] OHS Act 85 of 1993: Occupational Health and Safety Act, 85 of 1993.

[2] 240-105658000: Supplier Quality Management: Specification.

[3] OPR 3305: Plant Safety Regulations.

[4] SANS ISO 9000: SANS Quality Standards.

[5] 32-136: Contractor Health and Safety Requirements.

[6] Pressure Equipment Regulations

[7] SANS 347

[8] ISO 3834: Quality Requirements for Welding

2.2.2 Informative

N/A

2.3 DEFINITIONS

2.3.1 Disclosure Classification

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

2.4 ABBREVIATIONS

Abbreviation	Description
CRH	Cold Reheat
DA	Deaerator
DPI	Dye Penetrant Inspection
DST	Deaerator Storage Tank
EFP	Electric Feed Pump
FW	Feed Water
HP	High Pressure
HWL	High Working Level
LP	Low Pressure
NDT	Non-Destructive Test
NWL	Normal Working Level
OEM	Original Equipment Manufacturer
PA	Power Assisted
PMI	Positive Material Identification
QCP	Quality Control Plan
SFP	Steam Feed Pump
WPQR	Welding Procedure Qualification Record
WPS	Welding Procedure Specification

3. SCOPE OF WORK

3.1 GENERAL WORKS

1. The scope of work includes conducting stellite repairs on the identified valves, as per the agreed scope with the Employer's engineering representative.
2. This scope includes on-site in-situ repairs as well as off-site repairs at the Contractor's workshop.
3. Determination of in-situ or off-site repairs will be agreed upon between the Contractor and the Employer's representative. For off-site repairs, the Contractor will be responsible to transport the valve, gaskets, nuts and bolts to and from Kriel Power Station. Removal and installation of the valve will be done by Kriel Power Station.
4. The Contractor is responsible for providing manpower, consumables and any other resource/s required to perform the valve re-stellite and other activities required to return the valve to its intended state.
5. The Contractor is required to provide all equipment and associated engineering services including design requirements and design calculations, as required by the applicable plant area design code to fulfil and execute the requirements of the scope of work to provide a fully operational system.
6. This contract will service the requirements of outages and as-required repairs by Kriel maintenance department.
7. All rigging equipment and resources will be provided by Eskom.

3.2 VALVE REPAIR SCOPE OF WORK

1. A QCP must be generated and approved by the Employer's Quality personnel, System Engineer, Welding engineer and AIA, before job commences.
2. Strip valve and inspect seats. If upon inspections, valve seats stellite is found to be worn or damaged, a technical notification or equivalent visual inspection report shall be compiled and handed over to engineering for approval of re-stellite repairs. Photos of the noted defects shall accompany all technical notification or visual inspection reports.
3. If required, valve seats to be machined and cleaned to remove old damaged satellite overlay.
4. If required, base material repair welding shall be done before the new weld overlay with stellite can take place.
5. All seats must be PMI tested to verify the base material and the overlay chemical composition of the seat.
6. If seats are removed from the valve body only machining or abrasive cutting will be allowed. Under no circumstance will flame cutting be allowed.
7. A weld map and pictures must be submitted with the QCP to verify if base material weld build up will be required before stellite overlay welding. Sizes must be included of the required weld thicknesses/layers.

8. All welding procedure qualifications that will be used must be submitted with the QCP for approval.
9. Any heat treatment (as per the qualified WPS) will be done using calibrated recorders to generate the heat treatment chart. The HT chart and calibration certificate must be included in the final data pack.
10. Valve re-stelliting will range between 3mm and 6mm depending on the valve's size and operating conditions or application.
11. The exact re-stelliting thickness must be discussed and approved by Employer's system engineer in line with the relevant qualified procedure.
12. The re-stelliting will therefore be done on a case-to-case basis depending on the extent of damage on a particular valve. The thickness of stellite overlay must be within the ranges qualified on the welding procedure.
13. Upon completion of re-stelliting, the Contractor must carry out PT testing on the seats as well as the valve body through an independent company.
14. After NDE is completed valve to be blue checked.
15. If valve is repaired off site, perform pressure test on the valve/s

3.3 TRANSPORT REQUIREMENTS

1. Valves will be collected from Kriel Power Station to the Contractor's workshop by the Contractor. The project manager will arrange the necessary paperwork in terms of the required removal permits.
2. The Contract Fee will cover the collecting and transportation of Valves to and from Kriel Power Station to the Contractor's workshop.

3.4 NDT REQUIREMENTS

1. All NDTs must be conducted by an Eskom approved NDT company in position of an approval letter.
2. All welding NDT must be performed in accordance with 240-83539994: Standard for Non-Destructive Testing (NDT) on Eskom Plant.

3.5 REMOVAL AND INSTALLATION OF VALVES

1. The Turbine and Boiler valves that require repair are either flanged or welded connections. After inspections have been conducted by Eskom Turbine Engineering and the Contractor, any valve that requires off site repair will be removed by the Employer and handed over to the Contractor.
2. The Contractor will be responsible to:
    - transport it to their workshop,
    - conduct the agreed upon repair work,
    - transport the valve to site

- In terms of in-situ repairs, the Contractor will be responsible to strip the valve and conduct the agreed upon repair work once the necessary permit to work is in place.

4. WELDING REQUIREMENTS

4.1 Welding Statutory Requirements

There are several statutory requirements, governing rules, standards and specifications related to welding that are always applicable when the Contractor conducts welding activities on the Employer's equipment or machinery. These include:

- OHS-Act.
- SANS 347.
- Relevant area design and /or construction codes.
- Latest Eskom Welding Standard 240-106628253: Standard for Welding on Eskom Plant

4.2 WPS and PQR Requirements

1. Before commencing with the work, the Contractor must submit to the Employer's responsible Welding Agent/Engineer/Technologist for approval.
2. Verified copies of all WPS's used during the contract is included in the maintenance records.
3. Due to the criticality of the work, it is very important that every WPS is supported by a valid WPQR/PQR for all Level I and II area work, and is also recommended in the case of Level III area work.
4. The PQR/WPQR shall be approved by a registered IWE or IWT with minimum qualifications as defined in 240-106628253.
5. The following information must appear on the WPQR/PQR:
    - Heat input (defined in BS EN 1011-1): the speed of weld progression must be recorded in mm/s; the weld current range must be measured with a clip-on gauge/ tong tester; the open circuit voltage of the welding machine and the weld voltage range shall be measured with a voltmeter (multi meter). (Provide practical range and elaborate around arc energy, HI equipment characteristic etc.). When welding machines with pulsed mode is used; in which case the heat input as calculated by the equipment needs to be recorded.
    - Commercial trade name of the welding consumable.
    - The tensile strength of the coupons as recorded during the tensile tests. It is recommended that a copy of the actual graph generated during execution of the tensile tests shall be part of the permanent record package for the reviewer to check on the results.
    - The heat treatment chart (where applicable) shall form part of the permanent record of the WPQR/ PQR.
    - Material certificates for both filler and parent material(s) shall be part of the permanent record of the WPQR/PQR.

- The impact test results (where applicable)

6. The Employer reserves the right to review a WPS already verified by the AIA, prior to commencement of fabrication.
7. The information on the WPS accurately reflects the parameter ranges as reported on the WPQR/PQR, to be approved for use on Employer's areas. A suitably qualified TPI AIA Company must verify that the data listed in the WPQR/PQR is correctly transferred to the WPS.
8. Approval of the WPS document by an IWE/IWT is mandatory, with emphasis on the critical evaluation of the technical content suiting the circumstances and requirements of the intended applications.

4.3 Welding Requirements

In addition to fulfilling the regulatory and area safety requirements, the following is required by the Contractor:

1. The Contractor compiles and submits QCP's / ITP's, Weld maps, PMI reports, PQR's & WPS's for approval by the Employer's Agent prior to the commencement of any Works.
2. All welding must be done using a BS EN ISO 15614 or ASME IX qualified welding procedure.
3. Welding procedures must be qualified to BS EN ISO 15614 or ASME IX. All WPS's and PQR's must be approved by the company IWE/IWT before submission to Eskom.
4. Welding procedure mechanical test results must be accompanied with the PQR for review by Eskom.
5. All tests as required by the qualification code must clearly demonstrate an increase in the hardness as per stellite consumable data sheet. It must also proof that there will be no dis-bonding between the seat base material and the stellite overlay.
6. The acceptance criteria for all welds will be ISO 5817 quality level B. All the Works for send away valves shall be carried out at the Contractor's premises.
7. Sufficient and appropriate welding documentation approval, verification and control as required by applicable BS EN 3834 Quality level.
8. The requirement of ISO 3834 Part 2 certification of Contractors that work on Safety Critical Area / Level 1&2 area is mandatory. No welding work will be awarded if certification is not available. ISO 3834-2 certificate must include as a minimum material Groups 1, 5, 6 & 8.
9. Material and welding consumable control must be adhered to.
10. Completed data packages and record keeping are required for all work. Any work will only be released once the data pack are fully signed off.

4.4 Welding Personnel

1. The Contractor must have responsible welding coordinators according to ISO 14731 and ISO 9606.
2. These are individuals who can competently coordinate and apply good practice in the welding activities carried out by the Contractor.

3. The Contractor may be required to supply the *Employer* with a labour force as per activities allocated by the Employer. These may include but not limited to quality controller with a Level 2 SAIW Inspector Qualification, qualified welders (ISO 9606 or ASME IX) and welding operators (ISO 14731) working in accordance with the latest applicable health and safety standard (OHS Act).
4. All qualifications to be in line with the Eskom Welding Standard 240-106628253.

5. QUALITY REQUIREMENTS

1. No work shall be done without a QCP that is approved by Eskom Kriel Power Station. QCP's must be submitted to Eskom Kriel Power Station for the works not more than 2 days after the repair work is agreed upon. No work shall commence without an approved QCP.
2. QCP's and related documentation shall be subjected to comments and approval by Eskom Kriel Power Station Quality Control personnel as well as Engineering team.
3. QCP's used shall make provisions for signatures for interventions by at least the Contractors QC Representative, the Employers QC representative, the Eskom Kriel Power Station Engineering Department, and an AIA representative.
4. Each QCP shall have a page for proof signatures, so that signatures can be traced to the individual/s who has endorsed activities on the QCP.
5. Intervention points shall be signed as the work progresses and no back-dating shall be allowed.
6. Notification for hold and witness points shall be in writing (via email) and shall be done at least 24 hours in advance.
7. The following minimum hold points must be included for the Eskom Kriel Power Station Quality Control Department:
    - Approval of QCP.
    - Review of applicable certificates (calibration certificates, welder qualification, WPS and PQR, etc).
    - Review of Visual Inspection, Pressure Testing or Blue checking.
    - Final Sign off and Acceptance.
    - Final Data book review.

6. LIST OF VALVES FOR WELD REPAIR

The valves that are required to be included this scope of work form part of various Boiler and Turbine plant systems. The design conditions for the LPH, HPH and DA systems are as follows:

LP Heaters:

	LPH 1		LPH 2		LPH 3		LPH 4	
	Shell Side	**Tube Side**	**Shell Side**	**Tube Side**	**Shell Side**	**Tube Side**	**Shell Side**	**Tube Side**
Design Pressure	0.586 MPa vacuum	3.65MPa	0.586 MPa vacuum	3.65MPa	0.586 MPa	3.65MPa	0.586 MPa	3.65MPa
Design Temperature	220°C	220°C	220°C	220°C	220°C	220°C	220°C	220°C

HP Heaters:

	HPH 6A		HPH 6B		HPH 7A		HPH 7B	
	Shell Side	**Tube Side**	**Shell Side**	**Tube Side**	**Shell Side**	**Tube Side**	**Shell Side**	**Tube Side**
Design Pressure	2.5 MPa	25 MPa	2.5 MPa	25 MPa	5 MPa	25 MPa	5 MPa	25 MPa
Max working temp	450°C	230°C	450°C	230°C	320°C	260°C	320°C	260°C

Deaerator:

Design Pressure (g)	1.13 MPa
Maximum Operating Temperature	175°C

Cold Reheat:

Design Pressure (g)	5.01 MPa
Maximum Operating Temperature	410°C

IP Bled Steam:

Design Pressure (g)	2.5 MPa
Maximum Operating Temperature	431°C

The design conditions for all other systems are indicated on their specific tables below.

6.1.1 Valve details

The following valves will form part of the scope for weld repair. Given that all valves listed below may not require a weld repair at the same time, the valves required to be worked on will be issued via a task order based on the need.

6.1.1.1 Condensate and Auxiliary valves

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE
ASV 7344	DST A&B WARMING STM CONTROL V/V	100 MM	CONT
ASV 88	CRH TO DST A&B ISOL V/V	80 MM	GATE
ASV 89	CRH TO DST A&B ISOL V/V	100 MM	GATE
ASV 90	DST A&B WARMING STEAM ISOL VALVE	100 MM	GATE
ASV 92	DST A&B WARMING STEAM NRV	300 MM	NRV
ASV 93	DST A&B WARMING STEAM OUTL ISOL V/V	300 MM	GATE
BSV 103	BLED STEAM TO DA ISOL VALVE	450 MM	GATE
BSV 105	CRH STEAM TO DA ISOL VALVE	450 MM	GATE
BSV 107	CRH STEAM TO DA NRV	350 MM	NRV
BSV 108	CRH STEAM TO DA ISOL VALVE	350 MM	GATE
BSV 119A	HPH 6 A B/STEAM ISOL V/V	250 MM	GATE
BSV 119B	HPH 6 B B/STEAM ISOL V/V	250 MM	GATE
BSV 130	HPH 7 B/STEAM NRV	300 MM	NRV
BSV 131A	HPH 7 A B/STEAM ISOL V/V	200 MM	GATE
BSV 131B	HPH 7 B B/STEAM ISOL V/V	200 MM	GATE
BSV 7207	DA IP BLED STM SUPPLY NRV	450 MM	NRV
BSV 7208	DA IP BLED STM SUPPLY NRV	450 MM	NRV
BSV 7213	HPH 6 B/STEAM PA NRV	350 MM	NRV
BSV 7214	HPH 6 B/STEAM PA NRV	350 MM	NRV
BSV 7343	CRH STM TO DA CONTROL VALVE	300 MM	GLOBE
CV 211	SFP SUCTION ISOLATING VALVE	400MM	GATE

CV 212A	DA DRAIN ISOL VALVE	200 MM	GATE
CV 212B	DA DRAIN ISOL VALVE	200 MM	GATE
DWV 280	DA FILLING VALVE	200 MM	GATE
MSV 7235	CRH STEAM PA NRV	630 MM	NRV
MSV 7236	CRH STEAM PA NRV	630 MM	NRV

6.1.2 High pressure heaters

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE
RL71S001	HP HTR A BNK FW 2-WAY OUTLET V/V	300MM	2-WAY
RL72S001	HP HTR B BNK FW 2-WAY OUTLET V/V	300MM	2-WAY
RL61S001	HP HTR A BNK FW 3-WAY INL V/V	300MM	3-WAY
RL62S001	HP HTR B BNK FW 3-WAY INL V/V	300MM	3-WAY
RP62S002	HP HTR 6B HWL CONTROL V/V	150MM	BALL
RP62S502	HP HTR 6B HWL CONTROL ISOL. V/V	150MM	GATE
RP72S002	HP HTR 7B HWL CONTROL V/V	100MM	BALL
RP72S502	HP HTR 7B HWL CONTROL ISOL. V/V	100MM	GATE
RP71S002	HP HTR 7A HWL CONTROL V/V	100MM	BALL
RP71S502	HP HTR 7A HWL CONTROL ISOL. V/V	100MM	GATE
RP61S002	HP HTR 6A HWL CONTROL V/V	150MM	BALL
RP61S502	HP HTR 6A HWL CONTROL ISOL. V/V	150MM	GATE
RP61S601	HP HTR 6A TO DA NON RETURN V/V	150MM	NRV
RP62S601	HP HTR 6B TO DA NON RETURN V/V	150MM	NRV
RP62S001	HP HTR 6B NWL CONTROL V/V	150MM	BALL
RP62S501	HP HTR 6B NWL CONTROL ISOL. V/V	150MM	GATE
RP61S501	HP HTR 6A NWL CONTROL ISOL. V/V	150MM	GATE
RP61S001	HP HTR 6A NWL CONTROL V/V	150MM	BALL

RP72S001	HP HTR 7B NWL CONTROL V/V	100MM	BALL
RP72S501	HP HTR 7B NWL CONTROL ISOL. V/V	150MM	GATE
RP71S001	HP HTR 7A NWL CONTROL V/V	100MM	BALL
RP71S501	HP HTR 7A NWL CONTROL ISOL. V/V	150MM	GATE
RF71S304	HP HEATER 7A UPPER STANDPIPE CONNECTION	150MM	GATE
RF72S304	HP HEATER 7B UPPER STANDPIPE CONNECTION	150MM	GATE
RF71S303	HP HTR 7A LOWER STANDPIPE CONNECTION	150MM	GATE
RF72S303	HP HTR 7B LOWER STANDPIPE CONNECTION	150MM	GATE
RF61S304	HP HEATER 6A UPPER STANDPIPE CONNECTION	150MM	GATE
RF62S304	HP HEATER 6B UPPER STANDPIPE CONNECTION	150MM	GATE
RF61S303	HP HTR 6A LOWER STANDPIPE CONNECTION	150MM	GATE
RF62S304	HP HTR 6B LOWER STANDPIPE CONNECTION	150MM	GATE

6.1.3 LP Heaters

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE
RM10S501	LPH 1&2 COND INLET ISOL V/V	300 MM	GATE
RM70S501	LPH 1&2 COND BYPASS ISOL V/V	300 MM	GATE
RM20S501	LPH 1&2 COND OUTLET ISOL V/V	350 MM	GATE
RN20S503	LP HTR 2 EMERG DRN CTRL V/V INL ISOL V/V	250 MM	CONT
RN20S001	LP HEATER 2 CNDS EMERG DRN CTRL V/V	250 MM	PLUG
RN20S504	LP HEATER 2 EMERG DRN CV OUTL ISOL V/V	250 MM	GATE
RM30S501	LPH 3 COND INLET ISOL V/V	350 MM	GATE
RM30S503	LPH 3 COND OUTLET ISOL V/V	350 MM	GATE
RM70S503	LPH 3 COND BYPASS ISOL V/V	300 MM	GATE
RN30S503	LP HEATER 3 EMERG DRN CV INL IV	200 MM	GATE
RN30S001	LP HEATER 3 CNDS EMERG DRN CTRL V/V	200 MM	PLUG

RN30S504	LP HEATER 3 EMERG DRN CV OUTL IV	200 MM	GATE
RN30S002	LP HTR 3 CNDS DRN CTRL V/V TO LPH 2 F/BX	250 MM	PLUG
RN30S502	LP HEATER 3 DIST DRN CV TO HTR 2 OUTL IV	250 MM	GATE
RM40S501	LP HTR 4 CNDS INL SV	350 MM	GATE
RM70S505	LP HTR 4 CNDS BYP IV	350 MM	GATE
RN40S001	LP HEATER 4 EMERG DRN V/V TO MTC	150 MM	GATE
RM40S402	LP HTR 4 CNDS OUTL DRN V/V	150 MM	GLOBE
RM40S503	LP HTR 4 CNDS OUTL SV	350 MM	GATE
RM70S601	LP HTR 4 CNDS TO DST NRV	350 MM	NRV
RF40S002	LPH 4 IP B STM SUPL PA NRV	600 MM	NRV
RF40S001	LPH 4 IP B STM SUPL MOT ISOL V/V	600 MM	GATE
RN40S501	LP HEATER 4 DRN PMP SUCT H.I.V.	200 MM	GATE
RN40S601	LP HEATER 4 DRN PMP DISCH NRV	80 MM	NRV
RN40S002	LPH 4 DRN PMP DISCH CTRL V/V	80 MM	PLUG
RN40S502	LP HEATER 4 DRN PMP DISCH H.I.V.	80 MM	GATE

6.1.4 Air Evacuation Valves

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE	MAX PRES [BAR]	MAX TEMP [ºC]
AEV 56A	MAE AIR SUCT ISOL V/V A	250 MM	GATE	VAC	80
AEV 56B	MAE AIR SUCT ISOL V/V B	250 MM	GATE	VAC	80
AEV 61A	BFPT AIR EJECT AIR ISOL V/V	80 MM	GATE	VAC	60
AEV 61B	BFPT AIR EJECT AIR ISOL V/V	80 MM	GATE	VAC	60
AEV 65	QSAE AIR SUCT ISOL VALVE	250 MM	GATE	VAC	80
AEV 66	QSAE AIR SUCT NRV	250 MM	NRV	VAC	80
CWV 18	WAE RESERVOIR 10% MAKE-UP V/V	80MM	DIAP	3	32

CWV 23A	MAE PUMP A DISCH 10% LEAK-OFF NRV	80 MM	NRV	3	32
CWV 23B	MAE PUMP B DISCH 10% LEAK-OFF NRV	80 MM	NRV	3	32
CWV 27	MAE P/P 10 % LEAK-OFF ISOL V/V	80 MM	DIAP	3	32
MSV 7341	QSAE STM SUPPLY CNTRL V/V	100 MM	GLOBE	50	510
MSV 80	QSAE STEAM SUPPLY ISOL V/V	125 MM	GATE	50	510
CWV 17	WAE 10% MAKE UP V/V (2 OFF)	80 MM	DIAP	3	32
CWV 27	MWAE P/P A&B LEAK OFF ISOL V/V (2 OFF)	80 MM	DIAP	3	32
MSV 7341	QSAE STM SUPPLY CNTRL V/V	100 MM	PLUG	50	510
CWVAEV 55A	MTC AIR SUCT ISOL V/V A	150 MM	GATE	VAC	80
AEV 55B	MTC AIR SUCT ISOL V/V B	150 MM	GATE	VAC	80
CWV 42 A	H2 COOLERS CW INLET	125 MM	DIAP	4	32
CWV 42 B	H2 COOLERS CW INLET	125 MM	DIAP	4	32
CWV 42 C	H2 COOLERS CW INLET	125 MM	DIAP	4	32
CWV 42 D	H2 COOLERS CW INLET	125 MM	DIAP	4	32
CWV 43 A	H2 COOLERS CW OUTLET	125 MM	DIAP	4	32
CWV 43 B	H2 COOLERS CW OUTLET	125 MM	DIAP	4	32
CWV 43 C	H2 COOLERS CW OUTLET	125 MM	DIAP	4	32
CWV 43 D	H2 COOLERS CW OUTLET	125 MM	DIAP	4	32
CWV	H2 COOLERS INLET ISOLATING VALVE	250 MM	GATE	4	32
AEV 57A	MAE AIR SUCT NRV A	250 MM	CHECK	VAC	80
AEV 57B	MAE AIR SUCT NRV B	250 MM	CHECK	VAC	80
AEV 62A	BFPT AIR EJECT AIR NRV A	80 MM	CHECK	VAC	80
AEV 62B	BFPT AIR EJECT AIR NRV B	80 MM	CHECK	VAC	80
-	WAE TANK FLOAT V/V			3	32

6.1.5 Cooling Water Valves

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE	MAX PRES [BAR]	MAX TEMP [ºC]
CWV 33A	CW BOOSTER PUMP INLET V/V	350 MM	DIAP	5	70
CWV 33B	CW BOOSTER PUMP INLET V/V	350 MM	DIAP	5	70
CWV 35A	CW BOOSTER PUMP OUTLET V/V	350 MM	DIAP	5	70
CWV 35B	CW BOOSTER PUMP OUTLET V/V	350 MM	DIAP	5	70
VD20S503	PRIMARY COOLING STRAINERS INLET V/V B	250 MM	BUTT	4	65
VD20S504	PRIMARY COOLING STRAINERS OUTLET V/V A	250 MM	BUTT	4	65
VD20S505	PRIMARY COOLING STRAINERS OUTLET V/V A	250 MM	BUTT	4	65
VD20S506	PRIMARY COOLING STRAINERS INLET V/V A	250 MM	BUTT	4	65
CWV 7346	H2 CW TEMP CONTR VALVE	250 MM	CONT	5	75
CWV 7398	HP DEMIN SUPPLY TO MTC CONTROL VALVE	80 MM	PLUG	10	80
VD20S503	PRIMARY COOLING HEAT EXCHANGER A INLET VALVE	250 MM	BUTT	5	75
VD20S504	PRIMARY COOLING HEAT EXCHANGER A OUTLET VALVE	250 MM	BUTT	5	75
VD20S505	PRIMARY COOLING HEAT EXCHANGER B INLET VALVE	250 MM	BUTT	5	75
VD20S506	PRIMARY COOLING HEAT EXCHANGER B OUTLET VALVE	250 MM	BUTT	5	75
VD21S501	PRIMARY COOLING PUMP A DISCHARGE V/V	250 MM	BUTT	5	75
VD21S502	PRIMARY COOLING PUMP A SUCTION V/V	250 MM	BUTT	5	75
VD21S601	PRIMARY COOLING PUMP A DISCHARGE NRV	250 MM	NRV	5	75
VD22S501	PRIMARY COOLING PUMP B DISCHARGE V/V	250 MM	BUTT	5	75
VD22S502	PRIMARY COOLING PUMP B SUCTION V/V	250 MM	BUTT	5	75
VD22S601	PRIMARY COOLING PUMP B DISCHARGE NRV	250 MM	NRV	5	75
VD23S501	PRIMARY COOLING PUMP C DISCHARGE V/V	250 MM	BUTT	5	75

VD23S502	PRIMARY COOLING PUMP C SUCTION V/V	250 MM	BUTT	5	75
VS23S601	PRIMARY COOLING PUMP C DISCHARGE NRV	250 MM	NRV	5	75
VD11S401	SECONDARY COOLING PUMP A NRV	200 MM	NRV	3	75
VD11S501	SECONDARY COOLING PUMP A INLET V/V	200 MM	BUTT	3	75
VD11S502	SECONDARY COOLING PUMP A OUTLET V/V	200 MM	BUTT	3	75
VD12S401	SECONDARY COOLING PUMP B NRV	200 MM	NRV	3	75
VD12S501	SECONDARY COOLING PUMP B INLET V/V	200 MM	BUTT	3	75
VD12S502	SECONDARY COOLING PUMP B OUTLET V/V	200 MM	BUTT	3	75
VD13S401	SECONDARY COOLING PUMP C NRV	200 MM	NRV	3	75
VD13S501	SECONDARY COOLING PUMP C INLET V/V	200 MM	BUTT	3	75
VD13S502	SECONDARY COOLING PUMP C OUTLET V/V	200 MM	BUTT	3	75
CWV 10A	BFPT CW INLET ISOL VALVE A	500 MM	BUTT	3	65
CWV 10B	BFPT CW INLET ISOL VALVE B	500 MM	BUTT	3	65
CWV 11A	BFPT CONDENSER CW OUTLET ISOL V/V	500 MM	BUTT	3	65
CWV 11B	BFPT CONDENSER CW OUTLET ISOL V/V	500 MM	BUTT	3	65
CWV 34A	CW BOOSTER PUMP NRV	350 MM	NRV	3	65
CWV 34B	CW BOOSTER PUMP NRV	350 MM	NRV	3	65
-	CONDENSER LEVEL CONTROL	200 MM	BALL	40.2	80

6.1.6 Stator Water Valves

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE	MAX PRES [BAR]	MAX TEMP [ºC]
CWV 38 A	STTATOR WATER COOLER CW INLET	250 MM	DIAP	5	32
CWV 38 B	STTATOR WATER COOLER CW INLET	250 MM	DIAP	5	32
CWV 39 A	STTATOR WATER COOLER CW OUTLET	250 MM	DIAP	5	32

CWV 39 A	STTATOR WATER COOLER CW OUTLET	250 MM	DIAP	5	32

6.1.7 LP Bypass Spray Water Valves

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE	MAX PRES [BAR]	MAX TEMP [ºC]
CV 178 A	LP BYPASS SPRAY WATER INLET VALVE	150 MM	GATE	40	80
CV 178 B	LP BYPASS SPRAY WATER OUTLET VALVE	150 MM	GATE	40	80
CV 3810	LP BYPASS SPRAY WATER CONTROL VALVE	100 MM	CONT	40	80
CV 180	LP BYPASS SPRAY WATER CONTROL VALVE BYPASS	150 MM	CONT	40	80

6.1.8 Gland Steam System

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE	MAX PRES [BAR]	MAX TEMP [ºC]
GSV 6301	HOT REHEAT STEAM TO GLAND STEAM CONTROL VALVE	80 MM	DIAP	32	510
GSV 6305	STEAM OUTLET FROM GLAND STEAM SYSTEM	80 MM	DIAP	32	510
GSV6310	GLAND SEAL SYSTEM CONTROL VALVE DRAIN	80 MM	DIAP	32	510

6.1.9 Boiler Valves

VALVE No	VALVE DESCRIPTION	VALVE SIZE	TYPE	MAX PRES [BAR]	MAX TEMP [ºC]
AR5112	HP BYPASS VALVE 1-4	200 MM	GLOBE	195	535
FIG 23928W	MAIN STEAM STOP VALVE 1-4	200 MM	GATE	195	535
MSV200	HRH SAFETY VALVE 1-4	350 MM	SAFETY	50	535
FIG 24940W	CIRC PUMP SUCTION STOP VALVE	305 MM	GATE	215	420
FIG 24940W	CIRC PUMP DISCHARGE STOP VALVE	305 MM	GATE	245	360
FIG 24940W	CIRC PUMP LEAK-OFF ISOL BYPASS VALVE	125 MM	GATE	215	420
-	CIRC PUMP REGULATING VALVE	305 MM	CONT	245	360
FIG 24940W	COLL VESSEL 33 % DRAIN STOP VALVE	200 MM	GATE	215	420

FIG 24940W	COLL VESSEL 66 % DRAIN STOP VALVE	200 MM	GATE	215	420
-	COLL VESSEL 33 % REGULATING STOP VALVE	200 MM	CONT	215	420
-	COLL VESSEL 66 % REGULATING STOP VALVE	200 MM	CONT	215	420
-	BLOWDOWN VESSEL REGULATING VALVE	300 MM	CONT	10	400

7. TENDER RETURNABLES

7.1 MANDATORY TENDER RETURNABLES

1. Proof of valid, up to date ISO 3834-2 certificate
2. The Contractor must demonstrate previous experience in successfully conducting off-site and in-situ stellite repair of valves on Eskom plant. A list of at least 8 relevant verifiable references (3 off-site repairs and 5 for in-situ repairs) within the last 10 years must be provided.

7.2 QUALITATIVE TENDER RETURNABLES

7.2.1 Welding Requirements

1. The Contractor must submit a WPS and WPQR for group 1 materials, as per the BS EN 15608 standard. The butt weld joint welding procedure, with a qualified thickness range of 3-14mm, must be in accordance with BS EN 15614-1
2. The Contractor must submit a WPS and WPQR for group 1 materials, as per the BS EN 15608 standard. The WPS and WPQR must illustrate hard facing using the relevant electrode/consumable, in accordance with BS EN 15614-7, must be submitted.
3. The Contractor must submit a WPS and WPQR for group 5 materials, as per the BS EN 15608 standard. The butt weld joint welding procedure, with a qualified thickness range of 3-14mm, must be in accordance with BS EN 15614-1
4. The Contractor must submit a WPS and WPQR for group 5 materials, as per the BS EN 15608 standard. The WPS and WPQR must illustrate hard facing using the relevant electrode/consumable, in accordance with BS EN 15614-7, must be submitted.
5. The Contractor must submit a WPS and WPQR for group 6 materials, as per the BS EN 15608 standard. The welding procedure with PWHT (butt weld joint design), with a qualified thickness range of 3-14mm must be submitted, in accordance with BS EN 15614-1.
6. The Contractor must submit a WPS and WPQR for group 6 materials, as per the BS EN 15608 standard. The WPS and WPQR with PWHT must illustrate hard facing using the relevant electrode/consumable, in accordance with BS EN 15614-7, must be submitted.
7. The Contractor must submit a WPS and WPQR for group 8 materials, as per the BS EN 15608 standard. The butt weld joint welding procedure, with a qualified thickness range of 3-14mm, must be in accordance with BS EN 15614-1

8. The Contractor must submit a WPS and WPQR for group 8 materials, as per the BS EN 15608 standard. The WPS and WPQR must illustrate hard facing using the relevant electrode/consumable, in accordance with BS EN 15614-7, must be submitted.

7.2.2 Quality Control Plan, Technical Exclusions and Qualifications

1. Contractor to provide at least one example of a signed QCP for similar work done previously.
2. Technical exclusions. If there are no technical exclusions, this must be clearly stated in a signed letter format.
3. The Contractor must submit welder qualification record (WQR), as per BS EN 9606-1, that indicates competency in executing Group 6 materials.

8. AUTHORISATION

This document has been seen and accepted by:

Designation
Senior Technician: Kriel Power Station, Maintenance
Senior Engineer: Kriel Power Station, Turbine Engineering
Chief Engineer: Gx Asset Management - Welding
Engineer: Kriel Power Station, Turbine Engineering
Engineer: Kriel Power Station, Boiler Engineering
Group Engineering Manager: Kriel Power Station
Kriel Valve Specialist: Gx Asset Management
Senior Advisor: Outages
Engineering Manager: Kriel Power Station, Turbine Engineering
Engineer: Kriel Power Station, Turbine Engineering

9. REVISIONS

Date	Rev.	Remarks
January 2024	0	First Issue for Review
March 2024	1	Document updated to include missed scope.

10. DEVELOPMENT TEAM

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