| Eskom | Works Information | Generation<br>Tutuka Power Station<br>Engineering |
|---|---|---|

Title: **In line or offline valve components reconditioning – seat hard-facing weld overlay, or weld overlay on valve bodies and other components during planned outages and normal maintenance at Tutuka Power Station Works Information**

| | |
|---|---|
| Document Identifier: | **15ENG GEN-3118** |
| Alternative Reference Number: | **N/A** |
| Area of Applicability: | **Tutuka Power Station** |
| Functional Area: | **Engineering** |
| Revision: | **1** |
| Total Pages: | **21** |
| Next Review Date: | **N/A** |
| Disclosure Classification: | **Controlled Disclosure** |

| Compiled by | Supported by | Functional Responsibility | Authorized by |
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| Date: 13/05/25 | Date: | Date: | Date: |

## Content

# 1. Introduction

This document outlines the scope of work that will be executed throughout the duration of the valve service contract. The scope combines the outage/shutdown scope and normal maintenance activities.

# 2. Supporting Clauses

## 2.1 Scope

The scope covers all valves which are open for refurbishment during planned outages and during normal maintenance at Tutuka Power Station. The service provider to ensure that reconditioned valve components will not require same reconditioning for 12 years intervals.

- Zero forced shut down for rework after the outage
- Zero trips as a result of outage poor workmanship

### 2.1.1 Purpose

To propose and approve a contracting strategy for reconditioning of valve components i.e valve seat overlay (re-stelliting) and weld repairs on valve bodies as required during valve refurbishment of all valves at Tutuka Power Station.

### 2.1.2 Applicability

This document shall apply to Tutuka Power Station valve for in-situ and off-site repairs contract on units 1-6.

### 2.1.3 Effective date

This document shall be in effect from date of authorization.

## 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] ISO 3834: Quality requirements for welding

[2] ISO 9001 Quality Management Systems.

[3] API 598: Valve Inspection and Testing

[4] ASME B16.34: Valves — Flanged, Threaded, and Welding End

[5] 240-106628253 Standard for welding Requirements on Eskom plants

[6] 240-84979413 Maintenance and Repair of High Temperature and High Pressure valves and Fittings standard

[7] 240-83539994 Standard for Non-Destructive Testing on Eskom plant

[8] 240-142257054 – Technical evaluation standard for the capability Assessment of Service Providers for the Refurbishments of Valves and fittings in Eskom Power Plants

[9] 240-105020315 – Standard for Low Pressure Valves

[10] 240-84513751 – Material Specification and certification Guideline for Power Generation Plant

[11] 240-86546783 – Procurement Standard for Material Certification Requirements Applicable to Metallic Products Used on Low and Medium pressure application

### 2.2.2 Informative

N/A

## 2.3 Definitions

N/A

### 1.1.1 Disclosure Classification

**Public domain:** published in any public forum without constraints (either enforced by law, or discretionary).

## 2.4 Abbreviations

| Abbreviation | Description |
|---|---|
| BFPT | Boiler Feedpump Turbine |
| CRH | Cold re-heat |
| HRH | Hot-reheat |
| HP | High pressure |
| ISO | International Standard Organization |
| IP | Intellectual Property |
| IPT | Intermediate pressure turbine |
| IWT | International Welding Technologist |
| LP | Low Pressure |
| NDT | Non-Destructive Testing |
| NCR | Non-conformance report |
| OEM | Original Equipment Manufacturer |
| NRV | Assisted Non Return Valve |
| PEI | Production Engineering Integration |

| | |
|---|---|
| PER | Pressure Equipment Regulations |
| PPE | Personal Protective Equipment |
| QM | Quality Management |
| QCP | Quality control plan |
| QMS | Quality Management System |
| RH | Re-heater |
| SANAS | South African National Accreditation System |
| SANS | South African National Standards |
| SWL | Safe working load |
| SOW | Scope Of Work |
| V/V | Valve |

### 2.5 Roles and Responsibilities

**Engineering** – compile scope of work/ works information, Inspections

**Senior Technologist** – Reviews scope of work, conduct Inspections as and when available

**Outages** – Manages and supervise the contract during outages,

**Maintenance** – manages, supervises the contractor during normal on load condition, conducts inspections and QC during outages

### 2.6 Process for Monitoring

Once scope is issued the contractor will provide repair method statement and generate a QCP for each valve or component. Intervention points will be indicated by maintenance, engineering, mechanical QC and welding QC. All intervention points will be adhered to by both contractor and Eskom personnel.

The repairs will only start after method statement and QCP has been accepted.

There will be traceability of all material used, material certificates in accordance with EN10204:2004 to be provided in the data package

### 2.7 Related/Supporting Documents

N/A

## 3. VALVES SCOPE OF WORK

The valve components recondition can be done in-situ or offline depending on the valve size or component to be repaired. The repair evaluation shall be agreed upon between Eskom and Contractor before issuing of method statement.

Maintenance and repair work of High Pressure / High Temperature and General Valves and fittings must adhere to Eskom Standard 240-84979413, Maintenance and Repair of High Temperature and High Pressure valves and Fittings standard.

All welding to be done by following the Eskom Standard 240-106628253, the standard for Welding requirements on Eskom Plant. The service provider or subcontractor shall be ISO 3834 certified. Should the service provider make use of any subcontractor, the responsibility will be for the service provider, to agree on all paperwork, communication and quality of work by the so-called subcontractor. Eskom will not be liable for any damage, loss, poor workmanship nor defects by the subcontractor. Any rework and or repairs by a subcontractor will be for the service provider account.

1. Eroded valve body and valve components shall be sent for machining and welding build up repair to original size. This work shall be done according to Eskom welding standard.

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2. When damages are noted on the spindle, seat, body, stuffing box or body seat and damage cannot be removed or by lapping the seats will be sent for re-stellite. The interfacing components shall be sent together to ensure proper fit after final machining.

3. NDT shall be conducted on all valve bodies and components sent for offsite weld overlay or reconditioning. All NDT to comply with Eskom doc 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.
4. The proposed valve list for repair is on Annexure A

## 3.1 HIGH LEVEL SCOPE PER VALVE TYPE

1. No repairs to be done nor to started until Eskom has received and accepted a method statement and QIP/QCP for the repairs.
2. Provide approved welding procedure and all documentation in line with Eskom welding standard
3. Each valve must have a detailed QIP/QCP indicating scope of work for specified valve.
4. All valves and components to be marked clearly by the service provider
5. Contractor to provide pressure test procedure in line with SANS 347 which will be reviewed and accepted by Eskom.

### 3.1.1 Parallel slide valves

1. Conduct as received dirty inspection and compile an inspection report.

2. Sandblast/sponge blast valve body
3. All valves and components to be marked clearly by the service provider
4 Measure valve body seat face to face and record. Measure valve discs assembly.
5 Conduct a run out on spindle
6 NDT shall be conducted on all valve bodies and components sent for offsite weld overlay or reconditioning. All NDT to comply with Eskom doc 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.
7 Machine off the damage stellite
8 Obtain new body seat ring material if body seat damage and cannot be removed by skimming the stellite.
9 Conduct blue check of the seal surfaces.
10 Conduct pressure test at **1.25 x** the design pressure by an approved inspection authority: Provided that Category I equipment as categorized in terms of SANS 347 may be inspected, tested and witnessed by the user: Provided further that the user may, subject to the written approval of an approved inspection authority, dispense with the internal inspection and hydraulic pressure test where it could have an adverse effect on the operation or integrity of the pressure equipment
11 Issue Eskom calibration certificates
12 Issue Eskom pressure test report

### 3.1.2 Non-Return Valves

1. Conduct as received inspection and compile inspection report.
2. Sandblast/sponge blast valve body
3. NDT shall be conducted on all valve bodies and components sent for offsite weld overlay or reconditioning. All NDT to comply with Eskom doc 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.
4. Mark the seat ring angle before removing it.
5. Measure disc and body seat tilting angles.
6. Measure drive sizes of the drive arm and relative clearances.
7. Machine off damaged hard facing.
8. Obtain new body seat ring material if body seat damage and cannot be removed by skimming the stellite.
9. Perform blue check and record seat location on the disc.
10. Conduct pressure test at **1.25 x** the design pressure by an approved inspection authority: Provided that Category I equipment as categorized in terms of SANS 347 may be

inspected, tested and witnessed by the user: Provided further that the user may, subject to the written approval of an approved inspection authority, dispense with the internal inspection and hydraulic pressure test where it could have an adverse effect on the operation or integrity of the pressure equipment

11. Issue Eskom calibration certificates
12. Issue Eskom pressure test report

### 3.1.3 Globe valve

1. Conduct as received inspection and compile inspection report.
2. Sandblast/sponge blast valve body
3. NDT shall be conducted on all valve bodies and components sent for offsite weld overlay or reconditioning. All NDT to comply with Eskom doc 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.
4. Conduct blue check to record sealing location on the poppet/plug
5. Measure and record the following:
   a) Inner and outer diameter of the sealing surface taper.
   b) Run out measurements of the spindle.
   c) body bore.
6. Replace damaged components with new/manufactured ones.
7. Conduct pressure test at **1.25 x** the design pressure by an approved inspection authority: Provided that Category I equipment as categorized in terms of SANS 347 may be inspected, tested and witnessed by the user: Provided further that the user may, subject to the written approval of an approved inspection authority, dispense with the internal inspection and hydraulic pressure test where it could have an adverse effect on the operation or integrity of the pressure equipment
8. Issue Eskom calibration certificates
9. Issue Eskom pressure test report

### 3.1.4 Gate Valve

1. Conduct as received inspection and compile inspection report.
2. Sandblast/sponge blast valve body
3. NDT shall be conducted on all valve bodies and components sent for offsite weld overlay or reconditioning. All NDT to comply with Eskom doc 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.

4. Conduct a run out on spindle
5. Conduct blue check to record sealing location on the wedge seats.
6. Measure and record the following:
   a) Body seat angle
   b) Wedge seat angle
   c) Remove off all stellite to base material if insufficient stellite remaining or severely damaged.
   d) Re- stellite and ensure interfacing.
7. Replace damaged components with new/manufactured ones.
8. Conduct pressure test at **1.25 x** the design pressure by an approved inspection authority: Provided that Category I equipment as categorized in terms of SANS 347 may be inspected, tested and witnessed by the user: Provided further that the user may, subject to the written approval of an approved inspection authority, dispense with the internal inspection and hydraulic pressure test where it could have an adverse effect on the operation or integrity of the pressure equipment
9. Issue Eskom calibration certificates
10. Issue Eskom pressure test report

### 3.1.5 All types

1. Conduct as received inspection and compile inspection report.
2. Sandblast/sponge blast valve body
3. NDT shall be conducted on all valve bodies and components sent for offsite weld overlay or reconditioning. All NDT to comply with Eskom doc 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.
4. Remove damaged hard facing/Stellite
5. Replace damaged components with new/manufactured ones.
6. Conduct NDT – Etching to confirm that all stellite has been removed.
7. Conduct liquid penetrant to check area for defects.
8. Weld new stellite according to Eskom welding procedure.
9. Take measurements on both valve body and discs/seats/wedges.
10. Machine the seat to size – these sizes must match to OEM sizes as close as possible.
11. Lap the valve seats and discs/flap/ poppet.
12. Conduct blue check on sealing face.
13. Conduct pressure test on (parallel slide shall be test both sides of the seat) – this applies to offline/workshop repairs.

### 3.1.6 Other components to be refurbished

Individual valve components may require to be refurbished based on the damage noted during inspection.

1. Valve body
2. Spindle/stem/shaft
3. Gland follower
4. Stuffing box
5. Bonnets
6. Studs
7. Poppet or plug.

**Note:**

- **The list of valves is not limited to the listed provided.**
- **List only displays valve DN 100 and larger. Small bore valves are also include in this scope.**
- **Shell Pressure test shall be done if repairs were conducted on the valve body**.

## 3.2 DATA BOOKS

Each refurbished valve or individual components must have a refurbishment data book. It must include the following as a minimum:

1. Method statement/step by step procedure
2. Photos before and after repair to indicate valve condition.
3. NDE reports
4. Visual Inspection reports as listed in SOW
5. Calibration certificates.
6. Completed check sheets (QCP)
7. Material certificates
8. Sketch of the repair with final dimensions
9. Pressure test procedure – for valve body or valve body seat assembly
10. Pressure test certificate
11. Signed off by AIA, service provider and Eskom.

### 3.2.1 All test certificates

1. All valves will be subjected to a required Statutory Hydraulic Pressure Test and must be issued with pressure test certificate to be included in the databook.
2. The *works* are to be completed in accordance with the specifications in all respects and ready for take- over by the *Employer's* Representative except for the following work which may be done after the Completion Date, but before the dates stated below which are to be shown on the *Contractor's* program.
3. Completion of Documentation on delivery of valves to site.

### 3.2.2 MATERIAL SPECIFICATION:

1. The recommended stellite re-built on high pressure and high temperature valves is stellite 6 unless otherwise stated.

2. All materials used must be accompanied by material certificates.

## 4. Acceptance

This document has been seen and accepted by:

**Note:** Initials not acceptable

| Full Name and Surname | Designation |
|---|---|
| Lekgala Mabelane | Turbine System Engineer |
| Marius Prinsloo | Boiler System Engineer |
| Given Mkhonto | Boiler System Engineer |
| Armando Mathebula | Valve maintenance Manager |
| Sinki Seloana | GX Engineering |

## 5. Revisions

**Note:** Start with the latest Revision History in the first row and go backwards.

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| April 2025 | 1 | Lekgala Mabelane | New Document |

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| | | | |

## 6. Development Team

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

Note :To include full name ,surname and designation ( nicknames not permitted )

N/A

## 7. Acknowledgements( if applicable )

N/A

| Work Package Number | AKZ | Boiler /Turbine | Valve Description | Valve Type | Valve Location Elevation | Valve Size (mm) |
|---|---|---|---|---|---|---|
| 2 | NB11S001 | B | CIRC PMP SUCT V/V | WEDGE | BLR 45M | 350 |
| 2 | NB11S002 | B | CIRC WTR P/P OUTL CTRL V/V | GLOBE | BLR 52M | 300 |
| 2 | NB11S003 | B | CIRC WTR P/P OUTL V/V | WEDGE | BLR 52M | 300 |
| 2 | NB13S001 | B | CIRC SYST B/D Q/DRN A REG V/V | GLOBE | BLR 7M | 200/250 |
| 2 | NB13S002 | B | CIRC SYST B/D Q/DRN B REG V/V | GLOBE | BLR 7M | 200/250 |
| 2 | NB13S003 | B | B/D VESS REG V/V | GLOBE | BLR 0M | 350 |
| 2 | NB13S004 | B | CIRC SYST B/D Q/DRN A IV | WEDGE | BLR 12M | 200 |
| 2 | NB13S005 | B | CIRC SYST B/D Q/DRN B IV | WEDGE | BLR 12M | 200 |
| 2 | NB14S001 | B | CIRC WTR P/P L/O V/V | WEDGE | BLR 45M | 125 |
| 2 | NB41S101 | B | BOILER WARM UP V 1 | WEDGE | BLR 57M | 150 |
| 2 | NB41S102 | B | BOILER WARM UP V 2 | WEDGE | BLR 57M | 150 |
| 2 | NB41S103 | B | BOILER WARM UP NRV | WEDGE | BLR 57M | 150 |
| 2 | NV02S001 | B | R/HTR S/BLWR IV | WEDGE | BLR 81M | 125 |
| 2 | NV02S101 | B | R/HTR S/BLWR IV | WEDGE | BLR 81M | 125 |
| 2 | RA11S001 | B | MSSV 1 | WEDGE | BLR 63M | 250 |
| 2 | RA12S001 | B | MSSV 2 | WEDGE | BLR 63M | 250 |
| 2 | RA13S001 | B | MSSV 3 | WEDGE | BLR 63M | 250 |
| 2 | RA14S001 | B | MSSV4 | WEDGE | BLR 63M | 250 |
| 2 | RL24S013 | T | FW PMPS DISCH MAIN IV | WEDGE | T -1M | 400 |
| 4 | NW01S001 | B | HP BYP 1 SPRW REG V | GLOBE | BLR 63M | 80/80 |
| 4 | NW02S001 | B | HP BYP 2 SPRW REG V | GLOBE | BLR 63M | 80/80 |
| 4 | NW03S001 | B | HP BYP 3 SPRW REG V | GLOBE | BLR 63M | 80/80 |

| Work Package Number | AKZ | Boiler/ Turbine | Valve Description | Valve Type | Valve Location Elevation | Valve Size (mm) |
|---|---|---|---|---|---|---|
| 12 | RM18S028 | T | LP HTR 3 FW INL (HTR 1&2 BYP) IV | PARALLEL | T 0M | 250 |
| 12 | RM50S200 | T | COND EMERG MAKEUP CTRL V/V | PARALLEL | T 0M | 200 |
| 15 | RF11S001 | T | HP HTR 5A BSTM V/V | PARALLEL | T 14M | 350 |
| 15 | RF12S005 | T | HP HTR 5B BSTM V/V | PARALLEL | T 14M | 350 |
| 15 | RF21S015 | T | HP HTR 6A BSTM V/V | PARALLEL | T 14M | 250 |
| 15 | RF31S022 | T | HP HTR 6B BSTM V/V | PARALLEL | T 14M | 250 |
| 15 | RH51S002 | T | LPT 1 BSTM TO LP HTR 3 IV | PARALLEL | T 14M | 400 |
| 15 | RH52S005 | T | LPT 2 BSTM TO LP HTR 3 IV | PARALLEL | T 14M | 400 |
| 15 | RH61S008 | T | IPT BSTM TO DST V/V | PARALLEL | T 10M | 600 |
| 16 | NB11S102 | B | CIRC WTR P/P OUTL NRV | NRV | BLR 12M | 300 |
| 16 | RF11S008 | T | HP HTR 5A BSTM NRV | NRV | T 14M | 350 |
| 16 | RF12S007 | T | HP HTR 5B BSTM NRV | NRV | T 14M | 350 |
| 16 | RF21S018 | T | HP HTR 6A BSTM NRV | NRV | T 14M | 250 |
| 16 | RF31S025 | T | HP HTR 6B BSTM NRV | NRV | T 14M | 250 |
| 16 | RF41S056 | T | BFPT BLEDSTEAM NRV | NRV | T 14M | 450 |
| 16 | RH51S003 | T | LP HTR 3 BSTM NRV | NRV | T 14M | 400 |
| 16 | RH52S006 | T | LP HTR 3 BSTM NRV | NRV | T 14M | 400 |
| 16 | RH61S011 | T | DST BSTM NRV | NRV | T 12M | 600 |
| 16 | RH61S017 | T | DA BS PIPE NRV | NRV | D 33M | 700 |
| 16 | RL33S028 | T | HP HTR 5B IN L TO 6B INL NRV | NRV | T -1M | 250 |
| 16 | RM16S041 | T | LP HTR 3 OUTL NRV | NRV | T 8 | 400 |
| 16 | RP12S009 | T | HP HTR 5A DRN TO DST TNK NRV | NRV | T 0M | 250 |
| 16 | RP22S010 | T | HP HTR 5B DRN TO DST TNK NRV | NRV | T 0M | 250 |

| Work Package Number | AKZ | Boiler /Turbine | Valve Description | Valve Type | Valve Location Elevation | Valve Size (mm) |
|---|---|---|---|---|---|---|
| 16 | RQ54S024 | T | AUX STM TO DA NRV | NRV | D 33M | 250 |
| 17 | RQ52S001 | T | BFPT SAE A STM INL IV | PARALLEL | D 33M | 100 |
| 17 | RQ52S002 | T | BFPT SAE B STM INL IV | PARALLEL | D 33M | 100 |
| 17 | RQ53S003 | T | DST INL FROM AUX STM RNG IV | PARALLEL | D 42M | 200 |
| 17 | RQ54S021 | T | AUX STM RNG TO DST CTRL IV | PARALLEL | D 42M | 250 |
| 17 | RQ80S001 | T | AUX STM RNG CLD R/H SUPP MFOLD IV | WEDGE | BLR 26M | 250 |
| 17 | RQ84S001 | B | AUX STM RNG CLD R/H SUPP CTRL IV | WEDGE | D 33M | 200 |
| 17 | RQ84S002 | B | AUX STM RNG CLD R/H SUPP PRESS CV | WEDGE | D 33M | 200 |
| 18 | RM16S035 | T | LP HTR 3 FW INL IV 2 | PARALLEL | T 5M | 400 |
| 18 | RM16S037 | T | LP HTR 3 FW OUTL IV | PARALLEL | T 10M | 400 |
| 18 | RM21S039 | T | LP HTR 3 FW BYP IV | PARALLEL | T 5M | 250 |
| 18 | RM42S168 | T | M CDNS FW TO GSC OUTL RECIRC IV | PARALLEL | T 5M | 250 |
| 18 | RP13S005 | T | HP HTR 6A EMERG DRN BYP IV | PARALLEL | T -1M | 250 |
| 18 | RP21S002 | T | HP HTR 5B DRN IV 1 | PARALLEL | T -1M | 250 |
| 18 | RP23S006 | T | HP HTR 6B EMERG DRN IV | PARALLEL | T -1M | 250 |
| 18 | RW11S008 | T | BFPT COND EXTRN PMPS DISCH MOT IV | PARALLEL | T 5M | 200 |
| 19 | RL11S001 | T | EFP A SUCT IV | PARALLEL | T16 | 400 |
| 19 | RL11S029 | T | EFP A SUCT BAL IV | PARALLEL | T 8M | 100 |
| 19 | RL11S032 | T | EFP A SUCT DRN TO EXP VES IV | PARALLEL | T16 | 100 |
| 19 | RL11S033 | T | EFP A SUCT DRN TO RECOVY IV 1 | PARALLEL | T16 | 100 |
| 19 | RL11S034 | T | EFP A SUCT DRN IV | PARALLEL | T16 | 100 |
| 19 | RL12S002 | T | EFP B SUCT IV | PARALLEL | T16 | 400 |
| 19 | RL12S030 | T | EFP B SUCT BAL IV | PARALLEL | T 8M | 100 |
| 19 | RL12S035 | T | EFP B SUCT DRN TO EXP VES IV | PARALLEL | T16 | 100 |

| Work Package Number | AKZ | Boiler/ Turbine | Valve Description | Valve Type | Valve Location Elevation | Valve Size (mm) |
|---|---|---|---|---|---|---|
| 19 | RL12S036 | T | EFP B SUCT DRN TO RECOVY IV 1 | PARALLEL | T16 | 100 |
| 19 | RL13S003 | T | BFPT SUCT IV | PARALLEL | T16 | 500 |
| 19 | RL13S031 | T | BFPT SUCT BAL IV | PARALLEL | T 8M | 100 |
| 19 | RL13S038 | T | BFPT SUCT DRN TO EXP VES IV | PARALLEL | T16 | 100 |
| 19 | RL13S039 | T | BFPT SUCT DRN TO RECOVY IV 1 | PARALLEL | T16 | 100 |
| 19 | RL13S040 | T | BFPT SUCT DRN IV | PARALLEL | T16 | 100 |
| 19 | RL13S055 | T | BFP A/RHTR ATG SPR HTR NRV | NRV | T 8M | 100 |
| 19 | RL21S007 | T | EFP A DISCH IV | PARALLEL | T 0M | 400 |
| 19 | RL21S037 | T | EFP B SUCT VENT V/V | PARALLEL | T16 | 100 |
| 19 | RL21S059 | T | EFP A DISCH L/O CTRL IV | PARALLEL | T 10M | 100 |
| 19 | RL21S063 | T | EFP A DISCH L/O NRV | PARALLEL | T 8M | 100 |
| 19 | RL21S066 | T | EFP A DISCH L/O IV | PARALLEL | T 8M | 100 |
| 19 | RL22S009 | T | EFP B DISCH IV | PARALLEL | T 0M | 400 |
| 19 | RL22S060 | T | EFP B DISCH L/O CTRL IV | PARALLEL | T 10M | 100 |
| 19 | RL22S064 | T | EFP B DISCH L/O NRV | NRV | T 8M | 100 |
| 19 | RL22S068 | T | EFP B DISCH L/O IV | PARALLEL | T 8M | 100 |
| 19 | RL23S011 | T | BFPT DISCH IV | PARALLEL | T 0M | 500 |
| 19 | RL23S061 | T | BFPT DISCH L/O CTRL IV | PARALLEL | T 10M | 150 |
| 19 | RL23S065 | T | BFPT DISCH L/O NRV | PARALLEL | T 8M | 150 |
| 19 | RL23S068 | T | BFPT DISCH L/O IV | PARALLEL | T 8M | 150 |
| 19 | RL25S014 | T | FW PMPS DISCH LOW LD CV A INL IV 1 | PARALLEL | T 3M | 250 |
| 19 | RL25S016 | T | FW PMPS DISCH LOW LD CV A | GLOBE | T 3M | 250 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 19 | RL25S017 | T | FW PMPS DISCH LOW LD CV B | GLOBE | T 3M | 250 |
| 19 | RL25S018 | T | FW PMPS DISCH LOW LD CV A OUTL IV 1 | PARALLEL | T 3M | 250 |

| Work Package Number | AKZ | Boiler/ Turbine | Valve Description | Valve Type | Valve Location Elevation | Valve Size (mm) |
|---|---|---|---|---|---|---|
| 19 | RL26S015 | T | FW PMPS DISCH LOW LD CV B INL IV 1 | PARALLEL | T 3M | 250 |
| 1 9 | RL26S019 | T | FW PMPS DISCH LOW LD CV B OUTL IV 1 | PARALLEL | T 3M | 250 |
| 20 | RF41S054 | T | BFPT IP B/STM SUPP IV | PARALLEL | T 14M | 450 |
| 20 | RF51S057 | T | BFPT COLD R/H STM SUPP IV | PARALLEL | T 13M | 300 |
| 20 | RL31S020 | T | HP HTR 5A FW INL IV | PARALLEL | T 0M | 275 |
| 20 | RL31S024 | T | HP HTR 6A FW OUTL IV | PARALLEL | T 0M | 275 |
| 20 | RL32S022 | T | HP HTR 5B FW INL IV | PARALLEL | T 0M | 400 |
| 20 | RL32S026 | T | HP HTR 6B FW OUTL IV | PARALLEL | T 0M | 400 |
| 20 | RN51S020 | T | LP HTR 3 EMERG DRN IV | PARALLEL | T 10M | 150 |
| 20 | RN52S026 | T | LP HTR 3 DRN PMP A DISCH IV | PARALLEL | T 0M | 100 |
| 20 | RN53S027 | T | LP HTR 3 DRN PMP B DISCH IV | PARALLEL | T 0M | 100 |
| 20 | SG01S001 | T | TURB CR/H G/STM SUPP IV | PARALLEL | T 14M | 100 |
| 20 | SG02S002 | T | TURB AUX G/STM SUPP NRV | NRV | T 14M | 100 |
| 20 | SG02S003 | T | TURB AUX G/STM SUPP IV | PARALLEL | T 14M | 100 |
| 24 | RP11S001 | T | HP HTR 5A DRN IV 1 | PARALLEL | T -1M | 250 |
| 24 | RP12S095 | T | DST INL FROM HP HTR 5A | PARALLEL | D33M | 250 |

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|---|---|---|---|---|---|---|
| | | | IV | | | |
| 24 | RP14S011 | T | HP HTR 6A CASCADE DRN IV | PARALLEL | T 0M | 200 |
| 24 | RP14S014 | T | HP HTR 5A CASCADE IV | PARALLEL | T 0M | 200 |
| 24 | RP22S096 | T | DST INL FROM HP HTR 5B IV | PARALLEL | D33M | 250 |
| 24 | RP24S016 | T | HP HTR 6B CASCADE DRN IV | PARALLEL | T 0M | 200 |
| 24 | RP24S019 | T | HP HTR 5B CASCADE DRN IV | PARALLEL | T 0M | 200 |
| 17T | RQ53S006 | T | DST INL FROM AUX STM RNG NRV | PARALLEL | D 33M | 200 |

| Work Package Number | AKZ | Boiler/ Turbine | Valve Description | Valve Type | Valve Location Elevation | Valve Size (mm) |
|---|---|---|---|---|---|---|
| 4 | NW04S001 | B | HP BYP 4 SPRW REG V | GLOBE | BLR 63M | 80/80 |
| 10 | RF61S029 | T | CLD R/H STM TO DST V/V | PARALLEL | D 38M | 400 |
| 10 | RH62S018 | T | DA INL 4 FROM BSTM IV | PARALLEL | D 38M | 500 |
| 10 | RH63S021 | T | DA INL 3 FROM BSTM IV | PARALLEL | D 38M | 500 |
| 10 | RM16S042 | T | DA INL 2 FROM LP HTR 3 IV | PARALLEL | D 38M | 300 |
| 10 | RM22S044 | T | DA INL 1 FROM LP HTR 3 IV | PARALLEL | D 38M | 300 |
| 10 | SD31S009 | T | BFPT SAE A AIR LINE 2 IV | PARALLEL | D 33M | 100 |
| 10 | SD31S011 | T | BFPT SAE A AIR LINE 2 AIR CV | GLOBE | D 33M | 100 |
| 10 | SD33S014 | T | BFPT SAE A AIR LINE 1 IV | PARALLEL | D 33M | 200 |
| 10 | SD33S016 | T | BFPT SAE A AIR LINE 1 AIR CV | GLOBE | D 33M | 175 |
| 10 | SD34S013 | T | BFPT SAE B AIR LINE 1 IV | PARALLEL | D 33M | 200 |
| 10 | SD34S015 | T | BFPT SAE B AIR LINE 1 AIR CV | GLOBE | D 33M | 175 |

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|---|---|---|---|---|---|---|
| 10 | SD35S010 | T | BFPT SAE B AIR LINE 2 IV | PARALLEL | D 33M | 100 |
| 10 | SD35S012 | T | BFPT SAE B AIR LINE 2 AIR CV | GLOBE | D 33M | 100 |
| 11 | RQ80S102 | B | AUX STM RNG MFOLD PRV | WEDGE | B 29M | 200/250 |
| 12 | RM16S018 | T | M CDNS FW TO GSC INL IV | PARALLEL | T 0M | 400 |
| 12 | RM16S020 | T | M CDNS FW TO GSC OUTL IV | PARALLEL | T 0M | 400 |
| 12 | RM16S024 | T | M CDNS FW TO DRNS CLR INL IV | PARALLEL | T 0M | 400 |