 Eskom	Working Instruction	Matimba Power Station
--	----------------------------	-----------------------

Title: **Hydrogen plant pressure equipment preparation and pressure testing**

Document Identifier: **240-165573930**

Alternative Reference Number: **PWM/QGFBB/M/001**

Area of Applicability: **Matimba Power Station**




Functional Area Applicability: **Maintenance**

Revision: **4**

Total Pages: **10**

Next Review Date: **September 2025**

Disclosure Classification: **Controlled Disclosure**

Compiled by	Functional Responsibility	Authorized by
		
TC Mothiba Snr Technician	NE Mchunu Line Manager Maintenance	BM Chiloane (Middle Manager Maintenance)
Date: 2022/09/04	Date: 2022/09/05	Date: 2022/09/13

Content

	Page
1. Introduction	3
2. Supporting Clauses	3
2.1 Purpose	3
2.2 Scope	3
2.3 Applicability	3
2.4 Effective date	3
2.5 Normative/Informative References	4
2.5.1 Normative	4
2.5.2 Informative	4
2.6 Definitions	4
2.7 Abbreviations	4
2.8 Roles and Responsibilities	5
2.9 Process for Monitoring	5
2.10 Related/Supporting Documents	5
3. Document Content	5
3.1 Pre requisites / Preconditions	5
3.2 Precautions / Limitations	5
3.3 Special tools / Equipment	6
3.4 Materials/Spare Parts	6
3.5 Instructions	6
3.6 IBI tools	7
3.6.1 Self-Checking (STAR)	7
3.6.2 Post-Job Brief	8
3.6.3 Pre-Job Brief	8
3.6.4 Peer Checking	8
3.6.5 Place Keeping	9
3.6.6 Effective Communication (3 –Way)	9
3.7 Acceptance Criteria	9
4. Record(s)	9
5. Addenda / Appendix	9
6. Acceptance	9
7. Revisions	10
8. Development Team	10
9. Acknowledgements	10

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

1. Introduction

This procedure provide guidelines in the preparation and pressure testing or vessel under pressure.

2. Supporting Clauses

2.1 Purpose

To provide guidelines in the preparation and pressure testing or vessel under pressure.

2.2 Scope

This is applicable to the following floc location: 00QGJ 10/20/30

2.3 Applicability

<div>NOTE: Mark appropriate block/s with a “X” (Select at least one)</div>	All	Head of department	Head of function	Head of section	Administration	Auxiliary	Civil	Control & Instrument	Electrical	Mechanical	Projects	Support	Training	Shifts	Other (Specify):
	Matimba Staff														
	Operating														
	Maintenance									X					
	Engineering														
	Risk Management														
	Human Resources														
	Finance														
	Production														
	Contractors														

2.4 Effective date

This instruction is effective immediately after it is authorized.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

2.5 Normative/Informative References

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

2.5.1 Normative

- [1] ISO 9001 Quality Management System
- [3] 36-681 – Generation plant safety regulations
- [4] OHSA – Occupational Health and Safety Act

2.5.2 Informative

- [1] PS/234/001 – Management of maintenance mechanical outside plant function.

2.6 Definitions

Definition	Explanation
Approve Inspection Authority (AIA)	Means an inspection authority approved inspector, provided that an inspection authority approved by the chief inspector with respect to any particular service shall be approved, an approved inspection authority with respect to that service only.
Designated person (GMR 2.1)	The person designated in-terms of general machinery regulation (2) 1 by the employer who shall ensure that the provision of the act and the regulation in relation to the machinery are complied with 5.2.1
Responsible person (RP)	A person who has been authorised in terms of the regulation to perform work and supervise staff

2.7 Abbreviations

Abbreviation	Explanation
AIA	Approved Inspection Authority
AUX	Auxiliary
Floc	Functional Location
Kpa	Kilo Pascal
O/P	Outside Plant
PM	Plant Maintenance
R/P	Responsible Person
N/A	Not Applicable
SAP	System Applicable and Products
WMF	Work Management Function
Snr	Senior
MTS	Maintenance Technical Support

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

2.8 Roles and Responsibilities

The RP ensure that the plant to be worked on is safe and isolated.

2.9 Process for Monitoring

The procedure will be reviewed three yearly and input will be obtained from business unit stakeholder

2.10 Related/Supporting Documents

Hydraulic pressure test record forms – F/234/001

3. Document Content

3.1 Pre requisites / Preconditions

- 3.1.1 Work package including task risk assessment and quality control plan documents
- 3.1.2 Every pressure vessel shall have a manufacturers plate securely fixed in a conspicuous place to the shell of the pressure vessel with the following particulars
 - Name of manufacture
 - Country of origin
 - Year of manufacture
 - Manufacture's serial number
 - Name, number and date of the standard of design
 - Design gauge pressure in Pascal's
 - Maximum permissible operating pressure in Pascal's
 - Operating temperature
 - Capacity in cubic meters
 - Mark of an approved inspection authority
- 3.1.3 No person shall remove such a plate or alter the particulars stamped thereon, except if the maximum working pressure is reduced and then only in the presence of an inspection authority.
- 3.1.4 Pressure gauge to have been calibrated within a year and certificate to be available.

3.2 Precautions / Limitations

- 3.2.1 The requirements for preparation and pressure testing of a vessel under pressure as stipulated in the occupational health and safety act is relevant at all times.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

3.2.2 Isolation in accordance of Eskom plant safety regulations

3.3 Special tools / Equipment

3.3.1 Calibrated test gauge, with calibrated certificate.

3.3.2 Hydraulic test pump

3.3.3 Safety cell flash light (torch)

3.4 Materials/Spare Parts

3.4.1 Blank flanges/spades

3.4.2 Clean rags

3.4.3 Fitting to connect pump to vessel

3.4.4 Gasket material (klingerlite)

3.4.5 Hose pipe

3.4.6 Never seize

3.4.7 Safety solvent

3.4.8 Thread seal tape

3.5 Instructions

3.5.1 Internal and external inspection

- Remove all inlet and outlet piping as well as inspection doors
- Remove all gauges and pressure relief valves (safety valves)
- Inspect internally and externally for corrosion to the vessel, using a flash light (torch) and mirror to inspect internally
- Check for extreme corrosion or pitting to the vessel.
- Inspect externally for corrosion under paint where the paint has blistered or flaked away
- Inspect welding seams, attachments etc.

3.5.2 Pressure testing

- Fit the test gauge and hydraulic pump piping to the pressure vessel and blank of all openings except those, which will be used to fill the vessel with water and air vent
- Commence filling the vessel with water, making sure there is no trapped air.
- Close the opening used to fill the vessel and vent call authorised persons

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

- Before counting, be sure that all appointed personnel are present
- Using the hydraulic pump increase the pressure at a rate not exceeding 200Kpa per minute in the vessel until the test pressure is reached.
- Test pressure 1,25x the maximum working pressure.
- Close of the hydraulic pump supply inlet valve to maintain the pressure.
- The vessel must remain under pressure for minimum of 30 minutes before the pressure can be reduced or until the inspection has been carried out which ever takes the longest
- Slowly reduce the pressure in the vessel at a rate not exceeding 200KPa/minute as a sudden reduction in pressure can cause stress of the vessel structure.
- Caution: Ensure vent remains fully open during the draining of the vessel.
- Fit the safety valve onto a test bench and relief pump the pressure up to the maximum working pressure +10% the valve should open. Should there be any problems unlock or remove the seal from the valve then readjust to the correct setting. This will be witnessed by the appointed and third party authority and will be re-sealed by the third party authority when setting is completed.
- Replace all piping, doors, gauges etc.
- Return the vessel to service.

3.6 IBI tools

The following IBI tools should be used where applicable:

3.6.1 Self-Checking (STAR)

The STAR principle must be applied to ensure you do the right thing before and during manipulation of any plant and equipment to minimise the potential to make mistakes.

Before taking action

STOP: Stop everything you are doing and observe around you. Eliminate any current or potential distractions and risk

Think: Think through what you are going to do and what you want to achieve

Use SAFE

Summarise critical steps

Anticipate error-likely situations

Foresee consequences

Evaluate defences

Act: Take the action

Review: Verify the desired outcome

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

3.6.2 Post-Job Brief

After completion of the task, a post-job brief should be held identifying any suggestions for improvement required for the activities and lessons learned (what went well and what did not) for the next time the job is performed. These lessons must be documented. Relevant Operational Experience (OE) should be recorded and discussed.

3.6.3 Pre-Job Brief

Prior to work that has a potential impact on the plant or personnel being carried out, a pre-job brief must be undertaken. If this task is only to be carried out by a single individual, this discussion should take place between him/her and his/her direct supervisor or one of his peers or another suitably qualified person. In cases where the person performing the work is the supervisor, the principles of STAR (Stop, Think, Act and Review) should be followed. The purpose of the Pre-job Brief is to ensure that:

- ALL workers involved in the job are clear as to their role
- The scope of the work is understood by all involved with the job
- The reason (context) why the work needs to be done and needs to be done in a certain way is understood by all.
- Discuss the risk on specific tasks
- All risks mitigation measures in the work package are discussed and implemented
- All resources and materials for the task are available and work is performed in accordance with the procedure
- All past problems and successes (Operational Experience) are discussed, to minimise the potential for mistakes.
- All pre-job briefs shall include
 - S - Summaries of critical steps
 - A - Anticipation of error-likely situations
 - F - Foresight of consequences
 - E - Evaluation of defences

3.6.4 Peer Checking

Should be conducted:

- When the action to be taken is not immediately reversible.
- When performing actions/steps/manipulations that, if not done correctly, could result in significant consequences.

Is done to provide a second-check to make sure you are going to do the right thing to the right component, before you take an action.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

3.6.5 Place Keeping

Place Keeping should be done when using procedures to prevent performing procedure steps out of sequence and to miss /skipping/duplicating procedure steps.

3.6.6 Effective Communication (3 –Way)

To provide for the accurate, concise, clear and mistake free transfer of information

The following process should be followed;

- The sender provides clear and concise direction/information.
- The receiver repeats back the message to the sender.
- The sender confirms that the receiver understands the message.

3.7 Acceptance Criteria

3.7.1 All instruction as in 9 above to be carried out.

3.7.2 Certificate of competence to be issued by AIA after inspection

3.7.3 No leaks after conclusion of inspection

3.7.4 Pressure gauge certificate

4. Record(s)

Type of record	Retention time	Responsibility
Pressure test report	Station life	Documentation centre
Scheduled maintenance statutory PM	Station life	WMF
Maintenance history in SAP (all work done and all parts used to be recorded)	Station life	All responsible for closing out notification in SAP

5. Addenda / Appendix

None

6. Acceptance

This document has been seen and accepted by:

Name	Designation
T Mabela	Maintenance Manager
S Matlakala	Snr Supervisor Maintenance

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

Name	Designation
K Matloga	Snr Supervisor Maintenance
A Seraki	Snr Technician Maintenance
J Boroto	Snr Supervisor Maintenance
B Mukhomi	Snr Supervisor Maintenance
N Mchunu	Line Manager Maintenance
M Mampane	Line Manager Engineering
M Manthata	Line Manager Engineering

7. Revisions

Date	Rev.	Compiler	Remarks
Aug 1996	0	D Bridges	Original
Jul 2008	1	DL Mahlamela	Review procedure with new Eskom CI
Jun 2011	2	WO Nkabiti	According to the current practices and also comply with ISO 9001: 2008. New template, tittle changed. Line 2.1, 4.1.1, 4.2.1 & 9.2 Added abbreviations: 5.2.1 – 5.2.10, Added roles and responsibilities: 7.1
Jun 2017	3	M Mafora	New template, added sections 1, 2.4.1, 2.6, 3.1.1
September 2022	4	TC Mothiba	New template

8. Development Team

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

- See above revisions

9. Acknowledgements

None

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.