

	SCOPE OF WORK	GENERATION
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Title: **Metallurgical and mechanical testing of ferrous and non-ferrous materials on an as and when required basis for the period of 5 years.**

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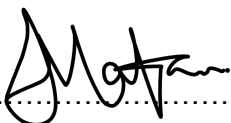
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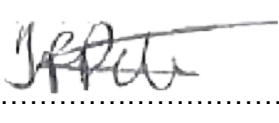
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CONTROLLED DISCLOSURE

1. Introduction

The Materials and Plant Integrity (M&PI) Department of the Generation Engineering Business Unit, located in Rosherville and Middelburg, plays a critical role in condition monitoring and remaining life assessment of plant components (viz. mainly operating in the creep regime), failure investigations, as well as providing solutions to materials-related problems to Eskom. To continuously provide this technical support to the business without interruption, support on mechanical testing and metallurgical evaluation services by an external laboratory is required.

The mechanical tests required include (but not limited to) hardness, impact, tensile, and fatigue which are critical in failure investigations and materials evaluation. Additionally, chemical analysis and electron microscopic analysis (e.g. using scanning electron microscopy, transmission electron microscopy etc) play a very important role in these types of investigations and analyses. Eskom uses a range of materials which include creep resistant alloys for high temperature and pressure applications, carbon and low alloy steels, titanium, aluminium, copper, brass and some structural plastics, refractories, etc. Given the complex microstructures exhibited by some of the advanced materials used on Eskom plant, more advanced, specialised materials characterisation tools are required.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of the document is to define the scope of work for the **Metallurgical and mechanical testing of ferrous and non-ferrous materials on an as and when required basis for the period of 5 years** for M&PI Department.

2.1.2 Applicability

This document shall only apply at Materials and Plant Integrity Department of Generation Engineering.

2.1.3 Effective date

This document shall be effective once authorised.

2.2 Normative/Informative References

Not Applicable

2.2.1 Normative

Not Applicable

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2.2.2 Informative

[1]32-1034 Eskom Procurement and Supply Chain Management Procedure

2.3 Definitions

Not applicable

2.4 Abbreviations

Abbreviation	Explanation
ISO	International Standard Organization
SANAS	South Africa National Accreditation System
OES	Optical Emission Spectroscopy
M&PI	Materials and Plant Integrity

2.5 Roles and Responsibilities

Not Applicable

2.6 Process for Monitoring

The effectiveness of scope of work will be monitored through management review, meetings, self-assessments and internal audits.

2.7 Related/Supporting Documents

Not Applicable.

3. Scope of work/Supply

- Sectioning, cutting and preparation of metallic samples (i.e. reducing the size of the sample to the required size using either a band saw or a cut off wheel machine)
- Carry out metallurgical and mechanical testing (i.e. Hardness, Tensile, fatigue and Charpy)
- Chemical Analysis using the Spark test (OES) and/or wet chemical analysis methods
- Mineralogical, phase & composition analysis (with e.g., X-ray diffraction, TESCAN)
- Microscopic evaluation of metallic and non-metallic samples using advanced electron microscopy techniques namely:

4. Specification of Products or Goods

Testing is to be carried out according to SANAS accreditation with regards to hardness testing, tensile testing, fatigue and Charpy impact testing. Additionally, testing is to be undertaken according to international/national standards.

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Service/ product	Quantity
1. Macro hardness testing on metallurgical materials (steel, etc) samples	
1.1. Vickers hardness test for one indent	Per sample
1.2. Vickers hardness test an average of 3 tests	Per sample
1.3. Vickers hardness test an average of 5 tests	Per sample
1.4. Vickers hardness test for transverse test up to 10 points	Per sample
1.5. Brinell hardness test for one indent	Per sample
1.6. Brinell hardness test an average of 3 tests	Per sample
1.7. Brinell hardness test an average of 5 tests	Per sample
1.8. Brinell hardness test for transverse test up to 10 points	Per sample
2. Carry out a tensile test at ambient temperatures	Per sample
3. Carry out a tensile test at high temperatures, up to 600°C)	Per sample
4. Carry out a fatigue test at ambient temperatures	Per sample
5. Carry out a fatigue test at high temperatures, up to 600°C)	Per sample
6. Carry out a Charpy impact tests	Per sample
7. High resolution microscopic analysis including fracture surface evaluation (e.g. using the Scanning Electron microscope, etc)	per sample
8. Spark chemical analysis (OES) of metallic samples	Per sample
9. Wet chemical analysis of metallic samples	Per sample
10. Sectioning, preparation, and cutting of power plant materials samples	per sample
11. Mineralogical, phase & composition analysis (with e.g., X-ray diffraction, TESCAN)	Per sample

Note: Samples to be delivered to the service provider by the Employer

5. Acceptance

This document has been seen and accepted by:

Name	Designation
Mhakamuni Makamu	Senior Advisor
Dr Thobeka Pete	Chief Engineer
Thendo Mphaphathi	Middle Manager

6. Revisions

Date	Rev.	Compiler	Remarks
17 February 2026	0	Mhakamuni Makamu	New document

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7. Development Team

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

- Mhakamuni Makamu
- Dr Thobeka Pete
- Thendo Mphaphathi

8. Acknowledgements

- None

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