 Eskom	Work Instruction	Risk & Sustainability Division/ Renewables Business Unit
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Title: **Crane and Hoist Inspections at
Sere Wind Farm**

Document Identifier: **240 - 155001067**

Alternative Reference
Number:

Area of Applicability: **Eskom Holdings SOC Ltd**

Functional Area: **Renewables Business Unit**

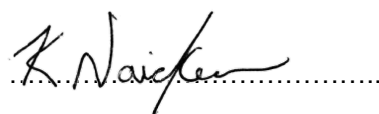
Revision: **1**

Total Pages: **9**

Next Review Date: **N/A**

Disclosure
Classification: **Controlled Disclosure**

Compiled by



Kuben Naicker

**Maintenance Manager –
Renewables Business Unit**

Date: **29 April 2020**

Functional Responsibility

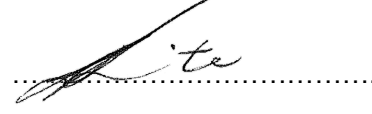


Frank Galant

**Maintenance Manager –
Renewables Business Unit**

Date: **29 April 2020**

Authorised by



Lehlonoholo Tinte

**Senior Manager –
Renewables Business Unit**

Date: **29 April 2020**

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1. Introduction

This document provides the Work Instruction for the statutory six monthly routine inspections on cranes and hoists as per the requirements of OCCUPATION HEALTH AND SAFETY ACT (OHS ACT 85 OF 1993) with particular reference to the DRIVEN MACHINERY REGULATION 18 – LIFTING MACHINES AND LIFTING TACKLE –SUB-REGULATION 6 at Sere Wind Farm.

1.1.1 Purpose

To specify the employer's requirements for the six monthly routine inspections on cranes and hoists.

1.1.2 Applicability

This document shall apply throughout Eskom Holdings SOC Ltd Risk & Sustainability Division.

1.1.3 Effective date

This Work Instruction shall be effective once signed by the authorising manager.

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] ISO 9001 Quality Management Systems.

1.2.2 Informative

[2] Occupational Health and Safety Act No. 85 of 1993 and Regulations

1.3 Definitions

Definition	Description
Contractor	A LME that undertakes a task to perform Crane and Hoist inspections according to this Scope of Work and OHS ACT.
Employer	Eskom Holdings SOC Ltd
LME	"lifting machinery entity" means a legal entity approved and registered by the chief inspector in terms of regulation 19 of the DMR

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Definition	Description
LMI	"lifting machinery inspector" means a person who is employed by a Lifting Machinery Entity and who is registered by the Engineering Council of South Africa in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);
Nacelle	Is a cover housing that houses all of the generating components in a wind turbine, including the generator, gearbox, drive train, and brake assembly.
Plant	Means WTG and includes the foundation bolts, service maintenance lifts, electrical balance of plant and SCADA system.
Site	Lot 1862 Olifants River Settlement, Koekenaap, Western Cape, South Africa
Wind Turbine Generator or WTG	Means a wind turbine generator so described in this Scope of Work, including without limitation the nacelle, rotor(s), blades, controller(s), turbine switchgear and transformer(s), and all associated equipment (including the SCADA system), parts and components.

1.3.1 Disclosure Classification

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

1.4 Abbreviations

Abbreviation	Description
DMR	Driven Machinery Regulations
LME	Lifting Machinery Entity
OHS ACT	Occupational Health and Safety Act
O&M	Operation and Maintenance
PPE	Personal Protective
SHE	Safety Health & Environment

1.5 Roles and Responsibilities

It is the responsibility of the O&M Manager at Sere Wind Farm and the Renewables O&M manager to ensure that this document is implemented.

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1.6 Process for Monitoring

N/A

1.7 Related/Supporting Documents

N/A

2. Crane and Hoist Inspections at Sere Wind Farm

2.1 Location

Sere Wind Farm is located near Koekenaap in the Western Cape, South Africa. The Wind Farm's precise location is in Lot 1862 Olifants River Settlement as shown in Figure 1 below. GPS Co-ordinates (31.5288513S 18.1925658E). The nearest major town from the Wind Farm is Vredendal, which is located 55km away. The distance between Sere Wind Farm and Cape Town International Airport is 356km via the N7.



Figure 1: Location of Sere Wind Farm

2.2 Description of Sere Wind Farm

Sere Wind Farm consists of 46 Wind Turbines (SWT 2.3-108) having a total capacity of 105.8MW. Each wind turbine has a 2.3MW asynchronous generator located in the nacelle and a converter located at the bottom of the tower. The 0.69/33kV transformer for each Wind Turbine Generator (WTG) is located on a plinth next to the tower. The 3-bladed horizontal, upwind rotor has a diameter of 108m. Each blade has a length of 53m consisting of glass fibre reinforced epoxy resin. The active yaw system consists of an externally geared slew bearing driven by eight braked electric motors. The Main bearing is of the spherical roller type. The 3-stage Winergy planetary gearbox has an inline and offline filter. The tapered tubular tower has a hub height of 115m.

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2.3 Scope of Work

2.3.1 DMR 18 Subsection 6 states “Notwithstanding sub regulation (5), the user shall cause all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine or hand-powered lifting device to be subjected to a thorough examination by a competent person at intervals not exceeding six months.

2.3.2 The contractor shall provide an examination report which will include the integral parts of the lifting machine that was inspected and a list of defective components and the corrective actions, general condition of lifting machinery, and test certificates for the tests done. For ease of identification, such report shall give all relevant information such as the manufacturer, serial number, safe working load and location description.

2.3.3 The LMI who is employed by a LME shall perform the 6 monthly legal service inspections of the lifting machinery in the nacelle of wind towers. There are 46 Wind Turbines.

The inspections per Wind Tower are for the following lifting machines:-

- 1) HMF Handy 265 Folding Hydraulic jib arm crane
- 2) 250kg Liftket chain hoist

The jib crane is fitted with the 250kg Liftket electrical chain hoist. Appendix A shown a picture of the jib crane in the nacelle and the name plate of the hoist.

2.4 Safety

2.4.1 Access

2.4.1.1 Contractors are not allowed access to the Wind Turbines unless they are accompanied by an Eskom/Siemens Authorised person. The Authorised person is responsible for the safety of visitors. Authorised persons shall use the Permit to Work System to isolate plant so that work can be performed safely.

Always wear a helmet when:

- Work is in progress at more than one level, one or more persons work above you.
- Being on sites where turbines are erected or disassembled.
- Working with heavy objects which may swing in your direction and accidentally hit you.
- Working on the outside of the turbine.
- Working with or near crane operations.

2.4.1.2 The Contractor shall provide his own helmet with chin strap, safety boots and clothing.

2.4.1.3 The Employer shall provide the Safety harness, and ensure that the visitor has correctly adjusted the safety harness.

Always use harness when:

- Harness must be worn when ascending/descending towers equipped with ladders.
- Ascending / descending towers with service lift. If one person in the service lift; the harness must be brought -2 persons in the service lift the harness must be worn.

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- Harness must be worn when staying in tower, platforms, or nacelles at the risk of falling over the edge.
- Harness must be worn whenever there is a risk of a fall likely to cause injury.

2.4.1.3 The Contractor shall at all times comply with all health and safety Laws and statutory requirements relevant to the Site (including but not limited to, all national and international legal requirements, including but not limited to the Occupational Health and Safety Act 85 of 1993, the Mine Health and Safety Act 29 of 1996, and the National Environmental Management Act 107 of 1998), the Plant and the Services and take all reasonable precautions to maintain the health and safety of the Contractor's Personnel and such other persons authorised to be on the Site.

2.4.1.4 Without prejudice to the generality of the above the Contractor shall itself and shall ensure that its employees, agents and Sub-Contractors comply with the Site Safety Rules and the Employer's Policies and Procedures.

2.4.2 Safety File

2.4.2.1 The minimum SHE file requirements are shown in Appendix B.

3. Acceptance

This document has been seen and accepted by:

Name	Designation
Lehlohonolo Tinte	Senior Manager Renewables
Kuben Naicker	Maintenance Manager - Renewables
Deon Van Der Merwe	Maintenance – Sere Wind Farm

4. Revisions

Date	Rev.	Compiler	Remarks
March 2020	1	K NAICKER	First Revision

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5. Appendix A



HOFFMANN Fördertechnik GmbH Wurzen Dresdener Straße 64-68 / Wurzen / Germany Tel. +49 3425 89240 / http://www.liftket.de			LIFTKET	
ELEKTROKETTENZUG / ELECTRIC CHAIN HOIST				
Typ/type 050/92		Fabrik-Nr./serial no.: D25036		Baujahr/fabr. year 2013
Laststränge/load falls	1	KLOR 71G2	60% ED	240 S/h
Traglast/S.W.L. (kg)	250	690V; 50 // 60 Hz; 3 ph	FEM/ISO	3m/M6
Hub/speed (m/min)	24,0 // 28,8	1,1kW // 1,1kW	Klasse/class	F; IP55
Kette/chain (mm)	5,2x15 EN 818-7, T	1,6A // 1,7A	Steuerung/control	24 V AC
FEM/ISO Kette/chain	1Bm/M3	2830U/min // 3380U/min	cos φ 0,76 // 0,82	
Prüf./cert08057		D8		Made in Germany
				

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6. Appendix B

Minimum SHE File Requirements

1. Instruction to HS Plan
2. Principal & Sub contractor information
3. Management & Supervisor Training
4. Notification of Construction Work
5. Letter of good standing
6. Statutory appointments
7. List of appointments
8. HIRA- (Hazard Identification Risk Assessment)
9. Induction Training
10. Fall Protection Plan
11. Certificate of medical fitness
12. Tools, equipment inspection register
13. Certificate of Compliance, PPE register
14. Hazardous Chemical Substance Control
15. Certificate of competency- Training
16. Incident Records
17. Policy
18. NCR
19. Minutes of toolbox talks/ SHE Meetings
20. Audit report
21. Disciplinary records

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