

	<b>Scope of Work</b>	<b>Generation/Peaking</b>
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**Compiled by**



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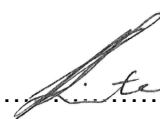
**Functional Responsibility**



**SE Hurling**  
**Plant Manager**

Date: 20 September 2023

**Authorised by**



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Date: 20 September 2023

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## **1. Introduction**

This document provides the Employer's Service Information for the Statutory lifting equipment inspections for a period of 5 years at Sere Wind Farm. The statutory inspection will ensure that the Employer comply to the following regulations:

- a) 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, and
- b) The statutory annual load test on cranes, hoists and Avanti lifts 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 5 (a) at Sere Wind Farm.

### **1.1.2 Purpose**

To specify the employer's requirements for; -

- a) The six monthly routine inspections on cranes, hoists, wire ropes and pallet lifter.
- b) The statutory annual load test on cranes, hoists, and service lifts inside the wind turbines at Sere Wind Farm.
- c) Annual load test on pallet lifter.

### **1.1.3 Applicability**

This document shall apply throughout Eskom Holdings SOC Ltd Generation Division.

### **1.1.4 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

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### 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
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.

### 1.4 Abbreviations

Abbreviation	Description
DMR	Driven Machinery Regulations
GPS	Global Positioning System
LME	Lifting Machinery Entity
LMI	Lifting Machinery Inspector
m	meter
m/s	meters/second
MW	Megawatt

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Abbreviation	Description
km	kilometer
kg	kilogram
kV	kilovolt
OHS ACT	Occupational Health and Safety Act
O&M	Operation and Maintenance
PPE	Personal Protective
SHE	Safety Health & Environment
WTG	Wind Turbine Generator

### 1.5 Roles and Responsibilities

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

## 2. Statutory Inspections/Tests 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

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## **2.2 Description of Sere Wind Farm**

Sere Wind Farm consists of 46 Wind Turbines (SWT 2.3-108) having a total installed 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.

## **2.3 Scope of Work**

### **2.3.1 Crane, Hoist and Lift Wire Rope Inspections**

The Contractor shall inspect the specified equipment at intervals not exceeding 6 months to ensure compliance to the following regulation:

- 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.

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.

The LMI who is employed by a LME shall perform the 6 monthly inspections of the lifting machinery in the WTG. There are 46 Wind Turbines.

The inspections per wind turbine generator are for the following lifting machines:

- 1) HMF Handy 265 Folding Hydraulic jib arm crane
- 2) 250kg Liftket chain hoist
- 3) Avanti Service Lift (Wire Ropes and attaching points)

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.

The inspections for equipment in the workshop are as follow:

- 1) 2500kg Pallet Lifter (Hand powered hydraulic lifting devices)

### **2.3.2 Crane, Hoist & Service Lift Load Testing**

The Contractor shall load test the specified equipment in accordance with site specific work instructions at intervals not exceeding 12 months to ensure compliance to the following regulation:

- DMR 18 Subsection 5 (a) states “at intervals not exceeding 12 months: provided that, in the absence of a manufacturing standard or a standard incorporated under section 44(1) of the Act, the whole installation of the lifting machine shall be tested with 110% of the safe working load applied over the complete lifting range of such machine and in such a manner that every part of the installation is stressed accordingly”

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- DMR 18 Subsection 5 (b) states “The lifting machinery inspector of the lifting machinery entity referred to in paragraph (a) must have knowledge of the erection, load-testing and maintenance of the type of lifting machine or similar machinery involved.

The contractor shall provide a Load Test Certificate for each of the lifting machines in each Wind Tower located at Sere Wind Farm. Each Load Test Certificate shall have all relevant information such as the manufacturer, serial number, safe working load, certificate number, customer name, site address, item location, description of item, overload applied, remarks, tested by, LMI Registration No, LME number, etc.

The LMI who is employed by a LME shall perform the load tests on the lifting machinery in each of the wind towers. There are 46 Wind Turbines at Sere Wind Farm. The jib crane and chain hoist is located in the nacelle of the wind turbines.

The load tests per wind turbine generator are for the following lifting machines:-

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

The jib crane is fitted with the 250kg Liftket electrical chain hoist. Appendix A show a picture of the jib crane in the nacelle and the nameplate of the hoist. The Avanti Service Lift data is shown in Table 1 below.

**Table 1**

Name of Manufacturer	Avanti
Year of Installation	2014
Rated load	240kg
Total weight	405kg
Rated speed	0.3m/s
Travel Distance	101 -110 m

The load test for equipment in the workshop are as follow:

- 1) 2500kg Pallet Lifter (Hand powered hydraulic lifting devices)

### **2.3.3 Summary**

The equipment covered under this scope of work is shown in Table 2 below.

**Table 2: Equipment List**

Equipment List	Quantity	6 Monthly Inspection	Annual Load Test
HMF Handy 265 folding hydraulic jib arm crane	46	<b>X</b>	<b>X</b>
250kg Liftket chain hoist	46	<b>X</b>	<b>X</b>
Avanti Lift Wire Ropes and attaching points	46	<b>X</b>	<b>X</b>
2500kg Pallet Lifter (Pallet Jack)	1	<b>X</b>	<b>X</b>

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### 3. Acceptance

This document has been seen and accepted by:

Name	Designation
Lehlohonolo Tinte	Senior Manager Renewables
Shawn Hurling	Plant Manager Renewables
Deon van Der Merwe	O&M Manager Sere Wind Farm

### 4. Revisions

Date	Rev.	Compiler	Remarks
September 2023	1	Deon v/d Merwe	First Revision

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5. Appendix A



HOFFMANN Fördertechnik GmbH Wurzen Dresdener Straße 64-68 / Wurzen / Germany Tel. +49 3425 89240 / <a href="http://www.liftket.de">http://www.liftket.de</a> ELEKTROKETTENZUG / ELECTRIC CHAIN HOIST			<b>LIFTKET</b>		
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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