
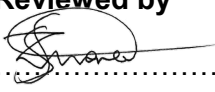
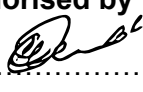
	<b>Scope of Work</b>	<b>Technology</b>
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Title: <b>Duvha Power Station U1 to U6 Diesel Generators, Station Diesel Generators, Fire Diesel Engines, Diesel Compressors, Maintenance Scope of Work</b>	Unique Identifier:	<b>382-139556</b>
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<b>Compiled by</b> 	<b>Reviewed by</b> 	<b>Authorised by</b> 
<b>T Magubane</b> <b>Snr Technician Mechanical (TSS)</b>	<b>S Zwane</b> <b>System Engineer:</b> <b>Diesel generators</b>	<b>L Mtembu</b> <b>Manager Turbine Auxiliaries Mechanical Maintenance</b>
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### **CONTROLLED DISCLOSURE**

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## **1. INTRODUCTION**

Duvha Power Station has a number of Diesel Engines in its operation that are critical for running of the Power Station, from Diesel fire pumps ,Diesel generators to Diesel compressors all need to be at their best performance and reliable state hence maintenance is critical to this plant.

## **2. SUPPORTING CLAUSES**

### **2.1 PURPOSE**

The purpose of this document is to define the scope of work for service and maintenance of all Diesel engines at Duvha Power Station.

Procurement lead times will be eliminated by task order creation directly against a contract, instead of following the procurement process.

To establish an effective and efficient maintenance and repair process for Diesel Engines.

It is therefore imperative that the successful and suitably qualified Contractor aligns his/her organisation fully to these specified scope activities and processes laid down in this document.

### **2.2 APPLICABILITY**

This document is applicable to Duvha Power Station only.

### **2.3 EFFECTIVE DATE**

This document is effective from the date of authorisation.

### **2.4 NORMATIVE/INFORMATIVE REFERENCES**

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

#### **2.4.1 Informative**

- |                         |   |
|-------------------------|---|
| [1] Act No 107 of 1998: | National Environmental Management Act, 1998.            |
| [2] Act No 85 of 1993:  | Occupational Health and Safety Act & Regulations, 1993. |
| [3] ISO 9001:           | Quality Management Systems.                             |
| [4] 36 - 681:           | Plant Safety Regulations.                               |
| [5] 32-846:             | Operating Regulations for High Voltage Systems.         |

#### **2.4.2 Normative**

- |                         |   |
|-------------------------|---|
| [6] Act No 107 of 1998: | National Environmental Management Act, 1998.            |
| [7] Act No 85 of 1993:  | Occupational Health and Safety Act & Regulations, 1993. |
| ISO 9001:               | Quality Management Systems.                             |

### **CONTROLLED DISCLOSURE**

- [8] 36 - 681: Plant Safety Regulations.
- [9] 32-846: Operating Regulations for High Voltage Systems.
- [10] Act No 102 of 1980: National Key Points Act, 1980
- [11] 32-846: Operating Regulations for High Voltage Systems
- [12] 240-97661287: Duvha Power Station Construction Regulation - SHE File

## **2.5 DEFINITIONS**

- a) Contractor: Service provider contracted for supplying specific service to Eskom, Duvha Power Station
- b) Employer: Eskom, or Eskom Duvha Power Station
- c) Service Manager: The Employer's representative in regard of the agreement (Contract)
- d) Contract Manager: The Contractor's representative in regard of the agreement (Contract)

## **2.6 ABBREVIATIONS**

<b>Abbreviation</b>	<b>Explanation</b>
BMCR	Boiler Maximum Continuous Rating
ISO	International Standards Organisation.
AKZ	Kraftwerk Kennzeichen System.
KPI	Key Performance Indicator.
NEC	New Engineering Contract.
ORHVS	Operating Regulations for High Voltage Systems.
PCLF	Planned Capability Loss Factor.
PJFFP	Pulse Jet Fabric Filter Plant
PPE	Personal Protective Equipment.
PSR	Plant Safety Regulations.
QCP	Quality Control Plan
QMP	Quality Management Program.
SOW	Scope of Work.
UCF	Unit Capability Factor.
UCLF	Unplanned Capability Loss Factor.

## **2.7 ROLES AND RESPONSIBILITIES**

The Employer, the Contractor and the Service Manager shall act as stated in this contract and in a spirit of mutual trust and co-operation.

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## **2.8 PROCESS FOR MONITORING**

N/A

## **2.9 RELATED/SUPPORTING DOCUMENTS**

None

## **2.10 REQUIREMENTS**

- The contractor will ensure all Safety Documentation is submitted before the contract is placed.
- The contractor shall ensure that all Quality Control Documents are to be submitted before contract placement.
- The employer will be responsible for ablution facilities.
- The contractor shall ensure that all the required equipment (including compressors and generators if required) for executing the job is included in his/her tender.
- The contractor must mobilize within 2 weeks of contract placement.
- The contractor must submit a program and quality control plan to the contracts manager before commencement of the job.

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### **3. SCOPE OF WORK**

The works is for the Maintenance service for Unit 1 to 6 on Diesel generators, A&B Station diesel generators, diesel fire pumps and compressor Engines. All repairs, services & maintenances will be on a monthly fixed price:

The price includes the following service spares, repairs, labour & traveling:

- A. oil filter
  - B fuel filter
  - C all gaskets including exhaust & intake gaskets
  - D oil pipes and any fittings
  - E pipes – hose – water
  - F any clamps
  - G v – belts
  - H repair and calibration injectors
  - I any external repair
- Eskom shall supply engine oil

These include

#### **12 X MTU DIESEL ENGINE – 12 V 652 TB 31**

- 2 X Oil filters
- 2 X Oil Seals
- 2 X “O” Rings
- 4 X diesel filters
- 4 X Gaskets
- 1 X centrifugal filter + seal
- 12 X Injector seals (compression)
- 12 X Tappet cover seals
- 2 X gaskets – water cooler
- 2 X gaskets water – oil cooler

#### **2 X DIESEL STATION ENGINE – CUMMINGS KT1150**

- 2 X Oil filters
- 2 X Diesel filters
- 1 X Water filter
- 1 X Air filter-out
- 1 X Air filter-in

#### **CONTROLLED DISCLOSURE**

- 1 X By-pass oil filter

#### **2 X DIESEL DEMIN WATER – CATERPILLAR 3304**

- 2 X Diesel filters
- 1 X Oil filters
- 1 X Air filters
- 1 X Air – in

#### **2 X DIESEL FIRE PUMP ENGINE – CUMMINS NT- 855-P335**

- 2 X Oil filters
- 2 X Diesel filters
- 1 X Water filter
- 1 X Air filter-out
- 1 X By-pass oil filter

#### **2 X MOBILE DIESEL WATER PUMPS**

#### **6 X INGERSOLL RAND COMPRESSORS ON DIESEL GENS**

#### **6 X DIESEL GEN COOLING TOWERS – BALTIMORE AIRCOIL COMPANY TME 90A**

NB: Ingersoll rand compressor will be serviced on every outage/change on filters-check v-belts condition-v-belts alignment and change if necessary

Cooling tower – will be serviced on every outage – change water – clean inside cooling tower – check v-belts, all spray nozzles/fans bearings and change if necessary.

#### **CONTROLLED DISCLOSURE**

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**Service schedule:**

“A” – service – every 1-week & test run

“B” – service – monthly

“C” – service – every 3 months

“D” – service – once a year

**Description:-**

“A” – service – test run.

**Description Task description**

Engine operations

Check engine speed, temperatures and pressures

Engine operation Perform test run (not less than 1/3 load) operate engine at least until steady temperature is reached

Turbo charger Listen for unusual sounds as turbo charger runs

Down

Air system Check condensate bleeding line of inter-cooler outlet for water discharge and obstruction

Fuel pre-filter Turn filter handle several times

Fuel Check supply and transfer pump

Engine coolant Check water level

Engine oil Check oil level

Engine Check oil pressure, all running period, water temperature, oil leaks, water leaks and hard starting

Battery Check state of charge, electricity level and specific gravity, clean and grease terminal if necessary

**CONTROLLED DISCLOSURE**



B” – service – monthly

Above include “a” service

Description Task description

Engine operators Check engine and external pipe work for leaks

Governor linkage Check that linkage between governor and injection pump(s) does not bind and lubricate

Air filter Check oil level in oil-bath air filter

Air system Check function of emergency air shut off flaps

Engine coolant cooler Check louver and lubricate linkage

Air system Check condensate bleeding line of intercooler outlet for water

“C” – service – every 3 months

Above includes “a” & “b” service

Description Task description

Lubrication points Lubricate

Valve gear Check cylinder head cover gasket, replace if necessary. Check function of valve gear excess lubrication prevention system

Turbo charger Change oil – if it is a separate system if necessary

Air filter Clean (multi-plate or wet-type air filter screen) change oil of oil-bath air filter

Exhaust system Inspect system

Fuel pre-filter Clean/replace paper elements

Take water sample from the engine coolant – if necessary change coolant flush cooling system, and corrosion inhibitor

Centrifugal oil filter Check thickness of deposited oil sludge, clean filter, drain oil sludge and examine for metallic residue if necessary

Engine oil Take sample and analyse – if necessary

Starter Clean, grease terminals

Monitoring system Check function of monitoring instruments-

**CONTROLLED DISCLOSURE**

V-belts Check v-belts and tension

Compressor Clean and change filter if necessary,  
Change oil

“D” – service – once yearly

Above includes “a”, “b”, and “c” – service

In addition, all filters and oil will be changed.

Check and adjust valves/tappets

Scope Diesel Compressor Engine

To do minor CAT15 Engine service

Carry out inspection for oil, fuel and water leaks

Check water jacket heater operation

Check batteries and battery charger

Check water jacket heater operation and condition of the hoses.

Check air filter element condition.

To do major CAT15 Engine Services

Perform minor service

Check valve clearance and adjust if necessary

Grease all joints as required.

Drain and flush cooling system, refill with clean water and add cooling.

System conditioner

Replace worn belts

Replace air filter elements (both primary and secondary)

### **CONTROLLED DISCLOSURE**

Clean radiators

Replace fuel/water separator element

PLEASE NOTE THAT ONLY OEM SPARES WILL BE ACCEPTED FOR BOTH CAT C15 ENGINE AND THE AIR-REND DURING SERVICE OR REPAIRS

- The Contractor provides all Equipment and associated engineering services to fulfil and execute the requirements of the Works Information and to provide an operational system.
- The works also include the de- and re-commissioning, removal, dismantling as well as making good of areas affected by the removal thereof. The Contractor must remove all redundant equipment.
- Contractor to start with preparation work once award of contract but access to start with work is as per contract start date.

#### **4. ENVIRONMENTAL MANAGEMENT**

- a) The Contractor will be required to contain spillages and clean up oil/grease spillages.
- b) The Contractor to compile a spillage prevention and spillage recovery procedure for the Employer's approval.
- c) The contractor shall be responsible for the removal of all waste in regards to this SOW. Spillage philosophy dictates that the responsible party is liable for all costs incurred.
- d) Prevention of water and oil leaks forms a critical part of this SOW.

#### **5. QUALITY AND DOCUMENTATION CONTROL**

- a) The Contractor shall ensure that any witness, hold and inspection points are strictly adhered too.
- b) The Contractor has to ensure that all measuring and testing equipment are calibrated as per the relevant SANS standard at all times & proof thereof must be readily available.
- c) All Quality References and Standards as stipulated in this document will be adhered to.
- d) Work will only be conducted with an Employer approved QCP.

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- e) The Contractor shall utilise the Employer's quality documentation management system and processes.

## **6. ACCEPTANCE**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
Lucky Mtembu	Mechanical Maintenance Manager
Thabani Magubane	Mechanical Senior Technician
Siyabonga Zwane	System Engineer – diesel generators
Tembeka Tshamano	Technical Support Services Manager
Kakanyo Mabaso	Group Maintenance Manager
Nhlanhla Ngcobo	System Engineer - compressors

## **7. REVISIONS**

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

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
N/A			

## **8. DEVELOPMENT TEAM**

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

- Thabani Magubane
- Siyabonga Zwane

## **9. ACKNOWLEDGEMENTS**

None

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