

	<b>Works information</b>	<b>Medupi Power Station</b>
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Area of Applicability: **Medupi Power Station**




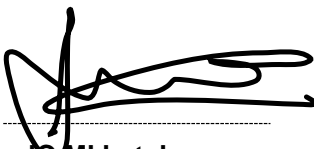
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Compiled by	Supported by	Functional Responsibility	Authorized by
			
<b>NG Mbatha</b> System Engineer	<b>C Matthee</b> Senior Engineer	<b>ND Chauke</b> Electrical Engineering Manager	<b>JS Mkhathswa</b> Engineering Manager
Date: <b>2024/06/18</b>	Date: <b>2024/06/18</b>	Date: <b>2024/06/18</b>	Date: <b>2024/06/19</b>

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**CONTROLLED DISCLOSURE**

## **1. Introduction**

Medupi Power Station is designed to be a highly efficient and effective coal fired power station supplying power to the South African National Grid. The continuity of supply should be maintained by ensuring that the plant power output is not negatively impacted by unavailability, inefficiency and unreliability of plant equipment or components. The power station is designed with an UCLF capped at 2% and this can be achieved by, amongst others, ensuring that the time spent on maintenance is minimized. One of the ways to minimize the maintenance downtime is by ensuring the availability of necessary equipment or component maintenance spares.

The main function of generator protection is to protect the generator, generator busbar and associated equipment, generator transformer and unit transformer and feeders to the Units boards and the HV yard. This protection function include preventing excessive damage to the applicable equipment by disconnecting the equipment during fault conditions where required. The Generator Protection system consists of;

- Main 1 and Main 2 that are 100% dual redundant,
- Fault recorder panel,
- Auxiliary control panel, which houses the synchronisers and generator transformer tap change control scheme and Visual Monitoring & Commissioning Interface (VMCI) for all the units at Medupi Power Station.

Due to the fact that the protection system consist of dual redundant protection systems the failure of one protection relay/function would not place the primary equipment at risk. A failure would therefore lead to the loss of redundancy.

The purpose of this document is to provide a comprehensive list for all generator protection related spares required for the Medupi Power Station and will outline the works information for the procurement of spare components of the abovementioned generator protection system. This will include, but not limited to, the scope for supplying spares technical information and supply of spares.

The process of procuring spares, while in compliance to Eskom's Procurement and Supply Chain Management Policy (32-1033), would include the requirements for the sourcing and supply of specified spares.

Some of the equipment supplied requires specialist skills to troubleshoot or repair once failure has occurred. Therefore, there is a need for a technical service contract with competent *Supplier* who will assist with repairs and commissioning of these equipment. These services will only be utilized on ad hoc basis and only for those instances where the skills are not available within the organization (Eskom).

## **2. Supporting Clauses**

### **2.1 Scope**

The Works Information specifies the required spares, DCF's information and the expected minimum and maxim quantities of spares to be supplied by the contractor during the contract period. The scope also includes technical support services (repairs and commissioning) required and conditions for acceptance. The scope outlined in this document shall not substitute nor supersede the Eskom procurement procedures that will be followed during the procurement process.

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### **2.1.1 Purpose**

The purpose of this document is to capture the requirements from all relevant stakeholders and to ensure that the deficiencies in the plant that may be caused by lack of maintenance spares are addressed adequately through procurement of spares. The works information (scope of work) for the procurement of the generator protection system spares will be discussed based on the requirements and guidelines incorporated in this document. In addition to the spares supply, technical support services will be provided by the *Supplier* which will ensure that skills is transferred to Eskom personnel and the plant is kept in good operating condition. This process is only applicable during the initial spares procurement.

### **2.1.2 Applicability**

This works information is only applicable to the maintenance spares procurement and technical support for the generator protection system at Medupi Power Station.

### **2.1.3 Effective date**

The effective date is the date of authorisation.

## **2.2 Normative/Informative References**

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

### **2.2.1 Normative**

- [1] ISO 9001 Quality Management Systems
- [2] 240-76960420 Guideline for Spares Procurement Technical Evaluation and Quality Inspection
- [3] 32-1033 Eskom Procurement and Supply Chain Management Policy
- [4] 32-1034 Eskom Procurement and Supply Chain Management Procedure
- [5] 474-132 GBE Plant Engineering Baseline Change Management
- [6] 240-1096204 Medupi Power Station Generator Protection Spares Strategy

### **2.2.2 Informative**

- [7] 240-89390239 Medupi Power Station Generator Protection Maintenance Strategy

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## 2.3 Definitions

Definitions	Description
<i>Supplier</i>	An enterprise that provides goods or services. For the purpose of this Works Information, the <i>Supplier</i> may refer to the OEM, OEM approved distributor or <i>Supplier</i> appointed to implement the works herein.
<i>Employer</i>	Company that is a recipient of a good or service provided by a <i>Supplier</i> under a purchase order or contract of sale. For the purpose of this Works Information, the <i>Employer</i> is Eskom Holdings SOC Medupi Power Station or representative thereof.

## 2.4 Abbreviations

Abbreviation	Explanation
DCF	Data Capture Form
OEM	Original Equipment Manufacturer
QC	Quality Control
RFI	Request for Information
RFQ	Request for Quotation
UCLF	Unplanned Capability Loss Factor
WI	Works Information

## 2.5 Roles and Responsibilities

### ***Supplier***

- a. Supply procured spares as requested by the *Employer*.
- b. Provide technical support services as and when requested by the *Employer*.
- c. Confirm correctness of the supplied spares information
- d. Provide spares technical information in accordance with this Works Information
- e. Timeously inform the *Employer* of any delays or when outstanding or additional information from the *Employer* is required.
- f. Responsible to ensure that a quality product is delivered.
- g. Responsible to ensure that the correct spare is supplied.
- h. Responsible to ensure that every effort is made to keep to the agreed program and plan.
- i. Provide all required technical datasheets and/or product brochures.
- j. Provide Material Management with populated DCFs for cataloguing of spares and record keeping.
- k. Conform to all the other requirements stipulated in this document.
- l. Supply all the necessary test sheets/results, where applicable.

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- m. Invite the *Employer* or representative thereof three (3) working days in advance for witness/hold points, if applicable, as agreed
- n. Supply the software and other maintenance tools required for maintenance purposes, where applicable.

**Medupi Power Station Electrical Engineering Generator Protection System Engineer**

- a. Provide input and compile this Works Information
- b. Liaise with all relevant stakeholders for any input.
- c. Ensure that the Works Information is in accordance with Eskom policies and procedures.
- d. Provide all necessary information to assist in spares and technical support services procurement.
- e. Participate in technical evaluation of the tender documents.
- f. Assist with the preparation of all the reports to different tender committees, where applicable
- g. Provide technical assistance to Maintenance, Materials Management and Procurement Departments during the execution of this Works Information
- h. Perform Quality Checks on procured spares and accompanying documentation.
- i. Provide Materials Management with populated DCFs for cataloguing of spares and record keeping.
- j. Verification and acceptance of all supplied documentation including DCFs.
- k. Responsible for QC at delivery of procured spares.

**Medupi Power Station Materials Management Department**

- a. Catalogue the spares after completion of DCFs.
- b. Confirm that the information supplied by the engineer is enough for cataloguing.
- c. Perform QC on all submitted DCFs.
- d. Make provision for storage of procured spares.
- e. Work together with Engineering and Maintenance when accepting spares into stores.
- f. Ensure the station has the required stock as per the min and max on the spare's strategy.

**Medupi Power Station Procurement Department**

- a. Perform all procurement processes outlined in this Works Information
- b. Issue invitation to tender to the *Supplier*.
- c. Supply engineering with *Supplier* information for sole source justifications, where applicable.
- d. Set up clarification meetings between *Supplier* and *Employer*
- e. Act as communication link between *Supplier* and *Employer*
- f. Ensure all necessary payments are effected timeously and keep record thereof
- g. Arrange technical evaluation sessions.

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- h. Compile and present mandate to negotiate and arrange negotiation meetings if and when required and give feedback to relevant tender committee.
- i. Keep record of all tender documentation

### **Medupi Power Station Electrical Maintenance Function**

- a. Perform inspections and QC on spares upon delivery.
- b. Ensure spare items are stored properly by Materials Management as per relevant storage recommendations by the specific manufacturers.
- c. Book refurbishable spares back to stores once replaced.

## **2.6 Process for Monitoring**

Not Applicable

## **2.7 Related/Supporting Documents**

240-1096204 Medupi Power Station Generator Protection Spares Strategy

# **3. Generator Protection Spares**

## **3.1 Work to be performed by *Supplier***

The following are the *Supplier's* requirements:

- a. The *Supplier* will ensure that the correct spare is supplied and will replace or be liable for damage at his/her cost if the incorrect or defective spare/s is supplied. The costs may include, but not limited to, repairs and/or replacement of a defective or incorrect spare.
- b. The *Employer's* (i.e. Eskom Holdings SOC) acceptance of delivered spare/s does not absolve the
- c. *Supplier* of the liability to supply the correct and/or defect free spare.
- d. The *Supplier* may, at the *Employer's* discretion, be given access to the plant to verify the information of the installed spare.
- e. The spare must be exactly the same (e.g. same Part Number) as specified on this works information and the part number will also be used to perform quality control checks. Notwithstanding the stipulated condition that the *Supplier* is responsible for verifying the correctness of the spares information provided by the *Employer* in relation to the existing installed component. This may include the *Supplier* consulting the original *Supplier* of the spare to ensure correctness of information provided by the *Employer*. Where a part has become obsolete, the *Supplier* will offer a suitable alternative with all the documentation as specified within this Works Information to be submitted to the *Employer* for acceptance before delivery.
- f. The *Employer* may at his/her discretion make the *Employer's* Engineer or employees or others available to the *Supplier* for the purpose of soliciting additional information or verifying information as the need arises.

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- g. The *Supplier* will supply any additional information such as brochure, general arrangement drawing, test certificates, detailed specification, etc.
- h. The *Supplier* shall supply preservation and storage procedure/s, where applicable.
- i. "Estimated Spare Quantities to be Procured over Three Year Period", indicated by the *Employer* in the attached table as one of the subheadings, is the estimated number the *Employer* may require the *Supplier* to supply over the contract period. The *Supplier* may only supply the quantity as specified by the *Employer* in the individual order instruction.
- j. If deemed necessary, the *Employer* may subject the *Supplier* to a quality assurance assessment at the *Supplier's* or sub-*Supplier's* premises as part of the technical evaluation or before the contract placement or at any time during the contract period.
- k. Where the spare requires testing, the *Supplier* will inform the *Employer* to invite or make available the *Employer's* System Engineer to witness the tests.
- l. Should the *Employer* be dissatisfied with all or certain aspects relating to a specific spare tests (including but not limited to suspected inferior quality or non-compliance) the *Supplier* will make good, rectify the faults or supply a new spare at his/her cost.
- m. Complete price breakdown must be supplied with the quotation and must include the cost of transport to Medupi Power Station. However, the *Employer* reserves the right to use the *Employer's* own transport.
- n. Spares will be opened for inspection, counting and quality control check at the *Employer's* stores.
- o. The *Employer* has provided the Bill of Material table and copies of individual spares DCF's in order to assist the *Supplier* to meet the requirements of the Work to be Performed by the *Supplier*.
- p. The *Supplier* shall provide technical support services for Medupi Power Station Generator Protection systems when requested by the *Employer*. These services shall be available 24 hours a day for the duration of the contract. The services include fault finding, repairs and commissioning work.
- q. The scope include telephonic and site assistance. The services shall be performed by a qualified technician accredited by the original equipment manufacturer for that specific equipment.
- r. The *Supplier* shall provide all tools required for the services at their own cost. The turnaround time for a qualified technician to arrive on onsite when called-out shall be 8 hours.
- s. The *Supplier* shall transfer skills by means of on the job training to the *Employer's* personnel when performing work on site.
- t. The *Supplier* shall be responsible for the transport cost, accommodation, meals, and all resources required by their technicians.
- u. All refurbishable spares sent back to the *Suppliers* for repairs shall be repaired by a service provider accredited by the Original Equipment Manufacturer to perform such repairs. A copy of an accreditation certificate, repairs reports and test reports shall accompany the equipment on delivery.
- v. The *Employer* may make clarification sessions available to either prospective *Suppliers* in order to further assist the prospective *Suppliers* to meet the requirements of the Work to be performed by the *Supplier*.

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Where the *Employer* has entered into a National Framework agreement for the supply of any listed items in Appendix A before this contract is in place, those items shall not form part of the contract.

## **3.2 Specifications of the Spares and Services**

### **3.2.1 Spares Identification**

Appendix A lists all the spares to be procured under this works information. This list shall correspond to the provided hardcopy and/or electronic copy DCF's that will contain more information about required spares. Each spare is identifiable by means of a KKS number (as is used in the Power Station), part description, OEM and/or OEM part number. Where the information available on the spares list in Appendix A or that supplied by materials management as catalogued is not sufficient to positively identify the applicable spare, the *Supplier* shall notify the *Employer* such that the *Employer* can assist the *Supplier* in identifying the correct spare.

The *Supplier* shall be liable to replace a supplied spare that is found to be defective within the guarantee period.

### **3.2.2 Information to be provided**

Accompanying this Works Information is the DCF's with the information deemed enough to procure the correct spares as required. The DCF is required by the *Employer's* Material Management System to be able to book the item in the stores and the information should be sufficient enough to procure the goods in future. Where a field is populated, the *Supplier* needs to review and verify/correct the information against the OEM part number for correctness.

The following information to be provided with the spares:

- a. Documentation detailing the technical characteristics of the procured spare item. This may be in the form of data sheet or brochure. The *Employer* reserves the right to reject the documentation if it is not deemed sufficient
- b. Any other additional information that has not been specified on the DCF / WI but necessary for storage, installation and utilisation of spares where applicable
- c. Supply preservation and storage procedures of goods.
- d. Any spares information which has been omitted which is deemed relevant for spares identification, storage, maintenance, etc.
- e. In instances where the *Supplier* uses another company, other than the item OEM, to provide required information, this to be declared in advance to the *Employer*
- f. Shelf life of all spares to be specified as part of provided information
- g. DCF form for each spare type will have all fields completed
- h. Valid OEM letter stating that the *Supplier* is the authorised distributor or repairer of the equipment
- i. The *Supplier* shall submit a service report within 7 days after each callout

### **3.2.3 Spares Quantities**

The estimated spares quantities to be provided as stipulated in the purchase order.

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### 3.2.4 Design, Manufacturing and Testing

The required spares shall be the same, in all respects, as the original components. The spares shall also conform to the same specifications as the original components. This includes all aspects such as design, materials and material specifications, manufacturing and manufacturing processes, testing and operating and storage specifications.

### 3.2.5 Replacement Parts Upgraded/modified

Where equipment or spares, including the whole assembly, have been upgraded/ modified the *Supplier* shall indicate this to the *Employer* as part of the tender. The *Employer* shall be made aware immediately where the upgrade/modification to the component is only identified subsequent to the tender being issued. The detailed compatibility to the existing component shall be indicated. This includes hardware, firmware and software upgrade/modification.

If the components to be supplied will be obsolete, or envisaged to be obsolete, in the 5 years subsequent to tender being issued, the *Supplier* shall indicate this to the *Employer* and indicate viable alternatives thereof. Written evidence from the OEM shall be submitted to the *Employer* stating the year in which the component will/has become obsolete.

### 3.2.6 Packaging

All supplied spares shall be packaged in such a manner that they may be transported and stored for an extended period of time without resulting in damage to the packaged components. This includes preventing damage due to moisture ingress, especially for electronic components. Where possible, silica gel/desiccant may be included to ensure protection against moisture for at least 3 months. However, this inclusion should not lead to damage to the component.

Modules / sensitive electronic components shall at all times be suitably packed in anti-static material and other protective packaging such that it is protected against static, EMC and handling hazards.

Different spare types shall be packaged separately such that each spare type can be stored separately. Packaging shall be such that the spare can be identified without opening the packaging. Packaging shall be of material that will not be damaged, to an extent possible, by harsh weather conditions during transportation. If that is not possible, then the packaging shall be protected against such conditions.

Where possible, packaging to be such that procured spares can be positively identified through the packaging. Where this is not possible, the packaging to be such that it allows opening and closing of packaging and still maintain the packaging integrity thereafter.

Delivery packaging to have the following details on it:

- Order number
- Physical address of Medupi Power Station
- Delivery note number

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### 3.2.7 Transportation

Transportation of all spares shall be conducted with due regard of the sensitivity of the units and in such a manner that spares are suitably protected. All possible care must be taken to ensure that the components are not subjected to undue rough handling, vibration, humidity, excessive temperatures or abuse. When courier service is used for transportation, the courier services service provider shall be alerted to the nature of the content of the packages and instructed to handle with care. Labels shall be used to indicate the fragile nature of the items.

### 3.2.8 Exclusions

The following shall be noted as exclusions as per this works information:

- The *Supplier* shall not supply offloading facilities during delivery of spares.
- The *Supplier* shall not be responsible for the storage of spares after acceptance at delivery by *Employer*.
- Subcontracting shall not be permitted, unless declared and accepted prior to contract placement.

### 3.2.9 Acceptance of Spares

- No incorrect, damaged or faulty spares will be accepted.
- All the spares will be inspected before payment could be processed.
- Where applicable; test certificates, material certificate, manuals, data sheet and signature shall be provided as required.

### 3.2.10 Service Requirements

The following services will be required as a minimum:

- VMCI softwares to be pre-installed upon delivery.
- Repairs of defective protection IED's

Other services may be negotiated during the contracting phase.

## 3.3 Constraints on how the *Supplier* provides the goods

### 3.3.1 Work to be done by the Delivery Date

A clarification meeting to be held 3 weeks subsequent to the issuing of the enquiry to confirm the scope of the Works and to confirm spares identification. All questions can be forwarded to the *Employer* during this meeting. Where more than one *Supplier* is available, all responses from the *Employer* will be forwarded to all *Suppliers*, regardless of which *Supplier* required the clarification.

All required spares to be delivered to the *Employer* 4 weeks from the day the purchase order is placed by the *Employer*. The *Employer* may request, in writing, that a spare be expedited quicker if its delivery in 4 weeks may lead to a delay that may result in undesirable consequences (loss of production, loss of revenue and/or safety to personnel or environment) to the *Employer*.

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The *Supplier* shall make available a service technician on a 24 hour basis. Response time for site work shall be 8 hours. The *Supplier* shall submit a repair report within 7 days after each callout.

### 3.3.2 Documentation Control

The information for spares to be provided will either be in electronic format and/or hard copy. Other information provided with each spare to be either in electronic format and/or hard copy. Information provided to be documented in such a manner that the information for each spare will be easily identifiable. All documentation supplied shall bear the OEM's official name and logo.

### 3.3.3 Quality Assurance Requirements

The spares and services to be provided shall conform to all quality assurance requirements that will be defined at contracting phase.

### 3.3.4 Program Constraints

The following shall be included in the *Suppliers* program:

- The delivery date as stipulated to be provisional. This date may change prior to delivery. The *Supplier* to indicate standing time and storage costs should the *Employer* delay the delivery date. Proof of actual costs to be provided.
- Provision to be made for delays that may be caused owing to items being sourced from outside The Republic of South Africa.

### 3.3.5 Guarantee of delivered spares

All delivered spares shall come with a 12-months guarantee period starting from the *delivery date*. This also applies to refurbished spares which has been repaired by the *Supplier*.

### 3.3.6 Insurance of the Goods

Insurance to be the responsibility of the *Supplier* until *delivery*.

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#### 4. Acceptance

This document has been seen and accepted by:

Name	Designation
Letshabisa Miya	Acting Technical Plant Manager
Mbongeni Mqadi	Maintenance Group Manager
Nothando Nkosi	Finance Manager
Jappie Morudu	Procurement Manager
Derrick Chauke	Electrical Engineering Manager
Sarita Henning	Acting Turbine Engineering Manager
Portia Lutumbu	Electrical Maintenance Manager
Pieter Myburgh	Process and Reliability Engineering Manager
Neo Monini	Outage Execution Manager
Lebo Pebane	Senior Materials Storekeeper
Kevin Rabbolini	PTM Maintenance Manager
Henry Murray	Senior Technical advisor

#### 5. Revisions

Date	Rev.	Compiler	Remarks
May 2024	3	Ntando Mbatha	Updated the BoM on Appendix A, template change and section 4.
September 2019	2	JJ Bruwer	Revised 2
October 2014	1	JC Pieterse	Revision 1

#### 6. Development Team

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

- Ntando Mbatha and Previous System Engineers

#### 7. Acknowledgements

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## Appendix A – Bill of Material

Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
1	Generator protection	Current and Voltage Test Blocks	Current and Voltage Test Blocks: MICOM P991.	10	580196	Areva	P991
2	Generator protection	Indication LED	Indication LED- New Fault Record, Fault Recorder Memory Low& Fault Recorder Unhealthy: TYPE ND 22	10	580197	Mimic Craft	TYPE ND 22-B
3	Generator protection	Synchronising Relay	Synchronising Relay - 7VE6320	10	226183	Siemens	7VE6320
4	Generator protection	FREQUENCY GENERATOR	Signal generator, 20 Hz Generator, Uin = 3x100-125 Vac & 110, 220Vdc, Output current = 3.25A, F = 20hz, Uout = 26V. F-nr:BF0803092502, Diag no.: C53207-A332-X1-1*-12	6	252067	Siemens	7XT3300-0CA00/CC
5	Generator protection	Filter, bandpass	20 Hz bandpass for stator earth fault 100% protection. The 20hz bandpass filters the square-wave voltage and trans- forms it to sinus curves with frequencies of approx. 20Hz. The resistance is approx. 160 ohm (50Hz). Max. Power consumption is approx. 80va. In 7xp20 case for flush mounting.	8	239781	Siemens	7XT3400-0CA00/BB

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
4	Generator protection	PRetrans ROTOR REPEATER 5104 E/F	Repeater, light signal: type: galvanic isolator; operation method: automatic; frequency rating: 50/60 Hz; overall gain: 0-20/4-20 ma; suppl p/n: prs5104a; application: used for analogue current and voltage signals; mount: din rail; 3/5 port: 3.75kvac; loop supply: 17.1v; -1:1 signal conversion of analog current/voltage; protection: ip20.	8	608668	PR Electronics	PRS5104A
5	Generator protection	Generator Biotronics Recorder Bay M871	Biotronics M871 Fault Recorder (Gen Bay)	10	580199	Areva	M87120V1515C
6	Generator protection	400kV Biotronics Recorder Bay M871	Biotronics M871 Fault Recorder (400kV Bay)	10	580200	Areva	M8712Y91515C
7	Generator protection	Unit Transformers 1+2 Bay Biotronics M872 Recorder	Biotronics M872 Recorder (Unit Transformers 1+2 Bays)	10	580200	Areva	M8723Y9000151Y5C
8	Generator protection	Ethernet Communications Switch	Ethernet Communications Switch: MOXA 7728	10	608672	MOXA	MOXA 7728
9	Generator protection	Fuses & Links holders (DC Circuits)	Fuses & Links Holders Type NSH (DC Circuits)	15	608676	Alstom	RS63HWH

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
10	Generator protection	Fuses**	Per fuse size	20	118168	Indo Asian Fuse Gear	TIS40
11	Generator protection	3 Pole MCB (Miniature Circuit Breakers)	2A 3 pole MCB's (VT circuits) - Type C45	15	119855	Merlin & Gerin	MCB452P15A
12	Generator protection	DC Line Filter	Shaffner Type FN670 220V DC Line Filter	6	608673	Arrow Electric	S-SHAFFNER (FN670-10/06)
13	Generator protection	Industrial Relays	Schrack Type MT321220 with desentisiser in base	12	609277	Electromechanical	MT321220
14	Generator protection	Industrial Relays	Schrack Type MT321024 with desentisiser in base	12	609275	Electromechanical	MT321024
15	Generator protection	Earth Leakage Unit	63A Earth Leakage Unit (C63)	10	608707	Merlin & Gerin	MCBGE2P63AE/L
16	Generator protection	Contact Protection Module	Contact Protection Module	12	649140	Telbit	S-SNUBCIRCUIT
17	Generator protection	220/24V DC/DC Converter	Phoenix - 220/24V DC/DC Converter	15	609279	Phoenix Contact	MINIPS-SV2687
18	Generator protection	Modbus Transducer	Type 4017 (ADAM 8) Modbus Transducer (input 4-20mA)	10	608669	Promico	ADAM 4017+

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
19	Generator protection	Modbus Transducer	Type 4520 RS232/RS45 Communications Controller (input 4-20mA)	10	608674	Promico	ADAM 4520
20	Generator protection	400kV Busbar VT Transducer	400kV Busbar VT Transducer (4-20mA)	12	238553	Power Contractors	VA7-LDG6
21	Generator protection	PTC I-21	PTC Thermistor	1000	608671	EPCOS	C885
22	Generator protection	UPS	UNINTERRUPTIBLE POWER SUPPLY	6	608670	MGE UPS Systems	UPS800MGE (PULSER 800)
23	Generator protection	Power (Busbar) terminals	Power Terminals (DC & AC INCOMING SUPPLIES)	12	581479	ELMEX	DPBB 70
24	Generator protection	Disconnecting Terminals	ALL ALARMS CIRCUITS	12	575281	ELMEX	KULTD4WS
25	Generator protection	Disconnecting Terminals	8mm SPRING LOADED TERMINALS (CT & VT BUSWIRING)	12	581480	ELMEX	KULT D6
26	Generator protection	Terminals	Spring Loaded Feed through terminal	12	581481	ELMEX	KULT 1
27	Generator protection	Resistor Terminals	8mm Terminal WITH 1Mohm Resistor	12	581482	ELMEX	KUDF 4

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
28	Generator protection	Diode Terminal	Type KCH Diode Terminal	12	581483	ELMEX	KCH
29	Generator protection	Visual Monitoring Commissioning Interface	PANEL PC, VMCI - Touch Screen - Panel mount	8	648991	IEI Technology Corp	PPC-5190AD
33	Generator protection	Buttons	P/BUTTON ARF1 BLK 2 N/O CONNECTION	8		Mimic Components/Mantech	
34	Generator protection	Indicator Lights	INDICATION LED - TYPE ND22 (220V DC, COLOUR = AMBER)	20		Mimic Components/Mantech	ND16-22B/2 (O)
35	Generator protection	Indicator Lights	INDICATION LED - TYPE ND22 (220V DC, COLOUR = WHITE)	20		Mimic Components/Mantech	ND16-22B/2 (W)
36	Generator protection	Indicator Lights	INDICATION LED - TYPE ND22 (220V DC, COLOUR = RED)	20		Mimic Components/Mantech	ND16-22B/2 (R)
37	Generator protection	Indicator Lights	INDICATION LED - TYPE ND22 (220V DC, COLOUR = BLUE)	20		Mimic Components/Mantech	ND16-22B/2 (B)
37	Generator protection	Buttons	EMERGENCY PUSHBUTTON - LATCHING	20		Mimic Components	

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
38	Generator protection	Switches	DCI, TIS & ACI SWITCHES	15	0717656	Alstom/ACTOM	A0104026
39	Generator protection	Switches	LOR SWITCHES	15		Alstom/ACTOM	A010404445
40	Generator protection	Switches	SIS SWITCHES, ref.: SRP169A.TB, 16A, 500Vac	15		Alstom/ACTOM	A0106044 (RS04030)
41	Generator protection	Switches	RLS, MAS & Synch Relay select SWITCHES	15		Alstom/ACTOM	A010108545R2
42	Generator protection	Switches	LCS Switches	15		Alstom/ACTOM	A010108545
43	Generator protection	Fuses	HRC fuse link, 2A, gG,80kA, 500V, BS88, Off-set blade tag fuses	30		GEC ALsthom	NS-2A
44	Generator protection	Fuses	HRC fuse link, 16A, gG,80kA, 500V, BS88, Off-set blade tag fuses	30		GEC ALsthom	NS-16A
45	Generator protection	Fuses	HRC fuse link, 10A, gG,80kA, 500V, BS88, Off-set blade tag fuses	30		GEC ALsthom	NS-10A
45	Generator protection	Fuses	HRC fuse link, 6A, gG,80kA, 500V, BS88, Off-set blade tag fuses	30		GEC ALsthom	NS-6A

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
46	Generator protection	Fuses	HRC fuse link, 20A, gG, 80kA, 660Vac, IEC 60269-1 & II/BS 88	30		Bussmann	TIA20
47	Generator protection	Switches	A.V.M - SRP112B/TA	20		Actom	MS33590
48	Generator protection	Switches	A.M SE2964, SRP112/TA	20		Actom	MS41170
49	Generator protection	Switches	SE3707, SRP146B.TA	20		Actom	RS04090
50	Generator protection	Switches	SRP169A.TB, SE3707	20		Actom	RS04030
51	Generator protection	Switches	SRP146.TB, SE3707	20		Actom	RS04040
52	Generator protection	Switches	SRP145.TB, SE3707	20		Actom	RS04070
53	Generator protection	Switches	SRP112B.TA, SE3707, 16A, 500Vac	20	675633	Actom	RS04080
54	Generator protection	Switches	SE3707, SRP168.TB, 16A, 500Vac	20		Actom	RS04050

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Item Nr.	Plant System	Type Of Spare	Description	Quantity	Material number	OEM	OEM Part No (where available)
55	Generator protection	Switches	SRP14H2D, SE3558, 16A, 500Vac	20		Actom	RS08500
56	Generator protection	Switches	SRP168.TB, SE3707, 16A, 500Vac	20		Actom	RS04060

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## Appendix B – Notice to Tenders

### A. Technical evaluation

The supply and delivery of the Generator Protection spare components will be technically evaluated based on the following key performance areas:

i. Approval to supply electrical Generator Protection components.

Proof must be provided to the *Employer* that a tenderer is an original manufacturer or approved distributor of the items to be procured.

ii. Component interchangeability

Mechanical and operational interchangeability is a requirement for all the above listed components to be procured. The components shall be evaluated to ensure that the procured spare components may be installed without any modification to the plant. This criterion is a gatekeeper, i.e. failure of the tendered item to fulfil the required interchangeability will result in the tendered item being found technically unacceptable.

iii. Ability to populate DCF's

It is highly important that the *Employer* is in possession of the correct technical details of the components used in the power plant. This ensures future plant projects, plant health analysis and operation capabilities will be executed without any hassles. Lack of recorded technical information may lead to wrong utilisation and maintenance on the item. This criterion is also a gatekeeper.

iv. Components preservation

All the items to be procured will be stored until they are required to replace faulty components in the plant. It is thus imperative that the items be preserved correctly to ensure total useful life out of the items when they are utilised in the plant. Procedures are required so that the items may be preserved as recommended and/or instructed by the manufacturer. This criterion is also a gatekeeper.

v. Technical expertise

The *Employer* needs to be satisfied that the *Supplier* has enough technical expertise to work on the procured items when complex problems are encountered. The expertise may be in a wide range of electrical switchgear, through technical support or direct contact with the OEM's service centres.

vi. Warranty and lead times

The *Supplier* must specify the warranty period and lead times for all items. This is a requirement to assist the *Employer* plan when to use the procured items.

vii. Tender quality

Received tender technical documents shall be evaluated for complete fulfilment of the specified scope of work.

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B. Adjudication

The scoring system to be used to evaluate the different tenders will be mainly as in the table below. The criteria scoring matrix will be supplied to make it easier for the tenderer to evaluate themselves against the set evaluation criteria.

Score	Result	Remarks
0	Non-responsive	Totally deficient or non-responsive
2	Non-compliant	<ul style="list-style-type: none"><li>• Does not meet technical requirement(s) and/or;</li><li>• Unacceptable technical risk(s) and/or;</li><li>• Unacceptable exceptions and/or;</li><li>• Unacceptable conditions.</li></ul>
4	Compliant with associated qualifications	Meet technical requirement(s) with; <ul style="list-style-type: none"><li>• Acceptable technical risk(s) and/or;</li><li>• Acceptable exceptions and/or;</li><li>• Acceptable conditions.</li></ul>
5	Compliant	<ul style="list-style-type: none"><li>• Meet technical requirement(s) and;</li><li>• No foreseen technical risk(s) in meeting technical requirements.</li></ul>

C. Quality Control

All procured items will undergo quality checks to ensure they meet all set requirements. All items will be inspected upon delivery, before acceptance by the *Employer*.

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