	Scope of Work	Kriel Power Station
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**Title: DC Systems (Essential Supplies)
Batteries, Battery Chargers, UPSs,
Diesel Generators and DC Boards:
All Units and Common Plant Non-
OEM Spares Procurement Works
Information**

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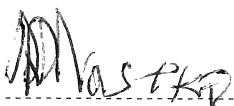



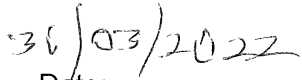
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1. Introduction

At Kriel Power Station, the turbine and generator controls including all plant protections are supplied from a 110VDC source. The 110V battery banks supply the emergency backup when there is a power failure. If the batteries are not operational, the Unit protection will not operate during emergencies (such as when the AC supplies or battery chargers have failed) and this may result in extensive plant damage.

The 220V battery banks supply the DC lube oil drives, the seal oil pumps and the Boiler Feed Pump Turbine DC lube oil pumps. The backup supply to the lube oil drives is very necessary for the safe run down of the turbine and generator in case of emergency where the normal supply has failed. Failure of the DC supply can cause major damage to the bearings. Therefore, It is required during an emergency when the normal AC power supply is unavailable.

The C&I to the equipment room is being run with 24VDC battery backup. If the AC supply fails, the batteries will take over and supply the load. It is crucial that the standby time for the batteries is long enough to allow for Maintenance personnel to reach the Station and correct whatever fault that occurred (of essential Supplies for Power Station control) requires that the standby time should not be less than 4 hours. The batteries to be purchased as installed to some other Units, will give the required 4 hour standby time. When the battery supply is exhausted, the Unit will trip. The Unit will be off-load for a period of time while the fault in Battery Chargers is being attended to. This will result in load loss and considerable expense in lighting up the Unit again.

In addition with regards to Common plant, the Coal-Plant North battery bank is the back-up supply for tripping coils of the 11/3.3kV boards supplying the main compressor house. Without the batteries, the switchgear might not operate once in the open position.

Maintenance Philosophy:

All the protection circuits of DC at Kriel Power Station have two battery banks in parallel (dual redundant supply) from the Units. In the event of one battery bank failing, the other bank will still be able to handle the required load of the equipment being supplied. This is with the assumption that the alternate bank is healthy.

Assessments are done during scheduled maintenance opportunities as the replacement of UPSs Batteries were installed and commissioned successfully for all the Units in 2019/20.

Thus, the philosophy is to consider general battery replacement (GO). The current Kriel outage programme is a six-year general overhaul cycle. For this reason, the battery replacement is to be done every 10 to 15 years, depending on the severity condition of the equipment.

This document will outline the works information for the procurement of spare components of the above mentioned. This will include, but not limited to, the scope for supplying spares technical information and supply of spares. The scope covers the DC Systems (Essential Supplies) Batteries, Battery Chargers, UPSs, **Diesel Generators** and DC Boards: All Units and Common Plant.

Unit DC spares strategy is as follows:

WI Number	DC Systems (Essential Supplies) Batteries, Battery Chargers, UPSs, Diesel Generators and DC Boards: All Units and Common
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240-56176852	Essential Power Supplies for Power Stations Standard
240-53114248	Specification for Thyristors and Switch Mode Chargers AC/DC to DC/AC converters and Inverter/Uninterruptible Power Supplies
240-56535959	Management of Emergency AC and DC Supplies at Power Station Standard
240-56176852	Capacity of Essential Power Supplies for Power Stations Standard
240-131061685 (Version 1)	Battery Maintenance Task Lists
240-118705834 (Version 2)	Maintenance of Battery Chargers

2. Supporting Clauses

2.1 Scope

The Works Information specifies the required spares, quantities of spares to be supplied as and when required for 5 years by the awarded on contract *Supplier* and conditions for acceptance. The scope included here does not substitute procurement procedures that will be followed during the procurement process.

2.1.1 Purpose

The purpose of this document is to formally request the *Supplier* to supply spares and ensure that all maintenance spares which are being procured by Kriel Power Station are correct.

2.1.2 Applicability

This scope is only applicable to the spares procurement of Kriel power station covers the DC Systems (Essential Supplies) Batteries, Battery Chargers, UPSs, Diesel Generators and DC Boards: All Units and Common components or sub-components.

2.1.3 Effective date

This document shall be effective from the authorisation date

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.

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[5] 474-132 GBE Plant Engineering Baseline Change Management.

2.2.2 Informative

2.3 Definitions

2.4 Abbreviations

Abbreviation	Explanation
DC	Direct Current
AC	Alternating Current
UPS	Uninterruptible Power Supplies
EOD	Electrical Operating Desk
OEM	Original Equipment Manufacturer
GO	General Outage
BFPT	Boiler Feed Pump Turbine
ES	Essential Supplies
SHEQ	Safety, Health, Environment and Quality
WI	Works Information

2.5 Roles and Responsibilities

Supplier

- Supply procured spares as requested by the *Employer*
- Confirm correctness of the supplied spares information
- Provide spares technical information in accordance with this Works Information
- Timeously inform the *Employer* of any delays or when outstanding or additional information from the *Employer* is required
- Responsible to ensure that a quality product is delivered
- Responsible to ensure that every effort is made to keep to the agreed program and plan
- Provide all required technical datasheets and/or product brochures for all the spares supplied
- Conform to all the other requirements stipulated in this document
- Supply all the necessary test sheets/results, where applicable
- Invite the *Employer* or representative thereof three (3) working days in advance for witness/hold points, if applicable, as agreed

Engineer

- Provide input and compile this Works Information
- Liaise with all relevant stakeholders for any input
- Ensure that the Works Information is in accordance with Eskom policies and procedures

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- Provide all necessary information to assist in spares procurement
- Participate in technical evaluation of the tender documents
- Assist with the preparation of all the reports to different tender committees, where applicable
- Provide technical assistance to Materials Management and Procurement Departments during the execution of this Works Information
- Perform Quality Checks on procured spares and accompanying documentation
- Provide Materials Management with fully populated DCFs for cataloguing of spares and record keeping
- Verification and acceptance of all supplied documentation
- Responsible for QC at delivery of procured spares

Materials Management

- Catalogue the spares after completion of DCFs
- Confirm that the information supplied by the engineer is enough for cataloguing
- Perform QC on all submitted DCFs
- Make provision for storage of procured spares
- Work together with engineering when accepting spares into stores

Procurement

- Perform all procurement processes outlined in this Works Information
- Issue RFQ's and/or RFI's for the procurement of spares
- Supply engineering with *Supplier* information for sole source justifications, where applicable.
- Set up clarification meetings between *Supplier* and *Employer*
- Act as communication link between *Supplier* and *Employer*
- Ensure all necessary payments are effected timeously and keep record thereof
- Arrange technical evaluation sessions
- Compile and present mandate to negotiate and arrange negotiation meetings if and when required and give feedback to relevant tender committee
- Keep record of all tender documentation

Maintenance

- Perform inspections and QC on spares upon delivery
- Ensure spare items are stored properly by Materials Management as per relevant storage recommendations by the specific manufacturers

2.6 Process for Monitoring

Not Applicable

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2.7 Related/Supporting Documents

None

3. WORK TO BE PERFORMED BY SUPPLIER

The following are the *Supplier's* requirement:

- 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 as a result of a defective or incorrect spare.
- The *Employer's* (i.e. Eskom Holdings SOC) acceptance of delivered spare/s does not absolve the *Supplier's* of the liability to supply the correct and/or defect free spare.
- The *Supplier* may, at the *Employer's* discretion, be given access to the plant to verify the information of the installed spare.
- The spare must be exactly the same (i.e. 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 spare. This may include the Supplier consulting the original supplier of the spare to ensure correctness of information provided by the Employer.***
- 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.
- The *Supplier* will supply any additional information such as brochure, general arrangement drawing, certificates, detailed specification, etc.
- The *Supplier* provides the *Employer* with additional spares information and verifies information required in the attached data capturing forms (DCF) at least three months after order placement or conclusion of the contract or (where lead time is less than three months) a week before delivery of respective spare.
- The *Supplier* shall supply preservation and storage procedure/s, where applicable.
- The Spares Procurement limit over five (year) period, indicated by the Employer in the attached table as one of the subheadings, is the maximum number the *Employer* may require the *Supplier* to supply over the contract period. However the *Supplier* may only supply the quantity as specified by the *Employer* in the individual order instruction and does not imply that the Supplier is entitled to supply the total number indicated in the Spares Procurement Limit over Three (Year) Period.
- The *Employer* reserves the right to exclude the supply of some spares items included in the contract with the Supplier should the *Employer* become aware that National Supply Contract exists or is placed by the *Employer* with Others in respect to those specific spares items.
- 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.
- 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.
- 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.

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- Complete price breakdown must be supplied with the quotation and must include the cost of transport to Kriel Power Station. However, the *Employer* reserves the right to use the *Employer's* own transport.
- Spares will be opened for inspection, counting and quality control check at the *Employer's* stores.
- 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*.
- The *Employer* may make clarification sessions available to either prospective *Supplier/s* in order to further assist the prospective *Supplier's* to meet the requirements of the Work to be performed by the *Supplier*.
- The *Employer* reserves the right to exclude the supply of some spares items included in the contract with the *Supplier*, should the *Employer* become aware that the National Supply Contract exists or is placed by the *Employer* with others in respect to those specific spares items.

3.1 SPECIFICATIONS OF THE SPARES

3.2 SPARES IDENTIFICATION

Appendix A lists all the spares to be procured under this works information. This list shall correspond to the provided hardcopy DCF's that will contain more information about required spares. Each spare is identifiable by means of component/part description, 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 spares to be provided to be the same as the original component, in all technical respects, as those utilised on the equipment it is intended for. This includes, but is not limited to, design (including dimensions and material specifications) and manufacturing (including manufacturing processes, standards and acceptance testing).

The *Supplier* shall be liable to replace a supplied spare that is found to be defective and/or wrong.

3.3 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:

- 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
- Any other additional information that has not been specified on the DCF / WI but necessary for storage, installation and utilisation of spares where applicable
- Supply preservation and storage procedures of goods, where applicable
- Any spares information which has been omitted which is deemed relevant for spares identification, storage, maintenance, etc.
- 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*

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3.4 SPARES QUANTITIES

The spares quantities to be provided as stipulated in APPENDIX A.

3.5 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 coming 3 years subsequent to tender being issued, the *Supplier* shall indicate this to the *Employer* and indicate viable alternatives thereof.

3.6 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.

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 Kriel Power Station
- Delivery note number

3.7 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

3.8 ACCEPTANCE OF SPARES

- No incorrect, damaged or faulty spares will be accepted.
- All the spares will be inspected before payment could be processed.

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- Data capturing forms information must be supplied and must meet an acceptable level.
- Where applicable; test certificates, material certificate, manuals, data sheet and signature shall be provided as required.
- The *Supplier* must provide references of the companies that they have supplied similar spares to, and include the respective supply order/contract value, the contact name, physical address and telephone number.

3.9 CONSTRAINTS ON HOW THE *SUPPLIER* PROVIDES THE GOODS

3.9.1 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*. In instances where design reviews are necessitated, the 4 weeks will be from the day of design freeze. 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*.

3.9.2 DOCUMENTATION CONTROL

The information for spares to be provided will either be in electronic format or hard copy. Other information provided with each spare to be either in electronic format 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.

3.9.3 QUALITY ASSURANCE REQUIREMENTS

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

3.9.4 PROGRAM CONSTRAINTS

The following shall be included in the *Supplier's* 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.

3.9.5 INSURANCE OF THE GOODS

The Insurance of spare components is the responsibility of the *Supplier* until delivery and acceptance by the *Employer*.

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3.10 SHEQ

The *Employer* reserves the right to request certification from the *Supplier* that proves compliance to relevant SHEQ legislations, standards and procedures. If, during procurement, the *Supplier* is found guilty of contravention of any SHEQ legislations, the *Employer* shall, at *Employer's* discretion, cancel the contract and the *Supplier* shall be liable to all the costs incurred therein.

4. Acceptance

This document has been seen and accepted by:

Name	Designation
Rofhiwa Nelwamondo	Acting Group Engineering Manager
Lungile Gumbi	C&I Maintenance Manager
Busisiwe Sikhosana	Procurement Manager
Nomatshawe Gantsho	Control and Instrumentation Engineering Manager
Mavis Mutheiwana	Materials Management Manager

5. Revisions

Date	Rev.	Compiler	Remarks
30 th March 2022	1	Mafu Maseko	New document

6. Development Team

Not Applicable

7. Acknowledgements

Not Applicable

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**DC Systems (Essential Supplies) Batteries,
Battery Chargers, UPSs, Diesel Generators and
DC Boards: All Units and Common Plant Non-
OEM Spares Procurement Works Information**

Unique Identifier: **240-165498746**

Revision: **1**

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Sub-System	Description	Stock No.	OEM/Open Market	Manufacturer or Supplier	Contract	Stock Level	Minimum Stock Holding	Max. Stock Holding
Diesel Generators (CATERPILLAR 400 kVA)								
Diesel Generators	Electronic Control Module	668218	OEM	Barloworld	No contract	0	2	3
Diesel Generators	EMCP 4.2 (CAT)Also to be programmed if applicable	668219	OEM	Barloworld	No contract	0	2	3
Diesel Generators	Finder relay 24DCV, 10A, 250VAC	668061	OEM	Barloworld	No contract	0	10	20
Diesel Generators	Battery Charger	667186	OEM	Barloworld	No contract	0	4	6
Diesel Generators	Radiator Coolant (100 litres)	0668060/0668059	OEM	Barloworld	No contract	0	10	20
Diesel Generators	CATERPILLAR FUEL FILTER: 1R-0749	669170	OEM	Barloworld	No contract	0	4	6
Diesel Generators	CATERPILLAR FUEL WATER SEPARATOR: 326-1641		OEM	Barloworld	No contract	0	4	6
Diesel Generators	CATERPILLAR OIL FILTER: 1R-1808	516859	OEM	Barloworld	No contract	0	4	6
Diesel Generators	CATERPILLAR AIR FILTER: 151-7737	668220	OEM	Barloworld	No contract	0	6	8

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8. Spares List

<u>CARTERPILLAR DIESEL GENERATOR SET 400kVA</u> <i>(BARLOWORLD POWER)</i>	STOCK NUMBERS
<i>Deapsea Controller 8620</i>	0668188
<i>Electronic Control Module(to be programmed by BARLO before delivery</i>	0668218
<i>EMCP 4.2 (CAT)Also to be programmed if applicable</i>	0668219
<i>Finder relay 24DCV, 10A, 250VAC</i>	0668061
<i>Battery Charger</i>	0667186
<i>Radiator Coolant (100 litres)</i>	0668060/0668059
<i>CARTEPILLAR FUEL FILTER: 1R-0749</i>	669170
<i>CARTERPILLAR FUEL WATER SEPARATOR: 326-1641</i>	
<i>CARTERPILLAR OIL FILTER: 1R-1808</i>	516859
<i>CARTERPILLAR AIR FILTER: 151- 7737</i>	668220

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