Eskom	Scope	Kriel Power Station

Title: **The supply of Control and Instrumentation Modules for a period of five (5) years**

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Compiled by	Supported by	Functional Responsibility	Authorized by
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1. Introduction

The Kriel Power Station C&I (Control and Instrumentation) field instrumentation/equipment are used for measurement and control of various systems across the power plant. These field instrumentation or equipment are connected to different supervisory control systems used at various control rooms for a safe and reliable monitoring and control of the plant.

The Control & Instrumentation field equipment are installed in the following areas at Kriel Power Station, namely:

- Boiler
- Turbine and
- Auxiliary Plant

The primary purpose of field instrumentation as installed in the different plant is to measure and monitor process conditions. Sensors are employed to detect process conditions, such as pressure, temperature, level, flow, humidity, strain, displacement and more. Measurements are further processed by card modules for the following purposes: process controlling, protection of plant and personnel.

Instrumentation components are prone to failure. Guaranteed timeous availability of Modules replacements during failures is important to improve productivity and reliability of electricity supply.

2. Supporting Clauses

2.1 Scope

This scope 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.

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 spare's procurement of Kriel Power Station Control and Instrumentation plant field equipment.

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.

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

2.2.2 Informative

[1] 559-949809726 Tender Technical Evaluation Strategy for Kriel Power Station Modules used on Control and Instrumentation system

2.3 Definitions

None

2.4 Abbreviations

Abbreviation	Explanation
C&I	Control and Instrumentation
DCS	Distributed Control System
OEM	Original Equipment Manufacturer
QC	Quality Control
SCADA	Supervisory Control and Data Acquisition

2.5 Process for Monitoring

Not Applicable

2.6 Related/Supporting Documents

None

3. SPECIFICATIONS OF THE SPARES

3.1 SPARES IDENTIFICATION

Appendix A lists all the spares to be procured under this scope. Each spare is identifiable by means of component/part description, part number. The spares to be provided should 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.

3.2 SPARES QUANTITIES

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

3.3 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.

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.

3.4 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.

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.

3.5 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.

4. Acceptance

This document has been seen and accepted by:

Name	Designation
Bongani Madonsela	C&I Maintenance Manager
Harry Mokabane	Control and Instrumentation Engineering Manager
Rofhiwa Nelwamondo	Engineering Manager

5. Revisions

Date	Rev.	Compiler	Remarks
May 2025	1	Kali Kekana	New Issue

6. Development Team

Kali Kekana

7. Acknowledgements

None

8. Appendix

Item No	Material No	Description of material	QTY Est
1	134314	MODULE: TYPE: FLAME MONITOR CONTROL; REFERENCE NO: GEN 18A51; CARD FOR USE ON BURNER MANAGEMENT PANELS ON FUEL OIL BURNERS	180
2	139373	MODULE: TYPE: MOTOR CONTROL; INPUT: 0-15 VDC; POWER SOURCE: 24 VDC; SUPPL P/N: 2008980; MODEL NO: RM41; REFERENCE NO: 2702244; FOR USE ON ERWIN SICK SMOKE DUST MONITOR	24
3	150373	MODULE: TYPE: SEQUENCE CONTROL; POWER SOURCE: 95/245 VAC 50/60 HZ; DRAWING NO: ASCO 214A332B REV 1; REFERENCE NO: 214A332B; NOTE, ITEM MUST BE ORIGINAL PACKED TO PREVENT ANY DAMAGES	60
4	184269	MODULE: TYPE: CONTROL MODULE; OUTPUT: 4-20 MA; POWER SOURCE: 12-35 VDC; SUPPL P/N: 6DR4004-8J; PS2; SUPPLIER NOTE, THE ITEM MUST BE ORIGINAL PROTECTIVE PACKED, SEALED AND CLEARLY MARKED	100
5	189733	MODULE: TYPE: ANALOG OUTPUT; INPUT: 24 VDC; OUTPUT: 4-20 MA; POWER SOURCE: 24 VDC; SUPPL P/N: 6ES7432-1HF00-OABO; 8AO; S7-400; SM 432 AL; N ECCN N, OPTIC, ISOLATED, 13 BIT RESOLUTION, U/I	100
6	234007	MODULE: TYPE: DIGITAL INPUT; SUPPL P/N: SIM326 OI; 6ES7 326-1BK01-0AB0	12
7	236035	MODULE: TYPE: OVERSPEED PROTECTION; SUPPL P/N: ESN-ODC-ST-VIB-FT3000; SYSTEM 3 CHANNEL, FOR UNIT REFURBISHMENT	12
8	236285	MODULE: TYPE: PROTECTION CARD; INPUT: -20 TO 0 V; OUTPUT: 0-10 VDC; POWER SOURCE: 24 V DC; SUPPL P/N: 200-510-SSS-1HH; VIBCO-METER MPC4, USED FOR UNIT REFURBISHMENT	12
9	238826	MODULE: POWER SOURCE: 24 VDC 1 A; SUPPL P/N: 6DL3100-8AC; TYPE ADD FEM, FOR USE ON GAS 1 PLANT	12
10	239643	MODULE: TYPE: DIGITAL OUTPUT; SUPPL P/N: 6ES7322-1BH01-0AA0; 16 OUTPUTS	12
11	256691	MODULE: TYPE: SIMATIC S7; MANUF P/N: 6ES7417-4HT14-0AB0	12

12	597474	MODULE: TYPE: ANALOG OUTPUT; POWER SOURCE: 24 VDC; OEM P/N: 6ES7232-4HD32-OXBO; SIMATIC S7-1200; SM 1232; 4 AO;+/- 10 V; 14 BIT RESOLUTION OR 0-20 MA/4-20 MA 13 BIT RESOLUTION	12
13	610278	MODULE: TYPE: INTERFACE; APPLICATION: GENERATOR PROTECTION; COMMERCIAL SIZE: SQ 270 X THK 30 MM; SUPPL P/N: 6DP1616-8BA	12
14	614066	MODULE: TYPE: CPU; MANUF P/N: 6ES7513-1AL00-0AB0; SIMATIC S7-1500 CPU 1513-1PN; CENTRAL PROCESSING UNIT WITH WORKING MEMORY 300KB FOR PROGRAM AND 1.5MB FOR DATA; 1 INTERFACE; PROFINET IRT WITH 2 PORT SWITCH; 40 NS BIT PERFORMANCE; SIMATIC MEMORY CARD NECESSARY	12
15	620682	MODULE, POWER SUPPLY: TYPE: SITOP MODULAR; INPUT: 230 VAC; OUTPUT: 24 V 20 A; APPLICATION: AUX BOILER CONTROL; SPECIFICATION: PCB PLUS 20; HARDWARE: SIMATIC S7-300PLC; SUPPL P/N: 6EP1336-3BA00-8AA0; STORAGE REQUIREMENTS AS PER 240-56355731; TEMPERATURE: 20-24 DEG C	12
16	631333	MODULE, COMMUNICATION: TYPE: SERIAL INTERFACE; APPLICATION: ENHANCED SYSTEM CS3000; SUPPL P/N: 6DU1161-4E500-0BS1; 1X LAN RJ45; 4X SERIAL RS232; USABLE AS SINGLE SYSTEM; IN REDUNDANT CONFIGURATION; APPROVED FOR SPPA-T3000 REC4.2/5/6/7	12
17	632912	MODULE: TYPE: DIGITAL O/P, SM 322; APPLICATION: DHP SIMATIC S7-300; MANUF P/N: 6ES7322-1HH01-0AA0; REFERENCE NO: C-B6TR0249; OPTICALLY ISOLATED 16DO; RELAY CONTACTS, 1 X 20 PIN; AC 120/230V; SIMATIC	12
18	637529	MODULE: TYPE: PLC; INPUT: 240 VAC/DC; OUTPUT: 5 A; POWER SOURCE: 240 VAC; APPLICATION: MASTER DRIVES; DIMENSIONS: WD 35.5 X LG 90 X HT 58 MM	12
19	651926	MODULE: TYPE: SIMATIC S7 CP443-1; INPUT: 4-20 MA; POWER SOURCE: 24 VDC; APPLICATION: EQUIPMENT ROOM; SUPPL P/N: 6GK7443-1EX11-OXEO	12
20	651932	MODULE: TYPE: PLC; INPUT: 4-20 MA; POWER SOURCE: 24 VDC; SUPPL P/N: 6ES7505-0KA00-OABO; REFERENCE NO: PS25W24VDC	12
21	658075	MODULE: TYPE: TRIP CONTROL; INPUT: 20-50 V 10-15 MA; POWER SOURCE: 18-33 VDC; APPLICATION: TURBINE PROTECTION; SPECIFICATION: IEC61508-2-3; SUPPL P/N: 3772611855; JAQUET MODULE CARD FTBU-3034	12
22	659565	MODULE: TYPE: DIGITAL OUTPUT; INPUT: 24 VDC; OUTPUT: 4-20 MA; APPLICATION: DRY DUST PLANT; SPECIFICATION: PLC S7-1500-DQ; SUPPL P/N: 6ES7522-1BL10-0AA0	12

23	659569	MODULE: TYPE: CPU; INPUT: 24 VDC; OUTPUT: 4-20 MA; APPLICATION: DRY DUST PLANT; SPECIFICATION: PLC S7-1200; SUPPL P/N: 6ES7222-1HF32-0XB0	12
24	659570	MODULE: TYPE: DISPLAY; INPUT: 24 VDC; OUTPUT: 4-20 MA; APPLICATION: DRY DUST PLANT; SPECIFICATION: PLC S7-1500; SUPPL P/N: 6ES7591-1AA01-0AA0	12
25	659731	MODULE: TYPE: FRONT CONNECTOR NORMAL; INPUT: 4-20 MA; POWER SOURCE: 24 VDC; SUPPL P/N: 6ES7972-0BB52-0XA0-NORMAL	12
26	659732	MODULE: TYPE: FRONT CONNECTOR THIN; INPUT: 4-20 MA; POWER SOURCE: 24 VDC; SUPPL P/N: 6ES7972-0BB52-0XA0-THIN	12
27	662318	MODULE, POWER SUPPLY: TYPE: SIMATIC S7; INPUT: 4-20 MA; OUTPUT: 24V 10A; APPLICATION: EQUIPMENT ROOM; SPECIFICATION: 405/10A; HARDWARE: S7-400H; SUPPL P/N: 405-0KA02-0AA0	12
28	662321	MODULE, POWER SUPPLY: TYPE: SITOP POWER-10; INPUT: 120/280 VAC; OUTPUT: 24VDC 10A; APPLICATION: EQUIPMENT ROOM; SUPPL P/N: 6EP1336-3BA00/6EP1334-2BA20; SPECIAL LINE SPECIALIZED LOAD	12
29	662322	MODULE: TYPE: PLC/CPU; INPUT: 24 VDC; OUTPUT: 4-20 MA; POWER SOURCE: 24 VDC; APPLICATION: DRY DUST PLANT; SPECIFICATION: S7-1500; SUPPL P/N: 6ES7513-1AL04-0AB0-PLCS7-1500	12
30	662324	MODULE, COMMUNICATION: TYPE: JAQUET MODULE CARD; APPLICATION: TURBINE PROJECTION; SPECIFICATION: IEC 61508-2-3; SUPPL P/N: 830K-36366	12
31	662333	MODULE: TYPE: JAQUET MODULE CARD FTFU-3024E03; INPUT: 100 KOHM; 24 V; OUTPUT: 0-1-V 30 MA; POWER SOURCE: 18-33 VDC; APPLICATION: TURBINE PROTECTION FT3000; SPECIFICATION: IEC 61508-2-3; SUPPL P/N: 3772-05855; AC UMAX: 30 V; IMAX: 2 A; PMAX: 60 VA; DC UMAX: 60 V; IMA: 2 A; PMAX: 60 W	12
32	662334	MODULE: TYPE: PAULLY MODULE CARD E656.1; APPLICATION: BOILER HP BYPASS VALVES; SUPPL P/N: 8538-9091	12
33	675822	MODULE: TYPE: CPU; INPUT: 2.5-10 V 4-20 MA; POWER SOURCE: 24 VDC; OEM P/N: 6ES7214-1HE30-OXBO, OEM: SIEMENS; CPU1214C DC/DC/RELAY, OEM: SIEMENS; SIMATIC S7-1200; CPU 1214C; DC/DC/ RELAY	12
34	675823	MODULE: TYPE: INTERFACE; INPUT: 24 VDC; OEM P/N: 6ES7155-6AR00-OANO, OEM: SIEMENS; IM PNBA 155-6; SIMATIC ET200SP; PROJECT INTERFACE IM155-6PN; BASIC; MAX 12 1/0; 2X INTERGRATED RJ4S SOCKETS	12

35	675829	MODULE: TYPE: SIMATIC ANALOG; INPUT: 24 VDC; OEM P/N: 6ES7134-6GF00-0AA1, OEM: SIEMENS; AI 8X1; 2-/14; ET200SP; INPUT MODULE; 2 WIRES AND 4 WIRES TRANDUCER	12
36	236328	POWER SUPPLY: INPUT: 230 VAC; OUTPUT VOLTAGE: 24 VDC; OUTPUT CURRENT: 35 MA; TYPE: AC/DC; SUPPL P/N: RPS 6U 200-582-500-013; REDUNDANT, RPS 6U	12
37	236327	MODULE: TYPE: IP/OP; INPUT: 50-500 MV; OUTPUT: 0-10 VDC; POWER SOURCE: 12 VDC; SUPPL P/N: 200-560-100-14H; TYPE IOC4T	12
38	610278	MODULE: TYPE: INTERFACE; APPLICATION: GENERATOR PROTECTION; COMMERCIAL SIZE: SQ 270 X THK 30 MM; SUPPL P/N: 6DP1616-8BA	50
39	255912	MODULE: TYPE: ET 200; SUPPL P/N:6ES7153-2AR03-0XA0; M BUNDLE; SIMATIC DP; RED BUNDLE CONSISTING OF TWO IM 153-2HF (-2BA02) AND ONE 10-OXAD BUSMODULE IM/ IM BES 719 5-7HD	60
40	611877	MODULE: TYPE: CONTROLLER; POWER SOURCE: 24 VDC; MANUF P/N: 6DD1607- 0AA2; SIMATIC S7-400; FM458-1; OP APPLICATION MODULE FOR SIMATIC	60
41	238826	MODULE: TYPE: CONTROL; INPUT: (15) 24 VDC 1 A; OUTPUT:(16) 24 VDC 0.5 A; POWER SOURCE: 24 VDC 1 A; APPLICATION: S7-PLC; SUPPL P/N: 6DL31008AC; TYPE ADD F AND M, ADD FEM	40
42	234439	MODULE, POWER SUPPLY: TYPE: DC AUXILIARY; INPUT: 20 A; OUTPUT: 24 V;SUPPL P/N: 6EP1336-3BA00	50
43	614056	POWER SUPPLY: INPUT: 120-230 VAC;OUTPUT VOLTAGE: 24 VDC; OUTPUT CURRENT: 8 A; MANUF P/N: 6EP1333-4BA00; SIMATIC PM 1507 24/8A STABILIZED POWER SUPPLY FOR S7-1500; INPUT: 120/130VAC; OUTPUT: 24V/8A DC; LOAD CURRENT SUPPLY PM 190W.	45
44	662321	MODULE, POWER SSUPPLY: TYPE: SITOP POWER-10; INPUT:120/280 VAC; OUTPUT:24VDC 10A; APPLICATION: EQUIPMENT ROOM; SUPPL P/N: 6EP1334-2BA20;SPECIAL LINE SPECIALIZED LOAD	50
45	245515	PROCESSOR: TYPE: CPU; SUPPL P/N: 6ES7417-4HT14-0AB0;6ES7417-4HT140AB0; RGL-N	75
46	651926	MODULE: TYPE: SIMATIC S7 CP443-1; INPUT: 4-20 MA;POWER SOURCE: 24 VDC; APPLICATION: EQUIPMENT ROOM;SUPPL P/N: 6GK7443- 1EX11-OXEO	50
47	714304	SWITCH, NETWORK: TYPE: SCALANCE X204-2; PORT TYPE: 4X 10/100MBIT/S RJ45, 2X 100MBIT/S MULTIMODE BFOC; TEMPERATURE RANGE: -40 TO+ 60 DEG C; POTENTIAL: 32 (MAX) V; PORT QUANTITY: 4; CURRENT: 0.265 A; OEM P/N: 6KG5204- 2BB10-2AA3, ; MODEL NUMBER: X204-2	45

48	61501	MODULE: TYPE: PLC I/O; INPUT: 24 VDC; OUTPUT: 24 VDC; POWER SOURCE: 24 VDC; DIMENSIONS: WD 40 X HT 125 X DP 124 MM; REFERENCE NO: SCALANCE X101-1; SUPPL P/N: 6GK5101- 1BB00-2AA3; 35 MM DIN RAIL; SCALANCE X 101-1; MEDIA CONVERTER UNMANAGED X 10/100MBIT/S; RJ45 PORT; 1 X 100MBIT/S MULTIMODE BFOC; LED DIAGNOSIS;FAULT SIGNAL; CONTACT WITH SET BUTTON; REDUNDANT POWER SUPPLY; PROFINET COMPLIANT SLEEVE	50
49	238787	MODULE, COMMUNICATION: TYPE: PROCESSOR; SUPPL P/N: 6ES7441- 1AA04-0AE0; TYPE SIMATIC S7-400, CP 441-1, FOR POINT TO POINT CONNECTIONS 1 CHANNEL INCL. CONFIG. PACKAGE ON CD	75
50	148907	RACK, EQUIPMENT: TYPE: EU 902 FOR FUM-B; DIMENSIONS: WD248.9 X HT237 MM; APPLICATION: DCS CUBICLE; OEM P/N:6DP9902-8BA00, ; SUBRACK (19 SLOTS)	10
51	578539	COMPUTER, SERVER: UNIT TYPE: FTSERVER 4500; PROCESSOR CHIP TYPE: INTEL PENTIUM 4; MEMORY: 4 X 4GB DDR3-FBDIM; HARD DRIVE: 2 X 146 GB; NETWORK CARD: ETHERNET PAIR 10/100/1000; DRIVE: DVD-RW PAIR; POWER SUPPLY: 230 VAC; PROCESSOR CLOCK SPEED: 2 X 2.0 GHZ; NETWORK: ETHERNET; DATA STORAGE TYPE: INTERNAL; MANUFP/N: 6DU2121-1AX00- 0EX0	6