

	<b>Scope</b>	<b>Kriel Power Station</b>
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**Title: The supply of Control and Instrumentation Thermo-sensors for a period of five (5) years**

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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 Thermo-sensors 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

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## **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**

<b>Abbreviation</b>	<b>Explanation</b>
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

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### **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 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.

#### **3.2 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.

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#### **4. Acceptance**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>

#### **5. Revisions**

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

#### **6. Development Team**

Kali Kekana

#### **7. Acknowledgements**

None

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**8. Appendix**

Item no	Material No	Full Description	QTY Est
1.	153414	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 300 MM; TEMPERATURE RANGE: 0-1000 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; SPECIFICATION: SABS 1488-1989 PART 2; REFERENCE NO: K; COMPLETE WITH SMALL HEAD; MINERAL INSULATED; MANUFACTURED ACCORDING TO SPECIFICATIONS	100
2.	153904	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 460 MM; TEMPERATURE RANGE: 0-1100 DEG C; JUNCTION: SIMPLEX, UNGROUNDED; HEAD: YES; WITH SMALL DIE CAST AL HEAD	30
3.	153905	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 950 MM; TEMPERATURE RANGE: 0-1000 DEG C; SHEATH MATERIAL: STAINLESS STEEL; JUNCTION: DUPLEX, UNGROUNDED; HEAD: YES; WIRES: 4; DUAL; WITH SMALL DIE CAST AL HEAD; WIRE SIZE 0.5MM	60
4.	154261	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 3 MM; DESIGN LENGTH: 3.77 M; TEMPERATURE RANGE: 0-1100 DEG C; SHEATH MATERIAL: STAINLESS STEEL; JUNCTION: DUAL; ELECTRICAL CONNECTION: TERMINAL; INSERT; NICR-NI; WITH SPRING LOADED BLOCK; FOR S03 LANCE THERMOCOUPLES; WIRE SIZE 0.5MM	80
5.	155568	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 1.83 M; TEMPERATURE RANGE: 0-1100 DEG C; SHEATH MATERIAL: STAINLESS STEEL; REFERENCE NO: T14R 1830MM DK8C	60
6.	155571	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 8 MM; DESIGN LENGTH: 2 M; TEMPERATURE RANGE: 0-1000 DEG C; SHEATH MATERIAL: STAINLESS STEEL; JUNCTION: SINGLE; ELECTRICAL CONNECTION: TERMINAL; REFERENCE NO: T14K 2M FK9C; WIRE SIZE 1MM	60
7.	155665	THERMOWELL: PROCESS CONNECTION: 1/2 IN-BSP; IMMERSION LENGTH: 149 MM; MATERIAL: SS GR 316; BORE: 10 MM; LENGTH OF POCKET 149MM FROM BELOW THE NUT; OUTSIDE DIAMETER 18MM; INSIDE THREAD 1/2 IN BSP X 30MM LONG; OUTSIDE THREAD BSP X 25MM LONG; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	20
8.	155666	THERMOWELL: IMMERSION LENGTH: 140 MM; MATERIAL: SS GR 316; BORE: 10 MM; STEM LENGTH: 175 MM; SHANK STYLE: THD STRAIGHT; INSTRUMENT CONNECTION: BSP 1/2 IN; LENGTH OF POCKET FROM BELOW THE NUT; OUTSIDE DIAMETER	20

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		18MM; INSIDE THREAD 1/2 IN BSP X 30MM LONG; OUTSIDE THREAD 1/2 IN BSP X 25MM LONG; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	
9.	155667	THERMOWELL: PROCESS CONNECTION: 1/2 IN-BSP; IMMERSION LENGTH: 175 MM; MATERIAL: SS GR 316; BORE: 10 MM; STEM LENGTH: 209 MM; SHANK STYLE: THD STRAIGHT; LENGTH OF POCKET FROM BELOW THE NUT; OUTSIDE DIAMETER 18MM; INSIDE THREAD 30MM LONG; OUTSIDE THREAD 25MM LONG; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	40
10.	155674	THERMOWELL: TYPE: THERMOCOUPLE POCKET; POCKET; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	30
11.	155678	THERMOWELL: PROCESS CONNECTION: 1/2 IN-BSP; IMMERSION LENGTH: 100 MM; MATERIAL: SS GR 316; BORE: 8 MM; STEM LENGTH: 107 MM; SHANK STYLE: THD; INSIDE THREAD 30MM; OUTSIDE THREAD 25MM; LENGTH OF POCKET FROM BELOW THE NUT 100MM; OUTSIDE DIAMETER 13MM; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	60
12.	155683	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 850 MM; TEMPERATURE RANGE: 0-1000 DEG C; SHEATH MATERIAL: STAINLESS STEEL; PROCESS CONNECTION: 1/4 IN-NPT; JUNCTION: SINGLE; TURBINE; WIRE SIZE 0.5MM	50
13.	155685	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 4.5 MM; DESIGN LENGTH: 6 M; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; TURBINE; MINERAL INSULATED; HEAT SHRINK SEAL; 50 MM LEADS	80
14.	155700	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 4.5 MM; DESIGN LENGTH: 4 M; TEMPERATURE RANGE: 0-1100 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: SIMPLEX, UNGROUNDED; WIRES: 2; NOTE, ITEM MUST BE PROTECTIVE PACKED; WIRE SIZE 0.5MM; LEADS 50	50
15.	174552	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 4.5 MM; DESIGN LENGTH: 6 M; SHEATH MATERIAL: SS GR 316; JUNCTION: SIMPLEX, UNGROUNDED; WITH 50 MM TAIL	50
16.	174553	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 4.5 MM; DESIGN LENGTH: 3 M; SHEATH MATERIAL: SS GR 316; JUNCTION: SIMPLEX, UNGROUNDED; WITH 50 MM TAIL	200
17.	211971	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 3 MM; DESIGN LENGTH: 300 MM; TEMPERATURE RANGE: 18-1200 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; SPRING LOADED BLOCK; QUIK REPOSE; SUPPLIER NOTE, THE ITEM SHALL BE PROTECTIVE PACKED AND CLEARLY MARKED	150

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18.	211972	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 3 MM; DESIGN LENGTH: 375 MM; TEMPERATURE RANGE: 18-1200 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; SPRING LOADED BLOCK; QUICK RESPONSE; SUPPLIER NOTE, THE ITEM SHALL BE PROTECTIVE PACKED AND CLEARLY MARKED	600
19.	565469	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 375 MM; TEMPERATURE RANGE: 0-600 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; HEAD:SPRING LOADED	150
20.	565472	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 300 MM; TEMPERATURE RANGE: 0-600 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; HEAD:KS SMALL	210
21.	565473	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 740 MM; TEMPERATURE RANGE: 0-600 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1	40
22.	565478	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 350 MM; TEMPERATURE RANGE: 0-300 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; KS SMALL HEAD; PROCESS CONNECTION: ADJUSTABLE	120
23.	565480	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 3 MM; DESIGN LENGTH: 375 MM; TEMPERATURE RANGE: 0-600 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; HEAD: SPRING LOADED	300
24.	565481	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 220 MM; TEMPERATURE RANGE: 0-300 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; KS SMALL HEAD	60
25.	565485	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 130 MM; TEMPERATURE RANGE: 0-600 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; HEAD: KS SMALL	40
26.	565486	THERMOCOUPLE: TYPE: K; SHEATH DIAMETER: 6 MM; DESIGN LENGTH: 170 MM; TEMPERATURE RANGE: 0-600 DEG C; SHEATH MATERIAL: SS GR 316; JUNCTION: UNGROUNDED; HEAD: YES; WIRES: 2; SPECIFICATION: NI-CR NI-A; ACCURACY: CL 1; NUMBER OF JUNCTIONS: 1; HEAD: KS SMALL	40

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27.	685040	POCKET: TYPE: THERMOCOUPLE; SIZE: 650 MM; MATERIAL: STAINLESS STEEL; CERAMIC COATED 1/2, BSP; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	400
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