

	<b>Scope of Work</b>	<b>Kusile Power Station</b>
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### **CONTROLLED DISCLOSURE**

## **1. Introduction**

Kusile Power Station management intends to establish a partnership with a suitably qualified; experienced and well-established *Contractor* for C&I Cable pulling, installation, commissioning including Fibre Optic splicing and Outage scope of work for **“as and when required” basis for the period of 60 Months** in operating units (Kusile Power Station unit 1 to 6) and associated BOP.

This document describes the details of the requirements, standards, scope of work and the terms and conditions of the maintenance partnership.

## **2. Supporting Clauses**

### **2.1 Scope**

#### **2.1.1 Purpose**

The purpose of this document is to define the scope of work specified for the Cable pulling, installation, commissioning including Fibre Optic splicing and Outage scope for Kusile Power Station.

The specified C&I maintenance must support the requirement of the station to perform at maximum output.

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

#### **2.1.2 Applicability**

This document is applicable to Kusile Power Station Generation.

#### **2.1.3 Effective date**

This document is effective from the date of authorisation (last signature) until its succeeding document has been authorised.

### **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] GGR 0992: Plant Safety Regulations
- [2] 240-56227443: Requirements for Control and Power cable for Power Stations Standard
- [3] 240-56355754: Field Equipment Installation Standard
- [4] 240-56355815: Control & Instrumentation Field Enclosures and Cable Termination Standard

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- [5] 240-132042241: Power Plant Controls & Instrumentation; Control Systems; Distributed Control Systems (DCS); Part 1: General Standard

## **2.2.2 Informative**

- [1] ISO 9001: Quality Management Systems
- [2] ISO 14001: Environmental management System
- [3] Act No 102 of 1980: National Key Points Act, 1980
- [4] Act No 85 of 1993: Occupational Health and Safety Act & Regulations, 1993.
- [5] KUS-20230331- Kusile Power Station Quality Control- Work Instruction

## **2.3 Definitions**

**2.3.1** Availability: Period when a system is operating satisfactory when used under specified conditions.

**2.3.2** Contractor: Service provider contracted to provide a specific service to Eskom, Kusile Power Station.

**2.3.3** Employer: Eskom, or Eskom Kusile Power Station or representative

## **2.4 Abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
<b>AP:</b>	Appointed Person
<b>C&amp;I:</b>	Control & Instrumentation
<b>CM:</b>	Corrective Maintenance
<b>FFFR:</b>	Fuel Fossil Firing Regulations
<b>NEC:</b>	New Engineering Contract
<b>OEM:</b>	Original Equipment Manufacturer
<b>OHS Act:</b>	Occupational Health and Safety Act
<b>PCLF:</b>	Planned Capability Loss Factor
<b>PPE:</b>	Personal Protective Equipment
<b>PM:</b>	Plant Maintenance
<b>PSR:</b>	Plant Safety Regulations

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Abbreviation	Explanation
<b>PTW:</b>	Permit to Work
<b>QC:</b>	Quality Control
<b>QCP:</b>	Quality Control Plan
<b>QMP:</b>	Quality Management Programme
<b>RP:</b>	Responsible Person
<b>SP:</b>	Skilled Person
<b>SAP:</b>	Systems, Applications, Products (Plant Maintenance, Procurement, Finance and Materials Management) integrated maintenance management system.
<b>SHE:</b>	Safety, Health, Environment
<b>SOW:</b>	Scope of Work
<b>UCF:</b>	Unit Capability Factor
<b>UCLF:</b>	Unplanned Capability Loss Factor
<b>URS:</b>	User Requirement Specification

## **2.5 Roles and Responsibilities**

All parties concerned in this SOW “shall act as stated in this contract and in a spirit of mutual trust and cooperation”

### **2.5.1 Employer**

- a) The *Employer* shall provide induction and ensure compliance before commencement of work.
- b) The *Employer* shall provide a conducive workplace for the *Contractor* during the period of work.
- c) The *Employer* shall provide required spares needed by the *contractor* which are not listed on the spares list (Bill of material).
- d) The *Employer* shall always determine the cable way and ensure provision of scaffolding where required.
- e) Provide sectional Managing Supervisors for all *Contractor* employees to supervise and monitor adherence to SOW.
- f) The *Employer* shall provide training for PSR and FFFR.

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### **2.5.2 Contractor**

- a) All *Contractor* employees shall comply with Eskom's policies and site regulations, adherence to Eskom's Life Saving Rules.
- b) The successful *Contractor* shall utilise/provide skilled and suitably qualified staff (in line with Eskom Job specifications) with current experience in the Eskom power plants.
- c) All staff brought onto site in connection with this SOW should be able to fluently speak, understand and write in English.
- d) Proof of qualification is to be supplied on request by the Employer.
- e) The *Contractor* ensures that all staff being brought to Kusile Power Station site has a valid fitness certificate based on the specified plant man-job specification.
- f) Provide daily supervision of all related plant through trained and competent personnel to ensure that inspections & work activities are conducted daily.
- g) The *Contractor* must also provide knowledge on other plant falling within his field of expertise.
- h) The *Contractor* must ensure daily housekeeping, adherence to safety requirements and that any deviation is reported to the Employer on a required basis.
- i) Ensure logging and marking of all *Contractor* assets used during the contract period
- j) The *Contractor* shall be held responsible or held liable for any defects arising from poor workmanship performed by their staff.

### **2.6 Process for Monitoring**

This specification shall be reviewed annually from date of initial authorisation or when necessary to conduct assessment on the following:

#### **KPI's details as follows:**

- 1- Floor, not acceptable performance
- 2- Kick, meeting some expectations
- 3- Target, meeting expectations
- 4- Stretch, exceeding expectation
- 5- Ceiling, exceptional performance

Service provider shall maintain a quarterly target of 3, failure to which Employer to issue early warning to the service provider for the service provider to mitigate. Subsequent to the early warning being issued and the target is still at level 2 or less the Employer shall send the contract for review and termination process to resume.

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**Key Performance Indicators will be evaluated on a quarterly basis.**

	Non-performance as per SOW	Pulling cables without preventing incident re-occurrence of cable burn or cable damage	Removed Old Cables. Install new cable and terminated as per the provided loop drawing. In all concerned control circuits	Work completed on time. All Loops Tested. Housekeeping Maintained. PTW cleared.	Identified and utilised a safe route. Preventing excess cabling & possible cable burn and/or damage.
<b>Floor, Not Acceptable Performance</b>	<b>1</b>				
<b>Kick, Meeting Some Expectations</b>		<b>2</b>			
<b>Target, Meeting Expectations</b>			<b>3</b>		
<b>Stretch, Exceeding Expectation</b>				<b>4</b>	
<b>Ceiling, Exceptional Performance</b>					<b>5</b>

## **2.7 Related/Supporting Documents**

- a) A daily attendance registers for all *Contractor* employees to be signed by all employees and maintained in a file.
- b) All drawings or documents developed during the contract period remain the property of Eskom
- c) *Contractor* to provide a daily site service sheet to log daily activities.

## **3. Document Content**

### **3.1 Works information**

The services of this SOW are C&I cable pulling, installation, commissioning including Fibre Optic splicing and Outage scope “as and when required” basis for the period of 60 Months at Kusile Power Station in accordance with Eskom C&I Maintenance Standards.

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The cables associated with C&I are marshalling single-core cable, field multi-core control cables, fibre optic cables, communication, or network cable. It shall be required that a suitable service provider is familiar with all types of these cables installation and termination suitable for various plant conditions.

The works shall be but not limited to removing old cables and racks, pulling new cable and racks, termination, marking, splicing, crimping.

### **3.1.1 Installation and Commissioning of C&I Cables**

- a) The works is the installation and commissioning of C&I cables including fibre optic splicing and Outage scope on at all plants that are related to Kusile Power Station Gx-C&I Maintenance and its boundaries.
- b) Install cable racks, new cabling, test and repair, complete earthing and perform termination as and when required.
- c) All cable connections at junction boxes, field Instruments and marshalling cabinets shall be made using tension clamp terminals and Cables to be terminated in a crimped bootlace ferrule i.e., preventing numbers from slipping off the cable ends.
- d) When cables are replaced or new cables installed in any DCS Cubicle, the damaged entry hole shall be fire sealed with Micon FLAMSAYF 325 Fire Retardant Mastic from cable entry and inside cubicle.
- e) Labelling of cables: Cable number tags to identify cable as per requirements and colour coding.
- f) On completion of the work the relevant equipment shall be properly re-commissioned prior to the clearance of the Permit to Work.

### **3.2 Work Preparation and Work Management**

- a) Adhere to work management system SAP PM.
- b) Adhere to Eskom plant safety regulations (PSR).
- c) Risk assessment shall be done and documented/filed for each task.
- d) Job observation shall be done on agreed frequencies.
- e) All documentation required to complete work shall be referenced and filed for future reference (Test results, reports, drawings etc.) All documentation to be completed and filed (test sheets, test results, technical reports, drawings etc.)
- f) Ensure compliance to PSR before any work commence.
- g) Attend various departmental meetings. (Safety, Maintenance, Commissioning etc.)
- h) The *Contractor* must identify all potential hazardous tasks in the Works Information and prepare safe working procedures to issue to his staff before any work shall start.
- i) The *Contractor* must provide proof that toolbox talks have been held.
- j) Perform toolbox talks, discuss, and fill risk assessment, ensure you're in possession of the correct drawings, correct check sheet, correct work procedure, correct QCP's and you're at the correct plant.

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### **3.3 Contractor Provisions**

- a) The *Contractor* shall provide necessary spares as and when required
- b) The *Contractor* shall provide manual mobile lifting equipment where necessary
- c) The *Contractor* shall provide stepladders and all relevant cabling tools
- d) The *Contractor* shall continuously provide all relevant PPE (Arc flash, Safety Harness, etc)
- e) The *Contractor* shall provide as and when required a fire-retardant whole sealant in cubicles
- f) The *Contractor* shall provide calibrated measuring and test equipment
- g) All *contractor* equipment for the scope of work shall remain ESKOM property at the end of the contract

### **3.4 Management and Reporting**

- a) The *Contractor* shall be responsible or held liable for any defects arising from maintenance/operational faults within twenty-four hours (24 hrs) after an intervention, provided that the equipment has been placed into service.
- b) The type of reports, level of detail and frequency of reporting shall be mutually agreed by the Employer and the *Contractor*. These may change from time to time on request by the Employer.
- c) The *Contractor* to be represented at any ad-hoc meetings that may arise to address any production or safety related matters.
- d) Liaison meetings shall be held between the Employer's representative or his/her delegate and the *Contractor's* representative or his/her delegate monthly or when necessary to discuss any technical details, or concerns.
- e) All old cables removed belong to Eskom and shall not be removed off-site by the *Contractor*.

### **3.5 Quality and Documentation Control**

- a) The *Contractor* shall ensure that all measuring and test equipment provided is calibrated at all times & proof thereof must be readily available.
- b) The *Contractor* shall adhere to all 'Quality References' and 'Standards' applicable to this SOW.
- c) The *Contractor* shall utilise the Employer's quality documentation management system and processes.
- d) The *Contractor* shall comply with QM58, 240-105658000 Supplier Quality Management: Specification Rev 2.
  - Refer to o Appendix A for Category 2, 240 – 12248652 Supplier Quality Management List of Tender Returnable Documents Rev 2Acceptance
  - QCP document standard. KUS-20230331- Kusile Power Station Quality Control- Work Instruction

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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**

#### **7. Acknowledgements**

N/A

### **Appendix A**

#### **A.1 Bill of Materials**

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Quantity	Description
100 each	Hellermann Tyton Arrowtag cable tie cable markers, black,151-41210 AT2-PA66-BK
200 each	100mm cable ties (100 per packet)
200 each	150mm cable ties (100 per packet)
200 each	200mm cable ties (100 per packet)
200 each	250mm cable ties (100 per packet)
200 each	300mm cable ties (100 per packet)
100 each	0.5mm white Bootlace ferrules (100 per packet)
100 each	0.75mm blue Bootlace ferrules (100 per packet)
100 each	1mm red Bootlace ferrules (100 per packet)
100 each	Terminal blocks / strips DIN Rail mount (different sizes) OEM weidmuller
100 each	Flexible conduit with connectors and glands / spring tubes (different sizes)
100 each	Steel conduit pipes, with mounting brackets (different sizes)
100 each	Black shrinks sleeving (different sizes: 4.8/2.4mm (100 metre)
150 each	Cable trays with mounting brackets (different sizes: 3m (width-50mm, 100mm,200m)
150 each	Cable trucking with covers and mounting brackets / wire ducts (different sizes) OEM Phoenix contact 50mm,100mm,150mm,200mm
150 each	Wire mesh cable trays with mounting brackets (different sizes)
100 each	30m Fishtape steel
5000 M	H07 RN-F Multicore flexible rubber
5000 M	Spring tubes heat resistance
1000 each	Cable glands
1000 M	Ethernet cable
5000 M	UVM08ACM blue stripe
5000 M	UVG08 ACM with blue stripe -16 cores
5000 M	UVG04 ACM with blue stripes – 8 cores
5000 M	UVG02 ACM with blue stripe – 4 cores
1000 M	Compensating wire
500 each	Fibre patch with plugs
500 each	Modbus/profibus plugs
1000 M	20mm PVC coated flexible conduit
1000 M	25mm PVC coated flexible conduit
100 each	20mm liquid tight connector M25 thread
100 each	25mm liquid tight connector M25 thread
50 each	24 core single mode fiber optic cable 200m
50 each	24 core Multi mode fiber optic cable 200m
25 each	12F-50/125-CST-DC (12 Fibre Multi Mode) 1398.56m
30 each	24F-SM-CST-DC (24 Fibre Single Mode) 303.55m
30 each	24F-SM-CST-DC (24 Fibre Multi Mode) 355.51m
30 each	Optic Patch Cable 138.83m

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Commissioning Scope of Work**

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15 each	12F-50/125-CST-DC (12 Fibre Multi Mode) 473m
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