	<b>Works Information</b>	<b>Kusile Power Station</b>
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Compiled by	Supported by	Functional Responsibility	Authorized by
			
<b>HB Marobane</b> <b>C&amp;I Engineer</b>	<b>M van der Bank</b> <b>C&amp;I Engineering Manager</b>	<b>T Mbulawa</b> <b>Auxiliary Engineering Manager</b>	pp <b>G Olukune</b> <b>Engineering Group Manager</b>
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## **1. Introduction**

Kusile Power Station currently processes coal handling and ash handling at the stockyards manually through a fleet of earth moving equipment. Due to the large fleet size, it becomes imperative to track the fuelling cycles and consumption of each equipment to optimise the diesel logistics and track equipment that consume more than expected fuel. Currently the Kusile Power Station operation's fuel management process is a manual with intake captured by hand by means of tank dip stick recording. Dispensing is captured manually on a logbook the site by diesel dispensing attendants. All fuel transactions are collected on a daily basis by an administrator and the information is passed onto a data capturer who consolidates all fuel transactions for the organisation.

## **2. Supporting Clauses**

### **2.1 Scope**

#### **2.1.1 Purpose**

The objective of the works information is to provide a scope of work for the scalable fuel management automation solution with technical support and active dashboard reporting of the diesel facility at Kusile Power Station including the supply, installation, commissioning, and maintenance of equipment.

The works must include but not be limited to:

- a) Develop a detailed design of the fuel management automation solution including the upgrade of the currently installed equipment to versions that can be automated and tags for tracking distance travelled by all equipment consuming the diesel from the diesel facility.
- b) Perform a detailed design of the pump dispenser support base/s. The *Contractor* shall take full professional accountability for the design Works or provide design assurance for the Works.
- c) Submit a detailed design report for the Works for review and acceptance by the *Employer*. A Professionally Registered Engineer/Technologist with ECSA shall sign the design report. The design report shall include but not be limited to the following:
  - Design criteria/parameters, specifications and standards used, loadings, assumptions, calculations results/records including detailed design calculations, design models and any other record of information associated with the completed Works. All calculation files and analysis/design models are to be submitted in native electronic format. The design report shall be submitted in electronic and PDF formats.
- d) Prepare and submit detailed engineering design drawings. All designs shall be submitted to the *Employer* for review and acceptance prior to commencement of construction. Detail design drawings shall be submitted in native (DGN/DWG) and Adobe PDF formats.
- e) Supply equipment required to execute the project, install, and commission all equipment. All equipment shall be securely mounted and be protected against damage from vehicles, plant and machinery (e.g. by use of an island or barrier).
- f) Install the design solution equipment

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- g) Commission the design solution and issue calibration certificates for all metering devices.
- h) And the maintenance of the design solution equipment
- i) The *Contractor* is required to:
  - Design and construct a support bases/s for the pump dispensers as well as bollards or barrier columns to protect the installed equipment
  - Demolish and/or cutting of the existing pump bases and ground slab for the purposes of constructing a new pump support base/s
  - Perform Geotechnical testing and/or investigation (if required) and provide geotechnical solutions, where applicable, for the area for the construction of the pump support base/s
  - Perform geometric survey to verify existing infrastructure in the area
- j) Perform technical assurance at appropriate stages/phases of construction to ensure that the *Works* are executed per the approved designs, specification, and standards.
- k) Supply, construct, and handover *Works* as per detailed designs
- l) Supply labour, materials, equipment, plant tools. required to complete the *Works* as specified herein. The *Contractor* shall submit a price/cost proposal, which will include the pricing for the Construction Works. The price proposal shall also include the following:
  - Rate and price for the resource(s) required to execute the Works
  - Cost for materials required to execute the Works. This shall be accompanied/supported with a detailed bill of materials
  - Proposed equipment costs or rental costs required to perform the *Works* – rate and pricing to be included
- m) Design, supply and construct all the necessary temporary Works that are required for the execution of the Works. This shall be done in accordance with applicable codes and standards. Temporary work designs shall be submitted to the Consultant for review and acceptance.
- n) Supply consumer power requirements, potable water requirements and any other termination interface requirements that are required to complete the Works, to the *Employer*
- o) Submit a Level 3 Construction/Execution Schedule for the detailed works. The schedule shall highlight all project related activities and durations. The *Contractor* shall notify the *Employer* timeously should there be any changes in the submitted programme. The *Contractor* shall also acquaint themselves with the work involved and verify all quantities, materials etc. necessary to undertake the Works, for proper programming and co-ordination.
- p) Submit a comprehensive/detailed method statement for the related work activities as well as a Quality Control Plan (QCP)/ Inspection, Test Plan (ITP). The *Contractor* in his work method statement shall include the following as a minimum:
  - The scope of works to be undertaken.
  - Comprehensive description of work activities/construction methodology and sequence of construction activities.
  - Health, safety and quality control measures for the activities.
  - All plant, equipment and machinery required to complete the work activities.

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- Temporary works to be used during the execution of the works.
  - Manufacturer's literature/Technical Data Sheets/Material Certificates for all materials that will be used for the works. These shall be submitted for review and acceptance by the *Employer* and *Consultant*, prior to the start of works.
  - Risk assessment associated with the *works*.
  - Plan/s for confining, collecting, and disposing of waste materials as a result of any removal operations, where applicable.
- q) The *Contractor* shall be responsible for the complete surveying and setting out of the works. The *Contractor* must submit survey data pre-construction and post-construction
- r) The *Contractor* shall confirm the available space in the proposed area for the construction of the proposed shield structure taking note of all existing services, pipes, structures, and any obstructions to the works.
- s) The *Contractor* shall arrange for all laboratory and field tests that are required for process control. Test results and records that are carried out on materials and workmanship shall be submitted to the *Consultant* for approval and acceptance.
- t) Construction supervision, monitoring and quality control shall be provided by the *Contractor* for the Works
- u) The *Contractor* shall submit as-built drawings for all the components of the finished Works to the *Employer*
- v) The *Contractor* shall compile and submit a data package for the completed works – this must contain all the documentation that was used to complete the Works. The documentation shall include but not limited to the following:
- Construction drawings used to execute the Works
  - Approved construction method statement, QCP/ITPs
  - Material certificates/data sheets
  - Laboratory and field test results. This shall include but not be limited to the following:
    - i. Concrete 7 days and 28 days cube test results
    - ii. Slump test results
    - iii. Concrete mix designs including all required test results (e.g. aggregate test results)

### **2.1.2 Applicability**

This document shall apply to Kusile Power Station.

### **2.1.3 Effective date**

June 2022

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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] 240-55410927 Cyber Security Standard for Operational Technology
- [3] 240-105658000 Supplier Quality Management Specifications
- [4] 240-56355754 Field Equipment Installation Standard
- [5] 240-56355789 Flow Measurement Systems Installation Standard
- [6] 240-56355815 Control & Instrumentation Field Enclosures and Cable Termination Standard
- [7] 240-56356396 Earthing and Lightning Protection Standard
- [8] 240-71432150 Plant Labelling Standard
- [9] 240-109607332 Eskom Plant Labelling Abbreviation Standard
- [10] SANS 10142-1 Part 1: Low-voltage installations
- [11] 32-644 Eskom Documentation Management Standard
- [12] Occupational Health and Safety Act No. 85 of 1993
- [13] Construction Regulations, 2014
- [14] 240-53113685: Design Review Procedure
- [15] 240-4332798: Engineering policy
- [16] 240-56364545: Structural Design and Engineering Standard
- [17] 240-86973501: Engineering Drawing Standard
- [18] 240-56356396: Eskom Earthing and Lightning Protection standard
- [19] 240-56356396: Eskom Earthing and Lightning Protection Standard
- [20] 240-76992014: Project/Plant Specific Technical Document and Records Management Work Instruction
- [21] 240-65459834: Gx Projects Documentation Deliverable Requirements Specification
- [22] 203-770: Kusile Power station specification for structural concrete
- [23] 240-57127953: Execution of Site Preparation and Earthworks Standard
- [24] 240-57127955: Geotechnical and Foundation Engineering Standard
- [25] SABS 1200 series, Standardized specification for civil engineering construction
- [26] All laboratory testing shall be conducted in accordance with the latest standard methods and procedures as outlined by the appropriate authorities (B.S/ Euro Code equivalent, A.S.T.M, A.A.S.H.T.O, I.S.R.M, S.A.B.S / S.A.N.S)
- [27] Environmental Protection Acts NEMA & NEMWA and regulations

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[28] National Environmental Management Act, Act no 107 of 1998

[29] National Environmental Management Waste Act, Act 59 of 2008

### **2.2.2 Informative**

[30] 204-53114002: Engineering Change Management Procedure

[31] Mine Health and Safety Regulations

## **2.3 Definitions**

<b>Term</b>	<b>Definition</b>
<i>Contractor</i>	Service provider contracted for supplying specific service to Eskom, Kusile Power Station.
<i>Employer</i>	Any person appointed in writing by Eskom as the delegated <i>Employer</i> in terms of the provisions of the Act, (normally the Power Station Manager)
KKS	Is a code used to clearly identify systems and components in a power plant according to process functions, points of installations and structures. "Kraftwerk-Kennzeichen-System (KKS)"
Plant	Any structure, machinery, apparatus or equipment which does not fall within the scope of the operating regulations for high Voltage systems, and excludes, mobile, portable lifting equipment, domestic circuits, appliances, and tools.
Controlled Disclosure	controlled disclosure to external parties (either enforced by law, or discretionary).

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## **2.4 Abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
C&I	Control and Instrumentation
GPS	Global Positioning System
Gx	Generation
ISO	International Organisation for Standardisation
MIE	Master Installation Electrician
NFC	Near-field Communication
OTS	Operating Technical Specification
PEC	Professional Engineering Certificate
QMS	Quality Management System
RFID	Radio Frequency Identification
VDSS	Vendor Documentation Submittal Schedule

## **2.5 Roles and Responsibilities**

### **2.5.1 System Engineers**

- a) Shall notify Operating Support of any changes to the Operating Technical Specifications.
- b) Shall be responsible for updating the OTS as per recommendations from the Operating Support.
- c) Shall review design documents, perform site acceptance test, site integration test, and approve commissioned plant based on performance criterion.

### **2.5.2 Engineering Manager**

- a) Originator of the required capability

### **2.5.3 Coal Management**

- a) Shall ensure that the plant is run or operated according to the Operating Technical Specifications.
- b) Shall ensure that any deviations from the specifications have been approved accordingly.

## **2.6 Process for Monitoring**

Installation performance shall be assessed during the commissioning of the diesel facility automated system. Each tag tracking must be at least 99% accurate; the distance travelled will be compared with the odometer on the equipment. The acquisition of data from the tags must be reliable with less than 1% failure to connect to equipment tags. The system availability of the system must be greater than 99%.

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## **2.7 Related/Supporting Documents**

N/A

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### **3. Scope of Work**

#### **3.1 *Employer's* design**

##### **3.1.1 Description**

Currently the Kusile Power Station operation's fuel management process is a manual with intake captured by hand by means of tank dip stick recording. Dispensing is captured manually on a logbook the site by diesel dispensing attendants. All fuel transactions are collected on a daily basis by an administrator and the information is passed onto a data capture who consolidates all fuel transactions for the organisation. Kusile Power Station requires an automated fuel management system to enable the organisation to detect fuel usage anomalies within 24 hours and a real time active dashboard for all Kusile fleet equipment utilised under coal management. The solution to be implemented shall enable the *Employer* to track the distance travelled by each equipment in the fleet, to track the fuel consumption of each equipment, to track the amount of fuel re-filled in each equipment in the fleet.

**The Kusile diesel facility system current installation Base includes:**

- a) 83 000l tank
- b) Electric pump
- c) No receiving flow meter
- d) Manual tank gauging
- e) Manual logbook for fuel dispensing

**System design shall meet the following minimum requirements:**

- a) The system shall be capable of automatic tank gauging for inventory management with water warning limit, high water limit, lower-level limit, delivery level limit, high limit, overfill limit, maximum volume limit, tank temperature measurement, tank capacity in liters, and tank dimensions. This information must be displayed of the real time dashboard.
- b) The system shall have intake monitoring inlet electric flow meter, surge voltage protection, electronic ticket for delivery and trade verification. Inlet monitoring shall monitor contamination and lock out the offloading of the fuel into the *Employer's* facility.
- c) The system shall have the capability of full system remote diagnostics.
- d) The system shall have two new dual nozzle pumps with RFID protection and display for resettable fill quantity in liters and non-resettable totalized quantity in liters. The pumps shall have a protection for discharging fuel into a vehicle without an authorized tag.
- e) The system shall have a controller for dual tagging of vehicle tag and vehicle odometer input for consumption data.
- f) The system shall have the option of permanent and NFC sticker tags not limited to existing vehicle base.
- g) Two master tags shall be supplied for this service

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- h) The current vehicle base is 104 and will be and will increase as new units are becoming commercial the service will require 150 tags and pricing to be given for any additional tags. tags.
- i) The system shall provide detailed reporting of volumes used per yellow plant equipment with highlighting of anomalies within 24 hours.
- j) The *Contractor* shall provide a web-based dashboard reporting platform which shall provide a monthly report entailing identifiable vehicle tags consumptions, fuel intake into storage tank and mobile bowser, fuel take on out of storage tank and mobile bowser, and fuel volumes in storage tank and mobile bowser in editable excel format and a non-editable PDF format to the *Employer* by email.
- k) The system shall perform electronic recording of all meters, measurement devices, and shall retain transactions to a server database for a minimum of 5 years.
- l) Vehicle RFID with hours and odometer with GPS odometer collection, non-intrusive installation, and tag removal protection and alarming.
- m) Real time monitoring with actionable dashboards, targeted preventative maintenance, and detailed reporting of transaction breakdown per vehicle. Dashboards must be accessible remotely by the *Employers'* personnel.
- n) The *Contractor* solution should only allow fuel to be discharged into equipment belonging to the fleet.
- o) The *Contractor* solution shall have a 99% system availability.
- p) The *Contractor* solution shall include fuel inlet control monitoring for deliveries and stock replenishments.
- q) The *Contractor* solution shall include automatic storage tank gauging and site control to monitor fuel take-on.
- r) The *Contractor* solution shall be fully automated with technical support and near real-time active dashboard reporting for fuel transactions, distance travelled by each equipment, and fuel consumption of each equipment.
- s) The active dashboard shall have a built-in functionality to detect and highlight anomalies.
- t) The *Contractor* solution shall be fully scalable to afford Kusile Power station the ability to be able to expand into additional solutions in the near future.
- u) The fuel management data acquisition system shall have uninterrupted power supply at least 24 hours.
- v) The mobile bowser to be provided by the *Employer* shall be retrofitted with a fuel management data acquisition unit to relay filling data for each vehicle to the master data acquisition system which is fully equipped with the filling protection for un-authorized vehicles filling and dual tagging of vehicle tag and vehicle odometer input for consumption data
- w) The *Contractor* shall de-commission the existing pumps, tank level meters, intake valve, and pipes. The *Contractor* shall utilize the existing 83 000 litres tank and automate the intake and discharge of fuel in the tank and mobile bowser to be provided by the *Employer*.
- x) The *Contractor* shall supply, install and commission two new diesel pumps

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- y) The system shall enable the *Employer* to load new vehicle labels through the master tag, manually enter storage tank before and after fuel deliveries in case of data acquisition system failure through the master tag.
- z) The system shall be fully compliant to the hazardous location standard and shall have sufficient protection for lightning protection.

### **3.1.2 Eskom requires that the considered supplier shall as a minimum, provide the following:**

- a) The *Contractor* shall provide proof of competence in executing robust integrated fuel and fleet management solutions.
- b) The *Contractor* shall have a minimum of 3 years experience of installing and commissioning the integrated fuel facility management, fleet tracking, and fleet management solutions that are dependable and should have a minimum of 2 referral contacts.

### **3.1.3 Installation Requirements**

Refer to 2.2.1 for installation required standards.

- a) All equipment, enclosures, and instruments shall have an ingress protection rating of at least IP65.
- b) All enclosures shall be mounted on racks manufactured for heavy duty galvanised Unistrut and the mounting location shall not obstruct passage of vehicles.
- c) Electrical distribution boxes:
  - 304L stainless steel with slanted roof
  - IP 66
  - removable gland plate
  - 3 mm double-bar lock
  - Pad lockable lock cover
- d) As a minimum the *Contractor* solution shall be fully compliant with the requirements of the Eskom Cyber Security Standard for Operational Technology, SANS 1020:2013 Power-operated dispensing devices for flammable liquid fuels, hazardous locations standard 240 – 56536505
- e) The *Contractor* shall replace the existing electrical distribution box
- f) The *Contractor* shall supply a MIE compliance certificate.
- g) Each pump shall be equipped with a E-Stop for emergencies

### **3.1.4 Electrical Supply**

The *Employer* shall supply 220VAC power supply to the existing electrical distribution box. The *Contractor* shall be responsible to supply and install all necessary cabling required to fuel management system.

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### **3.1.5 Performance and Acceptance Testing**

The *Contractor* shall conduct a factory acceptance test, site acceptance test, and site integrations tests for acceptance by the *Employer's* representatives. The requirement listed in section 3.1.1 shall be the criteria for acceptance.

## **3.2 Work to be performed by the *Contractor* in delivering the works**

### **3.2.1 Project Schedule**

The *Contractor* shall execute the Works per the submitted schedule or as agreed between the *Contractor* and the *Employer*. The *Contractor* shall notify the *Employer* timeously should there be any changes in the submitted programme. The *Contractor* shall also acquaint themselves with the work involved and verify all quantities, materials etc. necessary to undertake the Works, for proper programming and co-ordination.

### **3.2.2 Project Execution Codes and Standards**

Works shall be done in accordance with SANS standards, prescribed Eskom standards and any other applicable codes of practice, specifications, and regulations. Reference to standards or manuals of any society, organization, or association, whether such reference is specific or by implication, shall mean the latest standard, manual, or code in effect at the time of the Contract Award. The *Contractor* is also required to adhere to the latest editions of the listed normative references. If there is any contradiction within the codes and standards, the *Contractor* is to liaise with the *Employer* for clarification.

### **3.2.3 Testing Requirements, Cost, Procedures, Records, and Equipment**

The *Contractor* shall be responsible for the testing of the Works. The Works shall be tested in accordance with the latest standards and procedures as outlined by the South African Bureau of Standards (SABS)/South African National Standards (SANS) as well as any other applicable and relevant standards and specifications. The use of materials without the *Employer's* written approval constitutes a default on the part of the *Contractor*. The *Contractor* shall be liable for reinstatement of works in areas requiring this.

The *Contractor* is responsible to supply copies of the following:

- i) All laboratory and field test results
- ii) All dimensional and level measurements
- iii) Calibration Certificates of all testing equipment

The *Contractor* is to ensure that all testing equipment have a valid calibration certificate. No testing equipment is to be used with an expired calibration certificate. Any Works that have been tested with such equipment will require retesting. Any rework required after testing will be at the expense of the *Contractor*.

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The cost of testing undertaken by the *Contractor* in terms of his obligations under the contract including the taking of samples, reinstating where samples have been taken and all testing equipment, labour, materials, etc, must be included in the rates tendered for the various items of work supplied and will not be paid for separately.

#### **3.2.4 Temporary Works**

The *Contractor* is responsible for all temporary works that are required to complete the Works. The *Contractor* shall submit all designs or proposals for temporary works to the Consultant's ECSA professionally registered engineer for approval. The *Contractor* shall design, procure, manufacture, and construct all temporary Works required for the execution of the Works. The *Contractor* shall dismantle/demolish temporary Works when such works are no longer required. The Consultant shall supervise the implementation of the temporary Works

#### **3.2.5 Health and safety risk management**

The *Contractor* complies with the Occupational Health and Safety Act Number 85 of 1993 and its regulations, *Employer's* SHEQ Policy, Standards, Procedures, Guidelines, Specifications and Regulations.

The *Contractor* ensures safety awareness at all times through continuous training.

The *Contractor* must at all times be responsible for the supervision of his employees, agents and sub-*Contractors*, and takes full responsibility and accountability in ensuring that they are competent, compliant and aware of the legal requirements and other applicable requirements and executes the works accordingly.

The *Contractor* ensures that all statutory appointments, and appointments required by any *Employer's* Policy, standard and Procedure, are recorded in writing and that all its appointees and/or agents fully understand their responsibilities and are trained and competent to execute their duties.

The *Employer's Project Manager*, or any person appointed by the *Employer's Project Manager*, may at any stage during the term of the contract:

Conduct health and safety audits by a competent person regarding all aspects of compliance with the SHEQ requirements, at any off-Site place of work, or the Site establishment of the *Contractor*.

Refuse any employee, sub-*Contractor* or agent of the *Contractor* access to the premises if such person has been found to commit an unsafe act or if any work is found not to be compliant or authorized.

Issue the *Contractor* with a STOP WORK ORDER should the *Employer's Project Manager* become aware of any unsafe working procedure or condition, or any non-compliance.

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The *Contractor* immediately reports all incidents as well as any threat to safety and health of which the *Contractor* becomes aware at the Site, to the *Employer's Project Manager*.

The *Contractor* agrees that the *Employer* is relieved of any and all of its responsibilities and liabilities in terms of the Occupational Health and Safety Act no 85 of 1993 in respect of any acts or omissions of the *Contractor*, and the *Contractor's* employees, agents or sub-*Contractors*, to the extent permitted by the Occupational Health and Safety Act no 85 of 1993.

The *Contractor* provides a health and safety plan based on the *Employer's* Safety, Health and Environmental Specification.

All persons entering the Site must undergo the *Employer's* safety induction course.

The designer of the works is mandated to comply with section 6 of the construction regulation 2014.

#### **3.2.5.1 Safety of Worker**

The *Contractor* is to ensure the safety of all persons working on the Site.

Any hot work, including welding, will be applied for in accordance with the permit to work system.

No hot work will be allowed on Site unless a hot work permit is granted in writing.

Precautions must be taken to prevent any objects, welding or grinding sparks from falling beyond the immediate working area.

Ear protection and all required PPE must be provided to all personnel by the *Contractor*.

The *Contractor* completes activity risk-based assessments and provides the assessments to the *Project Manager* for acceptance before activities take place.

#### **3.2.5.2 Fire Protection**

The *Contractor* must ensure that his employees are trained in the use of firefighting apparatus.

The *Contractor* must take precautions to prevent any occurrence of fires or explosions while carrying out any work near flammable gas and liquid systems. Any tampering with the *Employer's* fire equipment is strictly forbidden. All exit doors, fire escape routes, walkways, stairways, stair landings and access to electrical distribution boards must be kept free of obstruction and must not be used for work or storage at any time. Firefighting equipment must remain accessible at all times.

In case of a fire, the *Contractor* must immediately report the location and extent of the fire to the Electrical Operating Desk using the station's Emergency Number. The *Contractor* must take the necessary action to safeguard the area to prevent injury and spreading of the fire.

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### **3.2.5.3 First aid**

The *Contractor* provides First Aid services (level 2) to his employees and sub-*Contractors*. In the case of severe or serious injury, to his employees and sub-*Contractors* the *Employer's* Medical Centre and facilities will be made available and accessible to such persons.

### **3.2.5.4 Housekeeping**

It is the *Contractors* responsibility to ensure that the Site is cleaned daily. All electrical cables and hoses are routed so as not to cross unprotected over floors and walkways. All equipment is packed neatly without interference to access. All excess scaffolding material is removed from Site after the scaffolding has been erected. The *Contractor* is responsible for the removal of any scrap material to the designated scrap area on a daily basis.

### **3.2.5.5 Barricading**

Access to danger zones is restricted using handrail type guards at least 1.2 meters high and able to block access to the danger zone. Red tape is not allowed. Symbolic safety signs depicting 'Danger', name of *Contractor*, Responsible Supervisor, Contact details of supervisor and 'No entry' are attached to the guards. This includes access during the taking of X-rays.

### **3.2.5.6 Permit to Work System**

The *Contractor* allocates personnel to be trained and authorised as Responsible Persons according to *Employer's* Plant Safety Regulations (36-681). The *Contractor* ensures that adequate number of appointed Responsible Persons and Authorised Supervisors prior to the outage date or commencement of work at the station. The *Contractor* ensures that Responsible Persons and Authorised Supervisors are available on Site at all times during the execution of the Work.

If the *Contractor* breaches this obligation, the *Employer's Project Manager* withholds monthly payments until the *Contractor* complies with this obligation.

## **3.3 Information Technology, documentation, and Functional Requirements**

### **3.3.1.1 Cyber Security**

The *Contractor* reviews the Eskom standard on Cyber Security - 240-55410927 and identified relevant areas applicable for the Works and confirms his compliance to the relevant areas to the Eskom Standard. The *Contractor's* representatives to work on the maintenance support contract shall be subjected to the *Employer's* vetting process. *Contractor* shall provide cyber security proof of training for representatives who will be working under the contract to be established with the *Employer*. The *Contractor* solution should have the capacity to retain records for a period of 5 years.

### **3.3.1.2 Software Configuration**

The *Contractor* installs all required software to meet the functional requirements of the diagnostic and monitoring system as described in the Works Information.

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Installation software required to recover the system in the event of a failure shall be provided to the *Employer*. The software is categorised per installation and software licences are clearly defined.

### **3.3.1.3 Support - Hardware / Software / Backups**

It is of the utmost importance to ensure the reliability of the backup system. The system must be tested at least every 6 months and any test failures must be reported to management.

In normal situations any file, workspace or database must be recovered in less than 2 hours. If the time to recover a file exceeds 4 hours, the backup philosophy will be improved and updated.

### **3.3.2 Training Requirements**

The *Contractor* shall provide operating, maintenance, and administrator training of the solution to be provided.

### **3.3.3 Documentation**

The *Contractor* is responsible to plan for the supply of the commissioning manual, maintenance manual, functional description, and operating manual of the system including safety procedures for operating and maintain the system. The *Contractor* shall provide P&ID, Piping drawings, and wiring drawings for the system.

The *Contractor shall develop* and submit as-built data and drawings of the completed Works upon handover. As-built drawings shall be submitted in PDF and DGN/DWG formats

#### **3.3.3.1 Documentation control**

All documents and records management are performed according to Technical Document and Record Management Work Instruction (240-76992014), Gx Projects Documentation Deliverable Requirements Specification (240-65459834) and Engineering Drawing Standard – Common Requirements (240-86973501) and the *Project Manager* ensures that the *Contractor* is provided with latest revisions.

Any uncertainty regarding all specified documents should be clarified with the *Project/Training Manager* and clarification updates should be reflected in updated versions of these documents.

The *Contractor* complies with all minimum document metadata as specified in Smart plant Owner Operator Technical Documentation Metadata Standard (240-54179170).

#### **3.3.3.2 Documentation Pre-submission (VDSS)**

The *Project Manager* will compile and provide the Vendor Documentation Submittal Schedule (VDSS) to the *Contractor* as part of the enquiry package. The VDSS will list minimum documentation deliverables for the work to be done as per the Works Information.

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The *Contractor* upon receiving the VDSS must review it and ensure that the delivery dates of documentation are linked with the completion of work as per the activities in the programme. After review, the VDSS will then be submitted by the *Contractor* to the *Project Manager* for review and acceptance. Should the programme be revised and affect documentation deliverable dates, the updated VDSS must be submitted as per the revised programme.

### **3.3.3.3 Process for Documentation Submission**

All documents and records must be submitted and managed according to the Project/Plant Specific Technical Document and Records Management Procedure as well as the Generation (Gx) Projects Documentation Deliverable Requirements Specification. The *Employer* shall ensure that the *Contractor* is provided with the latest revisions of the mentioned documents. All documentation submitted must be accompanied by the completed transmittal with the following fields as a minimum:

- a) Name of *Contractor*
- b) Transmittal Number
- c) *Contractor* Details
- d) Date of Submission
- e) Description of Document
- f) Document Number
- g) Document revision
- h) Document type
- i) Document media type
- j) Number of copies
- k) Signed by and date

Final documentation is submitted in both electronic and hard copies to the *Employer's Project/Training Manager*. The *Contractor* adheres to one soft copy in a compact disc and one hard copy per station.

### **3.3.3.4 Documentation Recording**

The *Contractor* develops; list and maintains the Master Document List (MDL) of all documents submitted to the *Project/Training Manager* with all the relevant metadata.

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### 3.3.3.5 Documentation Review, Drawing Formats and Layouts

The *Contractor* shall conduct design reviews in accordance to the *Employers* Design Review Procedure and participate in all design reviews as specified by the *Employer*. The *Employer* shall review and consolidate review comments for submitted documentation by the *Contractor*. The *Contractor* shall also make the necessary revisions or rectify noted issues highlighted on the documentation by the *Employer*. The *Contractor* must include the documentation reviews as part of the Design and Construction schedules and allocate appropriate timelines/durations for these activities.

The Project/*Training Manager* has a maximum seven (7) working days to review and consolidate review comments for documentation submitted by the *Contractor*. The *Contractor* also has a maximum of seven (7) working days to respond and / rectify as per the comments by the Project/*Training Manager*.

### Drawing Formats and Layouts

- The creation, issuing and control of all Engineering Drawings will be in accordance to the latest revision of the Engineering Drawing Standard to be supplied as part of the enquiry documents.
- Drawings issued to the *Employer* will be a minimum of one hardcopy and an electronic copy.
- The *Contractor* is required to submit drawings electronically in both native CADD format and PDF format.
- Drawings issued to the *Employer* may not be "Right Protected" or encrypted [11].

### 3.3.4 Quality Management

The quality requirements are as per ISO 9001 and *Employer* Supplier Quality Management Specifications, QM 58. This quality management philosophy is developed from the basis that suppliers produce quality products, supervisor oversees the process, checks quality but liability for quality remains with the *Contractor*. The *Contractor* submits a QMS as a returnable schedule and uses it for all phases of the Project. The QMS complies with the requirements of ISO 9001:2008 standard. The *Contractor* provides evidence of a fully implemented QMS as and when requested by the *Project manager*. The *Project Manager* may at his sole discretion carry out an audit on the *Contractor*, the *Contractor's* suppliers and Sub-*Contractors*

Quality control plans will be produced by the *Contractor* or manufacturer which will indicate the level of product quality control to be applied. The CQP must be aligned to, and reference ISO 10006 QMS, guidelines for quality plans and in compliance with the guideline in 240-105658000. The CQP will make reference to the *Contractor's* QMS Procedures to be used in this Contract. This plan will be reviewed by the *Project Manager*. The project team monitors that these plans are being implemented and that it is yielding the expected results through process and product verifications.

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High quality standards are also assured by conforming to the following:

- a) The use of sound design and engineering principles,
- b) The design process uses a good performance and functional specification,
- c) It is ensured that the installation conforms to the Works Information.
- d) Design Review Procedure is followed
- e) Engineering Change Procedure
- f) QA/QC on project (manufacturing, installation)

Pre-Contract Award: Quality Requirement:

- g) The supplier shall complete and sign Form A (Enquiry/Contract/Quality Requirements for QM58 and ISO 9001).
- h) The supplier shall submit a valid copy of ISO 9001 or any applicable certificate of a quality management system (the latest applicable revision).
- i) The supplier shall submit the latest copy of an internal and external management system audit reports.
- j) The supplier shall submit a draft contract quality plan that is specific to the scope of work as described in the tender documents.
- k) The supplier shall submit an example of an inspection and test plan (ITP) or quality control plan (QCP) on similar and/ or previous work done.
- l) The supplier shall submit documented information for Control of Externally Provided Processes, Products and Services.
- m) The supplier shall submit a copy of documented information for roles, responsibilities and authorities.

The supplier shall submit the following documents within 30 days after the contract date, prior to the commencement of work, for acceptance by Eskom:

- n) The supplier shall complete a QCP before contract award. This shall be reviewed and signed off by Eskom within 30 days after contract award.
- o) The supplier shall complete a quality control plan and ITP(s) for review and acceptance by Eskom prior to the commencement of any work, inclusive of subcontracted work, within 30 days after contract award.
- p) The sub-supplier QCP/ ITP shall be submitted for review and comment by the supplier and by Eskom within 30 days after the award of the tender. All supplier and Eskom comments shall be resolved prior to commencing work.
- q) The equipment lists and an indication of pressurised components and systems.
- r) Method statements for works (describing how work will be executed)

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Correspondence shall be directed to the project manager, and periodic quality review meetings shall be convened by Eskom with the supplier. The mandatory quality review meetings are to be convened by the nominated project quality manager or his/her representative for the contract. Monthly quality performance and management reports are to be prepared by the supplier during contract execution. The content of these reports shall be agreed by Eskom when submitted to Eskom on a monthly basis.

#### **3.3.4.1 Supplier Quality Performance Monitoring**

During the contract execution phase, suppliers shall be periodically monitored by Eskom for performance on quality-related aspects and Eskom shall take appropriate actions pertaining to the supplier performance outcomes.

The monitored key performance areas include the following:

- a) Quality
- b) Delivery
- c) Design
- d) Cost
- e) Management system

Subsequent key performance indicators associated with these areas will include the following:

- f) Nonconformity monitoring
- g) Audit and assessment evaluation scoring
- h) Management system compliance and accreditation
- i) Achievement of delivery targets as per contractual agreements
- j) Process improvements
- k) Corrective and preventive action response and closure

#### **3.3.4.2 Tests and Inspections before Delivery**

It is the responsibility of the *Contractor* to ensure that the system is tested after installation/restoration to the satisfaction of the *Employer's* data quality requirements.

#### **3.3.4.3 Eskom rights of Access and to information**

The supplier shall be fully compliant with the *Employer's* requirement regarding the *Employer's* rights of access and the *Employer's* rights to information.

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#### **3.3.4.4 Preservation and storage**

The supplier shall develop and implement a comprehensive preservation programme consisting of plans, processes, procedures, and actions undertaken for the purpose of planning for, and maintenance of, material deliverables quality. The supplier shall fully comply with the preservation programme scope requirements entailed in the *Employer's* quality management system specification.

#### **3.3.4.5 Management of Nonconformities and Nonconforming Outputs**

- a) Nonconformity reports raised by Eskom and issued against the supplier shall be investigated by the supplier as a matter of urgency in order to determine the root cause, corrective action, and preventive measures, as required, with implementation time frames.
- b) A formal response shall be prepared in respect of the defined criteria and submitted to Eskom for its review, evaluation, and acceptance, within a maximum of 14 calendar days from the date of issue of the nonconformity and should be aligned with the site requirements/procedure.
- c) Should Eskom or its inspection authority/agency identify any non-conforming products during the conduct of its audits/surveillances/inspections, the supplier shall be deemed to be in breach of contract and shall be held liable for any repair, rework, and/or associated replacement costs. The supplier may, in such instances, also be held liable for the full costs associated with the conducting of follow-up audits/surveillances/inspections.
- d) The records of qualification of procedures, processes and operators shall be maintained by the supplier in accordance with the applicable procedure or code and these made available to Eskom at all times.

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### **3.4 Parts of the *works* which the *Contractor* is to perform**

The *Contractor* shall carry out, compile a Kusile specific detailed design of the diesel facility automation design. However, the appointed *Employer's* representatives will be required to work in close collaboration with the *Contractor* and assume overall responsibility on behalf of the *Employer* for all activities carried out the installation and commissioning.

- a) Work with the *Employer's* representatives to update drawings.
- b) Work with the *Employer's* representatives to create unique KKS for the additional devices.
- c) Work with the *Employer's* representatives to update tear detector firmware to trip with one arm.
- d) Work with the *Employer's* representatives to commission the belt protection system.

#### **3.4.1 Procedure for submission and acceptance of *Contractor's* design**

The *Contractor* shall meet requirements specified in section 3.2 of this Works Information. The *Contractor* shall confirm compliance to the specified training requirements as well as provide the training manuals for review to the Project Manager. The reports and all documentation shall meet the quality standards specified in sections 2.2 and 2.6 of the ISO 9001, Quality Management Systems [1].

#### **3.4.2 Project Handover**

The *Contractor* shall be responsible for handover of *all Works* associated with the contract as per this scope of Works. The *Contractor* shall handover to the *Employer* the completed Works and make good on any defects that are identified during the handover inspection.

The handover submissions shall include but not limited to the following:

- Engineered detail design and associated design drawings of the Works
- Design report inclusive of calculation records etc.
- As-built design drawings of the completed Works
- PEC or Certificate of Compliance for the built structure
- Results and records of test and/or assessment works
- Data package of the relevant drawings, test certificates, construction documentation etc. for the completed works

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### **3.5 Fuel Management System Maintenance and Support Services**

The *Contractor* shall enter into a fuel management system service contract for a period of 36 months to provide the following services:

- Monthly and yearly fuel management reports,
- Access to web-based fuel management platform (Fuel Recon, File transfer of data),
- Periodic system equipment calibrations reports and certificates,
- Periodic system updates and upgrades to mitigate cyber security threats and obsolescence,
- Site maintenance and monthly inspections
  - Emergency next day support

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#### **4. Acceptance**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
Mauritz van der Bank	C&I Engineering Manager
Grace Olukune	Engineering Manager
Khehla Shandu	Coal Management Manager
Thando Mbulawa	Auxiliary Engineering Manager

#### **5. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
December 2020	1	H.B. Marobane	This document was compiled to provide requirements for the Kusile Power Station diesel facility automation project
June 2022	2	H.B Marobane	Revised <i>Employer</i> requirements

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

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

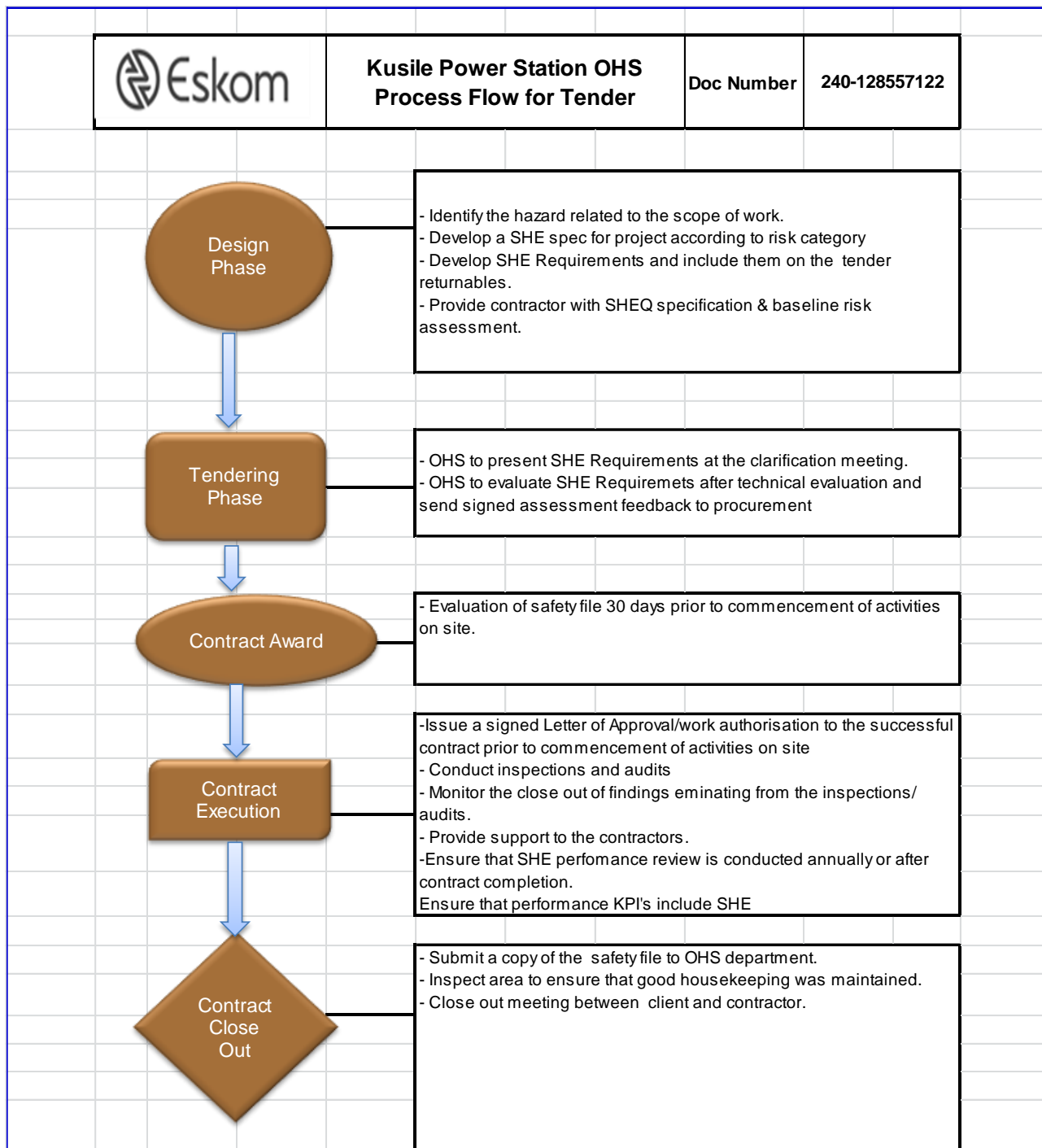
- Harold Marobane
- Mauritz van der Bank
- Andrew Lekganyane
- Sherperd Dibakoane
- Lelethu Thipa
- Mashudu Monyai
- Johann Moller
- Kgopotso Tshoga
- Gomolemo Mokgwabone

#### **7. Acknowledgements**

none

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## Appendix A: Kusile Power Station OHS Process Flow for Tender



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