	Scope of Work	Kusile Power Station
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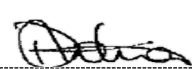

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1. Introduction

This document outlines the scope for the supply, install, and commission of the Installation of Different Dust Analysers project. A suitably qualified *Contractor* is required to supply, design, install, interface to the existing JB and commission the installed dust analyser on site. The supply of JB, trunk cable, DCS and HMI is performed by the *Employer*. These works should be done urgently as Kusile Power Station set to reintegrate with the FGD system, and AEL requirements must be met.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The objective of this document is to illustrate a scope of work for CEMS replacement project at Kusile Power Station. The work shall include the supply, installing the monitoring system, and equipment supplied by the *Employer* and the *Contractor*. The *Contractor* shall furnish and install all required materials to complete this work.

The works must include but not be limited to:

- a) Selection of fit for purpose dust and gaseous analysers applicable in a WFGD system for approval by Eskom personnel.
- b) Supply of dust analysers, gas analysers, water tanks, pumps, motors, level and flow instruments, cable pin lugs, instruments cables and power cables.
- c) Install the dust analysers, gas analysers, instruments cable devices and interface to existing JB.
- d) Decommission existing analysers and commission all newly installed analysers.
- e) Modify the flanges for CEMS replacement in each Unit.
- f) Design, install and commission the purging system.
- g) Install and commission level and flow instruments for the water tank, instrument cables and interface to existing JB.
- h) Install and commission pumps for purging.
- i) Provide maintenance support, installation training and operational spares.
- j) Provide the equipment list.
- k) Manufacture and install the KKS tags based on the list from the *Employer*.

2.1.2 Applicability

This document shall apply to Kusile Power Station.

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2.1.3 Effective date

This document will be effective from the date of its authorisation.

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] 240-68099512 Tender and Contract Quality Requirements for QM 58 and Quality Requirements for ISO 9001 Standard (Form A).
- [2] 240-107758130 Kusile Power Station Maintenance Execution Strategy for Balance of Plant Distributed Control System.

2.2.2 Informative

- [1] 204-53114002 Engineering Change Management Procedure.
- [2] 32-727 SHEQ Policy.
- [3] 32 - 95 Environmental, Occupational Health and Safety Incident Management Procedure.
- [4] 240-56242363 Emissions Monitoring and Reporting Standard.
- [5] 240-124194687 Kusile Flue Gas Emission Control Particulate Matter and Gases Rev 6.
- [6] 240-56242850 Continuous Emission Monitoring System Selection Standard (Rev 1).
- [7] 240-56355754 Field Instrument Installation Standard.
- [8] 240-56355815 Junction Boxes and Cable Termination Standard.
- [9] 240-53114002 Generation Engineering Change Procedure.
- [10] 240-93576498 KKS Coding Standard.
- [11] 240-71432150 Plant Labelling Standard.
- [12] 240-109607332 Eskom Plant Labelling Abbreviation Standard.
- [13] 240-110710597 Kusile Power Station Configuration Management Plan.
- [14] 240-150642762 Generation plant safety regulations
- [15] 240-56062752 Medium Voltage Miniature Substations for Systems with Nominal Voltages of 3.3kV 6.6kV 11kV and 22kV Standard.
- [16] 240-86973501 Eskom Engineering Drawing Standard.

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2.3 Definitions

Term	Definition
<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, and tools.
Controlled Disclosure	Controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Explanation
AEL	Atmospheric Emission License
C&I	Control and Instrumentation
CEMS	Continuous Emission Monitoring System
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
DCS	Distributed Control System
FGD	Flue-gas desulfurization
GA	General Arrangement
HMI	Human Machine Interface
IP	Ingress Protection
ISO	International Organisation for Standardisation
ITP	Inspection Test Plan
JB	Junction Box
NCR	Non-Conformance Reports
NGL	Natural Ground Level
NO _x	Nitrogen Oxides
O ₂	Dioxygen
OEM	Original Equipment Manufacturer
OTS	Operating Technical Specification
QA	Quality Assurance
QC	Quality Check
QCP	Quality Control Plan
QMS	Quality Management System

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Abbreviation	Explanation
SANS	South African National Standard
SO ₂	Sulfur Dioxide
VDSS	Vendor Documentation Submittal Schedule
WFGD	Wet Flue-gas desulfurization

2.5 Roles and Responsibilities

2.5.1 System Engineers

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

2.5.2 Engineering Manager

- a) Originator of the required capability.

2.5.3 Shift Managers

- a) Shall ensure that the plant is monitored or operated according to the OTS.
- b) Shall ensure that any deviations from the specifications have been approved accordingly.

2.5.4 Operating Support

- a) Shall be responsible for providing system engineers with information regarding required changes to OTS.
- b) Operating support shall conduct internal audits at planned intervals to determine whether the OTS system conforms to requirements and is effectively implemented and maintained.

2.5.5 Safety office

- a) Shall be responsible for providing system engineers with information regarding required the type of emission that has to be detected, and to ensure not gas is present during installation and commissioning.

2.6 Process for Monitoring

Installation performance shall be assessed during the commissioning of each analyser. Each analyser shall be commissioned, and safety cleared individually. Site acceptance test and site integration test shall be performed for each analyser.

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3. Scope of Work

3.1 Employer's design

3.1.1 Description

Kusile Power Station is a 4800MW rated power station with each of the 6 Units rated at 800MW. Combustion of fossil fuels at Kusile Power Station results in particulate and gaseous pollutants which are discharged into the atmosphere. In order to limit the detrimental effects to the environment, the pollutants are regulated under the National Environment Plan: Air Quality Act 39 of 2004. CEMS probes and analysers are installed in the chimney at 150m level for monitoring particulate matter gaseous emissions which are sulphur dioxide (SO₂), the nitrogen oxides (NO_x), carbon monoxide (CO), carbon dioxide (CO₂) and oxygen (O₂).

The CEMS is installed to meet the requirements of the AEL at Kusile Power Station in all Units. It is a requirement that CEMS is available 80% of the time. It is unfortunate that CEMS at Kusile operates at an unfavourable environment. Whilst the solutions to address the under performance of the primary sources of the unfavourable conditions for CEMS are being explored, there is an attempt to modify or upgrade the CEMS so that the technology that can perform under these extreme conditions can help the station to monitor emissions.

Eskom requires that the considered *Contractor* shall as a minimum, provide the following:

- a) The *Contractor* shall complete the scope of work as outlined in this document.
- b) The *Contractor* shall provide proof of competence for installation and commissioning of dust and gas analysers.
- c) The *Contractor* shall have experience of installing and commissioning of dust and gas analysers at at-least two local sites.
- d) The *Contractor* shall have experience of electrical installation as per Occupational Health and Safety Act requirements.
- e) The *Contractor* shall ensure compliance with relevant health and safety standards.
- f) The *Contractor* shall provide 12 months of maintenance support, installation training and operational spares.

The responsibilities of the Employer include the following:

- a) Provide clarify on the scope of work to the *Contractor* as and when required.
- b) Participate in quality control holding point as stipulated on the quality control plan.
- c) Authorise final release of product.
- d) Conduct design review and acceptance.
- e) Provide power supply for all electrical works.

3.1.1.1 Capacity

These CEMS replacement shall be used for the monitoring of gas and dust. This system will analyze dust and gaseous emissions across all the Units at the smokestack.

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3.1.1.2 Control & Instrumentation

- a) All field equipment & installations shall comply with the field installation standard as follows:
 - i. Passageways and the movement of people and equipment during maintenance activities.
 - ii. Ergonomics and maintenance access to the equipment.
 - iii. Field equipment supports shall not be welded to vessels or handrails but shall utilize self-supported racks with integrated cable and tubing trunking.
 - iv. Instrumentation and transducers shall be grouped together in areas away from other maintenance activities and where the environmental conditions are more favorable for the equipment.
 - v. All instruments on the racks shall be installed on the same level and with even spacing between instruments.
- b) The equipment installed shall be sufficiently protected against lightning induced currents.
- c) Each of the equipment installed shall be assigned a unique identity (KKS) by the *Employer* based on the submitted equipment list from the *Contractor*.
- d) All labels shall be in accordance with *Employer* specification. The location and designation of labels shall be to *Employer's* approval.
- e) Analyzers shall be installed at each duct on the smokestacks at 151m level, with a cable connecting to an existing JB.
- f) The *Contractor* shall verify that the equipment has 4-20 mA signal. This analogue signal shall be used for alarming in the control room.
- g) Alarms shall be activated in the control room should there be high dust concentration, gas concentration or any system failure.
- h) Any installation procedures not specified herein shall be done in accordance with the manufacturer's recommendations and good Engineering practice and shall be approved by the Engineer.
- i) All supports provided and installed by the *Contractor* shall be suitable for the seismic rating required for the facility.
- j) All field equipment shall operate over an ambient temperature range of: -10°C to 50°C.
- k) The equipment layout shall be such that when mechanical work is performed, no C&I equipment is damaged.
- l) All IP ratings shall be as per SANS 60529.
- m) All field equipment shall be installed in a suitable location ensuring that it operates in an environment within the parameters stipulated by the manufacturer.
- n) The selection and installation method of cabling and associated equipment, such as racking and junction boxes, panels shall be based on the environmental conditions it will operate in.
- o) The configuration of all cables, conduit and trunking associated to the enclosure shall be uniform and follow proper installation techniques as per Field Instrument Installation Standard, 240-56355754. The wiring of low voltage installations, and other appropriate installation standards shall be approved by the Eskom before the contract is placed.

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3.1.1.3 Electrical Requirements

- a) The *Contractor* to ensure that pump and motor designs adhere with Kusile reticulation of 6,6 kV and 400 V.
- b) The *Contractor* shall install a 5.5kW electrical pump on 0m level, along with a motor control panel. New distribution boards to be installed on 151m level for the CEMS equipment.
- c) Cables to be used should be of XLPE nature to ensure that Kusile standard is maintained.
- d) The *Contractor* is responsible for cable terminations both on the supply and load side.
- e) The *Contractor* designs, installs and tests earthing and lightning protection systems for the Electrical equipment that ties in with existing earth mat.
- f) The *Contractor* evaluates the closest earth point of the existing station earth mat to connect with newly designed earthing and lightning protection system.
- g) Earthing systems are aluminium to avoid implications of copper theft. The *Contractor* ensures that the aluminium conductors selected have equivalent earth resistance, as to when copper is used.
- h) Datasheets and certificate of compliance are to be provided for all electrical equipment that are utilised on this project.
- i) The *Contractor* is to request for clarification should there be any conflicting requirements.

3.1.1.4 Water Supply Requirements

This water will be used to supply the head tanks that will be located inside the smokestack at 180m level. The water supply tapping point is at -1.8m level, at the water abstraction point in a manhole below NGL near the main stack and connecting to the plant water supply network (potable water network). The motor control panel and pump shall be located at 0m level by the stack, and pipework for water delivery to the tank at 180 m level shall be provided.

Booster Pump Requirements:

- The pump shall be carefully designed and selected to meet the water demand at the specified heights of 180m.
- *Contractor* to determine flow rate at tie in point.
- *Contractor* to determine pressure at tie in point.

Pipework Requirements:

- All pipelines for this purpose shall be hot dipped galvanized steel specified in SANS 121. All pipes shall conform to SANS 62 and SANS 719. All mild steel pipes and equipment shall be pressure rated according to the maximum working pressure in the system.
- GRP as specified in SANS 1748-3 Part 3.
- Pipework colour coding shall be done in accordance with the Eskom colour coding standard.
- Any welding shall be done in line with Eskom Weld Rule book.

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Flange and Bolting Requirements:

All flanges supplied for system shall conform, as a minimum, to SANS 1123.

All flanges and bolts installed should:

- Flanges that comply with the requirements of SANS 1123.
- Bolts and nuts that comply with the requirements of SANS 1700.

Pipe Supports Requirements:

All hangers and hanging material will be hot dipped galvanized to SANS 121 after fabrication, and either welded or bolted on site. Site repairs and welding will be touched up with cold galvanizing in accordance with SANS 121.

Fasteners Requirements:

Fasteners shall conform, as a minimum, to SANS 1700, including the following:

- All fasteners used are metric fasteners.
- Each bolt head is fitted with a flat washer.
- Each nut is fitted with a flat washer.
- Each bolt length is sized so that two full threads are visible (minimum).
- No bolts are cut to the 'right' size.
- All fasteners are new.
- All fasteners are coated in an anti-seize compound before fastening.

3.1.1.5 Compressed Air System

Table 1 shows design information for the compressed air to be used for smokestack analysers and design parameters. Material and dimensions of the piping, fittings and valves are provided on the drawings (0.90/10025, 0.90/10026 and 0.90/1234 sh11).

Media	Service air
Supply pressure	800kPa
Supply flow	111 Nm ³ /min
Pipe size	50mm (DN50)
Type of connections	Threaded
Material	Galvanized Mild steel

The analyser will use service air supplied from the tapping offs at East and West FGD absorber plant since it's near the smokestacks. The compressed air will be supplied from east and West compressor plant.

East and West Smokestack Analysers:

- a) Work shall begin once all designs are approved for construction, QCP's are approve by Eskom representatives.
- b) Service air will be supplied from service air main supply from compressor plant to the FGD absorber plant.

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- c) Point of tapping: Service air will be tapped from the main supply line (KKS: 00QEB71BR003 for West service airline and KKS:00QEB71 BR004 for East service airline).
- d) At the point of tapping ball valve should be installed for isolation purposes. Material of the isolating valve should match of the pipelines. All the valves should be threaded.
- e) Final release of the equipment should be done by Eskom System Engineer.

3.1.1.6 Civil and Structures

The *Employer* requires the *Contractor* to design and commission a suitable and competent surface bed or foundation near or within the main stack and NGL for the placing and fixing of the piping system, valves, strainer, and related installations.

Structural IPE beams of the main stack staircase for the mounting and fixing of the piping network support brackets using non-destructive clamping solutions shall also be completed by the *Contractor*.

The *Contractor* shall perform the structural design assessment of the existing structural steel platforms to support the water tanks for the purging system. Therefore, the *Contractor* is to make sure the proposed tank does not compromise the structural integrity of the steel platforms. The proposed locations to house and support the tank is the 180m level platforms inside the East and West Smokestacks

The *Employer* is responsible for furnishing the *Contractor* with the design reports and drawings for the platforms.

3.1.1.7 Flange Modification

The *Contractor* shall modify the existing flange material and size on the chimney to accommodate the new analyzers. Modification of the flanges will resolve the issue of the existing analyzers as they are not sloping downwards.

3.1.1.8 External and Internal Coating

The *Contractor* shall make use for external and internal coating.

3.1.1.9 Documentation

The *Contractor* shall furnish fully annotated and indexed hard copy printouts of the loop drawings, mechanical hookup drawings, termination schedules, and cable schedules. The *Contractor* shall also provide the installation, operation, maintenance, training manuals, spare list, and drawings showing all control power, and grounding. Typical instrument stand GA drawings for each type of instrument stand shall be available to be provided showing dimensions, structural supports etc. All the drawings shall be in a Portable Document Format (PDF).

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3.1.1.10 Assumptions and Evidence

- a) KKS of the additional devices to be installed will be based on existing KKS plan for the plant installation base.
- b) The DCS configuration updates shall be implemented by Kusile Power Station Generation C&I Engineering personnel.
- c) The commissioning of the dust and gas analyzer loops shall be executed with an integration test with the DCS status.
- d) Installation will be done with requiring unit shutdown.
- e) Supplier can supply, install, and commission the required system within specified time frame.
- f) The project shall depend on outage dates for Kusile Power Station.
- g) The existing ABB DCS has enough spare capacity to accommodate the recommended design.

3.1.1.11 Station Risk

To manage the risk of DCS unavailability during the installation. The installation and commissioning of the equipment shall be done for one Unit at the time by the *Contractor*. This work shall be completed while the Unit is off, during the Kusile Power Station outage dates for each Unit.

3.1.1.12 Configuration Management Requirements

Comprehensive Configuration Management (CM) programme is to be established and applied throughout the duration of the work execution (kick-off to close-out) and shall be in compliance with ISO 10007: Quality Management System. It shall include the following elements as minimum requirements.

- a) Technical Document Management/Control (incl. Handover reviews).
- b) Plant labelling and coding (240-71432150: plant system identification or label (KKS))
- c) Engineering Change Management or Control (240-51093273)
- d) Configuration Status Accounting

Configuration management activities to be performed throughout the work execution and maintenance, record, and report on the status of all proposed engineering changes including deviations from configuration standards. An engineering change register per work execution shall be maintained throughout the life cycle of the project or contract. All KKS codes will be created based on VGB standards and supplied and approved equipment list and migrated to SAP PM post work completion or handover.

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3.1.1.13 Safety, Health, and Environmental Considerations

Considerations must be made for exposure to noise above 85 dB(A), exposure to high temperature environment, exposure to low temperature environment, exposure to low illumination environment, exposure to fly ash, exposure to flue gas, ergonomic stress due to awkward or strenuous and walking, electrical contact. The *Contractor* shall provide their own breathing apparatus of minimum half-face respirator with ABEK1 combination filter for gases and dust.

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

3.2.1 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* always ensures safety awareness 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.

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*.

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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.

3.2.1.1 Safety of Worker

- a) The *Contractor* is to ensure the safety of all persons working on the Site.
- b) Any hot work, including welding, will be applied for in accordance with the permit to work system.
- c) No hot work will be allowed on Site unless a hot work permit is granted in writing.
- d) Precautions must be taken to prevent any objects, welding or grinding sparks from falling beyond the immediate working area.
- e) Ear protection and all required PPE must be provided to all personnel by the *Contractor*.
- f) *Contractor* working at height shall be competent.
- g) The *Contractor* completes activity risk-based assessments and provides the assessments to the *Project Manager* for acceptance before activities take place.

3.2.1.2 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 always remain accessible.

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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3.2.1.3 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.

3.2.1.4 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 daily.

3.2.1.5 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.

3.2.1.6 Radiographic Examinations

When radiographic tests are carried out in the plant by Others, the danger area is evacuated with the exception only of authorized radiographic workers, and thereafter barricaded. To ensure that employees and contract staff working in *Employer's* premises are not exposed to more radiation than is reasonable level, the *Contractor* complies with the Kusile Power Station procedure 'Requirements and Rules for Radiation Protection and Safety of Radiation Sources'.

3.2.1.7 Permit to Work System

The *Employer* shall arrange the permit to work for the *Contractor* prior to any work commencement.

3.2.2 Information Technology Functional Requirements

3.2.2.1 Special Tools Requirements

The *Contractor* shall provide any special tools upon completion required to install and commission the analysing instruments.

3.2.2.2 Cyber Security

This system is not a cyber asset, thus there is no cyber security requirements for this work.

3.2.2.3 Software Configuration

N/A

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3.2.2.4 Support - Hardware / Software / Backups

N/A

3.2.3 Training Requirements

The *Contractor* shall have training program which is structured to provide the Customer's attendees with sufficient knowledge to carryout engineering, operations and maintenance during the operational life of the detector system.

3.2.4 Civil & Structures

The *Contractor* is required to perform the structural design assessment of the existing structural steel platforms to support the water tanks for the purging system. Therefore, the *Contractor* is to make sure the proposed tank(s) do not compromise the structural integrity of the steel platforms.

The proposed locations to house and support the tank(s) is the 90m level and 151m level platforms inside the East and West Smokestacks. The positioning of the tank(s) shall be proposed by proposed based on the instrumentation and piping study performed by C&I Engineering.

The *Contractor* shall receive the design reports and drawings for the platforms from the *Employer*. Further, the *Contractor* shall liaise with the *Employer* on further civil and structures information required for the assessment.

3.2.5 Documentation

The *Contractor* is responsible to plan for the supply of the documentation for the installations and commissioning.

3.2.5.1 Documentation control

All documents and records management are performed according to Technical Document and Record Management Work Instruction (240-76992014), Generation 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 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).

3.2.5.2 Documentation Pre-submission (VDSS)

The *Employer* will compile and provide the 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 or Scope of Work.

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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 *Employer* 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.

3.2.5.3 Process for Documentation Submission

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 Manager*. The *Contractor* adheres to one soft copy in a compact disc and one hard copy per station.

3.2.5.4 Documentation Recording

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

3.2.5.5 Documentation Review and Turn-around.

The *Employer* has a maximum 7 working days to review and consolidate review comments for documentation submitted by *the Contractor*. The *Contractor* also has a maximum of 7 working days to respond and / rectify as per the comments by the *Employer*.

3.2.6 Quality Management

The quality requirements are as per ISO 9001:2008 and *Employer* Quality Standard, QM 58. This quality management philosophy is developed from the basis that manufacturers produce quality products, supervisor oversees the process, checks quality but liability for quality remains with the

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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 QCP must be aligned to, and reference ISO 10005:2005 QMS, guidelines for quality plans and in compliance with the guideline in 240-105658000. The QCP will refer 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.

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).

The *Contractor* submits the following documents within 10 working days of the Contract Date to the *Project Manager* for review and acceptance prior to the commencement of work:

- a) The *Contractor's* QMS compliance with the requirements of ISO 9001:2008
- b) *Contractor's* quality manual
- c) *Contractor's* quality procedures
- d) *Contractor's* quality forms and work instructions
- e) *Contractor's* quality system documents referenced in this Works Information

The *Contractor* supplies the *Project Manager* with a QCP or ITP for review and acceptance.

The *Contractor* supplies the *Project Manager* with a detailed contractor organogram showing the quality personnel to be used in the Contract. The *Contractor* provides CVs of the quality management employees who will be responsible for quality.

The *Contractor's* Quality Management employee's responsibilities include but are not limited to the following:

- a) Implementation of the QMS.

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- b) Administration of QA/QC systems.
- c) Verification of approval status of Sub-*Contractor's* QCP and procedures.
- d) On-and-offsite inspections.
- e) Co-ordination, inspection, and verification of the *Employer's* intervention points.
- f) Review of *Contractor* testing and inspection documents (procedures, test results).
- g) Reporting on quality performance.

The requirement to submit these documents does not constitute a compensation event.

3.2.6.1 Quality Responsibility

- a) The *Contractor* is accountable for the quality of the output and liable for any failures.
- b) The *Contractor* is responsible for defining the level of intervention of QA/QC or inspections. These are in line with the *Employers* requirements.
- c) The *Contractor* is responsible for defining the level of intervention of QA/QC or inspections to be imposed on his Sub-*Contractor's*, suppliers and sub-suppliers and must ensure that these are in line with the *Employer's* requirements.
- d) The intervention requirements take into consideration the criticality of the Plant and Material.
- e) The intervention points include all witness, hold, verification and review points required by the *Employer*. The *Contractor's* failure to allow the intervention points will constitute a non-conformance.

3.2.6.2 Non-Conformances and Defects

Where NCR's and Defect notifications are issued, the *Contractor* acknowledges receipt within 48 hours and proposes corrective and preventive actions to the *Project Manager* as per the contract response period. The corrective and preventive actions will include the implementation and completion dates. Progress on all NCR's and Defect notifications issued to the *Contractor* must be reported to the *Project Manager* on monthly basis.

The *Contractor's* Quality Manager keeps a register of all NCR's and Defect notifications issued. Deviations from the Contract are treated as a non-conformance. Records of NCRs and Defect notifications are kept and form part of the data book records.

During the contract execution phase, the *Contractor* will be monitored by the *Project Manager* for performance on quality related aspects. The monitoring will be in the form of audits and assessments.

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3.2.6.3 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 Parts of the works which the Contractor is to perform.

The *Contractor* shall carry out, compile a Kusile specific detailed CEMS for the installation base. The *Contractor* shall do a site visit, inspect, and determine analysers and other project equipment placement, alarming remotely with non-voting systems and best measurement range to achieve the highest possible detection coverage. 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 commission the CEMS replacement.
- d) All instrument installation and accessories shall be executed and supervised by personnel experienced in this type of work.
- e) Sequence of installation work shall be coordinated with the Engineer and other *Contractors* to support the project commissioning schedule.

3.3.1 Procedure for submission and acceptance of Contractor's design

The *Contractor* shall meet requirements specified in section 3.2 of this Scope of Work. The *Contractor* shall confirm compliance to the specified requirements as well as provide the design documents 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, QMS [1].

4. Acceptance

This document has been seen and accepted by:

Name	Designation
Mauritz van der Bank	Chief Technologist Engineering
Puseletso Ndlovu	C&I Engineering Manager
Thabang Lejakane	FGD Engineering Manager
Siyabonga Mtsweni	Boiler Engineering Manager
Mohapi Mphirime	Electrical Engineering Manager
Busi Nkomo	Auxiliary Engineering Manager
Grace Olukune	Engineering Group Manager
Lesiba Kgobe	Environmental Manager
Thobile Yonga	Manager OCC Hygiene

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5. Revisions

Date	Rev.	Compiler	Remarks
December 2024	1	S. Mdakane	This document was compiled to provide requirements for the Kusile Power Station CEMS Replacement project.

6. Development Team

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

- a) Siphesihle Mdakane
- b) Boikobo Sikhosana
- c) Hloni Ramorena
- d) Sbusiso Nzama
- e) Musa Ngwane
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- g) Siyabonga Zwane
- h) Mncedisi Nkosi

7. Acknowledgements

- a) Puseletso Ndlovu

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Appendix A: Kusile Power Station OHS Process Flow for Tender

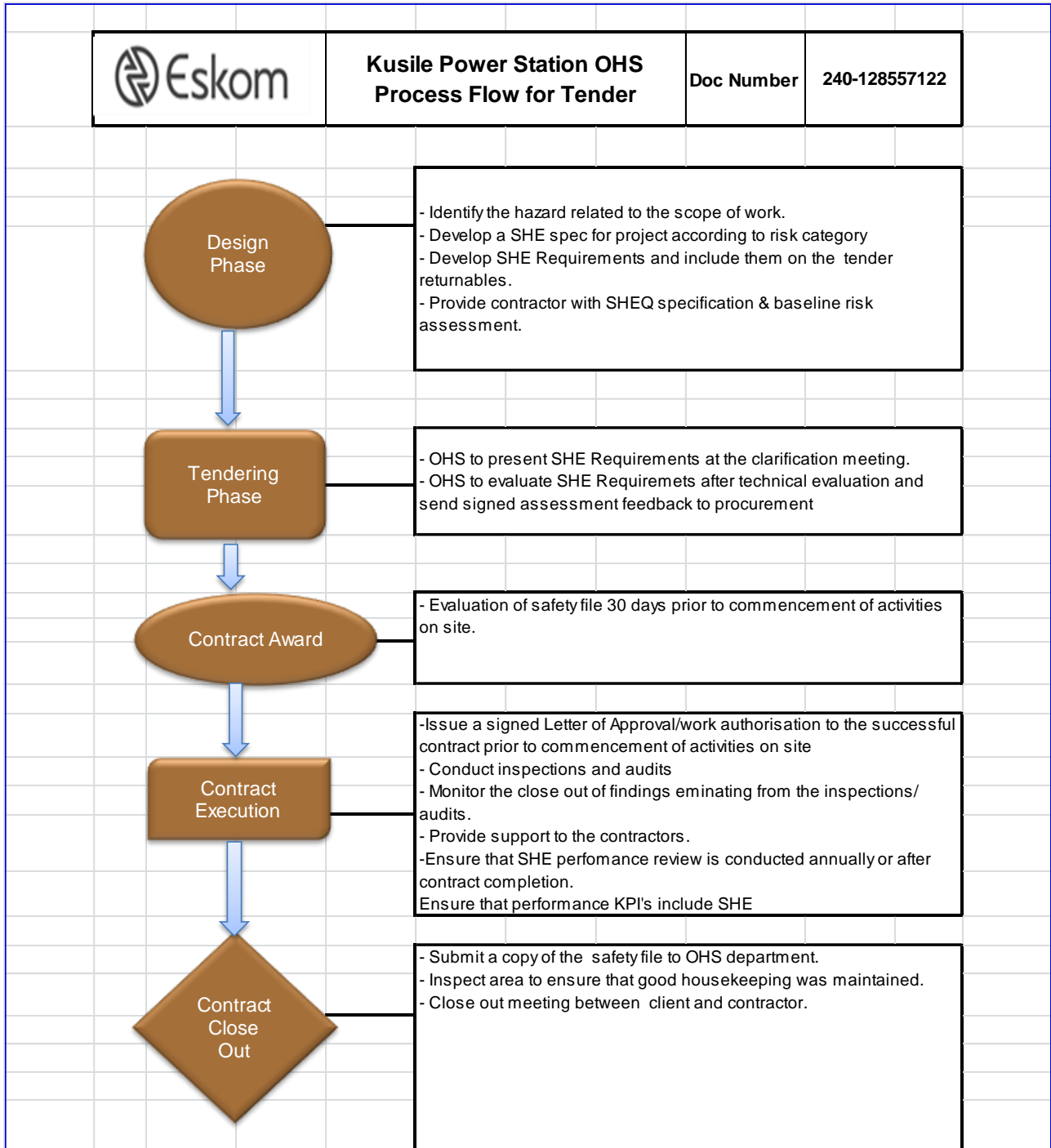


Figure 1: Kusile Power Station OHS Process Flow for Tender.

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