Eskom	Scope of Work	Kusile Power Station

Title: **Kusile Power Station SDD Oil Separator Plant Repair Scope of Work**

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1. Introduction

The Oil Water Separator (OWS) Plants at Kusile Power Station form a critical part of the station's environmental compliance and pollution prevention infrastructure. The purpose of the OWS Plants is to separate oil, grease and hydrocarbons from contaminated water prior to discharge or further treatment. The reliable operation of these plants is essential to ensure environmental compliance, protect surrounding ecosystems, minimise pollution risks and support the safe operation of Kusile Power Station.

The OWS Plants comprise electrical, control, instrumentation, protection, pumping and monitoring systems which operate together to provide the required oil-water separation functionality. Following vandalism and theft incidents, both Oil Water Separator Plants located within the same operating area were extensively damaged. The theft affected the associated Motor Management Centres (MMCs), Distribution Boards (DBs), power and control cabling, instrumentation cabling, electrical protection equipment, control equipment, earthing conductors, cable terminations, KKS identification tags, equipment labels and associated plant infrastructure.

The pumps, motors and cable racks remain installed in their original positions and are generally intact; however, the electrical and control infrastructure has been rendered non-operational. This project is a restoration project and not a plant redesign project. The existing approved drawings shall remain the governing design documents for the execution of the works. No new plant design drawings are required for the restoration of the existing installations. The only approved enhancement to the existing plant configuration shall be the provision of new containerised enclosures to house and protect the MMCs from environmental conditions, vandalism and theft.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this project is to restore both OWS Plants to their original design and operational condition using the existing approved drawings, cable schedules, KKS schedules, OEM data books and technical documentation provided by Kusile Power Station.

2.1.2 Applicability

This document shall apply to Kusile Power Station.

2.1.3 Effective date

This document is effective from the date of the authorization.

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

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2.2.1 Normative

[1] ISO 9001 Quality Management Systems

[2] Insert normative document references here.

[3] Act No 73 of 1989: The Environment Conservation Act No 107 of 1998: National Environmental Management Act, 1998

[4] Act No 14 of 2009: The National Environmental Act, 1989

[5] Act No 102 of 1980: National Key Points Act, 1980

[6] Act No 36 of 1998: National Water Act, 1998

[7] Act No 85 of 1993: Occupational Health and Safety Act & Regulations, 1993.

[8] GGR 0992: Plant Safety Regulations

[9] Act No 14 of 2009: The National Environmental Laws Amendment Act, 2009

[10] Act No 73 of 1989: The Environment Conservation Act, 1989

[11] 32-846 Rev 0 Operating Regulations for High Voltage Systems

[12] 240-134613227 List of Hazardous plant areas

[13] NMP47-7 Rev 0: Application of KKS Plant Coding

[14] Contractor OHS Management Strategy

[15] Contractor Safety Improvement Plan

[16] GGSS 1181: Specification for chemical product and material used in a power

2.2.2 Informative

[1] Insert informative document references here.

[2] 414 - 32 Rev 0: Kusile Maintenance User Requirement Specification

[3] 32 - 726 Rev 0: Mandatory S.H.E. Requirements for the Eskom Procurement and Supply Chain Management Process

[4] 237 - 0016 Rev 0:Integrated Business Improvement – prevention and improvement standard

[5] GGR 0992: Plant Safety Regulations

[6] NMP47-7 Rev 0:Application of KKS Plant Coding

[7] 36 -702 Rev 1: Remnant Life Monitoring

[8] GGSS 1181:Specification for chemical product and material used in a power plant

[9] GVLIR 0007:Safety, Health and Environment Specifications for Contractors

[10] ESKASAAA3:Eskom approval of personnel performing quality related special processes.

[11] 32-726 Annexure C: S.H.E. Requirements for Tender Enquiries

[12] 32-726 Annexure D: S.H.E. Tender Evaluation and Scoring Card

[13] 32-726 Annexure E: Supplier Suspension

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[14] 36 – 942: Arc Flash Protection Specification

2.3 Definitions

Definition	Explanation
Availability	**Period when a system is operating satisfactory when used under specified conditions**
Contractor	Service provider contracted to provide a specific service to Eskom, Kusile Power Station.
Employer	Eskom, or Eskom Kusile Power Station or representative.
KWENA	Anti-theft earthing cable

2.4 Abbreviations

Abbreviation	Explanation
OWS	Oil Water Separator
MMC	Motor Management Centres
DB	Distribution Boards
KKS	Kraftwerk-Kennzeichensystem
OEM	Original Equipment Manufacturer
FAT	Factory Acceptance Test
SAT	Site Acceptance Test
SANS	South African National Standard
ISO	International Organisation for Standard
TBA	To Be Announced
AC	Alternating Current
KW	Kilowatt's
LV	Low Voltage (less than 1000V)
ORHVS	Operating Regulation for High Voltage Systems
PPE	PPE Personal Protective Equipment
PSR	PSR Plant Safety Regulations
QCP	Quality Control Plan
SHE	Safety, Health and Environment
SOW	Scope of Work
URS	User Requirements Specification
VSD	Variable Speed Drive
V	Volts

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2.5 Roles and Responsibilities

2.5.1 Contractor

a) All Contractor employees shall comply with Eskom's policies and site regulations, adherence to Eskom's cardinal rules, smoking policy, zero tolerance on alcohol usage, etc. These requirements will be detailed during the induction training process.

b) The number of maintenance staff required to execute the works is to be recommended by Kusile, but the Contractor is responsible for allocating adequate resources in order to provide the required services, after his/her assessment of the scope of work and submitted to the Employer for approval.

c) The successful Contractor shall utilise/provide skilled and suitably qualified staff (in line with Eskom Job specifications) with current experience in the following but not limited disciplines;

i. Competent Maintenance Person according to OHS Act
ii. Occupational Health and Safety Act 85 of 1993
iii. NEC contract management
iv. Quality Management Control and Assurance procedures
v. Plant Safety Regulation authorisation
vi. Spares optimisation
vii. Plant optimisation and commissioning
viii. Procedure writing
ix. BOM compilation

d) Staff must meet minimum requirements of Eskom job descriptions, with additional requirements specified.

e) All personnel, certificates, will be kept valid and submitted to Eskom upon request

f) Safety file must be approved before contract commences, the requirements may be requested from the safety department

g) Proof of qualification is to be supplied on request by the Employer.

h) The Contractor ensures that all staff being brought to Kusile PS site has a valid fitness for duty certificate based on the specified plant man-job specification.

i) The successful Contractor shall utilise/provide skilled and suitably qualified staff (in line with Eskom Job specifications) with current experience of the scope.

j) All staff brought onto site in connection with this work scope should be able to fluently speak, understand and write in English.

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k) The Contractor shall employ in and about the execution of the works only such persons that are careful, competent and efficient in their several trades and callings and the Employer shall be at liberty to object to and require the Contractor to remove from the works forthwith any person employed by the Contractor in or about the execution of the works who, in the opinion of the Employer, misconduct's himself or is incompetent or negligent in the proper performance of his/her duties and such person shall not be again employed for the works without the written permission of the Employer.

l) Ensures proper behaviour of personnel under his/her supervision as per the Kusile culture.

m) Ensures training of all personnel under his/her supervision. The training required will include but not limited to Eskom safety training requirements.

n) Ensures that throughout the duration of the contract that they conform and adhere to the safety, health and environment regulations as stipulated in the Kusile Maintenance URS.

o) The Contractor shall be responsible or held liable for any defects arising from poor workmanship performed by their staff, within a 48hours period from the time that the equipment is put into operation including collection and delivery to site.

p) The contractor must provide all the required PPE to his staff during any site visit

q) The contractor must ensure that all the necessary induction has been done before any work will start.

r) The contractor must ensure before any work is carried out, the correct equipment and hand tools is available to his staff and that it is in a good and safe working condition and complying to all OHSA requirements.

s) The contractor must assist the Security Department by providing a name list and copies of identity documents for all the workers at least one day before coming on site.

2.6 Process for Monitoring

a) Risk assessment shall be done and documented/filed for each task.

b) Safe work procedures or temporary work procedures shall be available and used for each job.

c) 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.

d) 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 including hazardous environments.

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e) The contractor must supply with the tender an approved and signed copy of the "contractor's safety management policy".
f) 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 will start.
g) The contractor must familiarize himself with the works and must make available his specific "housekeeping" action plans to ensure that the working areas and surroundings are kept safe and tidy during the duration of the works and after the work is completed successfully

2.7 Related/Supporting Documents

N/A

3. Scope Of Work

The Service Provider shall provide all labour, supervision, engineering support, transport, tools, testing equipment, materials, consumables and services necessary to execute the complete restoration of both vandalised OWS Plants.

The Scope of Work shall include, but not be limited to, the following:

3.1 Site Inspection and Verification

The Service Provider shall:

a) Conduct a comprehensive site inspection.
b) Verify the extent of theft and vandalism.
c) Verify all equipment locations against approved drawings.
d) Verify the condition of the pumps and motors.
e) Verify all cable routes.
f) Verify all cable rack installations.
g) Verify existing power supply arrangements.
h) Verify station earthing connection points.
i) Verify all remaining KKS identifications.
j) Verify existing cable numbers and equipment numbering.
k) Verify the condition of the remaining plant infrastructure.
l) Report discrepancies between site conditions and documentation.

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3.2 Design Basis and Restoration Philosophy

The Service Provider shall note that this project is a restoration project and not a plant upgrade or redesign project.

The Service Provider shall:

a) Restore both OWS Plants to their original operational condition.

b) Restore all equipment in accordance with the existing approved drawings.

c) Restore all cable installations in accordance with the existing cable schedules.

d) Restore all terminations in accordance with the approved termination drawings.

e) Restore all KKS identifications in accordance with the existing KKS schedules.

f) Restore all control and instrumentation systems in accordance with the approved design documentation.

g) Restore all protection systems in accordance with the approved drawings.

h) Restore all earthing systems in accordance with approved earthing drawings and station standards.

The existing drawings included in Appendix A.1 shall be used as the governing design documents.

No new plant design drawings shall be required for the restoration of the existing plant.

The Service Provider shall only produce:

a) Redline drawings.

b) As-built drawings.

c) Updated schedules where approved by Kusile Power Station.

d) Commissioning documentation.

The addition of new MMC containers shall be incorporated into the final as-built documentation.

3.3 Supply Of Plant, Equipment and Materials

The Service Provider shall supply and deliver all equipment, components and materials required for the complete restoration of both plants.

The supply shall include all equipment identified in Appendix A.2, including but not limited to:

3.3.1 Electrical Equipment

a) Motor Management Centres (MMCs).

b) Distribution Boards (DBs).

c) Circuit breakers.

d) Contactors.

e) Overload relays.

f) Protection relays.

g) Control relays.

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h) Control transformers.
i) Terminal blocks.
j) Selector switches.
k) Push buttons.
l) Indication lamps.
m) Internal wiring.
n) Surge protection devices.

3.3.2 Cabling

a) Power cables.
b) Control cables.
c) Instrumentation cables.
d) Earthing conductors.
e) Cable glands.
f) Cable lugs.
g) Ferrules.
h) Cable markers.
i) Cable cleats.
j) Cable supports.

3.3.3 Instrumentation Equipment

a) Instruments.
b) Junction boxes.
c) Marshalling equipment.
d) Instrument termination equipment.
e) Signal interfaces.

3.3.4 Ancillary Equipment

a) Termination boxes.
b) Labels.
c) KKS tags.
d) Name plates.
e) Stainless steel mounting hardware.
f) Safety signage.

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g) All equipment shall be new and compliant with the approved drawings and OEM requirements.

3.4 Restoration Of Both MMCs

Two MMCs serving the two OWS Plants were vandalised and stripped of equipment.

The Service Provider shall:

a) Supply replacement MMC assemblies.
b) Remove damaged equipment.
c) Install replacement equipment.
d) Restore all power circuits.
e) Restore all control circuits.
f) Restore all protection circuits.
g) Restore all instrumentation interfaces.
h) Restore all internal wiring.
i) Restore all terminal wiring.
j) Restore all KKS identifications.
k) Restore all safety notices and warning labels.

3.5 Replacement Of Distribution Boards

a) The Service Provider shall:
b) Remove damaged DBs.
c) Supply new DBs in accordance with the approved drawings.
d) Install all switchgear and protective devices.
e) Install all internal wiring.
f) Complete all power and control terminations.
g) Install all KKS labels.
h) Install all equipment identification labels.
i) Perform testing prior to energisation.

3.6 Supply And Installation of MMC Containers

To improve protection against adverse weather conditions and future theft, the Service Provider shall provide new containerised enclosures for both MMC installations.

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3.6.1 Container Supply

The Service Provider shall:

a) Supply four new container units.
b) Provide one container per MMC.
c) Provide 3-metre steel containers suitable for industrial applications.
d) Provide weatherproof and corrosion-resistant containers.
e) Provide lockable anti-theft doors and locking arrangements.

3.6.2 Civil Works

The Service Provider shall:

a) Carry out all necessary civil works.
b) Excavate and prepare the installation areas.
c) Design and construct reinforced concrete foundations.
d) Construct concrete plinths.
e) Install anchor bolts and mounting structures.
f) Reinstate disturbed surfaces and infrastructure.

3.6.3 Container Services

a) Each container shall be equipped with:
b) Internal lighting.
c) Internal power outlets.
d) Ventilation systems.
e) Industrial air-conditioning systems.
f) Cable entry systems.
g) Equipment mounting arrangements.
h) Safety signage.

3.6.4 Container Earthing

a) The Service Provider shall:
b) Connect each container to the station earth mat.
c) Bond all metallic structures.
d) Bond container doors.
e) Bond cable gland plates.
f) Bond internal frames.
g) Test and certify all earth connections.

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3.6.5 Container Identification

a) The Service Provider shall:
b) Install KKS labels on each container door.
c) Install container identification labels.
d) Install warning notices.
e) Install internal equipment identification labels.

3.7 Restoration Of Power, Control and Instrumentation Cabling

The Service Provider shall:

a) Supply and install all stolen power cables.
b) Supply and install all control cables.
c) Supply and install all instrumentation cables.
d) Utilise the existing cable racks.
e) Secure and dress all cables.
f) Install cable cleats.
g) Install cable markers.
h) Install ferrules.
i) Install cable identification tags.
j) Restore all cable numbers in accordance with existing plant documentation.

All cable sizes, specifications and ratings shall be as detailed in Appendix A.2.

3.8 Existing Power Cable Jointing

An existing power cable remains on site and shall be incorporated into the restored installation.

The Service Provider shall:

a) Supply a new termination box.
b) Install the new termination box.
c) Joint the existing cable through the termination box.
d) Supply all glands, lugs and jointing materials.
e) Perform insulation resistance testing.
f) Perform continuity testing.
g) Verify phase rotation.
h) Verify cable integrity.
i) Provide test reports.

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3.9 Earthing System Restoration

All stolen earthing conductors shall be replaced.

The Service Provider shall fully restore the station earthing system associated with both OWS Plants.

3.9.1 Structural Earthing

a) The Service Provider shall supply and install:
b) Aluminium earthing conductors for structures.
c) Aluminium earthing conductors for cable racks.
d) Aluminium earthing conductors for support steelwork.
e) Aluminium earthing conductors for container structures.
f) Aluminium earthing conductors for metallic plant structures.

3.9.2 Active Electrical Earthing

a) The Service Provider shall supply and install:
b) KWENA equivalent insulated earth cables.
c) Insulated earth conductors for MMCs.
d) Insulated earth conductors for DBs.
e) Insulated earth conductors for motors.
f) Insulated earth conductors for instrumentation systems.
g) Insulated earth conductors for active electrical equipment.

The Service Provider shall:

h) Connect all equipment to the station earth mat.
i) Restore all earth bonds.
j) Restore all earth continuity paths.
k) Test all earth connections.
l) Perform earth continuity tests.
m) Perform earth resistance tests.
n) Submit certified test reports.

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3.10 Restoration Of KKS, Cable Numbering and Labelling

The Service Provider shall restore the complete plant identification and labelling system.

The Service Provider shall:

a) Verify all existing KKS tags.
b) Verify all existing cable numbering.
c) Verify all existing equipment labels.
d) Restore missing KKS identifications.
e) Restore damaged KKS identifications.
f) Restore missing cable numbers.
g) Restore equipment labels.
h) Restore motor labels.
i) Restore pump labels.
j) Restore instrumentation labels.
k) Restore MMC labels.
l) Restore DB labels.
m) Restore container labels.

All labels shall match the existing plant identification system.

3.11 Motors And Pumps

The Service Provider shall:

a) Inspect all motors.
b) Inspect all pumps.
c) Verify insulation resistance.
d) Verify winding condition.
e) Verify equipment integrity.
f) Restore all power connections.
g) Restore all control connections.
h) Verify rotation direction.
i) Conduct functional testing.
j) Conduct operational testing.

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3.12 Control And Instrumentation Restoration

The Service Provider shall:

a) Restore all field instrumentation.
b) Restore all control systems.
c) Restore all alarms.
d) Restore all indications.
e) Restore all interlocks.
f) Restore all monitoring functions.
g) Restore all process control functions.

The Service Provider shall perform:

a) Loop checks.
b) Calibration verification.
c) Functional testing.
d) Alarm testing.
e) Interlock testing.
f) Signal verification.

3.13 Testing And Commissioning

The Service Provider shall perform complete testing and commissioning of both OWS Plants.

Testing shall include:

3.13.1 Electrical Testing

a) Insulation resistance testing.
b) Continuity testing.
c) Earth continuity testing.
d) Cable testing.
e) Protection testing.
f) Functional testing.
g) Phase rotation verification.

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3.13.2 Instrumentation Testing

a) Loop checks.
b) Alarm testing.
c) Interlock testing.
d) Functional testing.
e) Signal verification.

3.13.3 Mechanical Testing

a) Pump testing.
b) Motor testing.
c) Operational testing.

3.13.4 Integrated Plant Testing

a) Manual operation verification.
b) Automatic operation verification.
c) Interlock verification.
d) Sequence testing.
e) End-to-end functionality testing.

3.14 Documentation, Data books And Handover

The Service Provider shall submit:

a) OEM data books.
b) Equipment manuals.
c) Factory test certificates.
d) Calibration certificates.
e) Cable test reports.
f) Earthing test reports.
g) Inspection reports.
h) FAT documentation.
i) SAT documentation.
j) Commissioning reports.
k) Redline drawings.
l) As-built drawings.
m) Updated cable schedules.
n) Updated KKS schedules.

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The plant shall only be considered complete upon successful commissioning, submission of all documentation and formal handover to Kusile Power Station.

3.15 References

All work shall be carried out in accordance with:

a) Existing Approved Electrical Drawings.
b) Existing Approved MMC Drawings.
c) Existing Approved DB Drawings.
d) Existing Approved Cable Routing Drawings.
e) Existing Approved KKS Schedules.
f) Existing Approved Cable Schedules.
g) Existing Approved Termination Drawings.
h) OEM Databooks.

4. Acceptance

This document has been seen and accepted by:

Full Name and Surname	Designation
Abel Vuma	Maintenance Manager
Mashudu Monyai	Electrical Engineering Manager
Bongekile Makini	Electrical Maintenance Manager
Collin Lepee	Electrical Senior Technologist
Ntombifuthi Ngwenya	Electrical Maintenance Senior Supervisor
Buti Makunyane	Electrical Maintenance Senior Supervisor

5. Revisions

Date	Rev.	Compiler	Remarks
September 2026	1	Vely Sondezi	First Issue

6. Development Team

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

a) Vely Sondezi
b) Ntombifuthi Ngwenya

7. Acknowledgements (if applicable)

Generation Maintenance teams.

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Appendix A – Eskom Document Hierarchy

A.1 Drawings

A.2 Equipment list

A.3 Electrical components datasheet

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