Eskom	Kendal Outside Ash Maintenance Scope of Work	Engineering

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Content

1. Scope Compilation Reference

SCOPE COMPILATION REFERENCES				
SOURCE & Ref No.	**Yes**	**No**	**N/A**	**Comments**
Previous outage service reports		X		
Return to service data packages		X		
Maintenance Strategy with Rev number	X			*1024674
SAP defects (attach list as appendix)	X			
GHRMS (STEP) reports (Generation Heat Rate Management System)		X		
Online Condition Monitoring		X		
Pre-outage performance test results	X			To be assessed before Execution
Post outage performance test results	X			To be assessed before Execution
GPSS/ Plant Performance data on UCLF incurred			X	
OMS / IIRMS recommendations (Audits Reports)			X	
Risk controls (IRM system)			X	
Previous audits and reviews (e.g. ERAP)			X	
Engineering Change Requests (Projects)			X	
LOPP strategy reports			X	
URS			X	
Philosophy (Outage)			X	
Condition Monitoring Report	X			
VA/PHD Viewer trends			X	
Corrective Actions	X			To be informed by failures
CARAB reports			X	
Statutory Requirements			X	
Grid code requirements			X	
Waivers and Exemptions			X	
Calibration requirements			X	
Previous Outage SOW variations			X	
Post Mortems Actions from previous outages			X	
Pre–Outage plant walks	X			
Risk based inspection (RBI) report			X	
Simulation, TOIs, OON, SI			X	

SUBSYSTEM	Y / N	Page №

2. Executive Overview

The *Contractor* shall provide and manage an all-inclusive mechanical maintenance service for the Outside Ash Plant at Kendal power station as specified in the Works information.

The *Contractor* will comply with the applicable SHE legal and Eskom SHEQ requirements to ensure that Eskom's goal of zero harm to employees, *Contractor*s, public and the environment is achieved. The *Contractor* shall develop a SHE plan and prepare a SHE file which meets these requirements as well as all relevant applicable legislation. The high-level works information covers trouble shooting all faults and defects pertaining to the Outside Ash Plant systems, maintenance of all mechanical and hydraulic systems, assistance during the execution of electrical and C&I maintenance work, and all administration work related to services provided.

The *Contractor* shall perform planned and opportunity maintenance work. The *Contractor* shall provide all necessary resources in the form of qualified and competent crew, and certified tools and equipment required to provide services. The Contractor will be expected to provide Spares to execute the scope of work. The *Contractor*'s team must be led by competent, qualified, and experienced leaders constituting of site manager, safety manager, quality controller and supervisors.

The *Contractor* shall ensure that asset management activities are performed to improve reliability, availability and sustainability of Eskom's assets and will be in line with strategic objectives and principles of Eskom as per Eskom Maintenance Policy, Document Identifier 32-1205. The *Contractor* is subjected to requirements of Maintenance Effectiveness Assessment Standard, Unique Identifier 240-105733494.

2.1 Definitions

Definition	Explanation
General Overhaul	(> 6 weeks) This is a full turbine centreline outage Boiler statutory inspection/tests and refurbishment Boiler & turbine auxiliary plant refurbishment
Inspection	(1 - 2 weeks) For inspection purposes only to determine scope of work or obtain history, i.e., fans, boiler, ducting, air heaters and precipitators/FFP
Interim Repairs	(2 - 4 weeks) This is done between a GO and MO Scheduled to perform critical repairs to prevent plant failures until the next scheduled outage like boiler tube leak prevention, air heater- and precipitators/FFP repairs/washing
Mini Overhaul	(4 - 6 weeks) This is a partial turbine centreline outage Scheduled at intervals between GOs to perform outage related refurbishment work that: Prevents the unit to run from GO to GO, typically boiler, air heater, burner, and ducting work etc. GO activities that can fit in during the outage without extending the duration to relieve resource risks and congestion during GO's, typically turbine steam admission valve refurbishment and generator inspections
Short Term Planned Repairs	(As required) Any planned work required outside of the normal outage philosophy Planned and requested 28 days in advance

	Readiness indicator and ORC Risk Report to be submitted with the request
Maintenance	A combination of all technical, administrative, and managerial actions during the lifecycle of an item intended to retain it in, or restore it to, a condition in which it can perform its required function.
Condition Based Maintenance	Predictive maintenance carried out because of findings from analysis of parameters measured under a condition-monitoring regime, or from recommendations from reliability analysis.
Corrective Maintenance	The process of restoring asset / plant and equipment which have failed or deteriorated to a state which renders it unable to meet the acceptance criteria required for its application.
Preventive Maintenance	Planned time or schedule-based maintenance carried out with the explicit objective of preventing functional failures and is directed towards maintaining the physical condition of the asset / plant or equipment. It includes scheduled overhauls and scheduled replacement of worn-out parts or failure prone components.
Reliability Centred Maintenance (RCM)	RCM represents a disciplined decision logic approach that focuses on the consequences of failure to develop the most cost-effective lifetime maintenance programme. The decision logic question is sequenced to those parts of the asset / plant that are maintenance significant. Significant components failure modes are evaluated to identify appropriate maintenance tasks and their costs
Reliability Basis Optimisation (RBO) Analysis	A structured methodology for analysing equipment or component failure and defining the tasks required to detect, mitigate, or even tolerate potential failures. Considerations are many and include the component function, its history of failure, its failure modes, the consequence of failure and the causes of failure. **NB**: currently Maintenance Basis Standardization is being phased in to replace the RBO.

Inspection	Activities, which by means of examination, observation, or measurement, determine the conformance of material, parts, components etc., to predetermined specifications and quality requirements.
Functional failure	The inability of a system or component to fulfil one or more intended function/s to a standard performance that is acceptable including the complete failure to perform its intended function.
Testing	All activities required determining the actual performance or condition of an item.
Critical spares	Critical spares are items of plant that will result in partial or full load loss or result a significant increase in the risk of having load losses or will have a negative impact on health, safety, the environment, or statutory compliance, if the replacement item is not available. Spares for all Level 1 and 2 components are also classified as critical spares. For critical components a minimum of one spare must be always kept.

2.2 Abbreviations

Abbreviation	Explanation
AHP	Ash Handling Plant
APM	Ash Plant Manager
DHP	Dust Handling Plant
EMD	Electrical Maintenance Depart
ENG	Engineering
EOD	Electrical Operating Desk
GO	General Overhaul
IR	Interim Repairs
i/s	In Service
MO	Mini Overhaul
MPa	Mega Pascal

Abbreviation	Explanation
MW	Mega Watt
PTW	Permit to work
P.O	Plant Operator
RP	Responsible Person
s/by	Stand By
SE	System Engineer
SM	Shift Manager
SOW	Scope Of Work
SS	Shift Supervisor
SSC	Submerged Scrapper Conveyor
SSS	Senior Shift Supervisor
PPE	Personnel Protective Equipment
PCLF	Planned Capability Loss Factor
TPH	Tons Per Hour
UCR	Unit Control Room
UCLF	Unplanned Capability Loss Factor

2.3Roles and Responsibilities

The goal of this scope of work is to establish the contract for mechanical maintenance activities on the Kendal Outside Ash plants; therefore, the Maintenance Services sought must help Eskom – Kendal power station with the realisation of the following benefits:

- Flexibility in the effective management of workload and the control of the work force involved in the service and operations of the Outside Ash Plant,
- Reduction in Mean Time to Repair,
- Increase in plant availability, reliability, and efficiency of the Outside Ash Plant systems to achieve station KPI targets.

Below are the roles and responsibilities of the *Contractor* to ensure that the above benefits are realised:

a) All *Contractor* employees shall comply with Eskom's policies and site regulations, and it is *Contractor*'s responsibility to ensure that his / her staffs are conversant with them throughout the duration of the contract.

b) The staff utilised on site shall meet all the requirements to ensure that good quality work is always achieved, and Kendal culture is upheld.

c) The number of staff required to execute all the maintenance activities is to be decided by the contractor after his / her assessment of the scope of work and then submit to the *Employer* for approval.

d) The performance of the contractor shall be scored on the percentage completion of Engineering SOW, Outside Ash Plant's availability and reliability after handover to OPS.

e) *Contractor* shall do a comprehensive risk assessment prior executing any work on the plant, subsystem, and equipment, then take a PTW using his / her RP and on completion of the work shall properly conduct function testing, re-commissioning prior to the clearance of the PTW.

f) The *Contractor* shall be responsible to safely transport personnel while utilising the appropriate means as defined by Eskom requirements the resources (staff, equipment, and spares) to and from the site.

g) The *Contractor* shall be responsible or held liable for any defects arising from maintenance or operational faults after an intervention. The Contractor will be held responsible for poor workmanship performed by his or her staff and intentionally use of inferior spare parts. The guarantee periods shall be agreed upon with the contract Manager.

h) The *Contractor* shall be responsible for the return to service of the plant (including redundant plant) after a maintenance opportunity.

3. Objectives

The objective of this document is to provide a suitable contactor with the mandatory prerequisites to perform competent and quality mechanical maintenance activities on Kendal Power Station's Ash Handling Plant.

4. System Description

The Outside Ash plant is defined by the following boundaries:

- Transverse conveying system is subdivided into the following subsystems.
  - Transfer chutes from the conditioned ash and coarse ash conveyors
  - Transfer house E, housing drive units and tension carriage system
  - Emergency dumping facility
  - Belt conveying system:
    - Transverse conveyors, 00ETK11 and 00ETK21
    - Belt protection system (belt skew detectors, belt rip detectors) and mass meters.
    - Transfer chutes
    - Impact stations
    - Belt scrappers
    - Hydraulic moving heads
    - Winches and gravity take-up system for belt tension
- Overland conveying system is subdivided into the following subsystems
  - Transfer house F, housing drive units and tension carriage system
  - In-loading conveyor
  - Belt conveying system:
    - Overland conveyors, 00ETK12 and 00ETK22
    - Belt protection system (belt skew detectors, belt rip detectors) and mass meters.
    - Transfer chutes
    - Impact stations
    - Belt scrappers
    - Hydraulic moving heads
    - Winches and gravity take-up system for belt tension
- Extendible conveying system is subdivided into the following subsystems
  - Drive unit and tension carriage system
  - Belt conveying system:
    - Extendible conveyors, 00ETK13 and 00ETK23
    - Belt protection system (belt skew detectors, belt rip detectors)
    - Transfer chutes
    - Impact stations

- Belt scrappers
- Electric Winches for belt tension

- Shiftable conveying system is subdivided into the following subsystems
  - Drive unit and tension carriage system at the head stations
  - Belt conveying system:
    - Shiftable conveyors, 00ETK14 and 00ETK24
    - Belt protection system (belt skew detectors, belt rip detectors)
    - Transfer chutes
    - Impact stations
    - Belt scrappers
    - Electric Winches for belt tension

5. General Work Description

- The contractor will perform refurbishment and repair maintenance on the above mentioned plants as planned on opportunity maintenance.
- The contractor shall be highly competent in performing the required work BMH plant but won't be limited to these descriptions/instructions. The contactor will supply all the necessary tools, spares, and equipment to execute the job correctly and safely.
- The contractor will conduct site surveys on the ash plant condition and integrity before the planned work starts.
- The contractor shall submit a report to the System engineer containing the results of the survey with recommendations to prolong the plant life span and prevent breakdowns.
- Contactor will have enough qualified riggers, boiler makers and artisans to complete the work.
- An approved SOW with all the relevant Quality Control documents and an approved schedule will be given to the relevant Outage Planner and System Engineer.
- Contractor will also provide the following:
  - Artisans on site
  - Assistants on site
  - Standby schedule

- Vehicles to transport personnel, equipment, components, and supplies.
- Safety clothing and equipment
- Radios for communication with Outside plant control room.
- On site containers for personnel and spares.
- Eskom Approved Responsible persons for permits
- Quality control officers

- The contactor will be responsible for the removal of non-functioning equipment from the plant.
- The contractor shall keep track of all spares used within the maintenance period and submit a detailed report every week to the planner, contract manager and System Engineer.
- The contractor shall develop an execution timeline and complete the task within the given time frame.
- The contractor shall report and defect any additional defects to the system engineer, planner, and contract manager.
- The contractor will plan and arrange with the onsite Scaffolding contactor to erect any scaffolding that's required.
- The contractor will also comply to the following requirements:

No	Activity description	Acceptance criteria
1	Standard performance criteria used to assess and improve effectiveness of maintenance	Maintenance effectiveness assessment standard unique identifier 240-105733494
2	Training, evaluation, and authorisation of personnel for Operating Regulations for High Voltage Systems and Plant Safety Regulations	To comply with the mandatory requirements within generation environment refer to procedure identifier number 240-46979537
3	Administrate or manage maintenance work	Management of maintenance within Eskom – Generation shall ascribe to Eskom's PCM for manage maintenance work, 32-1304

4	Housekeeping **NB**: Plant cleaning e.g., unblocking, floor seeping and removal of excessive ash is executed by third party contractor	Working area to be clear of foreign objects and waste material e.g., used parts while the waste produced to be handled according to applicable environmental legislations (to properly disposed of onto the demarcated area). Gearboxes, hydraulic power packs and plumber block shall always be free from oil or ash deposits
5	Inspection and function testing of the conveyor system protections **NB**: All Ash Plant alarms and signals testing to be conducted by C&I maintenance in the presence of the contractor and all stakeholders including fire systems, but fire extinguishers will be done by the fire risk department.	The South African Mines Health and Safety Act of 1996 Occupational Health and Safety Act 85, of 1993
6	Belt conveyor replacement and splicing.	Quality control standards: 240-55864585 and 240-55864586
7	Equipment service or refurbishment or modification	Eskom's Quality Control Plan Unique Identifier no. *1021707
8	Replacement of components	Technical data sheet or specification and OEM manuals
9	Alignment and calibration	Quality assurance by third party
10	Quality Root Cause Analysis	Eskom Unique Identifier: QM-56
11	Function testing and commissioning	Plant operating parameters
12	Plant walk-downs	Check sheets
13	Plant Status	System Health report

Note: The Scope is focused on plant specific failures that have contributed to the poor system health and affected the general availability of the ash handling plant.

5.1 Outside Ash general systems

a) It is the responsibility of the contractor to do all preparation work for the part of the plant that he/she will be working at.

b) **Note:** when doing belt replacement, it is the responsibility of the contractor to de-tension the conveyor belt.

c) The contractor shall assure that they have and provide welding, rigging, fitting, boiler making and artisan expertise and all associated equipment.

d) The contractor shall assure that they have and provide Hydraulic systems expertise and equipment.

e) The contractor shall provide own personnel to apply and take permits for work execution.

f) The contractor shall perform their own quality control for all jobs on site. This must include the relevant quality control documentation withhold-points. All jobs must follow Eskom SMP's and PM's where applicable. If an SMP or PM is not available, the contractor must work together with Engineering, technical support, and maintenance to develop one.

g) The contractor shall be conversant with safe rigging methodology where rigging activities will be executed by the third-party contractor.

h) The contractor shall assist with the decommissioning of old OAP systems and installation on the new OAP systems.

i) The contractor shall be conversant with scaffolding plan and associated safety requirement where its building and removal will be done by the third-party contractor.

j) The contractor shall be conversant with fire system equipment.

k) The contractor shall be conversant with electrical and C&I activities.

l) The contractor shall be conversant with plant safety regulations as applicable to PSR.

m) The contractor shall be conversant with hot and cold splicing methods.

n) The contractor shall be conversant with conveying system protections.

o) The contractor should be conversant with all belt shift activities on an ash dump.

p) The contractor shall be conversant with ash stacker and ash spreader machines. This must include all functions such as crawling, luffing, and slewing of the machines.

q) The contractor shall be conversant with maintenance execution activities and all related planning and scheduling activities within OAP systems.

r) The contractor shall possess skills to interpret the condition monitoring report obtained from P&T and shall address all defects as stipulated by the report.

5.2 Ash conveying systems

1) The Contractor shall be responsible for resolving all defects (faults and failures) within the outside ash handling plant.

2) Typical belt conveying system defects are damaged idlers and pulleys, ash leakages at transfer stations, defective protection devices, belt misalignment, ripped conveyors belt and splices, damaged and missing safety guards and warning signs, defective drives, cleanliness, damaged unsafe structural work etc.
3) The contractor shall be responsible for plant walk-downs and inspections to identify parts of the plant that is not in a safe and good working condition and rectify those deficiencies. There shall be two types of check sheets in used, when the belt conveying system is running and stationary.
4) The Contractor shall be responsible for replacing all damaged idlers and pulleys on the entire ash handling plant. Idlers include (troughing, return, mass meter, impact, garland etc.)
5) Note: all pulley lagging activities will be performed by third party contractor, but it is expected that the contractor will provide general assistance required during the pulley lagging.
6) The Contractor shall be responsible for adjusting and replacing the belt and pulley scrapers i.e. (primary, tertiary, secondary and plough). The contractor will also be responsible for the maintenance, removal and installation of impact systems, belt skirting systems and belt guidance systems.
7) Note: Related splice work on all OAP conveyor belts will be performed by the third-party contractor but the expectation is that all the general assistance required will be provided by this contract.
8) The Contractor shall be responsible for replacing all defective bearings as part of the OAP conveying systems including cleaning, greasing, and changing all related parts. The contractor shall address all the defects coming from the P&T condition monitoring report where condition monitoring is done by the third-party contractor.
9) The Contractor shall be responsible to clean and service of all stacker and spreader hydraulic power packs including its respective lifting & lowering systems, all moving head power pack systems and gearbox oil circulation systems including their respective oil bund areas or drip trays.
10) The Contractor shall be responsible for maintenance, removal and replacement of the following systems, units, related equipment, and related components as per applicable strategy:
    - Impact stations
    - Hydraulic moving heads
    - mass meters,
    - NB: calibration of mass meters will be conducted by third part contractor.
    - In-loading conveyor
    - All electrohydraulic actuators
    - Bins and chutes liners
    - Ash plant chutes
11) The Contractor shall assure that conveyor belts are trained and not running skew.
12) The Contractor shall replace all missing and damaged belt skirts on all conveyor belts.

13) The Contractor shall be responsible to assist with all mechanical and structural scope during a belt shift outage on the ash dump. This will include but is not limited to:
    - Removal and installation of pontoons and associated equipment
    - Cable reel repairs and servicing and associated equipment
    - Movement of the head station platforms and associated equipment
    - Structural repairs

5.3 Lubrication work

1) The contractor shall provide the lubrication activity schedule or execution program aligned to the weekly OAP maintenance schedule which he or she must follow when providing the lubrication or greasing services. The contractor shall continuously revise the program to ensure its effectiveness.

2) All equipment and associated parts lubricated while the plant is in operation shall be monitored for abnormal noises and vibrations. Any anomalies should be reported to the maintenance supervisor, defect prioritised accordingly and then loaded on the system.

3) The contractor shall accordingly perform the leak checks on all responsible plant areas as part of the inspection schedule, raise and load the defect accordingly.

4) The contractor shall lubricate and grease all rotating equipment, flush, and top up all gearboxes and power pack systems and addressing the related.

5) The contractor shall execute all defects raised by P&T, all recommendations and all remedial actions identified by the third-party condition monitoring programme.

6) The contractor shall assist the third-party conditioning monitoring contractor during the taking of all oil and grease sample from the plant.

7) Clean and check for any mechanical damage and oil or grease or coolant leaks, all conveyor belts drive i.e., motors, gearboxes, hydraulic drives systems, coupling and moving head tanks and power packs including the ash dump machines hydraulic power packs and cylinders.

8) The Contractor shall be responsible for servicing, replacing, and greasing all plumber blocks including replacing missing nipple covers on all OAP conveyors and equipment.

9) The contractor shall be responsible for collection of oil and grease used from stores and to transport it to site for lubricating activities where dispensing equipment and transporting tools and equipment used are provide by the contractor.

10) The client shall provide the contractor with all grease or lubricants and oil used.

5.4 Drive train

1) The Contractor shall be responsible for maintaining, installing, or servicing ash conveying drive units

2) The Contractor shall be responsible for assuring that the gearboxes and couplings are inspected and have correct oil level

3) The Contractor shall be responsible for removal and installation of all filters and breathers on associated conveying systems

4) It is the responsibility of the Contractor to assure that hydraulic piping, joints, and fittings are not leaking

5) It is the responsibility of the Contractor to clean and service the cooling fan, its motor and radiator on applicable system

6) It is the responsibility of the contractor to ensure that all drive train baseplates have jacking bolts. The contractor is also to assist with laser alignment of the drive trains by providing manpower, rigging equipment and alignment expertise. The contractor will be responsible for performing all slow speed alignment using clock gauges etc.

7) **Note**: Related laser alignment work on all OAP conveyor belts will be performed by the third-party contractor but the expectation is that all the general assistance required will be provided by this contract. Laser alignment is only applicable to the high-speed section of the drive trains.

5.5 Ash structures

Taking into consideration that the maintenance contractor is responsible and accountable for the overall performance (reliability and availability) of the complete OAP to achieve station KPI targets and that the liners are main contributor to the conveyor belt damage, therefore chutes and bin repairs shall form the part of this contract where specifics are listed below:

1) The Contractor shall ensure that all transfer chutes and bins in the OAP are kept in good and sound working condition, therefore the contractor shall put in place measures to assure that chutes are proactively prevented from spilling ash. This can be assured by conducting integrity monitoring, prioritizing the identified defects, and executing work as per plan.

2) The contractor shall conduct scheduled inspections, test the functionality of the block chute detectors, check the condition of the liners and the inspection or access doors, and then compile the defects list.

3) The contractor shall assist with the removal of damaged liners of the chute and bins, and replacement thereof.

4) The contractor shall be responsible for all fabrication work of the chute, belt structures, machine structures and bin structures within the OAP.

5) The contractor shall be responsible for all cutting and welding activities within the OAP.

5.6 Cleaning

1) During maintenance activities, the contractor shall supply manpower, equipment, tools, safety equipment, and PPE, consumables, and cleaning equipment to be able to provide plant cleaning services at the locations where mechanical maintenance is required, where the cleaning methods utilised shall be effective and conducted in a safe manner.

2) Cleaning of all grease and lubricants spillages because of contractor's activity shall form the part of the plant housekeeping.

3) The contractor shall be responsible for cleaning and removing all grease or oil, dust and ash fines build ups from all plumber blocks and complete coupling systems within the OAP.

4) The removal of excessive dirty or ash spillages around the working area during emergency situations will be done by the third-party cleaning contractor on instruction from RP prior conducting the maintenance activities.

5) The contractor shall ensure that the integrity of the plant labelling is always upheld and immediately report all prevailing deficiencies. The contractor shall not install its own identification labels on the plant.

6) The contractor shall be responsible for the removal to the designated areas of all waste during the execution of the maintenance activities as per applicable legislation.

5.7 General information notes:

1) In the case of a breakdown, the contractor shall be highly competent in performing the required work on each plant but won't be limited to these descriptions/instructions. The contractor will supply all the necessary tools and equipment to execute the job correctly and safely. This must be done within a 2-hour repair commencement envelope.

2) Contractor must provide a daily standby schedule and standby crew for weekends

3) The contractor must have an on-site container for personnel and spares.

4) The contractor must have an Eskom Approved Responsible person for taking job permits

5) The contactor will be responsible for the removal of non-functioning equipment from the plant.

6) The contractor shall keep track of all spares used within a 30-day period and submit a detailed report every month to the Maintenance Manager and System Engineer.

7) The contractor shall attend to defect according to Priority and complete the task within the given time frame.

8) The contractor shall report and defect any additional defects found. This must be done through emails and logged onto the FLIP and SAP systems.

9) The contractor will plan arrange with the onsite Scaffolding contactor to erect any scaffolding that's required.

5.8 Welding Criteria

The contractor shall comply with the following, but not limited to:

- Welder qualification ISO 9606

- Welding operation shall be in compliance to Eskom Welding Procedure 15614
- Control of Welding during Construction, Repair and Maintenance Activities Standard-240-56241933

5.9 Technical Criteria

The *Contractor* shall possess the skills to carry out the technical plant risk assessment on all the systems that form the part of the OAP and submit the report with recommendations to the system engineer on prior and during outages.

Technical plant risk assessments expected are as follows:

- **FMECA** (Failure Mode Effects and Criticality Analysis) in accordance with Eskom FMECA Guideline: 240-49230046
- **RAM** (Reliability, Availability, and Maintainability study) in accordance with Eskom Guideline: 240-52844017
- **HAZOP** (Hazards and Operability) Study in accordance with Eskom HAZOP Guideline: 240-49230111

The objectives of the above assessments are to ensure that required plant reliability, availability and efficiency are sustained, and to feed new information into the maintenance optimisation programme refer to as System Health

Key performance indicators by which the contractor will be scored:

- Completion within agreed time frame based on the approved project plan (As supplied by the Contractor prior to the maintenance activity).
- Number of scope activities executed (Target 100%)
- Number of repeat defects after commissioning (Target = 0%).
- Time contribution for downtime of critical plant (Target = 0%).
- Quality of workmanship for known defects and timeous identification and addressing of defects.
- Identification of potential plant problems during inspections and addressing of these known issues.
- Zero forced shut down for rework will be allowed.
- Zero trips because of poor workmanship.

It is the responsibility of the C*ontractor* to ensure the correct quality of spares is used prior to installation. The *Contractor* shall report in writing if any quality issue is picked up prior to installation of such spares and written permission shall be granted before the work is executed using the specific spares. The *Contractor* is accountable for failure of spares and the rework of any breakdown or planned maintenance due to the lack in quality work.

5.10 Scope Variations

The contractor will attend to any variance in scope solely if it is approved by the Outage manager and if the new scope is clearly defined and understood.

5.11 Time Management

SOW shall be executed by the *Contractor* within the allocated outage duration. No work will be executed after the Unit is handed over to Operating.

5.12 Skills required

Various skills which are required for Ash Plant maintenance activities includes but are not limited to inspection or plant walk down, interpreting all related technical drawings, parts replacement, equipment installation, systems decommissioning and function testing, maintenance and repair of all mechanical equipment, hydraulic equipment and related structures used. It is expected that the contractor's crew has the technical understanding and knowledge of all the associated process control equipment for the EC&I systems.

The Contractor shall ensure that appropriate skills are available as and when required to evaluate, plan, assign, coordinate and execute outage and opportunity maintenance tasks. The Contractor shall be responsible for the administration work which involves execution plan development, job coordination, relevant resources assignment, availability of correct and sufficient spares prior execution, PTW management, commissioning, performance of the repaired system evaluation and reporting.

The contractor shall provide an organisational organogram related to this contract, which shall cover all the levels of execution from the site manager down to the lowest level of responsibility.

Below is the list of the minimum personnel required to properly execute the contract activities, but the onus is with the tenderer to ensure that all skills are indicated including the required quantity of the resources required:

Resources	Quantity	Qualifications
Site Manager	1	National Diploma (S4). Experience in management of the Bulk Material Handling Plant. At least 4-5 years proven experience on management of the Bulk Material Handling Plant At least 4-5 years proven planning and scheduling software experience.
Senior Mechanical Supervisor	1	N4 to N6. Trade Test Certificate or approved Red Seal Certificate (certified copies). experience on management of the Bulk Material Handling Plant At least 4-5 years proven experience on supervision of the Bulk Material Handling Plant

		At least 4-5 years proven planning and scheduling software experience.
Mechanical Supervisors	3	N4 to N6 in Mechanical Engineering. Trade Test Certificate or approved Red Seal Certificate (certified copies). Experience in welding, boiler making and fitting. At least 5 years proven Bulk Material Handling Plant
Quality controllers	3	S4 Mechanical/ N6 Mechanical with a trade test. Level 1 welding. At least 4-5 years proven experience in quality inspection or assurance field. At least a qualification in Quality Management Systems ISO 9001 At least 5 years proven Bulk Material Handling Plant maintenance experience. (certified copies).
Safety Officer	3	SAMTRAC 3-4 years' experience, or alternatively NEBOSH 2 years'

		experience. (certified copies).
Mechanical Fitter	12	Fitters employed by the Contractor shall be qualified and be able to submit proof of such qualification. Trade Test Certificate or approved Red Seal Certificate (certified copies).
Boiler Makers	3	Boiler Makers employed by the Contractor shall be qualified and be able to submit proof of such qualification. Trade Test Certificate or approved Red Seal Certificate (certified copies).
Welders	3	At least Welder qualification 9606. Trade Test Certificate or approved Red Seal Certificate (certified copies).
Riggers	3	Riggers employed by the Contractor shall be qualified and be able to submit proof of such qualification. Trade Test Certificate or approved Red Seal Certificate. (certified copies).
Mechanical assistants	12	Grade 10 (certified copies).

Site administrator	1	Administration certificate and 2-3 years' experience.
Storeman	1	Grade 10 (certified copies).
High-up truck (with wet rate)	1	8-10 tons
High-up truck driver	1	Valid national driver's license and PDP (Goods)
High-up truck driver assistant	1	Valid slinging requirements.

The contractor shall provide the personnel with the following minimum requirements in the form of a CV which is accompanied by valid and authenticable qualifications, experience, training, and related competency:

5.13 Tools and equipment requirements

The list of tool requirements to be supplied by the *Contractor* includes the following as a minimum but is not limited based on the *Contractor*'s own scope of work assessment:

- Complete toolboxes.
- Pneumatic/ Electric impact tools.
- Calibrated clocking gauges.
- Calibrated Torque wrenches.
- Bearing pullers and wrenches (Different sizes).
- Certified measuring equipment (Feeler gauge, Vernier, Micrometre etc.)
- Rigging tools and equipment.
- Supply and Use of Boiler-making tools if required to address the defects on the system. This may include CO_2 or Arch Welding equipment, Gas cutting and brazing etc.

- Supply and Use of a 380V/220V generator and lights for the use of tools to address defects in the plant and anytime of the day.
- Supply and use of mobile compressor for pneumatic tools.
- Electrical extension cords.
- Hydraulic jacks.

Note: Any other tools that might be required for the execution of the scope to be supplied by the contractor.

5.14 Preservation requirements

- N/A

5.15 Transportation Requirements

- Contractor is responsible to arrange transport to and from Kendal Power Station for the employees and must be within Eskom standards.

6. Detailed Scope of work

The Contractor shall obtain, interpret, clarify, and accordingly apply all appropriate compliance documentation and work execution requirements to safety, execution, function testing and commissioning of the conveyor equipment and ancillaries before proceeding. The Contractor shall prepare all material and resources required to effectively execute the allocated work. The Contractor shall prepare and approve all the execution project programs with duration, project team & responsibility per each task, QCPs and technical data or info required.

The Contractor shall coordinate his or her activities with others at the site prior commencement of and during the work activity. The Contractor shall apply and monitor safe requirements (isolation and tag out procedures) and housekeeping to establish and maintain a safe working environment throughout the outage. The Contractor shall perform allocated work in accordance with agreed plan, quality and within operating capabilities. The acceptance criteria for all activities executed shall be the quality control procedure (QCP). The Contractor shall ensure that the replaced equipment or

instrument is correctly labelled and coded. The contractor will be required to work 24 hours a day (7 days a week) and must provide shift roster.

System	Subsystem	Job Description
Transverse Conveyors 00ETK11 & 00ETK21 Overland Conveyors 00ETK12 & 00ETK22 Extendable Conveyors 00ETK13 & 00ETK23	Maintenance of discharge chute area.	Clean discharge chute and inspect/replace liners.
		Clean, repair install and set new belt scraper.
	Maintenance of conveyor and structure.	Replace pulley assemblies as well as pulley laggings as required based on inspections.
		Replace all worn idlers. Repair bent frames and fabricated missing frames.
		Open, clean, and repack or replace all pulley bearings.
		Inspect the physical condition of the conveyor belt. Replace conveyor belt if required.
		Inspect structure for damage corrosion and repair when needed.
	Maintenance of loading chute area	Clean discharge chute and inspect/replace liners.
		Clean chute and replace missing or worn tiles.
Shiftable conveyors 00ETK14 & 00ETK24	Maintenance of discharge chute area.	Clean discharge chute and inspect/replace liners.
		Clean, repair install and set new belt scraper.
	Maintenance of conveyor and structure.	Replace pulley assemblies as well as pulley laggings as required based on inspections.
		Replace all worn idlers. Repair bent frames and fabricated missing frames.
		Open, clean, and repack or replace all pulley bearings.
		Inspect the physical condition of the conveyor belt. Replace conveyor belt if required.

		Inspect structure for damage corrosion and repair when needed.
	Maintenance of loading chute area	Clean discharge chute and inspect/replace liners.
		Clean chute and replace missing or worn tiles.
	Belt shifts	Structural repairs during
		Removal and installation of pontoons and associated equipment
		Movement of the head station platforms and associated equipment
		Cable reel repairs and servicing of associated equipment

7. General Arrangement & Location Drawings

№	DRAWING NUMBER	TITLE
Drawing will be supplied as required and will remain the sole property of Kendal Power Station.		

8. Applicable Corporate/Generation/International Guidelines and Standards

№	REFERENCE NUMBER	DOCUMENT TITLE
1	Mine Health & Safety Act 29 of 1996	Mines Regulations
2	Occupational Health & Safety Act 85 of 1993	Factories Regulations
3	Unique Identifier 1016526	Permit to Work as per Plant Safety Regulations (GGR 0992)
4	ESKPVAEY6	Operating Regulation for High Voltage Systems
5	Unique Identifier 32-188	Eskom's Procurement and Supply Chain Management

№	REFERENCE NUMBER	DOCUMENT TITLE
6	Unique Identifier 240-48929482	Tender Engineering Evaluation Procedure
7	Unique Identifier 32-1304	Process Control Manual (PCM) for Manage Work
8	Unique Identifier 240-53114002	Engineering Change Management Procedure
9	Unique Identifier 36-943	Engineering Drawing Office and Engineering Documentation Standard
10	OPG 0159-35	Configuration Management Guideline
11	OPG 0163	KKS Coding and Identification System for Power Stations Guideline
12	Unique Identifier 32-727	SHEQ policy
13	ISO 9001:2008	Quality Management Systems Requirements
14	240-105658000 (QM 58)	Supplier Contract Quality Requirements Specifications
15	Unique Identifier *1017482	Quality Control Plan template form
16	BS EN 620 STD	Continuous Handling Equipment and Systems
17	Unique Identifier 36-1126	Specification for Corrosion Protection of Plant & Equipment with Coatings
18	GGSS 0407	Specification for Belt Conveyor Structural Steelwork & Welding
19	Unique Identifier 240-55864574	Onsite Hot Repairs on Steel Cord Reinforced Conveyer Belt Standard
20	Unique Identifier 240-55864576	Onsite Hot Repairs on Ply or Textile Reinforced Conveyor Belt Specification
21	240-56030556	Splicing procedure
22	ISO 14001	Environmental management Policy
23	240-53114002	Engineering Change Management Procedure
24	*1023822	Kendal outage Philosophy
25	GPM0072	Outage Management Procedure

9. General Considerations

ACTIVITIES	SPECIFICATIONS
PRE-REQUISITES / PRE-CONDITIONS	
Pre-work plan	a. The executor shall obtain, interpret, clarify and accordingly apply all appropriate **compliance documentation** and **work execution** requirements to safety, execution, function testing and commissioning of the conveyor equipment and ancillaries before proceeding b. The executor shall obtain, interpret, clarify and accordingly apply geological and survey data required to complete the allocated work c. The executor shall prepare all material and resources required to effectively execute the allocated work d. The executor shall prepare and approve all the **execution project programs** with duration, project team & responsibility per each task, **QCPs** and **technical data** or info required
Execution of the allocated work	a. The executioner shall coordinate his or her activities with others at the site prior commencement of and during the work activity b. The executioner shall apply and monitor safe requirements (*isolation and tag out procedures*) and housekeeping to establish and maintain a safe working environment throughout the outage c. The executioner shall perform allocated work in accordance with agreed plan, quality and within operating capabilities d. The acceptance criteria for all activities executed shall be the quality control procedure (QCP) e. The executioner shall ensure that the replaced equipment or instrument is correctly labelled and coded

	f. The executioner shall be responsible to update and approve all the existing reference drawings used in Micro Station or at least marked up
Pre-hand over	a. All the executed work shall be function tested to ensure compliance with OEM's instructions & site requirements, and commissioned (*start-up, shut down & running procedures*) prior hand over to Eskom b. Any modifications conducted to follow Engineering Change Management where all relevant technical documentation e.g. re-design information, component selection process, technical specification data and relevant technical drawings to be handed by Contractor during the hand over as requested by Kendal
SAFETY **Specified safety requirements for the specific system**	
System or Plant	**Safety requirements**
Access to Kendal site	All individuals shall attend induction course and the contractor shall provide and ensure that Safety File is approved
Inside ash plant areas	Agreement to comply to OHSA regulations (section 37 (2))
Inside ash plant areas	Appoint principal contractor to safely carry out construction work as per OHSA construction regulation 4
Inside ash plant areas	Ensure plant and equipment safety as per Kendal procedure 30/20/05-PI 001
Before starting any activity	Plant Isolation (permit to work) and tag out procedures
Inside Kendal site	32-95, Procedure to conduct EH&S Incident Management
ENVIRONMENT	

Specified pollution control requirements, specified waste management requirements, specified energy efficiency requirements.	
System or Plant	**Environmental requirements**
Ash Plant	Constant housekeeping to ensure safe working environment
	Oil spillages to be handled as per National Environmental Management Act
	Working areas to be cleared or cleaned from ash fines & debris
	Working areas to be well light and ventilated
QUALITY **All Outage QCP's to be done as per Kendal Control and Approval of QCP Process. (*1017482)**	
System or Plant	**Quality requirements**
Equipment manufacturing & / or repairs	On or off Kendal site manufacturing to be quality checked by Eskom – Kendal representative for acceptance
Function testing & commissioning	Function testing and commissioning to be conducted as per pre-approved function testing & commissioning procedure
Replacement or new equipment	No new or replacement component and instrument will be installed without a signed QCP and accompanying datasheet
RISK ASSESSMENT **A risk report with a complete list of risks, risk rating and mitigating actions for the specific plant system.**	
System or plant	**Risk requirements**
Prior and during any task every day	**Safety Officer to ensure that risk assessment, and risk control & management are properly conducted**

10. Acceptance

This document has been seen and accepted by:

Name	Designation
Siyanda Malgas	Auxiliary Engineering Manager (Acting)
Sazi Jele	Auxiliary Engineering Snr Engineer
Ramahlodi Maserumule	System Engineer
Mfanelo Hlongwani	System Engineer
Phindile Takane	Engineering Manager (Acting)
Aaron Masehla	Ash Maintenance Manager
Noma Khwele	Maintenance Manager
A Kgatla	Snr Supervisor Maintenance

11. Revisions

Date	Rev.	Compiler	Remarks
March 2025	00	R. Maserumule	Outside Ash Maintenance SOW