

 Eskom	Scope of Work	Generation
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Title: **Scope of Work for Tutuka Power Station Maintenance of Ash Conveyor Plant Facility for period of 60 months.**

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1. Introduction

The Ash Handling Plant is designed to handle both the coarse and pulverized fly ash from the six (6) boiler units to the Ash Disposal Facility (ADF) at Tutuka Power Station. The Ash Handling Plant scope of works covers all the six (6) units from unit 1 to 6, and the Common Inside Ash Handling Plant at the Power Station as well as the Ash Disposal Facility on the Ash Dump. The purpose of this maintenance contract is to ensure that the plant always remains reliable, available and maintainable during the station life (end of station life 2030). The maintenance philosophy of the plant requires that preventative maintenance, inspections, plant repairs and other activities must be conducted to preserve the condition of the plant –to ensure it is in a good state of repair. This document provides the details of the plant areas that must be covered, and the activities required to be done during the maintenance of the plant. The duration of this Maintenance Contract is 60 months.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this scope of works is to stipulate the work that must be performed during the maintenance of the Ash Handling Plant. The maintenance of the Ash Handling Plant includes the following but not limited to:

- all the coarse ash conveyors,
- all the conditioner conveyors,
- transverse and cross conveyors, overland conveyors,
- stacker (Main) system and spreader (Standby) system,
- the emergency off-loading and on loading facilities at TT02 (Emergency Ash Storage Facility),
- the brine water pipeline from the TT02 area to the ash dump sprayers and both the pump stations at the ash dump with all its pipelines,
- hosepipes and sprayers are part of this scope,
- the potable water supply line from TT02 to the ash dump head tank is part of the scope.
- and all ancillary included as indicated in this document.

2.1.2 Applicability

This document shall apply to Tutuka Power Station only.

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2.1.3 Effective date

The effective date is the authorisation date.

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] 15OPPROP/AP – 008 Ash Conveyors Cleaning and Maintenance Procedure.
- [2] 0.61/96347 Ash Dump Process Flow Diagram sheet 5 rev 0
- [3] 0.61/1482 Conveyor Equipment Schedule rev 4
- [4] 21.61/54817 Extendable Conveyor System P&ID rev 0
- [5] 21.61/54818 Shiftable Conveyor System P&ID rev 0
- [6] 21.61/54819 Spreader System P&ID rev 0
- [7] 21.61/54820 Stacker System P&ID rev 0
- [8] 0.61/17893 Stacker on Crawler General Arrangement A
- [9] 0.61/17894 Tripper Car General Arrangement rev 1
- [10] 21.61/54814 Ash conditioner conveyor P&ID drawing
- [11] 21.61/54815 Transverse conveyor P&ID drawing
- [12] 21.61/54816 Cross and overland conveyors P&ID drawing
- [13] 21.61/54766 Coarse ash conveyors P&ID drawing
- [14] 21.61/54821 Common plant scavenge water transport distribution & recovery system P&ID drawing

2.2.2 Informative

- [15] ISO 9001:2015 Quality management systems and standards.
- [16] 32-7 - Quality Management Policy

2.3 Definitions

2.3.1 Welding Artisan

Competent person who is qualified as welder and has underwent through the process of examination.

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2.3.2 Classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.3.3 Client

A person for whom repair work is being performed.

2.3.4 Engineer

- a) A competent person who-
 - i. Prepares a design;
 - ii. Checks and approves a design;
 - iii. Arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the **Employer**; or
 - iv. Designs temporary work, including its components;

2.3.5 System

An integrated set of constituent pieces that are combined in an operational or support environment to accomplish a defined objective. These pieces include people, hardware, software, firmware, information, procedures, facilities, services, and other support facets.

2.4 Abbreviations

Abbreviation & Acronyms	Description
ADF	Ash Dump Facility
AKZ	Anlagenkennzeichnungssystem
QCP	Quality Control Procedure
SHE	Safety, Health & Environmental
TPH	Tons per hour

2.5 Roles and Responsibilities

Designer:

- As per OHS Act (85/1993),
- Performs calculations, compiles drawings, design details and specifications (structures and plant must be resistant to corrosive environment),

Tutuka Operating:

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- Ensure system is operated according to the procedure to be developed by the designer

Tutuka Maintenance:

- Ensure the plant is maintained as per PM's developed by designer

2.6 Process for Monitoring

- Method Statement.
- Quality Control Plan.
- Splicing procedure.
- Fluid coupling filling procedure
- Shaft Alignment procedure

2.7 Related/Supporting Documents

N/A

3. Background

There are six (6) conditioner conveyors installed, that transport the conditioned ash from a designated ash conditioner to any of the selected (chosen) transverse conveyor. Each one of the conditioner conveyors has a moving head. There are six (6) short coarse ash conveyor, and six (6) long coarse ash conveyors installed which transport the coarse ash from the boiler's submerged scraper conveyors (SSCs) to any of the selected transverse conveyor. Each one of the long coarse ash conveyors has a moving head. There are two (2) transverse conveyors installed, that can feed any of the two (2) cross conveyors, and the two (2) cross conveyors can feed any of the two (2) ash overland conveyors (North and South). The transverse conveyor length is about 600 meters, and that of the cross conveyor is about 250 meters. The transverse conveyors each use a 110-kW motor drive, with each of the cross conveyors using a 90 kW drives –all installed with a gearbox and coupling. The conditioner and short coarse ash conveyors are using a 7,5-kW drives, whilst the long coarse ash conveyors are using a 11-kW size drives –all installed with a gearbox and coupling. The transverse and cross conveyor moving heads use a rack and pinion systems and chutes. Any of the two (2) cross conveyors can feed any of the ash overland conveyors. The ash overland conveyor structure is 3 800 meters long and each conveyor has two (2) drives (D001 and D002). The size of each of the drives is 300-kW, and both the conveyor are installed with an electric winch system for the belt tension control. This electric winch system consists of a motor, gearbox, winch drum, rope guides, sheeve wheels, ropes, and a trolley car with a bend pulley.

Both these ash overland conveyors can feed any one of the two (2) shuttles, either the main shuttle conveyor or the standby shuttle conveyor. The length of the main shuttle conveyor is approximately 20 meters, and the standby shuttle conveyor length is approximately 30 meters long. Each shuttle conveyor has a screw take-up at the tail end. The main shuttle conveyor feeds onto the main extendible conveyor. The standby shuttle conveyor feeds onto the standby extendible conveyor.

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The structure length of the main extendable conveyor is 3 000 meters, and this conveyor extends every year with 80 meters due to the growth of the main Ash Dump. The main extendable conveyor consists of three drives which are located at the tail end. This conveyor has a gravity take-up tower at its tail-end.

This main extendible conveyor feeds onto the shiftable conveyor, and the structure length of this conveyor is approximately 1 000 meters. This conveyor has a single 315-kW drive at the tail end and the electric winch system is also at the tail end of this conveyor. It consists of electric motor, gearbox, fluid coupling, cables, and trolley car. This complete conveyor is movable in case of stacker shifting.

This shiftable conveyor then feeds the link conveyor via the tripper car which travels along the length of the shiftable conveyor. The link conveyor then feeds the stacker boom conveyor atop the ash stacker machine. The ash stacker machine is a crawler mounted machine which supports the boom conveyor and the head section of the link conveyor. The stacker system can travel on the east side of the shiftable conveyor to perform the front-stack and it can travel at the west of the shiftable conveyor to perform the back-stack. The stacker boom conveyor can slew 240°, and this slewing system has two (2) drives with pinions and slew gear. The boom conveyor luffing system is a hydraulic cylinder system.

The length of the standby extendible conveyor is approximately 3 400 meters long and is extended over time depending on the growth of the standby ash dump area. The final length of this conveyor is approximately 3 500 meters. This conveyor is a twin tail drive pulleys with three (3) drives conveyor with a gravity take-up system at the tail end of this conveyor belt.

The size of each of the conveyor drives is 315-kW, and the winch system consists of an electric motor, gearbox, fluid coupling, cables, and trolley car. This standby extendable conveyor then feeds the ash spreader machine via the tripper car. The spreader machine and tripper car travels on rails. These rails are supported on sleepers, and these sleepers are on the ash platform. The spreader boogie wheels are electrically driven, and this machine can only travel to the front or to the back. The spreader boom conveyor can only stack the ash at the front, and sideways of the machine. The slew angle of this boom conveyor is 180°. The spreader slewing system is via the slew drives, pinions and slew gear. The boom conveyor luffing system is a hydraulic system. The shifting of this spreader is by using the rail leapfrog shifting process. This spreader machine only travels to the east side of the standby ash dump.

For conveyor equipment schedules, refer to drawings 0.61/21818 sheet 1 Rev B and drawing 0.61/15482 Rev 0. For more information on the stacker machine refer to the operating and maintenance manuals of the stacker machine and spreader machine.

3.1 Need Statement

The Ash Handling Plant requires regular maintenance as per the maintenance strategy and philosophy. The existing Ash Handling Plant has been in existence for 38 years and requires more attention and care to ensure that the reliability and availability of the plant are kept intact. The maintenance of the plant must consider, but not be limited to the following:

- Six (6) conditioner conveyors with its chutes and moving heads.

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- Six (6) short coarse ash conveyors with its chutes.
- Six (6) long coarse ash conveyors with its chutes and moving heads.
- Two (2) transverse conveyors with its chutes and moving heads.
- Two (2) cross conveyors with its chutes and moving heads.
- The link point (transfer points) between cross and overland conveyors with ancillary services.
- The complete overland conveyors system with ancillary.
- Transfer point between overland conveyors and shuttle conveyors.
- The main and standby extendable systems with ancillary.
- Shiftable conveyor.
- The tripper cars, stacker and spreader.
- Brine water supply pipe from TT02 to the ash dump sprayers.
- South clean and dirty water dam pump houses with all its piping and ancillary
- North clean water dam pump house with all its piping and ancillary.
- Potable water supply line.
- TT02 slit trap pump and piping system.
- Coal setting ponds both east and west pumps and piping systems.

4. Scope

The scope of work is for the plant inspection, and recording all plant defects on a daily basis, perform preventative maintenance, corrective maintenance, periodic maintenance, chute repairs, chute tiles repairs, deflector plate repairs, plant repairs, lubrications, conveyor belt replacements, belt extensions, belt splicing, belt insert, belt repair, re-lagging of pulleys, idler inspection and replacements, skirting thickness measurement and replacements, handling of sleepers and rails for the spreader machine, and the shifting of the stacker machine.

The *contractor shall* maintain the defect record list for the period of the contract and track the similar failure defects. The contract shall provide *Eskom Contract Supervisor* with the weekly report of all reported defects and inspections conducted. The contractor will be provided with the template of the report upon the commencement of the *contract*.

The *contractor* is to do coarse Ash Handling Plant inspections once a week on all the units. Any repairs, scraper cleaning and adjustments, idlers' replacements, skirtings' replacements, plumber blocks greasing, pulley laggings replacements, pulley replacements, belt replacement, chute repairs, chute tiling, moving head repairs, etc should be planned with the relevant *Production Manager*, so that the *Unit Operating Supervisor* can arrange for emergency dumping at the grizzly conveyors.

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The *contractor* is to do conditioner conveyors inspections once a week on all six (6) conditioner conveyors. Any repairs, scraper cleaning and adjustments, idler replacements, skirtings' replacements, plummer block greasing, pulley lagging replacements, pulley replacements, belt replacement, moving head repair work, chute repairs, chute tiling, etc should be planned with the relevant *Production Manager*. There are three (3) conditioners conveyor running per week, while the remaining three (3) conditioner conveyors are standing for cleaning and maintenance purposes. Usually, these conveyor belt changeovers take place every Thursday.

One (1) transverse conveyor and one (1) cross conveyor stream are normally in operation for a week and then changed over every Thursday. One (1) ash stream will be running whilst the other streams are on standby for maintenance and cleaning. The proposal is that the **Cleaning Contractor** (separate running contract already appointed) is to clean the upstream chutes, these transverse conveyors chutes and cross conveyor chutes first, and let these conveyors run empty at TT02. Then maintenance can be done on the relevant conveyor stream. The moving heads cleaning by the **Cleaning Contractor** (already appointed), and maintenance on these transverse and cross conveyors can also be performed during this period (**Important to note that the cleaning is not part of this scope it will be performed by the cleaning contractor and only the scrappers will be cleaned and adjusted by the maintenance contractor**).

The *contractor* is responsible for the training of the belts and observe that the ash on loading to the cross conveyors and overland conveyors is in the middle of the carry belt. The *contractor* is to perform inspection and repairs on the transverse and cross conveyors moving head systems. This involves pinion and plummer block repairs, rail repairs, , wheels greasing and travel wheel repairs. The *contractor* is to advice *Eskom* which spare parts he/she requires for repairs.

The *contractor* is to do the TT02 emergency onloading conveyor system (in loading feeder) inspections once a week. Any repairs, scraper cleaning and adjustments, idler replacements, skirtings' replacements, plummer block greasing, pulley lagging replacements, pulley replacements, belt replacement, chute repairs, chute tiling, etc should be planned with the relevant *Production Manager*.

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Due to the overland conveyor roof construction, the *contractor* needs to walk between the conveyors for the ash overland conveyors inspections. This conveyors inspection should be conducted at least twice per week. The one (1) conveyor stream runs for seven (7) days, and then the other belt runs for seven (7) days. The conveyors inspection should be performed, whilst the belt is running, and the necessary repairs must be done under the plant permit system. The *contractor* is also responsible for belt scraper cleaning, adjustments, and replacements. The V – plough inspections, repairs or replacements is also part of the scope of work. The *contractor* is to check the gearbox oil levels once per week and to lubricate the pulley bearings once per month. The *contractor* needs to take fluid coupling oil samples from the four (4) fluid couplings and to analyse this oil for any particles and water ingress, once a month. In case of any dirty oil, then the relevant fluid coupling oil needs replacement. These fluid coupling oils in general need replacement every six (6) months. The grid couplings at the gearboxes input shafts and at the gearboxes output shafts needs greasing every three (3) months. The inspection of the winch ropes, wheels and trolley car system must be once per month, and this must be done by a qualified rigger. If the *contractor* notes, that there is a conveyor drive vibration problem, he/she must inform *Eskom*, so that *Eskom* can do vibration readings. The *contractor* is also responsible for monitoring the stock levels of every item of these conveyor systems.

The ash stacker system is operational approximately 80% of the time, and the standby spreader machine approximately 20% of the time. The spreader system is only in operation during the shifting process of the stacker system, for stacker maintenance and stacker system break downs. The *contractor* is to inspect the stacker system every day, due to the high load factor of this system.

Any repairs, replacements and chute cleaning must be planned so that other disciplines also can have an opportunity to perform maintenance. The **Cleaning Contractor** needs to clean the ash chutes on the stacker system two times per week and in this period the **Maintenance Contractor** can do the necessary repairs, scraper cleaning and adjustments. In most cases the conveyor bearing greasing can be performed under plant in operation permit. But if there are dangerous moving parts close by, then plant isolation permit must be taken for save bearing greasing actions. The number of bearings which require greasing on the total ash stacker plant is approximately 214. The re-lagging of pulleys, replacements of the boom and link conveyor belts can be planned during the stacker shifts. The inspection of the extendable and shiftable conveyors' winch take-up systems must be done once per month. This must be done by qualified riggers. The power cable reel and control cable reel systems on the stacker tripper car must be inspected by the *contractor* once a week and to perform the required repairs. The inspection, lubrication and repairs on the stacker tripper car and stacker machine bogie wheels pins, bushes, bogie wheels, equalizer beams, drive tumblers with its bushes and shafts, crawler idler and its bushes and shafts, crawler system, stacker slewing and luffing systems are part of the scope of work. The luffing cylinder replacement and the power pack refurbishment is also part of this scope. The stacker crawler tension adjustment needs to be done by the *contractor* and any worn component of these crawlers must be replaced by the *contractor*. The *contractor* is to replace all tripper car travel drives. The *contractor* must also replace the stacker top slew pins and beams between the stacker and link conveyor. The stacker tripper car front-end bogie supports steel work and link conveyor tail-end support pin needs replacement.

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The *contractor* must also inspect all the gearboxes oil levels and top-up when and as required. The number of gearboxes on the plant at the stacker system is 21. The testing of structure welding, pin joints and bogie wheel system must be performed once per year. The inspection and maintenance of all the storm brakes on the boom conveyor slewing system and tripper car is part of the *scope of work*.

The ash stacker system requires shifting every six (6) months and the contractor must perform the total scope of work. This involves main extendable tripper car rail extension, shifting of the shiftable conveyor to the new position, pulling of the main extendable tripper car to the new position, driving of the ash stacker to the new position and the removal of all anchor plates and the installation of all anchor plates. The contractor is to build new conveyor modules and perform belt extension every two (2) shifts. The installation of all idlers is part of the scope of work. The conveyor module extension is 80 meters. The two splices must also be performed by the contractor. The contractor is also responsible to handle the 3, 3 kV cables during the shift. New cable joints, once per year, needs to be done by the **EMD Contractor**. **Eskom** will do the **C&I** part of this shift. The contractor must also repair any rail failures during the stacker shifting process. The contractor's land surveyor must set out the centre pins for the extendible conveyor and shiftable conveyor before the shiftable conveyor tail end station and shiftable conveyor plat forms can be constructed before the stacker shift starts. During conveyors extending and shifting the contractor must ensure that the survey for align straight the belt through its length from the tail end to the discharge chute is conducted and review by Eskom whenever the extension or shifting take place. The contractor shall ensure that the belt is straight and all possible misalignment of the conveyor structure is within recommended coordinates. The *contractor* must issue weekly reports to *Eskom Engineering* which may suggest engineering solution or change of maintenance frequency.

The *contractor* must also perform spreader system plant inspection two times per week; perform the required repairs, scraper cleaning and replacements. The contractor must make sure that this is on standby and reliable in case of stacker system failure. Since this system is standing most of the time, there is more than enough time to perform the required maintenance work. The contractor must also insure that the spreader system must not operate more than 15% of the time. The contractor must keep record of the running hours of the stacker and spreader systems. This will insure that the two ash dumps are in balance. The spreader boom conveyor support cables, major structure, pivot points and bogie wheels support steel work must be tested at the welding joints. This testing frequency is once per year. The contractor must also perform rail extension in front of the machine, so that this machine can stack the ash at the crest of the ash dump. The standby extendable conveyor requires belt extension three times per year. Please note it is depended on the usage of this machine. The standby extendible conveyor needs surveying and shifting of modules, so that this conveyor only has one (1) horizontal radius of 5 000 meters. It will helps with the belt training. The conveyor length is 3 700 meters.

The conveyor length extension is 80 meters and the belt splices is part of the scope of work. The contractor must also assemble the conveyor modules on the plant. The handling of these modules and belting has to be performed by the contractor. The handling of the rails and sleepers are part of the scope of work. The length of each rail is approximately 18 meters.

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The 11kV to 3, 3 kV transformer also require shifting to the location. This normally happens once per year. The shifting of this transformer is part of the scope of work. The **EMD Contractor** will perform the cable joints.

The contractor is responsible off all the lubrications and inspections and top ups of all the gearboxes and fluid coupling. The number of greasing points is 94. The number of gearboxes involved with the standby system including the shuttle conveyor is 15. The contractor is also check the spreader luffing hydraulic system, which involves the maintaining of the oil level, repairs of any oil leaks and the replacement of the oil filters. The inspection and maintaining of the power and control cable reel gearboxes and magnet couplings are also part of the scope of work. The spreader eight travel drives need replacement.

There are four critical scoop fluid couplings at the Ash Overland Conveyor belts on north and south overland conveyors. These couplings require filling up of oil after repair or after inspection, oil leak inspection, and visual inspection in terms of vibration monitoring, alignment with electric motors and gearboxes as well as temperature monitoring. The oil coolers must be inspected for any leaks, condition of the cooling fins, oil circulation, fan operations and be inspected every week. The contractor shall ensure that there is no oil/grease leak around the gearboxes, pulleys, couplings and motors. Any oil or grease spillage found around ash plant must be investigated and documented.

The contractor is also responsible for the north and south dam pump stations. The pumps and pipelines inspections frequency should be at least two times per month. If any repairs are required on these pumps, it is part of the maintenance scope of work. The brine water pipeline and potable water pipelines from TT02 to the sprayers and potable head tank must be inspected by the contractor and any repairs and HDPE pipe welding need to be performed by the contractor.

The south and north dams pump houses need to be inspected and these pumps needs test running once every week. Any water leaks need to be repaired. The sump pump sump needs to be inspected and the sump pumps needs to be tested once a week, to make sure that it is available to drain any water from these pump house floors. Any water leak on the discharge pipeline needs to be repaired by the Contractor.

In terms of spares the contractor is responsible for ensuring that the spares are levelled up and all the spares available are readily available and in good working conditions whenever required. Eskom has a routable process where the contractor can be very aware that the spare is no longer repairable. If the spare is no longer repairable or the cost of repairing is 70% or more than one of the new spare the new spare must be bought based on routable process.

The contractor shall review the current recommended spares and advise where there is a need to adjust the spares required to ensure that Ash Plant Facility is reliable, available and maintainable to suit operating and maintenance philosophy. The contractor shall have a capability of conducting reliability centre maintenance where the contractor will adhere to automated preventative maintenance stored in the system.

If there is any steel work repairs and steel sections, replacement need on the conveyors and stacker/spreader system, then the contractor need to do these steel work repairs.

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The contractor is also responsible for any lifting which may be required during heavy equipment removal, handling and installation.

5. Quality Control

The contractor shall prepare a method statement for each activity to be executed and quality control document which are required to be sent for approval before any work can be executed. The Eskom Contract Supervisor of the area shall give a good ahead for any repair and installation that will be required.

The bolts and nuts shall always meet the design specification. If the contractor is not sure about the specification, he/she should consult with the Eskom Engineer of the area.

All welding repairs and structural repairs must be done with accordance to Eskom latest version of welding rule book. All design standards must be adhered to, and Welding Procedure Specification (WPS) must be approved. Welding Procedure Specification (WPS) must be supported by welding qualification records and welder's qualifications.

The *Maintenance* shall include as a minimum the following activities and interventions:

- Approval of Method Statement and quality control plan – hold point for Eskom Contractor Supervisor.

5.1 Procedures, Guidelines & Other Documents

- Quality Control Plan.
- Method Statement.

6. General

The contractor must have enough artisans and labourers to maintain the inside and outside running plant, during the stacker shifting period or during the belt and rail extension on the spreader machine. He/she may reduce his/her work force during the normal operation of the ash conveyor plant.

The contractor is also responsible for the general site and workshop housekeeping.

The contractor must have at least ten responsible persons who can take out plant isolation permits, and he/she must supply sufficient manpower for standby purposes. The working hours during plant breakdowns must not exceed the hours as specified by law. The contractor must be able to replace tired workers. There should be sufficient personal that the Contractor can work at four places at the same time. Each team needs to work independently from other teams by have its own responsible person and artisans. The artisan of each team will communicate among the different teams and with operating and to his/her supervisors with two-way radios. The contractor should have two supervisors.

The contractor is responsible to dispose scrape metal in the correct bins and the spares and tools must be safe keeping in the stores in a neatly manner.

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The contractor's personnel must be transported in buses with safety belts from his/her home to work and back to home every day and the contractor may not transport his personal behind bakkies (LDV). The contractor is also to provide daily transport for his/her personal on site. The stacker and spreader systems are about 8 kilometres from the Power Station.

The contractor must perform toolbox meeting every morning before any work can start and the contractor must also inspect the tools for safe usage.

The contractor is to perform a risk assessment before any task is performed and he/she is to refer to the attached "Safety and health & environmental requirements for contractors" to insure safe working environment.

The contractor is responsible for lifting slings and chain blocks inspection. All lifting equipment must comply to the requirements of the OHS Act and Machinery Regulations.

In case for replacements of any gearbox, pulley and fluid drive, the contractor must take the defected gearbox, pulley or fluid drive to Eskom's Main Stores for repairs. All spares, including belts must be handled by the contractor. The contractor may use the crane with the operator and the tractor and trailer from Eskom. He/she has to make all the arrangements.

- Contractor to provide rigging equipment up to 15 Tons.
- Contractor to provide Hydraulic bearing puller on an "as and when required" basis to perform work.
- Alignment Technicians must be able to perform laser alignment and provide certificates after every alignment activity.
- All work will be issued via SAP Maintenance system.
- The *Employer's* Lifesaving rules, Safety rules / procedures to be adhered to.
- Standby crew to attend to breakdowns on an "as and when required" basis.
- All Artisans to be authorized in terms of Plant Safety Regulations (PSR) within 3 months after the contract has been awarded.
- The *Contractor* must provide Quality Control Plan documents for approval by *Service Manager* prior to performing any activity.
- The *Contractor* to provide proof of experience (CVs) and qualifications for all personnel.
- The Artisan must have a Red Seal qualification (section 28 will not be allowed)
- In the case of absence for more than two days (Sick or Annual Leave) a substitute must be available to maintain the plant.
- In the case where one or more employees of the *Contractor* are requested to leave site for other reasons than Annual leave or negotiated leave with the *Service Manager*, The personnel must be replaced immediately with the same skill level, qualifications and experience
- Rigging tools and electrical equipment to be inspected regularly and filed as per the OHS Act requirement.
- All PPE to be provided by *Contractor*.

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- Good housekeeping at all times. The *Contractor* must clean and remove all debris after completing a task.
- All communications must be printed and filed on *Service Manager's* file.
- Timesheets to be logged and signed by Contract Supervisor and *Contractor*.
- Daily attendance register must be submitted on a daily basis to the Contract Supervisor
- Site Manager to provide weekly plant status report
- Provide SANS approved Safety harnesses as per the Safety Requirements of the *Employer*.
- Yearly induction must be attended all personnel.
- Workshop portable tools to be provided by the *Contractor*.
- *Contractor* to provide QCP's and programme
- Safety Officer to provide monthly safety report

7. Manpower:

- 1 x Site Manager,
- 2 x Supervisors,
- 1 x Safety Officer,
- 10 x Artisans qualified Fitters, Each artisan with PSR. (belt training, bearings, hydraulics, 5 ton rigging, belt scrapers, gearboxes, couplings, fluid couplings, idlers, stacker/spreader, etc
- 2 x Boiler Makers,
- 1 x Drive alignment Technician,
- 1 x HDPE Pipe Welder
- 1 x Rigger,
- 2 x Welders
- 12 x Artisans Assistance,
- 5 x Semiskilled,
- 1 x Semi Skill (Rigger),
- 1 x Planner & Expedited,
- 1 x QC Technician.

As and when required:

- 1 x Boiler Maker
- 2 x Fitters
- 1 x Rigger
- 1 x Welder
- 1 x Semi Skill (Rigger)

8. Tools and Equipment:

- Eskom Standard Complete toolbox set per artisan. Refer to artisan toolbox list.
- Torque wrenches

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- Hydraulic pullers, 50 tons and 100 tons
- Hydraulic power pack with four 100-ton jacks
- Jacks, 25 mm, 50 mm, 100 mm, 200 mm and 300 mm
- 2 x Mobile Welders on trailers set.
- Generator 220/380V, 60 A
- 4 x 200 Watts Spotlights on stands
- 15-ton crane to handle heavy equipment.
- 4 – ton truck to transport any equipment on site.
- 2 x trailers for idler handling
- 4 x belt stands, two 10 tons and two 4 tons
- Angle grinders.
- Laser Alignment equipment and clock gauges for conveyor drives alignments. (Pruftechnik)
- Two-way radios with batteries and chargers.
- 2 x Long feeler gauges, 729865 B for pulley bearings
- 2 x HN 4-16 Hook spanner adjustable for pulley bearings
- 2 x TMFN 23-30 Impact spanner for pulley bearings
- 2 x TMFN 30-40 Impact spanner for pulley bearings
- 2 x TMFN 40-52 Impact spanner for pulley bearings
- 2 x TMJL 100- Hydraulic pump 100 MPa for pulley bearings
- 2 x 7298619 E – Hydraulic pump 150 MPa for pulley bearings
- 2 x Copper hammer, THO527 – 0160 – 25 mm for pulley bearings
- 2 x Copper hammers, THO527 – 0161 – 32 mm for pulley bearings
- 2 x Lock spanner set, TMHN 7 for pulley bearings
- 2 x Hydraulic nut, HVM 34E for pulley bearings
- 2 x Hydraulic nut, HVM 36E for pulley bearings
- 2 x Hydraulic nut, HVM 38E for pulley bearings
- 2 x Hydraulic nut, HVM 44E for pulley bearings
- 2 x Hydraulic nut, HVM 48E for pulley bearings
- 2 x Hydraulic nut, HVM 52E for pulley bearings
- 2 x Axial lock nut socket, TMFS 11 for pulley bearings
- 2 x Axial lock nut socket, TMFS 16 for pulley bearings
- 2 x Axial lock nut socket, TMFS 17 for pulley bearings

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- 2 x Axial lock nut socket, TMFS 20 for pulley bearings
- 750 kg chain blocks per artisan.
- 2 x Mobile cutting torch trailers with spare wheels and fire extinguishers.
- Belt clamps. 4 x 750 mm, 4 x 1200, 4 x 1800.
- HDPE class 16 pipe welding machines, from OD 63 to OD 355.

9. Price list:

Item nr	Description	Unit	No of People	Estimated Quantity	Total QTY 60M	Rate	Price
1	Monthly Fix Price (includes:-Normal working Hours , Mon – Friday,	Month		P/month	60 months		
	1 x Manager	Hr	1				
	1 x Site Supervisor	Hr	2				
	1 x Safety Officer	Hr	1				
	1 x Qualified Fitter	Hr	10				
	1 x Rigger	Hr	1				
	1 x Boiler maker	Hr	2				
	1 x Welder	Hr	2				
	1 x Semi-skilled	Hr	5				
	1 x Semi-skill Rigger	Hr	1				
	1 x Assistant	Hr	12				
	1 x Storeman	Hr	2				
	1 x Planner	Hr	1				
	1 x QC Technician	Hr	1				

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2	“As and when required”						
	1 x Boiler Maker	Hr	1	36	2160		
	1 x Welder	Hr	1	36	2160		
	1 x Fitter	Hr	2	36	4320		
	1 x Rigger	Hr	1	36	2160		
	1 x Semi skill (Rigger)	Hr	1	36	2160		
3	Normal Overtime and Saturdays @ 1.5						
	1 x Manager	Hr	1				
	2 x Site Supervisor	Hr	2				
	1 x Safety Officer	Hr	1				
	10 x Qualified Fitter	Hr	10				
	1 x Rigger	Hr	1				
	2 x Boiler maker	Hr	2				
	2 x Welder	Hr	2				
	5 x Semi-skilled	Hr	5				
	1 x Semi-skill Rigger	Hr	1				
	12 x Assistant	Hr	12				
	2 x Storeman	Hr	2				
	1 x Planner	Hr	1				
	1 x QC Technician	Hr	1				

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4	As and when required Normal Overtime and Saturdays @ 1.5						
	1 x Boiler Maker	Hr	1				
	1 x Welder	Hr	1				
	1 x Qualified Fitter	Hr	2				
	1 x Rigger	Hr	1				
	1 x Semi skill (Rigger)	Hr	1				
5	Sundays and Public holidays Overtime @ 2						
	1 x Manager	Hr	1				
	1 x Site Supervisor	Hr	2				
	1 x Safety Officer	Hr	1				
	1 x Qualified Fitter	Hr	10				
	1 x Rigger	Hr	1				
	1 x Boiler maker	Hr	2				
	1 x Welder	Hr	2				
	1 x Semi-skilled	Hr	5				
	1 x Semi-skill Rigger	Hr	1				
	1 x Assistant	Hr	12				
	1 x Storeman	Hr	2				
	1 x Planner	Hr	1				
	1 x QC Technician	Hr	1				

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6	Standby allowances	Per day					
	1 x team	Per day	30				
7	As and when required @ 2						
	1 x Boiler Maker	Hr	1				
	1 x Welder	Hr	1				
	1 x Qualified Fitter	Hr	2				
	1 x Rigger	Hr	1				
	1 x Semi skill (Rigger)	Hr	1				
8	As and when required Services						
	Drive alignment technicians	Per Year	120				
	HDPE Pipe repairs. From 63mm to 630mm	Per Year	60				
	Once off						
	Site establishment	ea	1				
	Site de-establishment	ea	1				
9	Monthly Transport related costs						
	Transport HWH	60 KM/22 days	2				
	Site Travelling 14 seater	km/ month	660				

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	LDV x 3	Km /month	930				
	4 – ton truck to transport any equipment on site.	km/month	400				
10	Yearly items						
	Medicals & Safety File	Per year	1				
	PPE (torch, safety harness, 2 x overalls per year, safety shoes, gumboots, earphones, hard hats, googles, arch fash suits	Per year	1				
11	Tools and equipment	Per year					
	Tools and equipment as per List	Per year	1				

- **Accommodation and traveling will be included in hourly rates.**
- **Total cost breakdown must be submitted by the *Contractor***
- **In the case where the *Contractor's* site has already been developed no Site establishment will be applicable**

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10. ARTISAN TOOLKIT - MECHANICAL:

QTY	DESCRIPTION	SIZE	MAKE	PRICE
1	TOOLBOX	5 TIER	AUDELL	
1	PADLOCK	50MM	VIRO	
1	IMPERIAL ALLEN KEYS	1/16" – ½ "	FUHR	
1	METRIC ALLEN KEYS	1,5 – 12MM	FUHR	
1	HAMMER (BALL POINT)	300G	LASHER	
1	HAMMER (BALL POINT)	900G	LASHER	
1	SHIFTING SPANNER	300MM	GEDORE	
1	SHIFTING SPANNER	150MM	GEDORE	
1	DIVIDER	150MM (50/6)	GROZ	
1	FEELER GAUGE	26 BLADE	BOKER	
1	CENTER PUNCH		GEDORE	
1	STEEL RULE	300MM	S/STEEL	
1	STEEL RULE	150MM	S/STEEL	
1	HACKSAW FRAME	300MM	ECLIPSE	
1	TIN SNIPS	250MM	WISS	
1	VICE GRIP	137/250MM	GEDORE	
1	WATER PUMP PLIERS	145/250MM	GEDORE	
1	ENGINEERS INSULATED PLIERS	200MM	MTS	
1	FLAT BASTARD FILE	250MM	PFERD	
1	FLAT 2 ND CUT FILE	250MM		
1	FLAT SMOOTH FILE	250MM		
1	FLAT 2 ND CUT FILE	200MM		
1	FLAT SMOOTH FILE	200MM		
1	FLAT 2 ND CUT FILE	150MM		
1	FLAT SMOOTH FILE	150MM		
1	BOBBEJAAN SPANNER	350MM	GEDORE	
1	CHISEL FLAT	16 X 150MM	MITCO	
1	TAPE MEASURE	5M	STANLEY	

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1	SCRIBER	150MM	GROZ	
8	FILE HANDLES (PLASTIC)		PFERD	
1	PAINT BRUSH	25MM		
1	SOFT FACE HAMMER (NYLON)	40MM	WERA	
1	COMBINATION SPANNER SET	6 – 32MM (18)	GEDORE	
1	ENGINEER SQUARE	100MM	GROZ	
1	PIPE WRENCH	227/350MM	GEDORE	
1	INSULATED ENGINEERS PLIER	200MM	MTS	
1	BLACKTIP SCREWDRIVER SET	6 PIECE	WERA	
1	VERNIER 530-102	200MM	MITUTOYO	
1	MICROMETER	0-25MM	MITUTOYO	
1	SCREW CUTTING GAUGE		GROZ	
1	SCREW PITCH GAUGE		GERMAN	
1	RADIUS GAUGE	26M	M&W	
1	HAMMER	4LB	LASHER	
1	DRIVE C19 TMZ SOCKET SET	½"	GEDORE	
1	TOMMY BAR	450MM	AFTOOL	
	OTHER TOOLS & EQUIPMENT: Refer to section 8 to see the other tools and equipment list.			

Notes: Each artisan to have his own toolbox as per tool list above.

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11. Acceptance

This document has been seen and accepted by:

Name	Designation
	Line Manager, Auxiliary Engineering
	Engineering Manager, Tutuka Power Station
	System Engineer (Inside Common Ash Handling Plant), Auxiliary Engineering
	System Engineer (Ash Disposal System), Auxiliary Engineering
	Senior Advisor, Mechanical Maintenance Department (MMD)
	Senior Supervisor, Mechanical Maintenance Department (MMD)
	Senior Supervisor, Mechanical Maintenance Department (MMD)
	Mechanical Section Manager, Mechanical Maintenance Department (MMD)
	Maintenance Manager, Tutuka Power Station

12. Revisions

Date	Rev.	Compiler	Remarks
December 2020	0.1		Draft
January 2021	1.0		The document has been finalised.
April 2023	2.0		Chute cleaning is removed from scope
June 2025	3.0		Title was revised to period of 12 months and added QC technician, coal settling ponds, TT02 slit trap pumps and piping scope.
July 2025	4.0		Title was revised back to include period of 60 months.

13. Development Team

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

14. Acknowledgements

- N/A

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