



Works information Cranes and Hoists

Generation Division

Title: **Routine maintenance of Overhead Cranes and Hoists at Duvha Power Station, Statutory inspections, Repairs and Load Testing.**

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1) INTRODUCTION

Overhead cranes and hoists are an essential part of the plant for safe lifting of goods and spares within Eskom generating plant. These are designed caution to ensure safety of people while performing/ lifting heavy objects. The equipment are regulated to ensure compliance and human safety.

The document describes requirements to ensure that all overhead cranes, and hoists, receive the highest degree of attention in quality engineering, operational and maintenance, all of which is aligned to South Africa National Standards (SANS) and OHS Act.

Since overhead cranes and hoists are used for lifting heavy objects, the management of such installations is highly critical to ensure that they are inspected, load tested and maintained to the highest degree in accordance with the SANS standards and the OHS Act No 85 of 1993 and to ensure that no injury or fatality will occur in relation to such installations, that could have been anticipated or foreseen.

2) SUPPORTING CLAUSES

2.1) SCOPE

Routine maintenance, repairs and statutory compliance of overhead cranes and hoists as required by SANS standards and OHS Act 85 of 1993. The scope covers all overhead cranes and hoists throughout Eskom Duvha Power Station. Cranes and hoists vary from 1 ton to a maximum of 60 ton. The exact quantities are stipulated/ included in the price list as per crane or hoist size.

2.2) Purpose

Overhead cranes and hoists are used in the lift heavy objects mainly spares for maintenance purpose. The purpose of this document is to detail the measures to be taken to ensure that these cranes and hoists are inspected, load tested and maintained to the highest degree standard in accordance with the SANS 10375 standards and the OHS Act 85 of 1993 and to ensure that no injury or fatality will occur in relation to such installations, that could have been anticipated or foreseen.

2.3) Applicability

This document shall apply to all overhead cranes and hoists at Duvha power station.

3) NORMATIVE/INFORMATIVE REFERENCES

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

3.1) Normative

- ISO 9001 Quality Management Systems.
- OHS Act: Occupational Health and Safety Act 85 of 1993
- Plant Safety Regulations (PSR) 36-681 – Generation Plant Safety Regulations
- 240-56179027 - Safety Measures and Approved Protective Clothing and Personal Protective Equipment against the Thermal Hazards of an Electric Arc for Metal Clad Switchgear (Up to 11 kV).
- EN 14502-1, Cranes – Equipment for lifting of persons – Part 1: Suspended baskets.
- ISO 4306-1, Cranes – Vocabulary – Part 1: General.
- SANS 687, Inspection and testing of non-fixed load-lifting attachments.
- SANS 4310, Cranes – Test code and procedures.

- SANS 12482-1/ISO 12482-1, Cranes condition monitoring – Part 1: General.

DEFINITIONS

Definition	Description
Lifting Equipment	means any equipment or machine or arrangement of equipment or machines intended or used for the lifting, lowering, suspension, or moving in suspension of any person or load.
Lifting Tackle	means any attachment, including according points, used to secure lifting equipment or a load to lifting equipment.
Thorough examination	means examination or inspection to determine whether the equipment is safe to use.
Safe working load	means the mass load applicable to a piece of equipment or system as determined by a competent person taking into account the environment and operating conditions.
Competent person	means a person who has the knowledge, training, experience and qualifications specific to the work performed: provided that where appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act, 1995, those qualifications and that training shall be deemed to be the required qualifications and training;
Lifting machine	means a power-driven machine that is designed and constructed for the purpose of raising or lowering a load or moving it in suspension, but does not include an elevator, escalator or hand-powered lifting device
Lifting machinery entity	means a legal entity approved and registered by the chief inspector in terms of regulation 19
Lifting machinery inspector	means a person who is employed by a Lifting Machinery Entity and who is registered by the Engineering Council of South Africa in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000); Notes: (a) These are commonly known as LMI and are registered at ECSA on behalf of Department of Labour.
Modification	Any alteration to cranes, hoists affecting the control, load, travel or safety thereof.
OHS Act	Occupational Health and Safety Act 85 of 1993
Operator	A person who is selected, trained, assessed, and authorised in terms of legislation to operate specific equipment.

4) DISCLOSURE CLASSIFICATION

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

5) ABBREVIATIONS

Abbreviation	Description
DOL	Department of Labour
ECSA	Engineering Council of South Africa
EOD	Electrical Operating Desk
GMR 2(7)a	General Machinery Regulation 2(7)a
LAR	Limited Access Register

Abbreviation	Description
NEC	New Engineering Contract
OEM	Original Equipment Manufacturer
OHS Act	Occupational Health and Safety Act 85 of 1993
PPE	Personal Protective Equipment
PSR	Plant Safety Regulations
QCP	Quality Control Plan
SANS	South African National Standards

6) Revision History

This is the first revision of the document.

Date	Rev.	Remarks
May 2024	0	First revision

7) Applicability

This document shall apply to Duvha power station cranes and hoists.

8) SCOPE OF WORK CONSIST OF:

Thorough Inspections, Load Testing of Cranes and Hoists at Duvha Power Station.

Routine type maintenance includes thorough Inspections, load tests and issuing of a technical feedback reports by Contractor.

- A list of all electric overhead cranes and hoists to be maintained is on the NEC price list.
- Inspections will be done once every six (6) months or twice (2) a year and a printed, stamped and signed technical report is to be issued with every crane, hoist inspected no later than a month after completion of such inspection.
- Load Tests will be done once every twelve (12) months or once (1) a year and a printed certificate ,stamped and signed by the Lifting Machinery Inspector who performed the test is to be issued with every crane, hoist load tested no later than a month after completion of such test
- Project manager has the authority to withhold payment of those specific cranes that have been inspected or load tested and the printed, signed and stamped reports are not received within a month
- The Technical report must be of acceptable format with check list of Crane, hoist components to be inspected and furthermore recommend any repair work necessary, state the condition of the various cranes and hoists as well as specify if crane or hoist is safe for use or not based on the report.
- The contractor has to report to the contract manager before any work or task is done on the plant
- The contractor has to report to site daily until all Statutory Services of Cranes, hoists and Statutory load testing of cranes, hoists have been completed as per the programme that will be sent out by the Contract Manager.
- Normal working hours for Routine Type Maintenance is from 07:00 to 16:00, applicable Monday to Thursday and 07:00 to 11:50 on a Fridays.

Scope of Work for Routine Type Maintenance on Cranes & Hoists-Inspections

General Crane Inspection

- Examine areas subjected to structural stresses, such as beams, supports and fixing points for excess wear, cracks, deformation and security blocks.
- Ensure that the Cranes and Hoists are conspicuously and clearly marked with the following:
 - The maximum Safe Working Load as per design(mml -maximum mass load)
 - Manufacturer's serial number.
 - Duvha Power Station Functional Location number.
- Bottom block and load hooks to be inspected visually for excessive wear and also Cracks .Spread in throat opening of hooks to be inspected by using the "three point measurement" method – the results will be recorded and compared to previous results. Safety latches to be inspected for any damage and correct functioning.
- Inspect gearboxes for excessive oil leaks, vibrations and noisiness. Inspect oil level`s and top up if necessary. Where needed, gearbox inspection covers must be removed for visual inspection of internals. (Oil samples to be taken once a year for analysis.
- Inspect motors for excessive noise and overheating. Record all motor info, measure and record individual motors amps per phase.
- Inspect brakes for correct operation and excessive wear and adjust if necessary.
- Inspect all limiting devices for correct settings and functionality.
- Ensure all end-stops or buffers are in position and secure.
- Inspect all travel wheels for security, wear and correct functioning. Cross travel and long travel units will be lifted on jacks to enable wheel-bearing wear to be checked. (Do not need to lift them)
- Lubricate all open gears, pinions, bearings and load ropes etc.(crane wire rope)
- Inspect the condition of access ladders, platforms, handrails and ensure they are free of oil and other debris.
- Inspect all operations and controls – whether cabin, pendant or remote controls.
- Inspection chains on hoists for any deformation, and damages

Electrical Equipment Inspection

- Pendant control and cable for damage, correct operation and correct suspension.
- Pendant key switches for correct operation.
- Remote control, where applicable, for correct operation.
- Contactor points for pitting and burning.
- Long travel bus bars, collector shoes and expander cables.
- Ensure that the spring tensions on collector arms are satisfactory and adjust where necessary.
- Ensure cross travel loop-system cable and cable roller-hangers/carriers are moving freely.
- All electrical covers, panel doors, enclosures, terminal boxes, glands and motor guards etc. are intact and ensure correct fitting and sealing.
- Inspect operation of warning lights and sirens.
- Inspect Load limiting devices where applicable.
- All elect cranes /hoist and work area to be cleaned using a blower or a vacuum cleaner after service and repairs to make sure the crane, hoist structures are free of loose lying debris.

Rope Inspection

- Ensure that there are at least three full runs of rope on the rope drum when load hook is at the bottom limit of operation.
- Ensure that there is one spare groove on the rope drum when the bottom block is at the upper limit.
- Inspect rope fixing points for security.
- Inspect the rope reeling for correct operation and rope guide for security and excessive wear.
- Inspect the rope for signs of excessive wear, broken wires, kinks, corrosion or any other defects which might be dangerous.

Should the use of the rope considered to be dangerous, for any reason, it must be reported to the *Employer's representative*. *Contractor* does a risk assessment immediately to determine the urgency of the problem. The *Employers representative* will instruct the rope replacement with a Task Order if the Risk is high. The following criteria will be used to determine when a rope should be replaced:

Over a given length, equal to ten diameters, 5% or more of the total individual wires are broken.

- A complete strand is broken.
- Local groups of wires are broken.
- Deterioration at a termination.
- Internal corrosion.
- Wire slackness caused by severe kinking.

Technical Report

- A comprehensive Statutory Inspection Report must be submitted to the *Employer's representative* following each six (6) monthly Statutory Inspection.
- The report shall include but not limited to the following:
 - For ease of identification, such report will contain all relevant information such as Crane name, functional location number, manufacturer, serial number, safe working load and location description.
 - A check sheet of all Crane, Hoist components to be inspected.
 - A list of defective components and the corrective actions required.
 - Crane, Hoist general condition, maintenance done and Inspection certificates of all load tests performed.
- The printed, stamped service report must be signed by a qualified Lifting machine inspector (LMI certificate (registration number) must be provided) and must be submitted within one month after completion of each six (6) monthly maintenance period.
- Technical report shall also be required even in cases where the inspection of a specific crane (s) has been requested by the Employers representative for as and when required basis.

Scope of Work for Routine Type Maintenance on Cranes & Hoists-Load Tests

General Load Test

- Load tests will be performed on all electric cranes and hoists as per Appendix B.
- The whole installation of the crane machine shall be load tested with 110% of the rated mass load, applied over the complete lifting range of such crane and in such manner that every part of the installation is stressed accordingly.

- The dates when the Load tests must be completed will be communicated to the Contractor in advance.
- The *Contractor* will plan his workload to allow for all maintenance to be done at least four weeks prior to the load tests due dates.
- The *Employer's representative* will witness the load tests.
- Load test certificates will be issued for each individual crane.
- In the cases where major component repairs or replacements were done or any work performed on the structure which affected its integrity or for any reason such that the safe performance of crane is in question, a full performance test, as prescribed by the standard to which the lifting machine was manufactured, shall be carried out by a registered LMI..
- Load test certificates will be issued to the *Employer's representative*, within one month after the load test was performed, certificates are to be printed, stamped with the company logo and signed by the LMI that performed the load tests.
- The project manager has the authority to withhold the payment to the contractor for cranes that have been load tested and the printed, stamped ,signed load tests report are not delivered to site within a month
- The *Contractor* is always responsible to lift and move test weights to the required locations for the load tests.
- The *Contractor* supplies his own forklift and truck if needed.

Technical Report

- A comprehensive Load Test technical report must be submitted to the *Employer's representative* following each twelve (12) monthly Load Test.
- The report shall include:
 - For ease of identification, such report will contain all relevant information such as Crane name, functional location number, manufacturer, serial number, safe working load and location description.
 - Visual Inspection of critical components necessary to safely perform the load test.
 - Load Limiter Test Results and Brakes Test results.
 - Type of load test weights used and serial numbers.
 - A list of defective components and the corrective actions required
 - Crane, hoist general condition, maintenance done and test certificates of all load tests performed.
- The report must be signed by a qualified Lifting machine inspector (LMI certificate (registration number) must be provided) and must be submitted within one month after completion of each twelve (12) monthly load test.
- The project manager has the authority to withhold the payment to the contractor for cranes that have been load tested and the printed, stamped ,signed load tests report are not delivered to site within a month
- Technical report shall also be required even in cases where the load test of a specific crane (s) has been requested by the Employers representative in the case of as and when required basis

Non-Routine Type Maintenance

Corrective Maintenance of Cranes and Hoists at Duvha Power Station.

- A list of all electric cranes and hoists to be maintained is attached to the Works information as Ap.
- Non-routine type maintenance will consist of :
 - Corrective maintenance performed as per the Inspection Report findings after each six (6) monthly inspection for which a programme for each crane repairs (If major repairs are required) must be provided to Employer's representative.

- Corrective maintenance due to unforeseen breakdowns or corrective maintenance as identified when inspections of specific crane(s) has been requested by the Employer's representative and carried out by the Contractor on an as and when required basis by the Employers representative.
- The contractor to report to the Eskom contract manager no later than 07:00 am and leave site at 16:00, applicable Monday to Thursday and 07:00 to 12:00 on Fridays for planned and non-routine type maintenance unless authorised by the Eskom Contract manager to leave site earlier.
- The Contractor has to leave site at 11:50 on Fridays.
- All defective components removed from the cranes and hoists during the repair work and replaced components due to upgrades will remain the property of Eskom. The *Employer's representative* will also inspect and verify each new component before installation.

Non-routine Callouts

- The *Contractor* shall provide a callout service to respond to any stoppage or malfunction of the equipment at any time after the contractor's working hours, providing a 24 hour standby service, with a response time of one (1) hour.
- Callout service shall consist of emergency adjustments and component replacement to restore an inoperative or faulty unit to safe and satisfactory service.
- An authorised Technician and an assistant to report to site for callouts
- Constant feedback to the *Project Manager / Supervisor*.
- Work continues until crane is safe for use unless in cases of unavailability of spares
- Everything possible must be done to get the crane running in the shortest possible time taking health and safety into consideration.
- In the case of any major breakdown, a repair plan of action must be submitted to the *Employer* in writing within 6 hours.
- Repair work to commence on the exact time agreed between the *Employer* and the *Contractor* on this plan of action. No additional cost to the *Employer* for this service will be acceptable.
- After hours and during weekends all callouts instruction to the Contractor will be made through EOD Control room. Contractor technicians must sign a register to be made available at EOD for all callouts and findings/feedback.

Minimum labour hours charged for any call-out is two (2) hours which

- Thirty (30) minutes allocated for travelling to site.
- Minimum of one (1) hour allocated for being on site for activities or work that is completed within an hour.
- Thirty (30) minutes allocated for travelling to the contractor's workshop.

Standby on site by Technician and an Assistant during Outages

When the availability of the cranes listed below is in question or when critical lifting work will be performed during Outages when lifting of Turbine casings, Generator Rotor, Turbine Rotors, it can be requested by the contract manager that a Technician and an Assistant be on site for a specific number of days which the contractor will be informed three (3) days in advance where possible. The standby will be applicable to the following Cranes/Hoists.

- Turbine House Cranes
- Air Heater Cranes

- ID Fan North and South Hoists
- Coal plant hoists

Authorisation of Contractor in terms of Plant Safety Regulations

- The Technicians will comply with the Plant Safety Regulations; this requires that the Crane Technician, to be appointed as the Responsible Person for Cranes (RP). Training will be provided by Duvha Power Station.
- Contractor will be given a period of six (6) months after contract start date to be Authorised as a Responsible Person for cranes in terms of plant safety regulations. The contractor will have to nominate two (2) technicians to be trained in order to be authorised in terms of plant safety regulation after successful completion of all the assessments
- Failure by contractor to have a minimum of two technician authorised for cranes and hoists at Duvha Power Station within the six (6) month period provided will result in penalties being charged for non-compliance which will be 20% of the monthly assessment or invoice amount due.
- Each Technician nominated by the contractor will have three attempts for the PSR authorisation. Thereafter a new candidate must be sent for the course.
- The penalties of 20% of an assessment or invoice due will continue up until a minimum of two technicians employed by the contractor are Authorised under cranes and hoists at Duvha Power Station
- In cases where there is no Authorised Person on site on a specific day(s)/task(s), penalties will only be applicable for that specific day(s)/task(s) only but an NCR will be issued to the contractor for not ensuring that their (Contractor) Authorised Technician is not on site for that specific day, work or task
- To be authorised, the following will have to be met
 - Attend a three week theoretical course and pass all theoretical assessments
 - One week practical training
 - Individuals that have passed all the theoretical modules and have completed the one week practical training will then be booked for the final assessment by the Plant Safety Regulations Committee whose purpose is to determine whether that specific individual has knowledge of the plant safety regulations and if his plant knowledge is enough to justify Authorisation in terms of Plant Safety Regulations on cranes and hoist at Duvha Power Station
 - Training will be provided by Eskom. There will be no cost to Eskom for PSR training, practical and evaluation.

Additional Duties of the Contractor

- The *Contractor* will attend meetings as and when needed or one meeting every month to discuss any items arising in connection with the Cranes Maintenance Contract with the Contract manager
- Individual to be nominated by the contractor to attend contract meetings at Duvha Power Station must be in a position to take decisions on behalf of the company or contractor.
- The *Contractor* shall provide parts (only components on the contract price list) and labour, to carry out all repairs, the employer reserves the right to supply the contractor with any spares that are readily available on site in order for particular repairs to be carried out to minimise downtime.
- Repairs will be carried out during the *Contractor's* normal working hours, unless an emergency stoppage has occurred or the crane, hoist is required for operation
- Planned maintenance will be carried out during Duvha Power Station's normal working hours.

- The *Contractor* will identify any need for modifications necessary to enhance the long-term health of the plant cranes, hoist and such modification must be requested in writing with all the details including, costs, time to complete, reason for the modification
- Any other duty as may be felt necessary to enhance the maintenance of Duvha Power Station's lifts will be communicated between the *Employer* and the *Contractor*.
- Contractor to perform a monthly walk down during contractors normal working hours on all cranes to check the following
 - Condition of Rope, Bottom Block physical inspection and rope guide.
 - All motions, motor brakes for security and check for gear box oil leaks and level of oil.
 - Testing all crane motions if they are operational and test the bottom, top and final limit for functionality.

New Hoists and Cranes Installation

Installation of any new hoist at the station must include the following mandatory documents

- Certificate of Compliance (COC)
- Load test certificate after the crane has been installed and load tested using test weights.
- Thorough Inspection Certificate of installed crane
- Original Equipment Manufacturer Manuals
 - Crane, hoist Operation Manuals
 - OEM drawings with inventory list of crane, hoist components
- Any other tests which may be recommended by Engineering

Hiring of Hoists

- Hiring costs will include: installation and removal and load testing of hired hoist.
- Installation certificate will be handed over to *Employer representative* stating that the hoist was inspected and load tested by an accredited LMI and that it is safe for use.
- Contractor to ensure that the Duvha Structure to which the hired hoist will be supported is load tested
- Maintenance and repair costs during hiring period will be on *Contractor's* account.
- Certificate of Compliance (COC) will be required after complete wiring of cranes/ hoists.

Refurbishment of cranes, and hoists

- All refurbishment work/ scope must be approved by Employer's representative before any work resume.
- All refurbished cranes/ hoists must be load tested and certificate of testing must be handed over to the Employer's representative before utilisation of the equipment.
- All spares used for refurbishment of cranes and hoist must be SABS approved.
- Refurbishment can be done on-site or at Service Provider's premises/ workshop based on how convenient the situation is depending on cranes/ hoists sizes.
- Certificate of Compliance (COC) will be required after complete wiring of cranes/hoists

Quality

- The *Contractor* guarantees to utilize the OEM approved parts and components unless it is not possible to obtain OEM spares, components, lubricants etc.
- Spares, specifications should be of OEM equivalent and can be recommended by the contractor as they are the subject experts when it comes to maintenance of Cranes and Hoists
- Spares recommended by the contractor should not compromise safety, quality and the environment and installation of that particular spare should not require any form of modification to the crane/hoist in order to have that particular component or spare installed.
- A Quality Control Plan should be drawn up comprising of customer intervention points and issued to the Project Manager for Engineering approval for any work to be done on cranes that exceeds a certain time period and depending on the quantity of the scope and severity.
- A quality control plan may be required for services and load test on specific cranes if the contract manager sees it necessary and may be subject to engineering approval.

Contractor to note and comply with the following:

- The *Employer* reserves the right to have any of the *Contractor's* personnel removed off site without any compensation to the *Contractor* in the event of the *Contractor's* personnel being in contravention with the OHS Act or any of the *Employer's* rules, regulations and procedures.
- The *Employer* reserves the right to request disciplinary/corrective action if, and when, required.
- The *Contractor* will operate under the direction and instructions of *Employer*.
- The *Contractor* will provide all safety apparel, safety equipment and cleaning materials to comply with the construction regulations.
- The contractor is to ensure that an assistant is always accompanied by a qualified Technician whenever work is performed on site for interests of quality and safety-The employer reserves the right to terminate the contract if this requirement is not adhered. No NCR(s) will be issued

9) Specifications

Title	Date revision	or Tick if publicly available
<u>General Specifications:</u>		
Health and Safety Specifications For Contracting Companies	OMOP 2605	Yes
Eskom Life Saving Rules	32-421	Yes
Occupational Health and Safety Act 1993, (Act No.85 of 1993)		Yes
SANS 10375		Yes
Conflict of Interest Policy	32-173	Yes
Plant Safety Regulations	36-681	Yes
<u>Technical specifications:</u>		

As per Scope of Works		

10) Constraints on how the *Contractor* Provides the Works

10.1. Meetings

The Contractor will comply with the requirements as set by the *Employer*. *The Contractor* will provide detailed feedback.

10.2 Use of standard forms

The contract will strictly be in accordance with the NEC TSC3. Early warnings, compensation events etc. are to be notified to the delegated personnel.

10.3 Invoicing and payment

In terms of core clause 50 the *Contractor* assesses the amount due and applies to the *Employer* for payment. The *Contractor* applies for payment with a tax invoice addressed to the *Employer*.

The *Contractor* includes the following information on each tax invoice:

Name and address of the *Contractor*

The contract number and title;

Contractor's VAT registration number;

The *Employer's* VAT registration number 4740101508;

The total Price for Work Done to Date which the *Contractor* has completed;

Other amounts to be paid to the *Contractor*;

Less amounts to be paid by or retained from the *Contractor*;

The change in the amount due since the previous payment being the invoiced amount - excluding VAT, the VAT and including VAT;

(add other as required)

The *Contractor* attaches the detail assessment of the amount due to each tax invoice showing the Price for Work Done to Date for each item in the Price List for work which he has completed.

All invoices are to be submitted to the *Employer's* Representative for processing.

10.4 Records of Defined Cost

In order to substantiate the Defined Cost of compensation events, the *Employer* may require the *Contractor* to keep records of amounts paid by him for people employed by the *Contractor*, Plant and Materials, work subcontracted by the *Contractor* and Equipment. [See clause 11.2(5) and 63.2].

The *Contractors* Site Manager will complete a site daily log and this will be submitted to the *Employer's Representative* for his signature before 12am of the following morning barring weekends. The Friday and weekend logs will be submitted before 12am Mondays. The log will include but not be limited to the following:

- Date and day.
- Weather.

- Site conditions.
- Work done.
- Labour on site.
- Any incidents during that period.
- Any communication that took place.

10.5 Accelerated Shared Growth Initiative – South Africa (ASGI-SA)

Not applicable.

10.6 BBBEE and preferencing scheme

Not applicable.

10.7 Facilities to be provided by the *Contractor*

The *Contractor* is to provide all necessary in order to implement and comply with the Works Information.

10.8 Title to material from excavation and demolition

Add to clause 70.2. The *Contractor* has no title to any material removed in the Plant. All material removed is to be stored at a place indicated by the *Employers Representative*.

10.9 Design by the *Contractor*

The design for any proposal is to be submitted to the *Employers Representative* for approval. Upon Completion, the design will belong to the *Employer* and all rights to use and modify it will be waived by the *Contractor*.

11. Requirements for the programme

The *Contractor* will provide a detailed programme every day or as requested by the *Employers Representative*. The *Employer* may terminate a contract if a detailed programme is not submitted during the morning outage meetings, or as requested by the *Employers Representative*. The final contract programme and breakdown will be agreed upon within three (3) days after order placement by the *Employer* & the *Contractor*.

The *Contractor* shall supply together with the tender a computerized detail MS Project bar chart programme indicating the sequence, link and duration of all activities and the required contractual completion dates.

- Computerized barchart weekly (or otherwise negotiated) updated programme to monitor their actual progress against contractual dates.

12. Services and other things provided by the *Employer*

Item	Date by which it will be provided
<p>Water connection /Disconnection point. Water will be made available on request free of charge from water points on site. The <i>Contractor</i> will supply at his own cost all the necessary connections, fittings, piping etc. for this facility. Eskom does not guarantee continuity of supply and quality of the water and the <i>Contractor</i> shall make his own arrangements for alternative supplies where required. Any breakdown or reduction in the water supply will not be grounds for claims for additional time or compensation. Should the <i>Contractor</i> have any particular requirements with respect to water quality or supply these must be stated in his tender.</p>	
<p>Electricity connection / disconnection. The <i>Contractor</i> to provide all necessary cabling, Certificate of Compliance (COC) etc. Electricity will be made available for construction purposes free of charge from power points, which will be indicated by the <i>Employers Representative</i>. The <i>Contractor</i> will be made responsible for the provision of the reticulation system from the point of supply. Both 220 (AC) Volt and 380 Volt (AC) are available on request. The <i>Contractor's</i> requirements are to be stated in his tender. Eskom does not guarantee the quality of supply of the power and the <i>Contractor</i> shall make his own arrangements for alternative supplies where required. Any breakdown or reduction in the power supply will not be grounds for claims for additional time or compensation.</p>	
<p>Site yard. A site will be made available to the contractor for his yard within the Power Station security area, but not adjacent to the work (the exact location is to be determined on site). The yard is to be considered as a raw site and the <i>Contractor</i> will arrange for temporary services.</p>	
<p>Scaffolding and insulation.</p>	
<p>Gas test and environmental certificate.</p>	
<p>Sanitary facilities and refuse. The <i>Contractor</i> is to supply own sanitary facilities at his Contractor's yard. Eskom's sanitary facilities may be used as directed by the <i>Employers Representative</i>. A refuse control system will be established by the <i>Contractor</i>. All waste and refuse shall be collected and disposed of as directed by the <i>Employers Representative</i>, at the Duvha Power Station refuse disposal site.</p>	

C4: Site Information**C4.1: Information about the *site* at time of tender which may affect the work in this contract****1. Access limitations**

The works is within the security area of the Power Station and access to the site will be governed by the terms and conditions laid down by the Station Security Officials from time to time. The *Contractor* shall satisfy himself as to these terms and conditions and shall price his works accordingly.

The *Contractor* shall liaise with the Power Station Security Staff in order to obtain temporary permits for his staff and vehicle, which will be working within the Station.

With the exception of Construction Plant the *Contractor* shall be restricted to having only one other vehicle on site for transporting his employees and materials. Any other need is to be granted by the *Employers Representative*.

Personnel and vehicles entering and leaving the site are subject to routine searches and substance abuse testing.

The *Contractor* will have to obtain a "gate permit" from the *Employers Representative*, before materials and equipment can be removed from the site. The "gate permit" gives an itemized list of materials and equipment to be removed from site.

The *Contractor* shall make his own assessment of, and shall allow in his rates for those access problems which may be encountered and no extra payment or claim of any kind will be allowed on account of difficulties of access to the Works.

2. Ground conditions in areas affected by work in this contract

Not applicable. The *Contractor* to specify any information required if necessary.

3. Hidden and other services within the *site*

All known services will be brought to the attention of the Contractor by *Employers Representative*. Should the *Contractor* encounter any other services in the work area, he will immediately bring them to the attention of the *Employers Representative* who will issue instructions as to what actions are to be taken.

The protection of all pipes, gauges and plant is of extreme importance. Should any damage take place, which is due to the *Contractors* negligence, another *Contractor* will be brought onto site to affect repairs. All costs will be to the account of the *Contractor* who caused damage.

4. Details of existing buildings / facilities which *Contractor* is required to work on

Not applicable. The *Contractor* to specify any information required if necessary.

5. Inspection on site

The *Contractor* shall take note of, and allow in his price for any items which may not be clearly defined on the enquiry drawings and / or document / s submitted with this tender. He shall also ensure that surfaces

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to be protected are inspected in order to evaluate extent of surface preparation for which he will be responsible. All inspections with Duvha Engineering are to be arranged 24 hours in advance.

6. Accommodation for employees

The *Contractor* is required to make his own arrangements for the accommodation of his employees.

7. Telephone & telecommunications

A telephone is not available on site. Should the *Contractor* require one, he is to make his own arrangements with the relevant authorities. Arrangements may be made with the *Employers Representative* to use telephones of the Station if they are available. Calls from these will be charged for at prevailing GPO rates. Should the *Contractor* wish to use radio communication equipment on site, he will make his own arrangements with the relevant authorities. In this case though, he is required to liaise with the Head of Security at the Station to ensure that there is no interference with existing channels or equipment.

8. First aid and fire fighting

Adequate first aid and fire fighting equipment to be provided by the *Contractor* who also may in cases of emergencies or accidents call upon the services of the first aid and fire fighting resources at the Power Station.

9. Welding on site

No welding will be allowed on site unless permission is granted in writing by the *Employers Representative*.

10. Safe plant isolations

It is the *Contractor's* responsibility to liaise with the *Employers Representative* in respect of safe plant isolations and all Eskom plant to be considered as live unit, such liaison is confirmed in writing.

11. Security, fire protection and safety

The *Contractor* shall be responsible for ensuring the security of the works, and of his plant, equipment and materials. To that end he shall make adequate provision for access control, lighting and watchman to the works where required.

12. Fire protection

The provision of Eskom's standard NWS 1494 "Fire Prevention and Protection of *Contractor's* premises at New Works sites" shall be applicable. The *Contractor* shall ensure that adequate fire fighting apparatus is provided at all his work sites, and that his staff is trained in the use of this apparatus.

13. Safety and incident prevention

The *Contractor* shall implement and maintain an active Site Safety and Accident Prevention Programme in accordance with the NOSA Standards Safety Regulations, NWS 1058 and the Safety Regulations as laid down in the Duvha Safety Manual. The overriding regulations will however be the Occupation Health and Safety Act.

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14. Safety

The *Contractor* shall comply with

- The Occupational Health and Safety Act, 1993, and all regulations made there under;
- All Eskom Safety and Operating Procedures.

The *Contractor* acknowledges that it is fully aware of the requirements of all the above and undertakes to employ only people who have been duly authorised in terms thereof and who have received sufficient safety training to ensure that they can comply therewith.

The *Contractor* undertakes not to do, or not to allow anything to be done which will contravene any of the provisions of the Act, Regulations or Safety and Operating Procedures.

The *Contractor* shall appoint a person who will liaise with the Eskom Safety Officer responsible for the premises relevant to this contract.

Do safety audits at the *Contractor's* premises, its work-places and on its employees;

Refuse any employee, sub-contractor or agent of the *Contractor* access to its premises if such person has been found to commit any unlawful act or any unsafe working practice or is found to be not authorised or qualifies in terms of the Act;

Issue the *Contractor* with a work stop order or a compliance order should Eskom become aware of any unsafe working procedures or conditions or any non-compliance with the Act, Regulations and Procedures referred to in 1 above by the Contractor or any of its employees, sub-contractors or agents.

The *Contractors* safety file is to be submitted for approval to Duvha's Safety Officer within three (3) days after order placement.

15. General

Contractor shall make provision in his rates for all costs involved in compliance with Security Requirements, Fire Protection, Safety and Accident Prevention. Eskom in this regard will entertain no claims for additional compensation.

16. Quality requirements

The *Contractor* shall be required to demonstrate by means of a Quality Plan that this organisation is so structured that all the requirements of the specification will be properly monitored and controlled. The Quality Plan and Control procedures are to be carried out in accordance with the Quality Control document NWS 1841/C1 and the Duvha Quality Manual for *Contractor*(get a copy of the Duvha Quality Manual if it exists). The Quality Control document is to be submitted for approval to Duvha Engineering within three (3) days after order placement by the *Contractor*.

No work may commence unless the Quality Control document has been approved in writing and a copy submitted to the *Employers Representative*. The *Contractor*, in conjunction with Duvha Engineering must sign off all Quality Control documents after completing all work on site. The *Contractor* to submit a copy of the final signed off document to the *Employers Representative* within 1 week after Completion of a Unit.

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17. Tender

Tender on the supplied Scope of Work shall be fixed and firm unless otherwise specified. The Tenderers shall include for compliance with all the provisions and requirements of site regulations and procedures in his pricing.

Any work not in the Scope of Work will be carried out only when the *Contractor* has received a signed variation order from Eskom.

Tenders must include for the official “Commissioning” and / or taking over hand handing over” of systems and / or the work executed by the *Contractor*.

17.1. Consumables

The *Contractor* shall allow in his tender price for any consumables that might be required for the execution of the work.

17.2. Transport

The *Contractor* shall make his own arrangements for transport of material and/or personnel on or to site in accordance with the site procedures and regulations.

The tenderer shall include in his tender price for any special tools and equipment to be used on site for the execution of the works.

Non-destructive examination will be deemed to be included in the tender price unless otherwise specified.

The *Contractor* shall allow in his tender price for tests as he considers or might be required by Eskom to satisfy himself that the work is sound.

The *Contractor* shall allow in his tender price for competent full time site supervision for the duration of the Contract.

Scaffold will be deemed to be included in the tender price unless otherwise specified.

Any crange required for the execution of the Works will be supplied by Eskom if it is available. Should crange be unavailable the *Contractor* shall negotiate a price with Eskom for the supply thereof. Arrangements for such crange must be made in advance at least two weeks prior to the required date. No extension of time and / or claim for standing time will be granted should the *Contractor* not conform with his specification.

Any design from Duvha Engineering is only for information additional to the Scope of Work. Tenderers are to be based on the Scope of Work and the specifications. If any discrepancy arises between the design and the Scope of Work Duvha is to be contacted for clarification.

Eskom carries no responsibility for unforeseen delays unless such a delay is negotiated within 24 hours of the occurrence and written agreement is submitted by Eskom.

19. Communication

The *Contractor* shall address all communications (after contract award) including telefaximilies to:

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Acting Contract Supervisor
Duvha Power Station
P.O Box 2199
Witbank
1035

Att : Riba Selobalobane
Tel : (013) 690 0255
Cell : 074 523 9070
Fax :
E-Mail : RibaSS@eskom.co.za

All communications from the *Contractor* shall carry the Enquiry Number or Contract Number after Contract Award, as well as the Title of the Works. All communication by the *Contractors* shall go through the buyer.

They shall be headed with the subject of the communications, and be numbered sequentially on the basis of the subject of the communication.

No recruiting is allowed on Eskom property. (Eskom property includes the area outside the main security gate).

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Appendix A

Driven Machinery Regulations, 1988

18. Lifting Machines and Lifting Tackle

1. No user shall use or permit the use of a lifting machine unless -
 - a. it has been designed and constructed in accordance with a generally accepted technical standard;
 - b. it is conspicuously and clearly marked with the maximum mass load which it is designed to carry with safety: Provided that when this mass load varies with the conditions of use a table showing the maximum mass load with respect to every variable condition shall be posted up by the user in a conspicuous place easily visible to the operator; and
 - c. it has at all times at least three full turns of rope on the drum of each winch which forms part of such a machine when such winch has been run to its lowest limit.
2. The user shall, where practicable, provide every power-driven lifting machine with-
 - a. a brake or other device capable of holding the maximum mass load should the power supply fail, or which is such that it will automatically prevent the uncontrolled downward movement of the load when the raising effort is interrupted; and
 - b. a limiting device which will automatically arrest the driving effort when -
 - i. the hook or load attachment point of the power-driven lifting machine reaches its highest safe position; and
 - ii. in the case of a winch-operated lifting machine with a lifting capacity of 5000 kg or more, the load is greater than the rated mass load of such machine.
3. The user shall cause every chain or rope which forms an integral part of a lifting machine to have a factor of safety as prescribed by the standard to which such machine was manufactured: Provided that in the absence of such prescribed factor of safety, chains, steel-wire ropes and fibre ropes shall have a factor of safety of at least four, five and ten, respectively, with respect to the rated carrying capacity of the lifting machine.
4. The user shall cause every hook or any other load-attaching device which forms an integral part of a lifting machine to be so designed or proportioned that accidental disconnection of the load under working conditions cannot take place.
5. The user shall cause the whole installation and all working parts of every lifting machine to be thoroughly examined and subjected to a performance test, as prescribed by the standard to which the lifting machine was manufactured, by a person who has knowledge and experience of the erection and maintenance of the type of lifting machine involved or similar machinery and who shall determine the serviceability of the structures, ropes, machinery and safety devices, before they are put into use following every time they are dismantled and re-erected, and thereafter at intervals not exceeding 12 months: Provided that in the absence of such prescribed performance test the whole installation of the lifting machine shall be tested with 110 % of the rated mass load, applied over the complete lifting range of such machine and in such a manner that every part of the installation is stressed accordingly.

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6. Notwithstanding the provisions of subregulation (5), the user shall cause all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine to be thoroughly examined by a person contemplated in subregulation (5) at intervals not exceeding six months.

7. Every user of a lifting machine shall at all times keep on his premises a register in which he shall record or cause to be recorded full particulars of any performance test and examination prescribed by subregulation (5) and (6) and any modification or repair to the lifting machine, and shall ensure that the register is available on request for inspection by an inspector.

8. No user of machinery shall require or permit any persons to be moved or supported by means of a lifting machine, unless such machine is fitted with a cradle approved for that purpose by an inspector.

9. No user shall use or permit any person to use a jib-crane with a lifting capacity of 5 000 kg or more at minimum jib radius, unless it is provided with -

a. a load indicator that will indicate to the operator of the jib-crane the mass of the load being lifted: Provided that such a device shall not require manual adjustment, from application of a load to the jib crane until the release of that load, using any motion or combination of motions permitted by the crane manufacturer to ensure safe lifting; or

b. a limiting device which will automatically arrest the driving effort whenever the load being lifted is greater than the rated mass load of the jib-crane, at that particular radius, using any motion or combination of motions permitted by the crane manufacturer to ensure safe lifting: Provided that such a device shall not arrest the driving effort when the jib-crane is being operated into a safer condition.

10. No user shall use or allow the use of any lifting tackle unless the following conditions are complied with, namely that -

a. every item of lifting tackle is well constructed of sound material, is strong enough and is free from patent defects and is in general constructed in accordance with a generally accepted technical standard;

b. every lifting assembly consisting of different items of lifting tackle is conspicuously and clearly marked with identification particulars and the maximum mass load which it is designed to lift with safety;

c. ropes of chains have a factor of safety with respect to the maximum mass load they are designed to lift with safety of-

i. ten for natural-fibre ropes;

ii. six for man-made fibre ropes or woven webbing;

iii. six for steel-wire ropes except for double part spliced endless sling legs and double part endless grommet sling legs made from steel-wire rope, in which case the factor of safety shall be at least eight;

iv. five for steel chains; and

v. four for high-tensile or alloy steel chains:

Provided that when the load is equally shared by two or more ropes or chains the factor of safety may be calculated in accordance with the sum of the breaking strengths taking into consideration the angle of loading;

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d. steel-wire ropes are discarded and not used again for lifting purposes if the rope shows signs of excessive wear, too many broken wires, corrosion or other defects that have made its use in any way dangerous;

e. such lifting tackle is examined at intervals not exceeding three months by a person contemplated in sub-regulation (5) who shall enter and sign the result of each such inspection in a book kept for this purpose; and

f. such lifting tackle is stored or protected so as to prevent damage or deterioration when not in use.

11. The user shall ensure that every lifting machine is operated by an operator specifically trained for a particular type of lifting machine: Provided that in the case of a lift truck with a lifting capacity of 750 kg or more and jib-cranes with a lifting capacity of 5000 kg or more at minimum jib radius, the user shall not require or permit any person to operate such a lifting machine unless the operator is in possession of a certificate of training, issued by a person or organization approved for the purpose by the Chief Inspector.

[Date effective 10 October 1993 - G.N.R.2483 of 4 September 1992]

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