

PART 3: SCOPE OF WORK

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C3.1: EMPLOYER'S WORKS INFORMATION

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1 Description of the works

1.1 Executive overview

The hydrogen production plant is required to safely produce, store and supply hydrogen on site for the cooling of all generators as it is an effective cooling agent and a cost-effective medium for the design of the generators. The existing hydrogen production plant at Kendal is unavailable due to internal damages in the electrolyser which will require asbestos gaskets to reseal the electrolyser if opened and fixed. Asbestos gaskets can no longer be used at Kendal Power Station due to a once-off concession given by the Department of Environmental Affairs back in 2010. The plant also has a significant number of aged and obsolete critical equipment. It is recommended that the existing hydrogen production plant be replaced with a newer technology High Pressure Hydrogen Production Plant.

This document details the work to be done to safely deliver, install and seamlessly integrate the new plant with the current receivers and the analysis system, and to properly commission and handover the new plant to the operating and maintenance departments. The strategy will be to place the new plant in shipping containers outside the existing building where the carbon dioxide cylinders are stored since it will be more cost-effective and timesaving than repurposing the current building. The new project will involve all engineering disciplines (mechanical, electrical, C&I, civil), operating, maintenance and training.

1.2 Employer's objectives and purpose of the works

The purpose of this document is to clearly define the technical specifications for the design, supply/delivery, installation, integration, testing, commissioning, certification, and handover of the new hydrogen production plant at Kendal Power Station. Upon completion the new hydrogen production plant should be able to reliably produce, store and supply sufficient hydrogen to meet the demand of the station.

The objective of this project is to satisfy the following requirements, as a minimum:

- a) The newly introduced system shall yield improved plant performance, availability and reliability by ensuring suitable production, storing and supplying of the efficient hydrogen to meet the demand of the station.
- b) To resolve the existing issues of obsolescence & limited spares availability.
- c) To upgrade the system to latest codes & standards.
- d) The system shall be easily maintainable by making use of a hydrogen production.
- e) To maintain and improve the current operating, alarm and control philosophy for the plant/unit after upgrade.
- f) Extend the life expectancy of the respective plant.
- g) Ensure that the plant is of a high-quality standard.
- h) Ensure selection technology options are in line with best industry practise and as per latest standards.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Name	Designation
AC	Alternating Current
A	Ampere
AIA	Approved Inspection Authority
°C	Celsius
C&I	Control And Instrumentation
m ³	Cubic Meters
DC	Direct Current
ECM	Engineering Change Management
EDWL	Engineering Design Work Lead

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Name	Designation
HAZLOC	Hazardous Location
HAZOP	Hazard and Operability
HP	High Pressure
hr	Hour
HMI	Human Machine Interface
H ₂	Hydrogen
KEN	Kendal
KOH	Potassium Hydroxide / Lye
kPa	Kilopascal
LDE	Lead Discipline Engineer
OEM	Original Equipment Manufacturer
OHS	Occupational, Health and Safety
OPCR	Outside Plant Control Room
O ₂	Oxygen
P&ID	Piping And Instrumentation Diagram
PS	Power Station
QC	Quality Check
QCP	Quality Control Plan
ROC	Required Operational Capability
SANS	South African National Standards
V	Voltage

1.4 The Contractor 's Scope

1.4.1 Detailed Scope of Work

The scope of this project is as follows:

- Purchase a complete turnkey high pressure hydrogen production plant that can work independently to produce dry hydrogen of high purity on site.
- The new hydrogen production plant must have 100% redundancy to ensure that breakdowns have limited effect on availability.
- The new plant must come built into its own containment unit, and the unit must have proper ventilation systems to prevent accumulation of an explosive mixture.
- The new plant must fit within the footprint of the current hydrogen production plant area.
- Install and integrate the plant with the current potable and Demin water supply systems, the analysis station, and the storage vessels.
- The new plant must be installed, tested and commissioned.
- Integrate the control and monitoring of the new plant with OPCR.
- Ensure that the new plant is compliant with statutory requirements, HAZLOC, SANS, and all relevant Eskom standards.

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- Ensure that the pipework of the new plant is compatible with the current storage vessels' pipework or replace the storage vessels' pipework to be compatible with the new plant.
- Ensure that the plant and surrounding areas are protected in case of emergencies.
- Design, supply, install and commission new receiver inlet and outlet valve panels.
- Supply new safety valves and arrangement in accordance with 240-56227413: Eskom Hydrogen Systems Standard.
- Supply and install correctly rated flash-back arrestor on each storage vessel's main vent.
- Replacement of all piping with Stainless Steel 316.
- Replace the underground hydrogen production plant's reticulation line with a nitrogen-jacketed hydrogen line from the metering panel to the point where it resurfaces.
- Refurbish the metering panel with new instrumentation as required per 240-56227413: Eskom Hydrogen Systems Standard.
- Provision of connections feeding into metering panel equipped with pressure transmitter and shut-off valve for pressure below 500kPa and provide manual open from HMI when pressure is above 500kPa.
- Make provision for bulk hydrogen delivery to be offloaded into the receivers.
- Ensure that the new plant can meet the following design requirement:

Process Condition	Requirement
Total power consumption	<120kVA
Plant Capacity	2 x 15Nm ³ /hr
Water Quality	Demin Water
Feed Water Flowrate	< 35L/hr
Pressure	27bar (30bar max)
Hydrogen Purity	≥ 99.5%
Oxygen Purity	≤ 1%
Dew Point	≤ -50°C
Operating conditions	240-56227413: Eskom Hydrogen Systems Standard

Table 1-1: New Hydrogen Production Plant Requirements

2 Management and start up.

2.1 Management meetings

- a) From the *starting date* until Completion of the whole of the *works* the *Project Manager* convenes and chairs a progress meeting on a day basis or at such frequency as is deemed appropriate and mutually agreed with the *Contractor*.
- b) The *Project Manager* and the *Contractor* schedules meetings to discuss and resolve any technical or commercial matters on an as required basis.
- c) Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings are submitted to the *Project Manager* by the person convening the meeting within two (2) days of the meeting.
- d) All meetings are recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register is not used for the purpose of confirming actions or instructions under the contract as these are done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Kick off meeting prior of the execution of the project.	Once at 09h00 morning	Kendal Power Station	Project Manager, Contractor, Engineer, Supervisor, Planner, Quality Controller, Safety officer, Environmental Officer.
Project Progress feedback meeting during execution.	Daily at 09h00 morning	Kendal Power Station	Project Manager, Contractor, Engineer, Supervisor, Planner, Quality Controller, Safety officer, Environmental Officer.
Risk register and compensation events.	Bi-weekly on Monday at 13h30	Kendal Power Station	Project Manager, Contractor, Engineer, Supervisor, Planner, Quality Controller and Buyer.
Overall contract progress and feedback	Monthly at 09h00 morning	Kendal Power Station	Project Manager, Contractor, Engineer, Supervisor, Planner, Quality Controller, Safety officer, Environmental Officer

Performance Management

- a) The *Contractor's* Performance will be assessed in accordance with the Performance Appraisal Process attached to this contract.

2.2 Documentation control

- a) All communication is routed via the *Project Manager*. All contractual documentation bears the contract number. Email is accepted as a means of communication, but all contractual communications are in the form of properly compiled NEC letters or forms attached to emails and not as a message in the email itself.
- b) All correspondence between the *Contractor* and the *Project Manager* follows the following rules:
 - 1) All letters bear the sender's signature.
 - 2) Letters follow the numbering scheme described in point 8.
 - 3) Correspondence sent via E-mail:
 - 3.1 Sender
 - 1.1.1. The letter is saved in PDF format and send as an attachment to the receiver.
 - 1.1.2. The email Subject field contains only the doc reference number as described in point 8.
 - 1.1.3. The e-mail body may contain informal text but is not contractually binding.
 - 1.1.4. Only the letter saved in PDF format is regarded as formal communication and legally binding
 - 3.2 Receiver
 - 3.2.1. The receiver replies to the e-mail received, ensuring that the complete message from

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the sender is included in the message as an attachment. This attachment includes the Letter in PDF format.

- 3.2.2. In his reply the receiver includes the following text on the first line of the Message Body: "Acknowledgement of receipt". This acknowledgement of receipt is contractually binding and serves as proof that the letter was delivered to the receiver's address (Core Clause 13.2).
- 3.2.3. When a reply to a letter is required, e.g. "Acceptance of documentation" the receiver now becomes the sender and the procedure under for 3.1 and 3.2 is followed with the receiver writing a new letter with a new reference number as described under point 8
- 4) Correspondence delivered by hand:
 - 4.1. Sender - The sender prepares the letter with a space for the receiver to sign and date acknowledgement of acceptance. The sender signs the letter and prepares two copies of the letter for delivery.
 - 4.2. Receiver - The receiver signs both copies of the letter upon receipt and returns a signed and dated copy to the sender.
- 5) Correspondence by fax:
 - 5.1. Sender – The sender prepares the letter with a space for the receiver to sign and date acknowledgement of acceptance. The sender signs the letter and sends it to the receiver by fax.
 - 5.2. Receiver - Upon receipt, the receiver signs and dates the letter and returns it to the sender by fax, acknowledging receipt.
- 6) Drawings and other technical document transmittals
 - 6.1. Transmittals are numbered as described in point 8.
 - 6.2. The same procedure as for letters described under point 4 is followed for transmittals
- 7) All correspondence not transmitted with one of the methods described above will be deemed as informal communication and not contractually binding. Only when a correspondence has been acknowledged for receipt by the receiver by way of points 3.2, 4.2 or 5.2 will it be deemed contractually binding.
- 8) Correspondence numbering scheme.
 - 8.1. Project Manager - The numbering of all formal correspondence from the Project Manager starts with a prefix K0XXX-B-E followed by the correspondence number 0001, 0002 etc. Example: K0XXX-B-E0021.
 - 8.2. Contractor - The numbering of all formal correspondence from the Contractor starts with a prefix K0XXX-B-C followed by the correspondence number 0001, 0002 etc. Example: K0XXX-B-C0021.
 - 8.3. During the project kick-off meeting the *Project Manager* informs the *Contractor* of the numbering to be used to substitute the XXX in the numbering K0XXX-B- mentioned in 8.1 and 8.2.

2.3 Health and safety risk management

The supplier or contractor will comply to the she specification and she tender returnable and other procedures that are specified on the she specification and annexure B form that is issued on tender documents:

- a) Adhere to the OHS Act 85 of 1993.
- b) All staff will undergo Safety Induction, presented by Employer's Safety Risk Department.
- c) National Disaster Management Act Covid-19

2.4 Environmental constraints and management

Contractors must comply with the environmental criteria and constraints stated below:

- a) Environmental Management System (ISO 14001, 2004)
- b) National Environmental Management Act (Act 107 of 1998)
- c) Eskom SHEQ policy (32-727)
- d) Kendal Environmental Aspect and Impact Identification, Rating and Management Procedure (*1015586)
- e) Kendal Environmental Communication Procedure (*1015692)

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- f) Kendal Emergency Preparedness Plan (*1015702)
- g) Kendal Non-conformance, Corrective and Preventive Actions Procedure (*1017357)
- h) Kendal Waste Management procedure (*1024102)
- i) Hazardous substance procedure (*1018300)
- j) Eskom Flash report
- k) SHEQ File Index (*1027127)
- l) Site Inspection Checklist (*1027246)

2.5 Quality assurance requirements

General

- a. The *Contractor* or Supplier complies with the *Employer's* quality and technical requirements including those listed in the *Employer's* specification document QM58 (Quality Management Specification 240- 105658000).
- b. The *Contractor* submits a QMS as a returnable schedule and uses it for all phases of the Project. The QMS complies with the requirements of ISO 9001 standard. The *Contractor* provides evidence of a fully implemented QMS as and when requested by the *Employer*. The *Employer* may at his sole discretion carry out an audit on the Contractor, the Contractor's suppliers and Subcontractors.

Quality Management documents requirements

The *Contractor* submits the following document after contract award to the *Employer* for review and acceptance and prior to the commencement of work

The *Contractor* will supply the *Employer* with a QCP which will detail the *Contractor's* organisation, quality assurance and quality control procedures specific to this project. The QCP must be aligned to, and reference ISO 10005:2005 QMS, guidelines for quality plans and in compliance with the guideline in QM 58(Quality Management Specification 240- 105658000). The QCP will make reference to the *Contractor's* QMS Procedures to be used in this Contract:

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

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

The *Contractor* provides CVs of the quality management employees who will be responsible for quality on site.

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

- a. Administration of QA/QC functions
- b. Verification of approval status of their or Subcontractor's QCP and procedures
- c. On-and -offsite inspections
- d. Co-ordination, inspection and verification of the Employer's intervention points
- e. Review of Contractor testing and inspection documents (procedures, test results)

The *Contractor* submits as a minimum the following documents, as required by the *Employer*, which requirement does not constitute a compensation event, during the execution of the Works: -

- a. Updated QCP register
- b. Inspection notifications accompanied by their inspection report
- c. Non-conformance and Defects registers and reports
- d. Updated Site and off-site inspection schedules.
- e. Inspections completed/outstanding.
- f. Inspection and test reports

Quality Responsibility

- a. The *Contractor* is accountable for the quality of the output and liable for any failures.
- b. The *Contractor* is responsible for defining the level of intervention of QA/QC or inspections. These are in line with the Employers requirements.
- c. The interventions points include all witness, hold, verification and review points required by the Employer. The *Contractor's* failure to allow the intervention points will constitute a non-conformance.

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Inspections

- a. The *Contractor* is responsible for the inspection of all the Works that is performed, and the Employer only verifies that the Works is conducted as per the Contract.
- b. The *Contractor* conducts all inspections in accordance with the accepted QCP / ITP.
- c. The *Contractor* drafts a QCP or ITP which shows each activity and submits to the Employer for acceptance.
- d. The *Contractor* provides suitably qualified personnel to conduct on-and-offsite inspections
- e. The *Contractor* ensures that all Works are inspected and approved before the Employer is invited for verification.

Non-Conformances and Defects

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

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

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

Quality Reporting

The *Contractor* submits a monthly quality report, on the last working day of the month. The report includes but not limited to the following:

- a) A register of NCRs and defects
- b) Updated QCP / ITP register
- c) Planned and completed local and foreign inspection dates
- d) Completed and outstanding Inspections

2.6 CONFIGURATION MANAGEMENT REQUIREMENTS**2.6.1 General Requirements**

The contractor shall include the employer's drawing number in the drawing title block. This requirement only applies to design drawings developed by the contractor and their subcontractors. It shall not apply to drawings developed by manufacturers for equipment and material such as valves, instruments, etc. Drawing numbers shall be assigned by the Employer as drawings are developed.

The project name shall be listed on all drawings, including manufacturers' drawings. A separate sheet may be attached to the submittal if needed to adequately list all tag numbers associated with the drawings such as valves or instruments which may have numerous tag numbers associated with it.

The language of all documentation shall be in the English language. The units of measure shall be metric. The contractor retains project design calculations and information for the entire life cycle of the plant and provides these to the employer on prior written notice at any time notwithstanding the expiry or termination of the contract.

2.6.2 Documentation Requirements

All documents supplied by the contractor shall be subject to Eskom's approval. Documents such as QCP's, Method Statements and other documents impacting the work shall be approved by the Employer at least 3 working days prior to commencement of the works.

Each revision of a document or drawing shall be accompanied with a list of the comments made by the employer on the previous revision if applicable and the response/corrective action taken by the contractor. Changes shall be recorded in a revision table contained on/in each drawing/document.

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Documents and drawings shall indicate the employer's drawing number as allocated by the employer. The contractor may have his own internal document or drawing number on the document or drawing, but where reference is made among documents or drawings, the employer's number shall be used.

The contractor shall compile a complete data book for all work done during manufacturing, construction and commission containing the following as a minimum if applicable:

- Scope of work
- Approved "As built" drawings
- Design calculations
- Approved QCPs
- Inspection reports
- Pipe reports if applicable
- As built drawings (isometric drawings and P&IDs)
- Material summary that gives full traceability between components used, drawings and material certificates
- All material certificates for pipes, fittings and all components used
- Pressure test certificate and the calibration certificates of the gauges used
- Pressure test procedures
- The manufacturer's/repairer's certificate
- All corrective actions
- Operating Philosophy including all alarm and trip values
- Parts catalogue
- Maintenance manual
- Storage, packing and transportation instructions

2.6.3 Document Identification

The Contractor is required to submit the Vendor Document Submission Schedule (VDSS) as per agreed dates to the delegated Eskom Representative. Eskom will pre-allocate document numbers on the VDSS and send back to the Contractor through the delegated Eskom Representative. The VDSS is revisable, and changes must be discussed and agreed upon by all parties. Changes in the VDSS can be additional documentation to be submitted, changes in submission dates or corrections in documentation descriptions, document numbers, etc. The Contractor's VDSS shall indicate the format of documents to be submitted.

2.6.4 Document Submission

All project documents must be submitted to the delegated Eskom Representative with transmittal note according to Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014). In order to portray a consistent image, it is important that all documents used within the project follow the same standards of layout, style and formatting as described in the Work Instruction. The Contractor is required to submit documents as electronic and hard copies and both copies must be delivered to the Eskom Representative with a transmittal note.

In addition, the Contractor shall be provided with the following standards which must be adhered to:

- Project Plant Specific Technical Documents - Handover Works Instruction 240-124341168
- Project Documentation Deliverable Requirement Specification 240-65459834.
- Technical Documentation Classification and Designation Standard 240-54179170.
- Project/ Plant Specific Technical Documents and Records Management Work Instruction 240-76992014.

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2.6.4.1 Electronic Submission (SharePoint Transmittal)

Electronic submissions could be done using the SharePoint Transmittal Site functionality and route. This shall be done by executing the following steps:

2.6.4.1.1 Bulk Submission

The contractor shall submit all documentation to the employer's representative as well as the Project's Documentation Centre in the following media:

- Electronic copies shall be submitted to Eskom Documentation Centre through SharePoint transmittal site that will be provided during contract award.
- Hard copies shall be submitted to the employer's representative accompanied by the Transmittal Note.
- For bulk document submission, the following link can be used <https://zendto.eskom.co.za/>

2.6.4.1.2 Emails and other submission methods

Electronic copies shall be submitted to the Eskom Representative email subject; Project Name_Discipline_Subject. Electronic copies that are too large for email will be delivered on large file transfer protocol and/or hard drives to the Project Documentation Centre. A notification email, with the transmittal note attached, shall be sent to the Eskom Representative.

2.6.5 Engineering Change Management

All design change management shall be performed in accordance with the latest revision of the Eskom Project Engineering Change Management Procedure (240-53114026) and the Employer shall ensure that Contractor is provided with latest revisions of this procedure. Any uncertainty regarding this procedure should be clarified with the Employer. All design reviews will be conducted according to the Design Review Procedure (240-53113685).

2.6.6 Drawings Requirements

The creation and control of all Engineering Drawings shall be in accordance with the latest revision of 240-86973501: Engineering Drawing Standards – Common Requirements. The Contractor shall provide detailed "As Required" arrangement/dimensional drawings for each part of work to be done. No work will commence without approval of these drawings approved by the Engineering representative of the Employer.

After the works have been completed, detailed "As-built" drawings shall be provided by the Contractor. The "As-built" drawings are subject to the Employer's Engineering representative comments and approval. All drawings shall indicate new installation/modified parts as well as adequate existing pipework to which the items are connected. This shall be done in sufficient detail to easily identify the location of the installation.

All drawings shall contain the following as a minimum:

- Description of component with AKZ number.
- Layout of the pipework with dimensions and angles.
- Bill of materials for all components traceable to the layout. BOM should include size, schedule, pressure rating or class, material, quantity etc.
- Design and operating pressures and temperatures.
- Proof Pressure Test requirements and pressures.
- Design Code.
- All drawing revisions must be provided as paper copies in original (in all cases at least A3) size as well as provided in .pdf format.

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To aid in the production of the drawings, the Contractor may request copies of P&ID's and the equipment's original drawings from the Employer's Library. The availability of current plant drawings cannot be guaranteed.

All required drawings shall be prepared in accordance with the requirements as specified in 240-86973501: Engineering Drawing Office and Engineering Drawing Standard. A drawing register (Master Document List, with document titles, document revision, status, transmittal details and project phase) which records the drawing's information shall be maintained by the Contractor.

Drawings to be prepared will include and not be limited to:

- Equipment drawings
- Equipment lists
- Isometric drawings and P&ID's
- Original Equipment Manufacturer (OEM) manuals and part catalogues
- Set point and parameter lists
- Three dimensional drawings requirements; DGN model

2.6.6.1 Drawings Format and Layout

The creation, issuing and control of all Engineering Drawings will be in accordance with the latest revision of engineering drawing Standard 240-86973501. Drawings issued to Eskom will be a minimum of one hardcopy and an electronic copy that is editable. All Contractors are required to submit electronic drawings in Micro Station (DGN) format, and scanned drawings in pdf format. No drawings in TIFF, AUTOCAD or any other electronic format will be accepted. Drawings issued to Eskom may not be "Right Protected" or encrypted. The Employer reserves the right to use these drawings to meet other contractual obligations. The Contractor shall include the Employer's drawing number in the drawing title block. Drawing numbers will be assigned by the Employer as drawings are developed.

2.6.7 Plant Coding and Labelling

2.6.7.1 Plant Coding

Coding of the design shall be based on the latest revision of 240-93576498 KKS Coding Standard and the Employer shall undertake the coding in line with its standards. The KKS coding shall be applied during the design review stage(s) and cross referenced to all arrangement drawings, schematics, instructions, and manuals and where practical to spare parts list/manuals. The Contractor shall be required to include allocated coding to the electronic design drawings.

The Employers KKS Standard shall be used to allocate codes to the plant or system included in the works. Plant Coding shall be undertaken by the employer and as such the service provider shall make available the following documentation to code:

1 Mechanical

- Piping and Instrumentation Diagrams (P&IDs)
- Interface list
- Process flow diagrams (PFDs)

2 Electrical

- Single line diagrams
- Electrical board general arrangements (GA)
- Cable schedule

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3 C&I

- C&I architecture drawings
- C&I Cubicle GA
- Cable block diagrams
- Remote control station lists
- Cable schedules

4 Civil

- Site layouts
- Building layouts
- Building sectional layouts
- Building floor plans per level
- Underground services layouts
- Cable rack & support
- Building lists (including room equipment lists)

Employer will only code the KKS code defining Documentation listed above. The employer will assign a coding technician who will interact with the Service Provider in coding the plant as listed above. It may be required that the person be based at the Service provider's offices full time. The Service Provider will then be required to include allocated codes to all other designs and related documentation. It is also the responsibility of the Service Provider to consistently apply the KKS codes throughout the rest of the technical documentation which shall include, but not limited to:

- Load schedules
- Board parts lists
- Cable block diagram
- Termination diagram
- Drive & actuator schedules
- Instrument schedules
- Alarm lists, loop diagrams
- Signal lists
- Schematic diagrams
- Termination diagrams
- Logic diagrams, etc.

The Service provider shall ensure that all documentation is coded (as per the codes assigned by the technician) prior submission to Employer for review.

2.6.7.2 Plant Labelling

The Contractor shall also manufacture and install KKS labels to identified plant items as per list supplied by the Employer. Labels shall be manufactured and installed according to the Employer's KKS Plant Labelling and Equipment Descriptions Standard. The labelling standard shall be supplied as part of the enquiry documents.

2.7 Programming constraints

Accepted Programme / project network

- a) The *Contractor* submits a single programme that incorporates the services and work (programmes) of all his Subcontractors. All contractual dates are integrated into the *Contractor's* programme. The programme includes the activities performed by Subcontractor(s), the interface points between different Subcontractor's work, the *Employer's* operations, the work of Others as well as the interface points between the *Contractor's* work and the individual Subcontractor's work.
- b) The following reports are required as supporting documentation to the Accepted Programme:
 - i. Time analysis print-out
 - ii. Critical activities report
 - iii. Key event report
 - iv. Resource schedules and histograms
- c) All programmes and reports are computer generated (MS project).
- d) The first Accepted Programme (at the Contract Date) serves as a baseline for the Provision of the Works until the *defects date*. This baseline is shown on all subsequent graphical presentations of revised programmes.
- e) A synopsis of all changes to the Accepted Programme is submitted, by the *Contractor*, with each revision. Each revision is uniquely identified by a revision number which is agreed with the *Project Manager* prior to submission of the first revised programme.
- f) The *Contractor* assesses the available data and knowledge explicitly. Any technical detail, policies, imposed organisational conditions, contract conditions, specifications, overall programme constraints, resource availability, long delivery items or any other factor of significance to Provide the Works, are considered by the *Contractor* in his planning.
- g) The *Contractor* provides work planning bar charts and resource schedules as agreed with the *Project Manager*.
- h) The *Contractor* submits a revised program to the *Project Manager* for acceptance at the interval stated in the Contract Data.
- i) The *Contractor* uses Microsoft Project 2010 to perform all his planning.

NB: Programme must be submitted in MS projects

Programme must be submitted and be accepted within two days after Contract award

Programme must be updated daily and Submitted to the Employer

2.8 Contractor's management, supervision and key people

- The *Contractor* provides the *Project Manager* with a detailed project organisation structure.
- The *Contractor* submits the project organisation structure to the *Project Manager* for acceptance within two (2) weeks of the Contract Date.
- The *Contractor* ensures that his workforce is trained and competent to perform their respective duties and that a formal health and safety induction training programme is provided.
- The *Contractor's* inspection personnel familiarise themselves with the content of the Works Information and the *Contractor* ensure consistency in interpretation and decision making.
- Any new foremen/supervisors appointed by the *Contractor* after the *starting date* or during the project are fully conversant with the details of the *Contractor's* methodology and communication process in use, prior to accessing the *working areas*.
- The *Contractor* ensures that the rigging personnel are qualified with operating the chain blocks and handling of other related lifting equipment to ensure personnel safety, productivity and prevention of plant damage.
- The *Contractor* employs, in and about the Provision of the Works, only such persons that are careful, competent and efficient in their several trades and callings.
- The *Contractor* ensures that his co-ordinators and employees are fluent in the language of the Contract.
- *Employer* working hours: Monday to Thursday 07h15 to 16h30 and Fridays 07h15 to 12h15.
- Abnormal working hours are pre-arranged with the *Project Manager*.
- Kendal emergency preparedness (e.g. evacuation, etc.) procedures are obtained from the Project Manager and adherence by the Contractor and his employees is mandatory.
- No recruiting of casual labour is done on the *Employer's* premises, including the area outside the Kendal Power Station Security gate

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2.9 Invoicing and payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager*;
- The contract number and title;
- *Contractor's* VAT registration number;
- The *Employer's* VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount 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 must be emailed to invoiceseskomlocal@eskom.co.za

2.10 Contract change management

The Contract management changes notes depicted below are at all times subjected to NEC3 ECC core clauses 16 and 60 and all clauses referring to the change to the contract. These clauses supersede the notes below:

- a) Changes to this contract do not automatically grant the *Contractor* legitimate right to compensation events, claims or proceedings
- b) Either party may request a contract change provided that such changes are formally communicated prior to implementation
- c) The *Project Manager* assesses and documents the potential impact of a proposed contract change before presenting it to the Compensation Events Committee
- d) The *Project Manager* has the right to request the *Contractor* to make reasonable amendments to a contract change request
- e) The *Project Manager* has the right to reject a change and specify his reasons
- f) No proposed contract change will be implemented by the *Contractor* without prior approval of the *Project Manager*
- g) Unless the *Project Manager* expressly agrees otherwise in writing the *Contractor* continues to provide the works in accordance with the Works Information and this contract as if the proposed contract change does not apply
- h) Any discussions, negotiations or other communications which may take place between the *Project Manager* and *Contractor* in connection with any proposed contract change, including submission of any change communications is without prejudice to the *Employer's* other rights under this Contract.
- i) Each party bears its own costs in relation to the preparation and agreement of each change request and impact assessment

Contracts changes executed by any State-Owned Enterprise are subjected to control by the Department of National Treasury. The lead time associated with this department will not justify claim for standing time from the *Contractor*.

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2.11 Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer's* right to termination stated in this contract.

3 Engineering and the Contractor's design

The Scope of *Works* includes the provision for the design, procurement, fabrication, manufacture, factory testing, delivery to Kendal Power Station site, off-loading, storage and preservation, installation, site testing, cold and hot commissioning, project management, quality control, training, document configuration and handover of the new hydrogen production plant for Kendal.

3.1 Employer's design

At Kendal Power Station, the existing Hydrogen generating plant is supplied from the 11kV Station network as follows:

- 01 BBA 12 AA001: 11kV Station Board 1, circuit 12, feeds a 0 5BHE: 380V Hydrogen Generating Plant Board, circuit 1, via a single 11kV / 380V, 315 kVA, ONAN transformer.

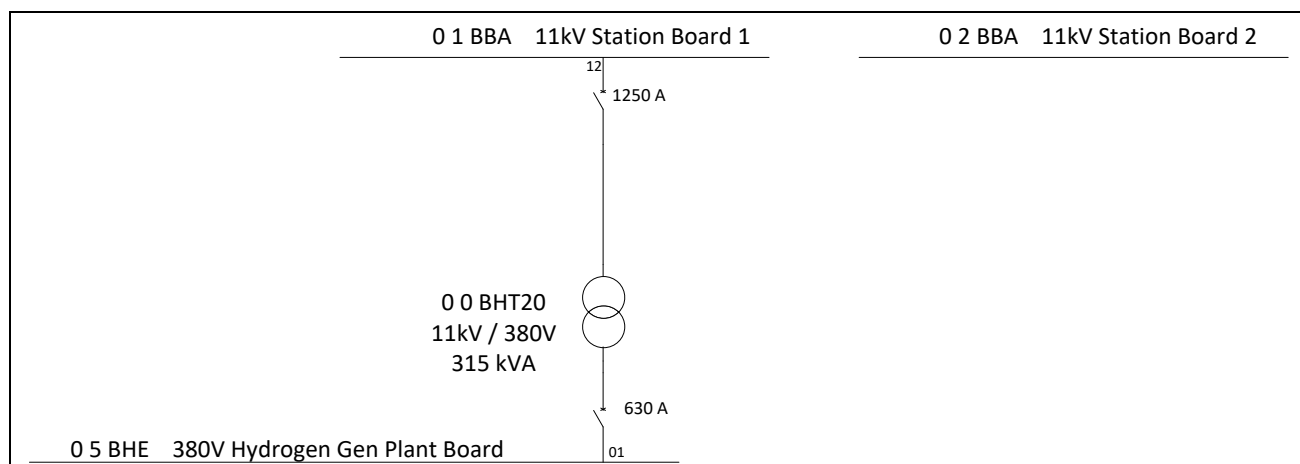


Figure 3-1: Existing electrical supply to Hydrogen Generating Plant

- 1) The *Employer* provides the existing interface details of the current Hydrogen generating plant for integration into the *Contractor's* detail design (See Figure 4-1 and Table 4-2).
- 2) The *Contractor* designs the new Hydrogen generating plant's electrical network, including all electrical loads, with interface to the existing point of supply.
- 3) The *Contractor* assesses the installed power cables to the existing plant for reuse.
- 4) The *Contractor* assesses the installed earthing and bonding to the existing plant for reuse.

Cable	Source	Destination	Cable Qty	Cores per cable	Core Area
01	0 1BBA 12 AA001	0 0BHT 20	1	3	150 mm ²
02	0 0BHT 20	0 5BHE	2	4	95 mm ²

Table 3-1: Interface Power Cables

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3.2 Parts of the works which the *Contractor* is to design

The *Contractor* develops the *Employers* design into a detail design from the scope of work, including detail design, manufacture or procure, transport, storage, install, test, commission, certify and handover:

- A new Hydrogen generating plant, including all electrical works, to provide a fully functional system in line with the requirements in Section 5.1 and the 240-56227413 Eskom's Hydrogen System Standard.
- The *Contractor* assesses the existing installed power cables for reuse into the design of the new Hydrogen generating plant. The *Contractor* develops an assessment report of the interface power cables, to be accepted by the Project Manager, for reuse into the design.
- The *Contractor* assesses the installed earthing and bonding to the existing plant for reuse into the design of the new Hydrogen generating plant.
- The *Contractor* zones the new Hydrogen generating plant and fully complies with installation requirements and equipment for the respective zones, in accordance with SANS 10108.
- The *Contractor* provides all drawings of the new Hydrogen generating AS BUILT plant.
- The *Contractor* is required to provide training to Eskom operating, maintenance and engineering staff. The *Contractor* supplies all training material. The training shall include both theoretical and practical (on-the-job) training.
- The *Contractor* shall provide multiple sets of training classes to cater for day and night shift workers.

Test and Commissioning

- Testing and Commissioning of the upgraded new hydrogen production plant shall be performed to ensure that the system shall meet the functional requirements and performance criteria required for the plant as stipulated. The following functions in addition to the tests stipulated shall be performed:

Optimisation of the entire system

- The programs often require improvement after the first test run. It is recommended that any corrections or modifications are made not just in the controller user program but are also taken into account in the documentation.

Commissioning of the entire system

- Once the final status of the controller user program and the documentation is established, all the controller functions need to be executed step-by-step again.
- If no faults are detected in the entire system commissioning, then the system is ready to be handed over to the client.

3.3 Procedure for submission and acceptance of *Contractor's* design**Design Reviews**

- The *Contractor* shall hold a design review as part of the compliance review of the plant, allowing the *Employer* to gain a clear understanding of the overall design.
- The review shall be after the completion of the design and the preliminary outline drawings.
- The *Contractor* shall make available the calculations and information for the detailed design verification.

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3.4 Other requirements of the *Contractor's* design**3.4.1 Design Requirements:****3.4.1.1 Electrical Motors:**

- 1) The *Contractor* ensures all motors are designed, procured, or manufactured; factory acceptance tested (FAT), supplied, delivered, off loaded, installed, site acceptance tested (SAT), and commissioned in accordance with the latest revision of the following Eskom standards:
 - 240-57617975 - Procurement of Power Station Low Voltage Motors Specification.
 - 240-56360387 - Storage of Power Station Electric Motors
 - 240-56361435 - Transport of Power Station Electric Motors Standard
- 2) The *Contractor* takes into consideration all relevant characteristics and operating conditions pertaining to the driven machine and the motor environment. The *Contractor* is responsible for designing or selecting from a standard range, a motor that will perform as required by the *Project Manager*. The preference is for motors to be selected from a standard range. Where this is not possible, the *Project Manager* is notified for approval on non-standard motor design.
- 3) Reliable motors with high efficiency, high power factor and low input power consumption values are required to support the Eskom Energy Efficiency drive.
- 4) The *Contractor* confirms all the interfacing with related equipment and Subcontractors to ensure the motors will function reliably within the required environment. The *Employer* is made aware of all shortcomings and risks which may affect the functioning of the motors.

3.4.1.2 Electrical Control and Power Cables:

- 1) The *Contractor* adheres to 240-56227443 Requirements for Control and Power Cables for Power Stations Standard, regarding the selection, design, and execution of cabling for all scope of work of the project.
- 2) The *Contractor* takes into consideration all relevant characteristics and operating conditions pertaining to the respective connected loads and environment of the control and power cables.

3.4.1.3 Lighting & Small Power:

- 1) The *Contractor* adheres to 240-55714363 Coal Fired Power Stations Lighting and Small Power Installation Standard, regarding the design, supply, installation and testing of lighting and small power for all scope of work of the project.
- 2) The *Contractor* takes into consideration all relevant characteristics and operating conditions pertaining to the respective environment of the lighting and small power equipment.

3.4.1.4 Earthing & Lighting Protection:

- 1) The *Contractor* adheres to 240-56356396 Earthing and Lightning Protection Standard and 054-393 Earthing Standards regarding the design, supply, installation and testing of earthing and lightning protection for all scope of work of the project.
- 2) The *Contractor* takes into consideration all relevant characteristics and operating conditions pertaining to the respective bonding points and environment of the earthing and lightning protection system.

3.4.1.5 LV Switchgear:

- 1) The *Contractor* adheres to 240-56227516: LV Switchgear and Control Gear Assemblies and Associated Equipment for Voltage up to and Including 1000V AC and 1500V Standard regarding the LV switchgear scope.
- 2) The *Contractor* submits a compliance schedule, as a tender returnable, for the upfront design compliance and associated user requirements.
- 3) The *Contractor* submits the switchgear detail designs for acceptance in a form of a package to the *Project Manager* prior to the commencement of any procurement, manufacturing, or fabrication.
- 4) The *Contractor* ensures LV Switchgear equipment compatibility with the existing Kendal control systems and DCS inputs & outputs.

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3.5 Use of *Contractor's* design

The *Contractor* develops the *Employers* design into a detail design for the following scope of work, including detail design, manufacture or procure, transport, storage, install, test, commission, certify and handover:

- 1) A new Hydrogen generating plant, including all electrical works, to provide a fully functional system in line with the requirements in Section 5.1 and the 240-56227413 Eskom's Hydrogen System Standard.
- 2) The *Contractor* assesses the existing installed power cables for reuse into the design of the new Hydrogen generating plant. The *Contractor* develops an assessment report of the interface power cables, to be accepted by the Project Manager, for reuse into the design.
- 3) The *Contractor* assesses the installed earthing and bonding to the existing plant for reuse into the design of the new Hydrogen generating plant.
- 4) The *Contractor* zones the new Hydrogen generating plant and fully complies with installation requirements and equipment for the respective zones, in accordance with SANS 10108.
- 5) The *Contractor* provides all drawings of the new Hydrogen generating AS BUILT plant.

3.6 Design of Equipment

All designs of the plant or equipment by the *Contractor* shall be used only and once review and approval of the designs has occurred. The review and approval shall be submitted to the Project Manager.

- The *Contractor* shall provide to the Project Manager and relevant Construction Management personnel the documentation for the warranties from manufacturers or suppliers of all equipment required.
- All the required documentation will be made available by relevant Construction Management personnel to the *Contractor* regarding the codification of equipment as well as the freight, storage, and delivery requirements within the Eskom sites prior to the procurement of any equipment required for the execution of the structures to be built within the area.
- The *Contractor* is solely responsible for providing the protection of the equipment from damage or loss due to weather, fire, theft, unexplained disappearance or similar during the execution of the works.
- The *Contractor* shall bear the cost of the replacement of any equipment or part thereof damaged or requiring replacement and all such cost shall be covered as per the required construction insurance taken out by *Contractor* for the construction of the works at that area.
- The liability of the use of such equipment in the execution of the works shall remain that of the *Contractor* (i.e this includes the design and transport, storage, maintenance, use of the equipment).

3.7 Equipment required to be included in the works

- All documentation, including reports, manuals, etc. is in the English language.
- The technical, training, operating and maintenance manuals are provided for each type of a functional unit. Technical manuals include all technical data as well as the technical data and leaflets of each individual component provided. Where generic manuals are provided, an addendum is provided indicating the applicable project specific components.

Manuals are of a good quality and cover the following as a minimum:

- a) Technical descriptions of the equipment and component parts
- b) General arrangement drawings
- c) Installation instructions with drawings or pictures
- d) Operating and maintenance instructions for all components
- e) Detailed parts lists (accompanied by exploded view type drawings clearly detailing the part and uniquely identifying it)
- f) Spare part ordering instructions

Any special instructions pertaining to storage of spare parts or their shelf life is included in the maintenance manual. All drawings requested for component location, dismantling and re-assembly for maintenance are included in the maintenance manual. All special tools required for operating and maintenance of the equipment are presented in a form of a schedule in the operating and maintenance manual, respectively.

4 Procurement

Materials, equipment, and services shall be procured only from approved suppliers. Approval for any deviations must be obtained in writing from the *Project Manager*.

4.1 People

4.1.1 Minimum requirements of people employed on the Site

- The Contractor ensures that his workforce is trained and competent to perform their respective duties.
- The Contractor's inspection personnel familiarise themselves with the content of the work and the Contractor ensures consistency in interpretation and decision-making.
- Any new foremen/supervisors appointed by the Contractor after Contract Award or during provision of the works are fully conversant with respect to details of the methodology and communication process existing, prior to accessing the Site.
- All personnel employed on the site must have valid work permits and comply with all South African labour laws and immigration regulations.
- All personnel must possess the necessary qualifications, skills, and experience relevant to their roles.

4.1.2 BBBEE and preferencing scheme

- Tenderers will be required to maintain or improve their B-BBEE Recognition Level for the duration of the contract, after contract award regarding any Broad Based Black Economic Empowerment (B-BBEE) or preferencing scheme measures.

a) B-BBEE Level Compliance:

- The *Contractor* must maintain its B-BBEE status throughout the duration of the contract.

b) Skills Development and Enterprise Development:

- The *Contractor* must implement skills development initiatives as part of the project, including on-the-job training, mentorship programs, or sponsorship of accredited training for local labourers and subcontractors.

c) Audit and Verification:

- The *Contractor's* compliance with B-BBEE and preferencing scheme requirements will be subject to audit. All documentation related to B-BBEE compliance, including subcontracting agreements, invoices, and training records, must be readily available for review upon request.

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

The *Contractor* complies with and fulfils the *Contractor's* obligations in respect of the Accelerated and Shared Growth Initiative - South Africa in accordance with and as provided for in the *Contractor's* ASGI-SA Compliance Schedule stated below

[Insert the agreed ASGI-SA Compliance Schedule here]

The *Contractor* shall keep accurate records and provide the *Project Manager* with reports on the *Contractor's* actual delivery against the above stated ASGI-SA criteria. [Elaborate on access to and format of records and frequency of submission etc.]

The *Contractor's* failure to comply with his ASGI-SA obligations constitutes substantial failure on the part of the *Contractor* to comply with his obligations under this contract.

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4.2 Subcontracting

4.2.1 Preferred subcontractors

N/A

4.2.2 Subcontract documentation, and assessment of subcontract tenders

- a) The *Contractor* submits the proposed contract data for each subcontracting for acceptance to the *Project Manager*.
- b) The *Contractor* prepares subcontracting document as according to the NEC Contract.
- c) The *Contractor* must inform the *Project Manager* when intending to subcontract some of the works from the contract scope.
- d) The *Contractor* takes note that their Subcontractors Safety Files will be accepted by the *Contractor* Safety Manager before it will be handed to the *Employer* SHE practitioner/Officers for verification of compliance before any work commence. Proof of acceptance by the *Contractor* Safety Manager needs to be in the Safety file when handed over to *Employer* SHE Practitioners for verification.
- e) The Contractor only employs qualified sub-contractors

4.2.3 Attendance on subcontractors

4.3 Plant and Materials

Arrangement must be made in advance with the Project Manager. The Contractor must plan ahead, any spares/material that will be required on Saturday, Sunday and Public holidays must be requested on Thursday latest in order to be issue to the contractor on Friday.

The contractor must provide own transportation, rigging equipment, labour force when collecting and offloading the material.

All material must be stored correctly, neatly and safely and must be barricaded. On completion of the work the contractor must return of unused material (surplus material); can be return partial during construction.

NB! The contractor shall provide their own vacuum cleaning truck as the area is full of dust during or after the work is done. It is the contractor's responsibility to make sure that they do the housekeeping to keep the working area clean and tidy.

4.3.1 Quality

- All Plant and Materials are new. All New Plant and Materials will be free from defects. No Reconditioned Plant and/or Materials are regarded as new under any circumstances.
- The Contractor will not use Plant or Materials which are generally recognised as being unsuitable or otherwise to be avoided for the purpose for which they are intended.
- Only components of high reliability will be utilised, with a proven operating history, to enable the Plant to achieve required reliability and availability. Plant and Material design, engineering and manufacture will accord with the best modern practice applicable to high-grade products of the type to be furnished, so as to ensure the efficiency and reliability of the Works and the strength and suitability of the various parts for the Works.
- Plant and Materials withstands ambient conditions and the variations of temperature arising under working conditions without distortion, deterioration or undue strains in any part.
- All parts are made accurately, and where practicable, to standard gauges so as to facilitate replacement and repairs. Like parts are interchangeable.
- No repair of defective Plant and/or Materials will be permitted without the Project Manager's acceptance and any such repair, if accepted, will be carried out to the satisfaction of the Project Manager.
- The Contractor ensures that co-ordinated and formally documented management system is in place for the assurance of quality as specified in ISO 9001, Quality management Systems – Requirements.
- The Project Manager is free to specify hold and witness points during the installation and on-site testing stages of the project. The Contractor issues preliminary notification of such hold and witness points by fifteen working days' advance notice to the Project Manager and confirms such hold and witness points at least seven days prior to the activity.

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- **Rejection of Non-Compliant Materials:** The *Employer* has the authority to reject any Plant or Material that fails to meet the required quality standards.
- Rejected items must be removed from the Site promptly and replaced at the *Contractor's* expense without impacting the project schedule.
- **Record-Keeping:** The *Contractor* must maintain comprehensive records of all quality assurance and control activities, including certificates of compliance, inspection reports, and test results.
- These records must be made available to the *Employer* upon request.
- The supplier will be expected to comply with the Supplier Quality Management Specification 240-105658000 (previously called QM58) and ISO: 9001 requirements **as per the relevant category from 240-10565800** and other Eskom Holdings SOC Limited's Standards and specifications

4.3.2 Plant & Materials provided "free issue" by the *Employer*

All Plant and Materials required for the Works are to be provided by the *Contractor* at their own expense and in accordance with the specifications.

4.3.3 *Contractor's* procurement of Plant and Materials

The *Contractor* is responsible for the procurement, handling, and delivery of all Plant and Materials required to Provide the Works, subject to the following constraints and requirements:

a) Transport to Site:

- The *Contractor* must arrange safe and secure transportation of materials to the Site, including appropriate handling measures for fragile or hazardous materials.
- The *Contractor* must inform the *Employer* of delivery schedules to facilitate coordination at the Site.

b) Storage Before Installation:

- All Plant and Materials must be stored in accordance with manufacturer guidelines and *Employer* requirements to preserve their integrity.
- The *Contractor* must provide secure and weatherproof storage facilities and take measures to prevent theft, damage, or degradation of materials.
- Any materials stored on-site must not obstruct ongoing operations or safety measures.

c) Warranties:

- The *Contractor* must obtain warranties for all procured materials from suppliers.
- Where required by the *Employer*, warranties must be made in favour of the *Employer*, covering the expected lifespan or performance requirements of the materials.
- Copies of all warranties must be submitted to the *Employer* for their records.

d) Compliance Monitoring:

- The *Employer* reserves the right to audit the *Contractor's* procurement processes to ensure compliance with the contract requirements.
- The *Contractor* must provide regular updates on procurement progress, including order status, delivery schedules, and any anticipated issues.

e) Defective or Non-Compliant Materials:

- The *Contractor* must immediately notify the *Employer* of any defective or non-compliant materials.
- Replacement or rectification of defective materials must be at the *Contractor's* expense, without impacting the project schedule or quality.

Components or parts that are transported separately are marked accordingly and are easily identifiable.

- The *Contractor* supplies the labelling for the Plant that forms part of the works. The *Contractor* provides labels for the Plant according to Kendal label specification. The *Contractor* makes use of the KKS codes and descriptions provided by the *Employer*.
- The labels are affixed in such a way that they are easily legible and not obstructed by other components.
- Clamping methods applied to the labels ensures that removal of the labels requires force. The Project Manager will approve the proposed method of clamping prior to use.

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- The Contractor supplies the Project Manager, for verification and acceptance purposes, with a label list showing the text only. The Project Manager will approve the positioning and designation of labels.
- The KKS codes are used accordingly on documentation (e.g. drawings, manuals, equipment lists, cable schedules etc.) as a unique identification means. References to plant are accompanied by the relevant KKS code for that item of plant.
- Abbreviations to descriptions on the labels are generally not acceptable. Where abbreviations are unavoidable, due to the limited number of characters that can be engraved/etched on labels, the abbreviations are submitted to the Project Manager for acceptance.

4.3.4 Spares and consumables

- The Contractor provides list of critical spares as part of the Works.
- The Employer is responsible for purchasing of recommended spares.
- Each recommended spare is uniquely identified with a part number, detailed specification and respective supplier name, which can be cross referenced to a spares list and associated drawing.
- The Project Manager prefers that support from the OEM or component supplier is available locally in South Africa. The Contractor is required to provide technical support for the compliance operating life of the Plant.

4.4 Tests and inspections before delivery

- The Contractor provides Quality Plan for all equipment to be repaired to the Project Manager for acceptance.
- The plan shall be reviewed and accepted to ensure all repaired items get to be checked prior to delivery and installation.
- For all items that require replacement, Contractor shall in writing inform the Project Manager and arrange for the Project Engineer to witness the equipment.

Approval of Delivery: No equipment, materials, or systems shall be delivered to the Working Areas until the results of the tests and inspections have been reviewed and accepted by the *Employer*.

- The *Employer* may require adjustments or improvements based on the findings from the tests and inspections before approval is granted for delivery.

4.5 Marking Plant and Materials outside the Working Areas

N/A

4.6 Contractor's Equipment (including temporary works).**a) Design and Construction of Temporary Works:**

If temporary works are required (e.g., scaffolding, temporary power supply), the *Contractor* must design, procure, and construct these works in compliance with the relevant standards and regulations. The temporary works must be fit for purpose and meet the specifications detailed in the Works Information.

b) Approval of Temporary Works:

Temporary works may be subject to the *Employer's* approval before they are used on site. The *Contractor* must submit detailed designs, materials lists, and work schedules for the temporary works to the *Employer* for review and approval.

c) Liability and Responsibility for Temporary Works:

The *Contractor* remains fully responsible for the safety, adequacy, and performance of any temporary works used during the contract. The *Employer* or *Project Manager* does not assume liability for the design, construction, or use of such works.

4.7 Cataloguing requirements by the *Contractor*

The Contractor makes recommendations and supplies a spares list with detailed technical description, model number, ex rating and other critical details that will form part of the installations report and be provided to the Project Manager during hand over.

5 Construction

The Contractor is responsible for carrying out all activities and supplying everything necessary to provide the Works in accordance with the requirements of the Works Information. This includes clarifying and co-ordination with plant engineers, and the Project Manager. A fully integrated, working system is provided which meets safety, reliability and operability criteria and performs all control, safety and protection functions as detailed in the Works Information.

In accordance with the Works information, the works is completed by the Completion Dates as outlined on the project program.

5.1 Temporary works, Site services & construction constraints

5.1.1 *Employer's* Site entry and security control, permits, and Site regulations

a) Site Access Permits and Entry Requirements

- The Contractor's personnel are required to attend an Eskom Kendal safety induction, provided by the Project Manager, before allowed to enter and work on the site of Kendal Power Station. It is the responsibility of the Contractor to ensure that all required personnel have attended the safety induction.
- All personnel must obtain **Site Access Permits** issued by the Employer before entry.
- Valid identification documents (e.g., South African ID or passport) must be presented for security clearance.
- Foreign workers must have valid work permits, and their details must be submitted for prior approval.
- Access permits are non-transferable and must be displayed at all times.
- The Contractor provides his/her safety file for acceptance by the Project Manager. The Project Manager and delegated safety personnel approves the safety file, before the Contractor attends the Eskom Kendal safety induction.
- Site access control to Kendal Power Station will be arranged with the Project Manager after successfully completing the safety induction.
- Alcohol and drug testing will be conducted at any time on all personnel entering the Kendal Power Station site premises. Any personnel tested positive for alcohol or drug usage will not be allowed on site.
- The *Contractor* obtains a "Gate Removal Permit" from the *Project Manager* before materials and equipment can be removed from site. The "Gate Removal permit" gives itemised list of materials and equipment to be removed from site.
- The *Contractor* ensures that a tool list is available on the day of arrival and that all tools are captured on the tool list. The tool list will be handed over to the Reception Security official that will stamp the tool list. The tool list will be kept safe and will be used when tools need to be removed from site. This message should be handed over to any of the *Contractor's* Subcontractors

b) Security Screening

- All individuals will undergo a **background check** as part of the permit approval process.
- The *Employer* reserves the right to deny entry to any person based on security concerns.

c) Vehicle Access

- Only vehicles authorized by the *Employer* will be permitted on Site.
- Vehicle permits must be obtained in advance, and all vehicles will be subject to security inspection upon entry and exit.

d) Personal and Equipment Inspections

- Security personnel may conduct random searches of individuals, equipment, and vehicles entering or leaving the Site.
- Any prohibited items found will be confiscated, and disciplinary action may be taken.

e) Compliance with Site Regulations

- All personnel must adhere to the *Employer's* Site Regulations, including but not limited to:
- Health, Safety, and Environmental (HSE) standards.
- Emergency response protocols.
- Restricted areas and access zones.
- Behavioural and ethical guidelines.

f) Induction and Training

- All personnel must complete the *Employer's* Site Induction Program before commencing work.
- Refresher training may be required periodically or as determined by the *Employer*.

g) Costs

- All costs associated with obtaining permits, access clearances, or delays caused by non-compliance with entry requirements shall be borne by the *Contractor*.

h) Breach of Security Protocols

- Any breach of security protocols will result in immediate removal of the offending party from the Site.
- The *Contractor* may be held liable for any resulting damages, delays, or penalties.

5.1.2 Restrictions to access on Site, roads, walkways and barricades

The following restrictions and rules apply to ensure safe and efficient access and movement on the Site:

a) Access Restrictions

- Authorized Areas Only: Personnel may only access areas designated for their work. Entry into restricted or hazardous zones is strictly prohibited without prior approval.
- Work Zone Demarcation: The *Employer* will provide maps and plans identifying approved access routes and restricted zones.
- Escort Requirements: Visitors and unauthorized personnel must be escorted by authorized *Contractor* personnel at all times.

b) Use of Roads

- **Designated Routes:** All vehicles and equipment must use designated roads or tracks specified by the *Employer*. Off-road driving is prohibited unless explicitly approved.

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- **Speed Limits:** Speed limits will be enforced, with the maximum speed posted along Site roads. Violators may face removal from the Site.
- **Right of Way:** Pedestrians, emergency vehicles, and operational machinery have right of way on Site.
- **Vehicle Restrictions:** Oversized or heavy vehicles require prior clearance and may only operate during designated times.

c) Barricades

Provision of Barricades: The *Contractor* must provide and maintain temporary barricades around hazardous areas, open trenches, excavations, or ongoing work zones.

- Barricades must be highly visible and constructed to withstand environmental conditions.
- **Employer's Standards:** Barricades must meet the *Employer's* standards, including height, visibility, and signage requirements.
- **Signage:** Appropriate warning signs must be placed on barricades to indicate the nature of the hazard.

5.1.3 People restrictions on Site; hours of work, conduct and records

The following restrictions and requirements apply to the *Contractor's* personnel, including subcontractors, while on the Site:

Hours of Work

- **Standard Working Hours:** The *Contractor's* personnel may work on Site from 07:15 to 16:30, Monday to Friday, excluding public holidays, unless otherwise agreed upon with the *Project Manager*.
- **Overtime and Extended Hours:** Any work outside standard hours, including weekends or public holidays, must be approved in advance by the *Project Manager*.
- **Restricted Operations:** Certain operations may be prohibited during specific hours due to environmental, community, or operational constraints.

5.1.4 Health and safety facilities on Site

The following health and safety facilities and measures will be in place on the Site to ensure compliance with the Occupational Health and Safety Act (OHSA) and to address potential emergencies, disease outbreaks, and other health risks:

- **First Aid Facilities**
Employer-Provided Facilities: First Aid stations equipped with basic medical supplies will be available at the following locations on Site:
 - Main Site Office
 - Construction Area Safety Cabin
 Trained Personnel: The *Employer* will ensure that trained first aiders are available during standard working hours.
- **Emergency Medical Services**
Emergency Contact Numbers: A list of emergency contact numbers (ambulance, fire department, nearest hospital, etc.) will be prominently displayed at all work areas and First Aid stations.
On-Site Ambulance: Where applicable, an on-site ambulance will be available to handle critical medical emergencies.
- **Disease Prevention and Epidemics**
Hygiene Facilities: The *Employer* will provide handwashing stations, sanitizers, and hygiene posters at key locations.
Vaccinations and Health Screening: Where required by local regulations or during epidemic outbreaks, personnel must provide proof of vaccinations or undergo health screenings.
Isolation Facilities: A designated area will be set aside for isolating individuals showing symptoms of contagious illnesses until medical assistance arrives.

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- **Emergency Procedures**

Evacuation Plan: An emergency evacuation plan will be displayed at prominent locations on the Site. Regular drills will be conducted to ensure readiness.

Fire Safety: Fire extinguishers and fire alarms will be installed at all major work areas. The *Contractor* must ensure personnel are trained in fire safety protocols.

Incident Reporting: All incidents, including near misses, must be reported immediately to the *Supervisor* and recorded in the Site incident log.

5.1.5 Environmental controls, fauna & flora, dealing with objects of historical interest

The *Contractor* is required to comply with the following environmental controls, measures for protecting fauna and flora, and procedures for managing objects of historical or cultural significance on Site:

a) Environmental Controls

- **Site Preservation:** The *Contractor* must minimize environmental damage to the Site, including avoiding unnecessary clearing or grading of land.
- **Pollution Prevention:** Measures must be in place to prevent air, soil, and water pollution.

b) Fauna & Flora

- **Protection of Wildlife:** The *Contractor* must avoid harming local wildlife. Any encounters with protected species must be reported to the *Employer* and dealt with under the guidance of environmental authorities.
- **Vegetation Management:**
 - Avoid clearing vegetation outside designated work areas.
 - For any unavoidable vegetation removal, the *Contractor* must consult the *Employer* or environmental officer.
 - Replanting or restoration may be required in disturbed areas.

c) Dealing with Objects of Historical Interest

- **Identification and Reporting:** If any objects of historical, archaeological, or cultural significance are discovered during the works, the *Contractor* must immediately cease work in the affected area and notify the *Project Manager*.
- **Preservation:** The *Contractor* must take steps to protect the object or area from damage or disturbance until guidance is provided by relevant authorities or the *Employer*.
- **Consultation:** Work must not resume in the affected area until approval is given by the *Project Manager* or authorities after proper assessments have been conducted.

d) Compliance and Monitoring

- The *Contractor* must comply with all applicable environmental regulations and standards.
- Regular inspections will be conducted by the *Supervisor* or environmental officers to ensure compliance. Non-compliance may result in penalties or work stoppages.

5.1.6 Title to materials from demolition and excavation

Unless explicitly stated otherwise, the *Contractor* does not have title to any materials resulting from demolition or excavation activities on the Site.

All materials, including but not limited to copper, steel, concrete, and reusable components, remain the property of the *Employer*.

The *Contractor* must segregate, collect, and store materials from demolition and excavation as instructed by the *Project Manager*.

Reusable materials identified by the *Employer* must be transported to designated storage areas or reused in the Works as directed.

The *Employer* reserves the right to sell or dispose of any scrap or surplus materials. The *Contractor* is not entitled to any proceeds arising from the sale or disposal of such materials.

5.1.7 Cooperating with and obtaining acceptance of Others

The *Contractor* must cooperate fully with any Others as defined in clause 11.2(10), including but not limited to:

- Other contractors or service providers working on the Site.
- Representatives of the *Employer* and designated agents.
- Other stakeholders involved in or affected by the Works.

5.1.8 Publicity and progress photographs

The *Contractor* shall comply with the following requirements regarding publicity, notice boards, advertising, media relations, and progress photographs:

a) Notice Boards

- The *Contractor* shall provide, erect, and maintain notice boards at the Site as directed by the *Employer* or *Project Manager*.
- The design, content, and location of notice boards must be approved by the *Project Manager*.
- **Notice boards must clearly display relevant project information, including but not limited to:**
 - Project name
 - *Employer's* name and logo
 - *Contractor's* name and logo
 - Safety information and contact details

b) Progress Photographs

- The *Contractor* shall take progress photographs of the Works as directed by the *Project Manager* at specified intervals or milestones.
- Photographs must be of high quality and provide a clear representation of the progress and condition of the Works.

c) Ownership and Use of Photographs

- All photographs taken under this contract will become the property of the *Employer*.
- The *Employer* reserves the right to use the photographs for project documentation, reports purposes.

5.1.9 Contractor's Equipment

The *Contractor* shall comply with the following requirements regarding the use, records, and management of Equipment on Site:

a) Records of Equipment

- The *Contractor* must maintain accurate and up-to-date records of all Equipment brought onto the Site.
- The records must specify the ownership status of each item of Equipment (owned, hired, or leased).
- These records must be made available to the *Project Manager* or *Supervisor* upon request.

All Equipment must be maintained in good working order, and regular inspections must be conducted to ensure operational safety and compliance.

The *Contractor* is responsible for the removal of all Equipment from the Working Areas upon completion of the Works or when no longer required.

The *Contractor* must ensure that Equipment is positioned and operated in a manner that does not obstruct Site access, walkways, or operations by Others.

Adequate barriers and warning signs must be in place when Equipment is in use to prevent unauthorized access or accidental interference.

5.1.10 Equipment provided by the *Employer*

N/A

5.1.11 Site services and facilities

The following outlines the site services and facilities provided by the *Employer* and the requirements for their use:

a) Power Supply

- All points of supply requested by the Contractor are provided in terms of quantity and location at the discretion of the Project Manager.
- There is no energy charge for electricity used for construction purposes.
- No connection is made to the permanent installation at the Power Station without the prior acceptance of the Project Manager.
- The *Contractor* is responsible for installing appropriate temporary connections, ensuring safety compliance, and adhering to all regulatory standards.
- Power usage is restricted to activities directly related to the execution of the Works
- No guarantees of power supply quality are given and power supply breaks of some duration may occur without warning. Planned outages are also a possibility. The Contractor makes arrangements at his own expense to improve continuity and quality of power supply where necessary for any reason and no claim of any nature relating to power failures is considered.

b) Water Supply

- Potable and non-potable water will be available at designated locations on-site,
- The *Contractor* must provide the necessary hoses, tanks, or infrastructure to connect to the water supply.

c) Waste Disposal

- Waste disposal facilities, including general waste and hazardous waste disposal areas, will be provided by the *Employer*.
- The *Contractor* is responsible for ensuring proper segregation, storage, and disposal of waste in compliance with local environmental regulations.
- Any additional waste management requirements beyond what is provided by the *Employer* will be the *Contractor's* responsibility.

d) Additional Requirements

- The *Employer* will not provide additional facilities or services beyond those stated above.
- The *Contractor* is responsible for providing all other necessary site services, equipment, and infrastructure to complete the Works.

Roads

- Main access roads are surfaced and complete and may be used by the Contractor with the necessary care. The Employer maintains the Site roads, described above, to a fair condition. Any costs incurred by the Project Manager from damage caused to underground services, structures, etc. as a result of the Contractor not using the prescribed routes is recovered from the Contractor.

5.1.12 Facilities provided by the *Contractor***a) Storage Facilities**

- Secure storage facilities must be provided for storing tools, equipment, and materials required for the Works.
- Separate storage for hazardous materials must be established, compliant with health, safety, and environmental regulations.

b) Office Equipment

The *Contractor* shall supply and maintain all required office equipment, including but not limited to:

- Computers with licensed software and internet connectivity.

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- Printers, copiers, scanners, and stationery.

c) Location and Layout of Facilities

- The *Contractor* must submit drawings of the proposed site facilities for approval by the *Project Manager* before commencing construction.
- Facilities must not interfere with ongoing site operations or encroach on restricted areas.
- The location of all temporary facilities shall comply with environmental and zoning regulations.

d) Post-Completion Disposition of Facilities

- Upon completion of the contract, temporary facilities such as site accommodation and construction camps must be dismantled.
- The *Contractor* is responsible for the removal of debris and the restoration of the site to its original or agreed-upon condition.
- Any permanent facilities provided by the *Contractor* that are to remain on-site must be formally handed over to the *Employer* in an agreed-upon condition.

5.1.13 Existing premises, inspection of adjoining properties and checking work of Others

N/A

5.1.14 Survey control and setting out of the works

N/A

5.1.15 Excavations and associated water control

N/A

5.1.16 Underground services, other existing services, cable and pipe trenches and covers

The *Contractor* is responsible for the use of detection equipment, such as ground-penetrating radar (GPR), electromagnetic locators, and other suitable technology, to locate all underground services before work commences.

Responsibility for Damage: The *Contractor* is responsible for any damage to existing services during construction activities, whether known or unknown, and must repair or replace damaged services to the satisfaction of the relevant authorities.

If unknown services are damaged during excavation or other activities, the *Contractor* shall immediately inform the *Project Manager* and the relevant service provider and take action to prevent further damage.

The *Contractor* must provide evidence of the extent of the damage and any mitigation measures taken to avoid further incidents.

5.1.17 Control of noise, dust, water and waste

The *Contractor* must implement measures to control noise levels on-site in compliance with relevant local regulations and standards. Noise control must be a priority to ensure that it does not exceed the prescribed limits or cause unnecessary disturbance to surrounding communities and workers.

The *Contractor* is required to take all necessary precautions to minimize dust generation on-site, particularly during dry weather, excavation, or material handling processes.

The *Contractor* must ensure the proper management and disposal of waste generated on-site, in accordance with local waste disposal regulations and environmental requirements.

5.1.18 Sequences of construction or installation

The *Contractor* is responsible for the construction and installation of the equipment according to the *Contractor's* construction and installation plans.

The *Contractor* complies with the Employer's Work Co-ordination Process.

Without derogating from the provisions of the Conditions of Contract, the Work Co-ordination Process is used by the *Project Manager* to monitor and manage activities on the Power Station and to facilitate the integration and co-ordination of the various works by Others.

If not included in the contract, the *Project Manager* will notify the *Contractor* of the requirements of the Work Co-ordination Process prior to the date of site establishment by the *Contractor*.

5.1.19 Giving notice of work to be covered up

- All intended activities must be captured in the Contractor scope of work, method statements and project schedule. The project schedule will be reviewed and updated by the Contractor and Project Manager.
- The *Contractor* provides a notice of work to be covered up to the *Supervisor*.

5.1.20 Hook ups to existing works

The adjacent plant and equipment may not be modified without written permission from the *Project Manager*. The *Contractor* complies with Eskom Life Saving Rules and will report any non-conformance.

5.2 Completion, testing, commissioning, and correction of Defects

5.2.1 Work to be done by the Completion Date

- a) All work is to be done by completion date as per accepted programme.
- b) On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case, before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

5.2.2 Use of the *works* before Completion has been certified

In accordance with Clause 35.2 of ECC3, the *Employer* may use any part of the works before Completion has been certified under the following circumstances:

a) Testing and Commissioning:

The *Employer* may use portions of the works for testing, commissioning, or other preparatory activities as specified in the Works Information to ensure proper functionality and integration of the systems.

b) Operational Necessities:

The *Employer* may use certain sections of the works to maintain ongoing operations or services essential to the *Employer's* business, provided such use does not impede the *Contractor's* ability to complete the remaining works.

c) Access to Other Contractors:

The *Employer* may grant access to portions of the works to other contractors or service providers to perform related or preparatory work.

d) Emergency or Safety Reasons:

The *Employer* reserves the right to use parts of the works for addressing emergencies, health and safety concerns, or compliance with regulatory obligations.

5.2.3 Materials facilities and samples for tests and inspections

In accordance with Core Clause 40.2, the following materials, facilities, and samples for tests and inspections are to be provided:

a) **Contractor's Obligations:**

- The *Contractor* shall provide all materials, samples, facilities, and equipment required for the tests and inspections outlined in the Works Information. This includes:
 - Samples of materials to be used in the works, as specified in the technical specifications.
 - Access to on-site facilities such as laboratories or testing areas for the Supervisor or authorized personnel.
 - Test certificates or reports from accredited laboratories for any pre-tested materials, if required.
 - Qualified personnel to assist with the preparation and execution of tests or inspections.

b) **Compliance and Reporting:**

- The *Contractor* shall maintain records of all tests and inspections, including results, dates, and any corrective actions taken. These records must be made available to the *Project Manager* and *Supervisor* upon request.
- The *Contractor* shall replace or rectify any material or work that fails to meet the specified standards, as directed by the *Supervisor*.

5.2.4 Commissioning

a) **Commissioning Procedure**

- The commissioning activities shall be carried out in accordance with the detailed provided commissioning procedure.
- Before plant is placed in service the contractor certifies that it is in a suitable and safe condition.
- The contractor is responsible for the commissioning of the work done and contracted to the requirements of this specification in conjunction with the Employer. In cases in which various components are already in place or are supplied by the Employer to form an integrated system, the contractor, at the time of commissioning, carries the responsibility for the correct functioning of the whole system.
- In the event of incorrect functioning, the Contractor determines the cause, and he corrects the fault if the trouble is within equipment of his own supply or notifies the Employer to rectify faults within their equipment.
- The Contractor has the authorisation, (or the attendance) of the Employers representative before proceeding with commissioning of a particular phase. Consequently, the contractor ensures the safety of his own plant in respect of any particular commissioning test and in the event of damage accepts responsibility for such equipment.

a) **Reporting and Documentation:**

- The *Contractor* shall maintain detailed records of all commissioning activities, including test results, adjustments, and approvals.

5.2.5 Start-up procedures required to put the *works* into operation

The *Contractor* gives the *Project Manager* written notice that the works are ready for operation. Such notice will suit the requirements of the *Employer* but will not, unless otherwise agreed, be less than 48 hours or more than fourteen (14) calendar days.

No alterations or adjustments will be made to the works after functional checks are done without the *Project Manager's* written permission.

At this stage the following must have been achieved:

- a) Installation and pre-commissioning completed.
- b) Testing report and the associated certificates received.

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- c) Signed erection and safety clearance certificates.
- d) Final Draft of the Technical, Operating, Maintenance manuals delivered.
- e) All Quality Control Plan (QCP) documentation received.

5.2.6 Take over procedures

Take over of the works will occur after or concurrently with the issuance of the Completion Certificate, as outlined in Clause 35 of ECC3.

The *Contractor*, in coordination with the *Project Manager* and *Supervisor*, shall conduct a joint inspection of the works before take over.

Any defects, incomplete works, or outstanding issues identified during the inspection shall be documented and addressed in accordance with the defect notification and correction procedures outlined in the contract.

The *Employer* will formally take over the works after successful verification and documentation, issuing a Take Over Certificate to confirm acceptance of the works.

5.2.7 Access given by the *Employer* for correction of Defects

The *Employer* will grant access to the *Contractor* for correcting Defects in accordance with Clause 43.4, subject to the following requirements and conditions:

a) Request for Access:

- The *Contractor* must submit a written request to the *Project Manager*, detailing the nature and location of the Defect, the corrective action required, and the anticipated timeline for the work.

b) Approval and Coordination:

- Access will be granted only after approval by the *Project Manager* and coordination with the *Employer's* operations team to minimize disruptions to ongoing operations.
- The *Project Manager* will schedule access based on operational priorities and the safety requirements of the site.

5.2.8 Performance tests after Completion

- The *Contractor* shall carry out necessary tests after completion to demonstrate that the performance of the Plant is in accordance with the *Employer's* Works Information requirements.
- The *Contractor* will be required to provide a detailed method statement on how this verification will be achieved and any instrumentation/equipment required shall be part of the system provided by the *Contractor*.
- After the work is completed by the *Contractor*, all stakeholders that includes Engineering, Technical support and Project Coordinator and the *Contractor* will perform the tests by running of the New Hydrogen production Plant.

5.2.9 Training and technology transfer

- a) To be done after the work is completed, tests are done and certified to work on it.

5.2.10 Operational maintenance after Completion

- a) To be handed over to the OPCR Controllers to control and monitoring of the new plant.

6 Plant and Materials standards and workmanship

- a) The *Contractor* is required to employ a competent Supervisor or Forman on site for the duration of the project to implement workmanship quality checks. The Contractor also appointed RP to take permit on behalf of the contractor. It must be person who knows Kendal H2 plant.
- b) Eskom will do inspections and quality checks on installations completed by the *Contractor* prior to hand-over of project.

- 6.1 Investigation, survey and Site clearance**
- 6.2 Building works**
- 6.3 Civil engineering and structural works**
- 6.4 Electrical & mechanical engineering works**
- 6.5 Process control and IT works**

- 6.6 Other [as required]**

7 List of drawings

7.1 Drawings issued by the Employer

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

Drawing number	Revision	Title

C3.2 ***CONTRACTOR'S WORKS INFORMATION***

This section of the Works Information will always be contract specific depending on the nature of the *works*. It is most likely to be required for design and construct contracts where the tendering contractor will have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical sub headings could be

- a) *Contractor's* design
- b) Plant and Materials specifications and schedules
- c) Other

The *Contractor* is responsible for the entire *works* as prescribed in this Works Information.

The *Employer* is responsible to provide the design requirements as well as the scope of the *works*.
