



KUSILE POWER STATION

DOCUMENT MANAGEMENT & COMMUNICATION

Part 3
Annexure X.3
Rev 4_0121

1. DOCUMENT MANAGEMENT

The documentation requirements cover the various engineering stages, from the design stage through fabrication, installation, testing and commissioning and most importantly for the operating, maintenance and training stage of the project. The *Contractor* ensures that the Technical Documents and Records Management Work Instruction (240-76992014) is used for any documentation requirements.

The *Contractor* is responsible for the compilation and the supply of the documentation during the various project stages and to provide the documentation programme to link with the milestone dates. Documentation and drawings are programmed for delivery to meet the milestone dates and in accordance with the agreed VDSS.

1.1 DOCUMENT IDENTIFICATION

Identification of the Documentation

The *Contractor* ensures that document has the following minimum attribute on the cover page:

- Title of the document
- Document Unique Identification number (Eskom number)
- *Contractor* Document number, if applicable
- Document status
- Revision number
- Document Type
- Document security level

- Document revision table/history
- Page number on the footer
- Document Author/Authoriser/
- Document Originator *Contractor*

The following additional attributes are important for technical documents:

Package/System name, sub-system if applicable

- Unit/s number
- *Contractor* name
- *Contractor* number
- Plant Identification Codes

Format and Layout of Documents

For consistency it is important that all documents used within a specific domain follow the same layout, style and formatting standard.

Layout and Typography

Every document complies with the following font specifications:

- Font Colour: Black
- Main Headings Font Type: Arial, Bold, Capital Letters
- Main Heading Font Size: 12pt
- Sub Headings Font Type: Arial, Bold, Title Case
- Sub Headings Font Size: 11pt
- Body Font Type: Arial, Sentence Case i.e., only the first letter of the first word is a capital letter.
- Body Text Font size: 11pt
- Line Spacing: 1.5 line spacing
- Margins: standard

- Alignment: full justification to be used
- Paragraphing: one line skip between paragraphs
- Pagination: centred page numbers (about 0.5 inches from bottom)
- Indentations: standard tab for all paragraphs (about 0.4 to 0.5 inches)

Document Headers

The header includes the project name, document title, document number, revision number and page number.

Naming of files

The *Contractor* complies with the Eskom standard for naming documentation files. The standard is as follows:

For documents that have approval date and signature

(YYYYMMDD_DocType_DocumentTitle_UniqueIdentifier_Revision.FileExtention)

For documents that do not necessarily require the 'Approved Date' and 'Revision & Versioning', use the date of update

(YYYYMMDD_DocType_DocumentTitle_UniqueIdentifier_Revision.FileExtention)

All further requirements are according to IEC 61355 – 1:2008 (Edition) Classification and designation of documents for plants, systems and equipment – Part 1: Rules and classification tables.

1.2 DOCUMENT SUBMISSION

Contractor engineering program allows a minimum of 21 days for mailing, processing, and review of drawings and data by *Employer*. The *Contractor* is responsible for the compilation and the supply of all the documentation required during the various project stages and to provide the documentation programmed to link with the milestone dates. Documentation and drawings are programmed for delivery to meet the milestone dates and in accordance with the agreed **Error! Reference source not found..** The VDSS is revisable and changes are discussed and agreed upon by all parties and properly documented.

Contractor documents submittals are provided in accordance with the Vendor Document Submittal Schedule (VDSS) which is included in **Error! Reference source not found..** The VDSS indicates the format of documents to be submitted. Eskom is responsible for the

management of the schedule i.e. to create a document register that is used to track submission progress of documentation by the *Contractor* as per the committed dates on the VDSS.

Contractor documents all documentation that are, to the *Employer* in the Master Document List (MDL) as provided by the *Employer* in **Error! Reference source not found. Error! Reference source not found.** All documentation, including reports, manuals, etc. is in the English language.

If the *Contractor* makes further changes to the equipment and materials shown on submittals that have been reviewed by the *Employer*, the changes are clearly marked on the submittal by the *Contractor* and the submittal process is repeated. If changes are made by *Contractor* after delivery to the Plant, as-built drawings indicating the changes are prepared by *Contractor* and submitted to *Employer* for review. Any resubmittal of information is clearly identifying the revisions by footnote or by a form of back-circle, with revision block update, as appropriate.

1.3 TRANSMITTALS

1. All document exchange is done using formal Transmittals. The following is the minimum information required for sending transmittals:
 - Title of the document
 - Reason for issuing/submission
 - Transmittal Number
 - Transmittal Name
 - Transmittal Description
 - Contract Number:
 - Package Number
 - Transmittal purpose
 - Sender Name
 - Sender E-Mail
 - Sender Organisation
 - Recipient Name
 - Recipient E-Mail
 - Recipient Organisation
 - Disclosure Classification
 - Date received
 - Quantity of documentation referenced on the transmittal
 - Number of copies
 - Format/medium submitted (e.g. paper, DVD, etc.)
 - Sender signature
 - Recipient signature, once submitted, to acknowledge receipt
2. If a transmittal is in response to an Eskom communication via transmittal, the Eskom Transmittal Number is referenced in the transmittal response and is provided in addition to the meta-data required in 1.4.
3. The *Contractor* follows a structured and standard definition for Transmittal Descriptions, i.e. subject line convention of **YYYYMMDD – <Contract & Package Number> – <Vendor> – <Short Description> – <Sender Initials>**.

4. The **Contractor** follows a structured method of communication as defined within **Communication Interface Memorandum (CIM)** for any correspondence
5. The *Contractor* follows a structured and standard definition for email subjects i.e. a subject line convention of **YYYYMMDD – < Package File Number> – > – <Email Subject line>**.
6. The *Contractor* selects the purpose for transmittal in line with the standard Eskom Selection Criteria:
 - Issued for Approval
 - Issued for Award
 - Issued for Basic Design
 - Issued for Commissioning
 - Issued for Concept Design
 - Issued for Consideration
 - Issued for Construction
 - Issued for Detail Design
 - Issued for Document Review
 - Issued for Handover
 - Issued for Information
 - Issued for Installation
 - Issued for Manufacturing
 - Issued for Procurement
 - Issued for Review
 - Issued for Tender
7. Issuing of documents with different transmittal purposes is done separately and is not combined into one transmittal. This ensures fast and efficient processing of incoming and outgoing transmittals and information exchange.

Electronic technical data submittals are made using the Eskom Document Control email address (KusileDocControl@eskom.co.za) and Zendto, a Web-based file transfer service. If *Contractor* does not already have Zendto transmittal capability, information is available at <https://zendto.eskom.co.za/>. (The Uniform Resource Locator [URL] required to be used for electronic file submittals is made available upon Contract award.)

In case of email submission, the Contractor should note that if a single file is transmitted and is over 2MB in size, then the document is uploaded on Zendto portal.

Notification to *Project Manager* that submittals have been posted to Zendto is in accordance with the correspondence requirements of this Contract. *For the Zendto submission, a transmittal record is submitted to the project email document control address information the Employer of such a submission.*

The hard copy prints are submitted to the address indicated for Technical Documents in the Supplementary Terms and Conditions of this Contract. The following numbers of prints are submitted unless otherwise indicated in the Schedule of Submittals:

Submittal Description	Copies Required
Performance Curves	2
Design Data	2
Test and Inspection Data	2
Drawings	2

7.1 Drawings

The creation, issuing and control of all Engineering Drawings are in accordance to the latest revision of 240-86973501 (Engineering Drawing Standards – Common Requirements) supplied as part of the enquiry documents. All drawings must be issued to Eskom in both native CADD format and PDF format as per 240-86973501 (Engineering Drawing Standards – Common Requirements).

Drawings are in sufficient detail to indicate the kind, size, arrangement, component weight, breakdown for shipment, and operation of component materials and devices; the external connections, anchorages, and supports required; the dimensions needed for installation and correlation with other materials and equipment; and the information specifically requested in the Schedule of Submittals.

The *Contractor* fully completes and certifies drawings for compliance with the Contract requirements. Drawings have title block entries that clearly indicate the drawing is certified.

Each submitted drawing is project unique and is clearly marked with the name of the project, unit designation, *Employer's* Contract title, *Employer's* Contract file number, project equipment or structure nomenclature, component identification numbers, and *Employer's* name. Equipment, instrumentation, and other components requiring Engineer-assigned identification tag numbers are clearly identified on the drawings. If standard drawings are submitted, the applicable equipment and devices furnished for the project are clearly marked.

Transmittal letters identify which Schedule of Submittals item (by item number) is satisfied by each drawing or group of drawings. The transmittal letter includes the manufacturer's drawing number, revision number, and title for each drawing attached. Each drawing title is unique and is descriptive of the specific drawing content. Transmittal letters for resubmitted drawings include the *Employer's* drawing numbers.

The *Contractor* includes the *Employer's* drawing number in the drawing title block. This

requirement only applies to design drawings developed by the *Contractor*. It does not apply to drawings developed by manufacturers for equipment and material such as valves, instruments, etc. Drawing numbers are assigned by the *Employer* as drawings are developed.

The project name is listed on all drawings, including manufacturers' drawings. Tag numbers and equipment names are listed on all 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 is in the English language. The units of measure are 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.

Drawing Submittal

All documents and records management are performed according to Project/Plant Specific Documents and Records Process. Any uncertainty regarding this is clarified with the *Employer*. The *Contractor* complies with all minimum document metadata as specified in Technical Documentation Classification and Designation Standard (240-54179170).

The *Contractor* uses Smartplant Owner Operator (SPO) for documents and records management. *Contractor* submits electronic copies of the documents using a fully secure web based solution providing carefully controlled access to appropriate project information for authorized personnel. All electronic design data and documents is in such a form which enables importing such data, documents and drawings, including 3-dimensional drawings, seamlessly into the Intergraph SPF (Smart Plant Foundation) system. Hard copy submittals are only required for the IOM Manuals and final as-built submittals.

Transmittal letters are provided with each document submittal. The transmittal letter includes the *Contractor* drawing number, revision number, and title for each drawing attached. Each drawing title is unique and is descriptive of the specific drawing content.

Catalogue pages are not acceptable, except as drawings for standard non engineered products and when the catalogue pages provide all dimensional data, all external termination data, and mounting data. The catalogue page is submitted with a typed cover page clearly indicating the name of the project, unit designation, specification title, specification number, component identification numbers, model number, *Contractor* drawing number, and *Employer's* name. Drawings are submitted with all numerical values in metric units.

Information Requirements

The *Employer* requires drawings, documentation, plans, information and data (collectively "Information") from the *Contractor* for two fundamental purposes; namely for the management and execution of the Contract and for the operation, maintenance and support of the *works* during its entire operational phase until disposal and decommissioning.

The *Contractor*, during the progress of and upon completion of the *works*, supplies the Information required in terms of the Contract and all such Information as may usually be supplied in connection with similar Works, including, whether or not specified in the Contract, all Information necessary or useful for:

1. Design reviews and the interface management of the works with the Project Works;
2. Quality assurance and control; and
3. The operation, maintenance, support, inspection, integrity management, training and technical optimization of the works, over the lifecycle thereof.

The scope of supply of Information from the *Contractor* includes drawings, documents, lists and data according to the types defined in Table 1 below:

Table 1: Typical Document Requirement List	
Document Group	Description of document type (includes information data sets)
General	Equipment arrangement drawings Piping & Instrument Diagrams (P&ID's) Material handling flow diagrams Engineering and procurement schedule Equipment list Isometric Drawings Valve list Pipeline list Hanger list 3D model Interface list Equipment specifications & data sheets Drawings and data for all equipment and material Installation, Operation, and Maintenance (IOM) Manuals Spare parts list Factory Acceptance Test (FAT) report

Table 1: Typical Document Requirement List	
Document Group	Description of document type (includes information data sets)
Quality Assurance	Quality assurance manual Quality control plans Quality control reports Weld summary index Material traceability certificates Manufacturing test reports Manufacturing Non-Conformance Reports (NCR's)
Civils & Structures	Site Layout Geotechnical Investigation Report Building arrangement and floor layouts Structural drawings Architectural drawings Structural analysis and design report Foundation drawings Structural support drawings Access Platform/Walkway Drawings

Table 1: Typical Document Requirement List	
Document Group	Description of document type (includes information data sets)
Construction	<p>Transportability study/report (including heavy haul study)</p> <p>Site management plan (QA, Safety, Environmental etc.)</p> <p>Construction schedule</p> <p>Site storage requirements for major equipment</p> <p>Construction test records (hydrotest, concrete strength, pile integrity test, etc.)</p> <p>Maintenance records for all equipment while stored on site</p> <p>Constructability report</p>
Commissioning	<p>Commissioning schedule</p> <p>Test & Evaluation Master Plan (TEMP)</p> <p>Commissioning procedures</p> <p>Commissioning database</p> <p>Performance test procedure</p> <p>Performance test reports</p> <p>Field test reports and certificates</p>
Operations	<p>Operating procedures</p> <p>Plant operational documentation</p> <p>Plant tech specs</p> <p>Incident & upset mitigation procedures</p> <p>Operating scenarios (for C&I control purposes)</p>

Table 1: Typical Document Requirement List	
Document Group	Description of document type (includes information data sets)
Logistic Support	Maintenance concept Plant maintenance documentation ISI plan/program Spare parts assessment Plant RAM analysis Equipment access and removal paths assessment Fault finding diagrams
Training	Training plan Training manuals and instructions
Safety & Protection	Fire hazard analysis Waste management plan
Design Analyses	Reliability model and analysis Transient / Transition Analysis Flow dynamics analysis Thermo-hydraulic analysis Pipe Stress Analysis Maintainability analysis FMECA / FMEA analysis HAZOP analysis 3D model interference checks

Table 1: Typical Document Requirement List	
Document Group	Description of document type (includes information data sets)
Electrical	Motor list Electrical load list Circuit list Raceway list Single line diagram Protection schematic diagram Electrical load flow and fault studies report Cable block diagrams Cabling routing and cable racking layout diagrams Cable termination diagrams EMC and earthing standards report Earthing layout drawings Lighting layout drawings

Table 1: Typical Document Requirement List	
Document Group	Description of document type (includes information data sets)
C&I	Alarm and set-point schedule Instrument schedule Instrument data sheets Mechanical hook-up drawings Electrical hook-up drawings Cable Schedule Termination Schedules Junction Box GA and Internal Layout Junction Box and Instrument location drawings Instrument Stand GA Maintenance Manuals and procedures Operating and Control Philosophies Functional Logic diagrams Field device calibration certificates Level measurement installation report

In addition to the official documentation submittals listed in Appendix D, the *Contractor* provides additional information for review and design coordination as requested by the *Employer* from time to time.

The *Contractor* uses the *Employer's* SmartPlant Environment and all design tools as the delivery mechanism for all project data and document deliverables. The EDMS and design tools are provided to the *Contractor* pre-configured based on *Employer's* data handover requirements. Any project data and document deliverables not generated from design tools provided by the *Employer* are supplied in a format specified by the *Employer*.

The *Project Manager* reviews the *Contractor's* submitted documents. The *Contractor* ensures adherence to the Works Information and that a technically sound design approach is incorporated. Specific information required from the *Contractor* during tender phase and as part of the *Works* is as set-out in the VDSS, in **Error! Reference source not found..** Each document submitted to the *Project Manager* requires a transmittal note (refer to *Employer's* template 240-71448626 for minimum metadata requirements) from the *Contractor*. The *Contractor* includes interpretation of results in every report compiled. All project documents are submitted to the *Project Manager* in accordance with Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014). The *Contractor* is required to submit documents as electronic and hard copies and both copies must be delivered to the *Project Manager* with a transmittal note.

.1 DOCUMENTATION RECORDING

The *Contractor* develops, documents and maintains the Master Document List (MDL) with all the required metadata which are submitted to the *Employer* in the monthly basis for tracking purposes irrespective of whether there are updates or not. The MDL includes a list of drawings and documents and contains the following minimum information for each document:

- Date of submission
- Transmittal number
- Transmittal title
- Document description
- Document number (both *Contractor* and *Employer*)
- Document Type
- Revision number
- Document Approval Status
- Document Authorisation Status (i.e. Accepted With Comments, Not Accepted with Comments, Accepted)
- Transmittal Reason for Issue

In addition, the *Contractor* adheres to the following standards:

- Project / Plant Specific Technical Documents and Records Management Procedure (240-53114186).
- SmartPlant for Owner Operators (SPO) Documentation Metadata Standard (240-58552870)

- SmartPlant Data Take-On Standard (240-107305502)

1.1 DOCUMENTATION REQUIREMENTS

All documents supplied by the *Contractor* are subject to Eskom's approval. For consistency, it is important that all documents used within the project follow the same layout, style and formatting as described in the Technical Documents and Records Management Work Instruction (240-76992014). Documents such as QCP's, Method Statements and other documents impacting the work are accepted by the *Employer* at least 3 working days prior to commencement of the *works*.

Each revision of a document or drawing is 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 are recorded in a revision table contained in each drawing/document.

Documents and drawings indicate the *Employer's* 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, the *Employer's* number is used as the reference number.

The *Contractor* compiles a complete data book for all work done during manufacturing, construction and commission containing the following as a minimum if applicable:

- 1 Scope of work
- 2 Approved "As built" drawings
- 3 Design calculations
- 4 Approved QCP / ITP
- 5 Inspection reports
- 6 Pipe ovality reports if applicable
- 7 As built drawings (isometric drawings and P&IDs)
- 8 Material summary that gives full traceability between components used, drawings and material certificates
- 9 All material certificates for pipes, fittings and all components used.
- 10 Pressure test certificate and the calibration certificates of the gauges used.
- 11 Pressure test procedures
- 12 The manufacturer's/repairer's certificate as defined in PER.
- 13 All CAR's and corrective actions

- 14 Operating Philosophy including all alarm and trip values
- 15 Parts catalogue
- 16 Maintenance manual
- 17 Storage, packing and transportation instructions

The *Contractor* submits documentation to the Eskom Representative as well as the Project's Documentation Centre in the following media:

- Electronic copies are submitted to Eskom Documentation Centre through generic email address agreed to by the project. Electronic copies large for email are delivered on CD/DVD, large file transfer protocol and/or hard drives to the Project Documentation Centre. A notification email, with the transmittal note attached, is sent to the project generic email address. The Representative is copied on the email as well.
- Hard copies are submitted to the Eskom Representative accompanied by the Transmittal Note.

The *Contractor* ensures two (2) sets of documentation are supplied, one (1) set in the form of an electronic format (dwg, dgn, native files and pdf) and one (1) set of paper prints.

1.2 GENERAL REQUIREMENTS

The *Contractor* includes the *Employer's* drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor*. It does not apply to drawings developed by manufacturers for equipment and material such as valves, instruments, etc. Drawing numbers are assigned by the *Employer* as drawings are developed.

The project name is 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 is in the English language. The units of measure are 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.