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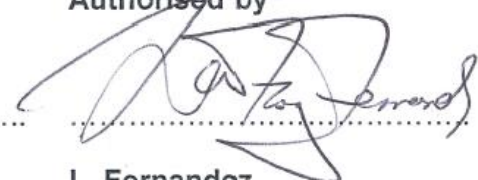
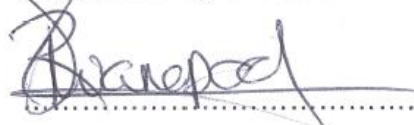
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## **1. INTRODUCTION**

The Handover Process is part of the Eskom Project Life Cycle Model (PLCM) as defined in Eskom Reference PLCM [13]. Technical documentation handover to the Client (i.e. Generation-Gx or Peaking) takes place once it has been confirmed that the works defined in the contract and the associated Project Life Cycle Model (PLCM) activities are completed. However, it should be planned well in advance. Planning ahead allows stakeholders involved to understand the Client's expectations and contractually agree on the delivery process regarding handover terms, dates, review and acceptance between the contractor and client in line with the overall project plan.

Apart from commissioning of new power plants and facilities, the Handover Process is an ongoing activity during operation of existing plants, where modifications, refurbishments and expansions frequently occur during plant lifecycle. In order to effectively operate and maintain the facility throughout its lifecycle, an appropriate technical documentation handover process is required by the Client. It is critical that the Client should possess accurate and sufficient information in the form of documentation for this purpose. This work instruction will ensure that the expectations from all parties (i.e. Generation Plant Engineering (GPE), Group Capital Division (GCD) and Generation Fleet) are aligned. It establishes the required baseline for ensuring that documentation handed over is complete, up-to date, and thus leading to cost saving for all contractual parties.

## **2. SUPPORTING CLAUSES**

### **2.1.1 Scope**

This work instruction defines the process of documentation handover to the Client, the roles and responsibilities of all the parties involved in executing this process on projects.

### **2.1.2 Purpose**

The purpose of this document is to outline an appropriate documentation handover process to the Client, and ensure that it is properly reviewed, accepted and handed over to the Client. The process in this Work Instruction shall ensure:

- Collaborative effort amongst all stakeholders involved in the handover process.
- That GPE provides the required assurance on the content of the handover documentation that makes up part of the "Handover package".
- That Commissioning staff will support the process and provide the required validation and verification information during the handover process.
- That Documentation Management staff ensures record keeping and electronic and physical handover of handover documentation packages to the Client.

### **2.1.3 Applicability**

This work instruction is applicable to GPE, GCD and Generation Fleet business units of Eskom, including all those parties contracted to conduct work for Eskom.

It applies to the entire scope of technical documentation (technical plant data and documents) necessary and used in the execution of projects i.e. in planning, construction and commissioning to ensure future operation and maintenance of plant.

## **2.2 NORMATIVE/INFORMATIVE REFERENCES**

Throughout this work instruction, the following documents are referred to. The latest approved revision of each document applies, unless otherwise stated.

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**2.2.1 Normative**

- [1] VGB-B-831-00-2015-05-EN: Provision of Technical Documentation (Technical Plant Data, Documents) for Energy Supply Units
- [2] 32-1286: Process Control Manual for Manage Item Configuration
- [3] [240-53113685](#): Design Review Procedure
- [4] [240-53114026](#): Project Engineering Change Management Procedure
- [5] [240-53114002](#): Engineering Change Management Procedure
- [6] [240-68604731](#): Design Base Standard
- [7] [240-86973501](#): Engineering Drawing Standard – Common Requirements
- [8] [240-53665024](#): Quality Management System Manual
- [9] [240-53114190](#): Internal Audit Procedure
- [10] [240-72100555](#): Engineering Management Framework and Operating
- [11] ISO 10007 Guidelines for Configuration Management
- [12] [240-53665024](#): Engineering Quality Manual
- [13] [240-95401790](#): Eskom Reference Project Life Cycle Model [PLCM]

**2.2.2 Informative**

- [14] 200-64535: Procedure- Handover Documentation Review and Handover Process for Medupi Power Station.
- [14] ISO 9001:2015 Quality Management Systems
- [15] 203-96814 Handover Process Work Instruction for Kusile
- [16] 202-7567 Ingula Handover Document Review Procedure
- [17] 203-60262 Kusile Documentation Handover Specification

**2.3 DEFINITIONS**

Definition	Description
As-Built	The latest revision of a drawing or document, which precisely and accurately reflects the current state of the plant (Power Station) once construction is completed and the plant deemed ready for hand over to the client. These are inclusive but not limited to: drawings, diagrams, manuals, operating procedures and test certificates defining the 'As Built' baseline status of the product.
Configuration Management	A discipline applying technical & administrative direction over an asset to: <ul style="list-style-type: none"> <li>• Identify and document the performance, functional and physical characteristics of a configuration item baseline.</li> <li>• Controls changes to the baseline.</li> <li>• Record and report on changes</li> <li>• Audit/verify that plant/product conforms to the performance, functional and physical characteristics of the configuration, for its entire lifecycle to decommissioning.</li> </ul>
Commissioning	The process of putting into service an item of the project, which has been successfully tested and safety cleared in accordance with the contractual and performance requirements.
Contractor	An individual or company that performs work on a contract basis for Eskom.

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<b>Definition</b>	<b>Description</b>
Client	The end-user or maintainer of the asset being handed over upon completion of the handover process.
Documentation Handover	Transfer of documentation (handover pack) to the Client subsequent to review and approval by the relevant person/parties.
Final Documentation	Documentation comprising of all information relating to the approved and constructed or delivered and accepted overall plant, systems, equipment and components.
Handover	Transfer of a plant (as built/as commissioned) and all related (technical and non-technical) documentations, as per the Client Master Document List (MDL).
Handover Documentation Matrix	A report used to capture all documents received per unit, per system and per discipline, also indicating the current handover documentation status. (It should be captured in the designated Eskom EDMS i.e. SPO Handover Module, available for all to review the status of their system(s) and should be updated daily as documents are being received and/or identified as artefacts earmarked for handover to the client).
Handover Documentation Package	A package consisting of all documentation associated to a specific plant system which has to be handed over to the Client as per the Client's requirements specification.
Implementation Documentation	Technical documents on the structure of the overall plant, systems, equipment and components. It also includes technical data and information used for operation and maintenance of the plant.
Master Document List (MDL)	A register of listing all documents created/submitted by the Contractor to the projects as per the requirements stipulated within the VDSS (Vendor Document Submission Schedule).
Review Team	A working team responsible for ensuring that all handover documentation and technical information requirements are met. The review team is made up of the following representatives: Generation technical personnel, Generation documentation management personnel, Generation Interface disciplines, the Project's Commissioning team, Project Supervisor, Engineering (System Engineer and Configuration Management(CM)). The project Document Control personnel must avail themselves for queries during the handover documentation review session.
Review Sheet	A document used during Documentation Handover Reviews to capture comments and review statuses
Variation Order (VO)	An official contractual document issued when there is an agreed alteration on scope of work in the construction contract in the form of an addition, substitution or omission from the original scope of work.

### 2.3.1 Disclosure Classification

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

### 2.4 ABBREVIATIONS AND CODES

<b>Abbreviation</b>	<b>Description</b>
ATR	Acceptance Test Review
C&I	Control and Instrumentation
CL	Commissioning Lead
CM	Configuration Management
CML	Configuration Management Lead
COC	Certificate of Compliance
CoE	Centre of Excellence

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<b>Abbreviation</b>	<b>Description</b>
DC	Document Controller
DMS	Document Management System
ECM	Engineering Change Management
EDMS	Electronic Document Management System
EDWL	Engineering Design Work Lead
EPC	Engineering Procurement and Construction
FAT	Factory Acceptance Test
GCD	Group Capital Division
GPE	Generation Plant Engineering
Gx	Generation
HAZOP	Hazard of Operation Study
HMI	Human Machine Interface
HR	Handover Review
IDR	Integrated Design Review
IL	Integration Lead
ITP's	Inspection Test Procedures
KKS	Kraftwerk Kennzeichnen System
LDE	Lead Discipline Engineer
MDL	Master Document List
MSDS	Material Safety Data Sheets
NDT	Non Destructive Testing
O&M	Operations and Maintenance
OEM	Original Equipment Manufacturer
OTS	Operating Technical Specifications
P&ID's	Piping and Instrumentation Diagrams
PCR	Pre-Commissioning Review
PDF	Portable Document Format
PLC's	Programmable Logic Circuits
PLCM	Project Life Cycle Model
PPM	Package Project Manager
QCP's	Quality Control Plans
QIP's	Quality Improvement Plans
SAT	Site Acceptance Test
SLD	Single Line Diagrams
SOW	Scope of Work
SPO	SmartPlant for Owner/Operators
URS	User Requirement Specification
VDSS	Vendor Document Submission Schedule
VO	Variation Order

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## **2.5 ROLES AND RESPONSIBILITIES**

It will be the responsibility of the CM CoE Manager to implement and manage the contents of this work instruction. The manager shall also ensure that the process is uniformly applied and kept up to date in the governance of CM activities for documentation handover within the relevant Eskom business units.

The contractor shall bear responsibility for compliance with the stipulations in this work instruction and its appendices.

### **2.5.1 Key roles in the Handover process**

- **Commissioning Lead (CL):** Coordinates the documentation handover review (e.g. schedule reviews, inform relevant parties of review, liaise with Project Document Controllers in advance to ensure that correct documentation has been prepared for reviews, lead the review session).
- **Configuration Management Lead (CML):** Provides administrative support, reports the status of the Master Document List and facilitates the setting up of SharePoint project environment, ensure all configuration information is linked to the configuration item. This includes seating in reviews to ensure documentation is aligned to As-built status before handover.
- **Contract Manager/Supervisor:** Ensures adequate internal review, checks and approves information before handing over to the PPM for distribution and authorisation. Handover electronic information to LDE, and receive notification from PPM to produce critical documentation for handover.
- **Document Controller (DC):** Responsible for:
  - Documentation processing on EDMS.
  - Preparation of documents for the handover documentation reviews.
  - Booking the review venue.
  - Maintaining and updating of the MDL.
  - Consolidating and updating of the handover matrix per system developed by the LDE.
  - Compilation of handover packages and developing the required transmittal(s) of handover documents for completed projects.
  - Ensuring that all documentation layout and format is appropriate.
  - Creating and issuing monthly report indicating missed delivery dates and percentage completion of package.
- **Engineering Design Work Lead (EDWL):** Facilitates the implementation of this work instruction during handover.
- **Generation Technical Representative:** Participates in review of technical content of the handover documentation along with the rest of the Review Team. Only Technical Representatives with appropriate level of authority can sign for an acceptance or rejection of a system on the review sheet.
- **Integration Lead (IL):** Reviews the handover matrix, ensures Gx has sufficient and appropriate information in the form of documentation to operate and maintain the facility throughout its asset lifecycle.
- **Lead Discipline Engineer (LDE):** The project lead discipline engineer assigned to engineering disciplines such as Process, C&I, Electrical, Mechanical and Civil. The LDE ensures that all the required handover documentation is submitted for registration, processing and compilation of handover packages.

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- **Package Project Managers (PPM):** Accountable and ensures that all significant documentation from the Contractor is received and made available for compilation in the Documentation Handover Package.
- **Review Team:** Responsibility for review all technical content and coverage inside the handover documentation. Ensure that documentation required for handover is defined and agreed upon by stakeholders.

### **2.5.2 Key Stakeholders involved in the Handover Process**

- **Commissioning:** Provide support for the Handover Process.
  - Typical Documentation: Commissioning Procedure/Manual, Handover Certificate, Commissioning Certificate, Provisional Handover Certificate, Final Handover Certificate etc.
- **Generation Plant Engineering:** Lead the handover process and ensure correct content of handover documentation and coordinate the documentation handover process.
  - Typical Documentation: Engineering Documentation, Final System Design Package, O&M Manuals.
- **Projects:** Accountable for leading the Handover Process to the Client.
  - Typical Documentation: Project Execution, Test and Statutory Certificates, Safety Requirements, Guarantees and Warrantees, Plant Out of Normal Status Approved, Training
- **Client:** Responsible for review of the technical content during Handover Process.
  - Develop and agree with Project the requirements for handover at the beginning of the project

### **2.6 PROCESS FOR MONITORING**

This document shall be monitored through Internal Audit Procedure (240-53114190) as well as Engineering Quality Manual (240-53665024).

### **2.7 RELATED/SUPPORTING DOCUMENTS**

[18] 240-49910705: Basic Design Report Template.

### **2.8 GENERAL**

This document shall be subject to review by the Document Owner / Document Custodian every three (3) years from the last date of issue.

## **3. HANDOVER PROCESS**

### **3.1 GENERAL INFORMATION**

The process defined herein is depicted in Paragraph 3.3. For the purpose of this document, the following terminologies shall apply:

- **Shall** - defines a company requirement where conformance is mandatory.
- **Should** - defines a company recommendation where conformance is not mandatory, but is recommended.
- **May** - defines a permissive statement (an option that is neither mandatory nor specifically recommended).

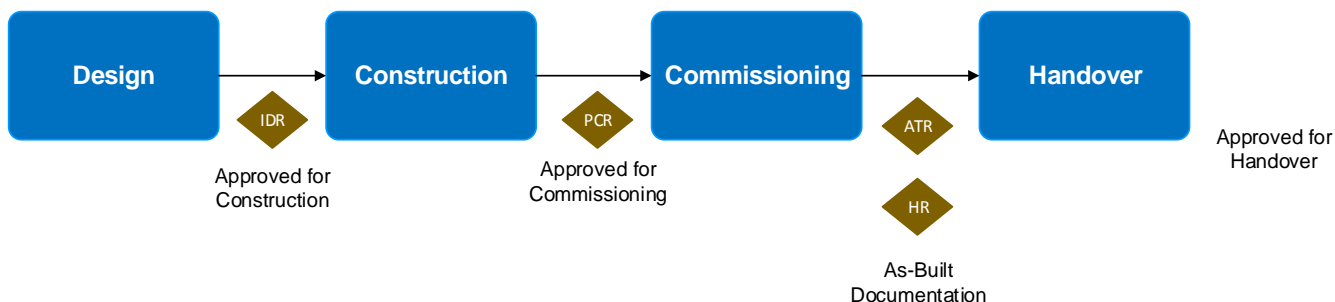
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### 3.1.1 Project Life Cycle Model

Handover Process is a phase within the PLCM which ensures design integrity intervention. Eskom PLCM comprises of design review gates which verify and validate technical information within a project. The PLCM consists of phases as depicted in Figure 1. The handover process shall only be initiated upon completion of the Pre-Commissioning Review (PCR).



**Figure 1: Eskom Project Life Cycle Model (PLCM)**

### 3.2 DOCUMENTATION HANDOVER PHASES

To fulfil the legal requirements, the Client must be provided with documentation in agreed dates for approval of putting the plant into commercial operation. The contractor shall ensure that the documentation is complete, correct and up to date. Documentation handover phases include:

#### 3.2.1 Handover – Preliminary Documentation

This includes handover of preliminary operating manuals for overall plant, systems, equipment and components as well Implementation Documentation to the Client which takes place in partial deliverables in accordance with the VDSS. This enables the necessary risk assessments to be conducted and compilation of the necessary documents for approval for take over. Handover of preliminary technical data will take place successively and shall be agreed with the Client to meet the requirements of preparation for operation.

#### 3.2.2 Handover – Documents with Redlines (as-built)

These are documentation necessary for operation e.g. operating manuals or circuit diagrams that have been revised as a result of approved change orders, necessary re-arrangement of equipment or changed routing. The Contractor shall redline the resulting changes in the Implementation Documentation, drawings and operating manuals and hand them over to the Client at the time of take-over.

#### 3.2.3 Handover – Final Documentation

These are handover documentation that comprises all information relating to the approved and constructed (or delivered and accepted) overall plant, systems, equipment and components. These are parts of Implementation Documentation that are available as final versions prior to take-over and have to be successively handed over to the Client in accordance with the VDSS. Documents to be revised as a result of maintenance work, conversions and adjustments under warranty must be handed over at this stage.

### 3.3 PROCESS OVERVIEW

All stakeholders involved in the handover process shall have a clarification meeting to determine the minimum set of documents required by the Client necessary for operating and maintenance of the plant. The Commissioning Lead shall meet, as necessary, with the Contract Manager/Supervisor and other

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stakeholders to explain commissioning-related handover requirements, interpret them where necessary, and provide input into handover activities.

The Project Engineer reviews documents and accepts documentation received from the Contractor through the Project Manager. The Commissioning Lead shall receive engineering approved documentation submitted by the Contractor via the Project Engineer, review them where appropriate/required and assist the PPM/LDE in establishing the handover schedule. The Project Engineer shall ensure that the correct revision of documents and drawings are included into the handover package created.

The Contractor shall use the Vendor Document Submission Schedule (VDSS) which outlines documents to be submitted and track the submission using an MDL as informed by the VDSS (as per the committed dates). The VDSS is contained within Contracts. Eskom's technical representative shall pre-allocate document and Eskom drawing numbers on the VDSS and send this back to the Contractor through the delegated Eskom's technical representative. The Contractor shall ensure that the correct Eskom document and drawing numbers are captured on documents submitted back to Eskom. In the case of drawings, use of sheets and sub-sheets on multi-page drawings shall be captured as part of the drawing number alternative Document ID (creating the "Common Reference" in SPO). The MDL shall be used to develop handover documentation matrix as agreed upon by all parties involved in the handover process.

GPE shall be custodian of the all the technical documentation handed over and shall manage the transition from EPC to O&M. Any changes on the documentation handed over to the Client shall follow the formal Eskom ECM Process.

**Notes:**

- *Documents to be handed over include some on the VDSS and associated internal documents for O&M (e.g. Stop-Start Procedures, System Definition; Commissioning Procedures and Design Philosophy etc.) as agreed beforehand. The handover documentation included on the Matrix (appendix A) should be extracted from the MDL.*
- *There are instances where certain Contracts have not catered for critical documents. Although not listed on the VDSS, if such a document is required for Maintenance & Operating, Projects are expected to source it from the Contractor. This might then have to be dealt with under the VO process.*

**3.4 DOCUMENTATION HANDOVER PROCESS**

The flow chart in Figure 2 depicts the Documentation Handover process. The activities that make up each stage of the process are discussed in detail on section 4 (Documentation Handover Process Description) of this document. These are expanded upon with descriptions, activities and responsibilities of individuals involved in the process activities.

The fundamentals of documentation handover to the Client are identified along with the sequence in which these shall be accomplished. Familiarisation with this process will assist the user to understand in detail the correct sequence of events required to ensure that the documentation handover to Client is effectively implemented and is executed in an efficient manner.

**Note:**

- *The LDE and PPM shall ensure that each Contractor is issued with blocks of Eskom document and drawing numbers which appears on the drawings and technical documents submitted at the start of the Client documentation process. This requirement must be stipulated within contracts.*
- *The Eskom approved Electronic Document Management System (EDMS) for technical documentation management (SPO) shall be used to store the plant technical data.*

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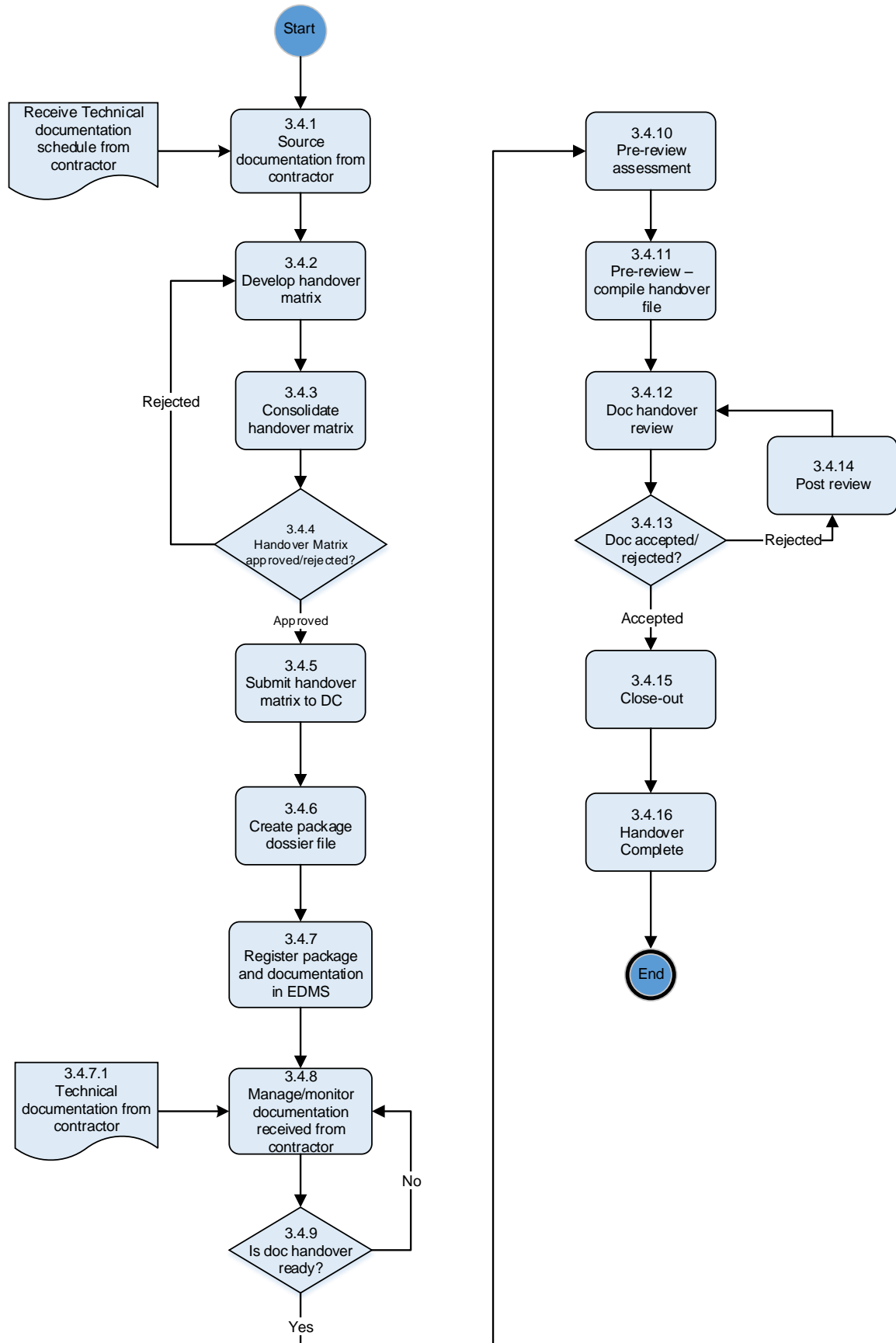


Figure 2: Documentation Handover Workflow

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#### 4. DOCUMENTATION HANDOVER PROCESS DESCRIPTION

The document handover review process follows:

This section must be read in conjunction with the process flowchart depicted in Figure 2: Documentation handover workflow.

**Table 1: Handover Process**

Flow Item	Description	Responsible Person (s)	Activities
3.4.1.	Source documentation from contractor for handover to Client.	LDE / PPM	<p>The LDE shall specify the documents required for submission as part of works to the Contractor. The Contractor shall submit a program of works (Master Document List) for completion of the Contract which includes:</p> <ul style="list-style-type: none"> <li>Dates for submittal and acceptance of technical documents, i.e., drawings.</li> <li>Dates for submittal of operation &amp; maintenance manuals.</li> </ul> <p>Each Contractor shall be issued beforehand, with blocks of Eskom document and drawing numbers which will appear on the drawings and technical documents submitted.</p> <ul style="list-style-type: none"> <li>In the case of drawings, each drawing sheet shall be listed separately in the MDL. This requirement must be stipulated within contracts.</li> <li>The filename of the electronic files of the technical documentation shall be the Eskom document number, sheet number (in the case of drawing) and the document revision; e.g. 083/8496 sheet 3 rev 2.</li> </ul>
3.4.2.	Develop hand over matrix per system/package & submit to the DC.	LDE / PPM / Gx	<p>Gx and the respective LDE shall:</p> <ul style="list-style-type: none"> <li>Review the contractor MDL for document delivery schedule.</li> <li>Review the submitted MDL for completeness and inclusion of all critical "MUST HAVE" submittal items. If it is not complete, there should be a notification to the contractor to re-submit and update the relevant VDSS. This will minimise rework of the Handover matrix later on and also prevent unnecessary Variation Orders by Contractors.</li> <li>Ensure that the correct standards are specified and implemented for the delivery of critical documents like O&amp;M Manuals. (All manuals should be in line with the minimum requirements as stipulated in the VGB Guideline [1])</li> <li>Develop a hand over matrix using the approved VDSS.</li> <li>Ensure that the client receives sufficient information to operate, maintain, repair &amp; overhaul the plant throughout its asset life cycle. (This shall be agreed upfront between the client and the LDE).</li> </ul> <p>The handover matrix to be compiled, per system, shall as a minimum contain the following:</p> <ul style="list-style-type: none"> <li>System Name</li> <li>Document number (Eskom number allocated by the Contractor).</li> <li>Mandatory fields for documentation</li> <li>Date for submittal by the contractor.</li> <li>Whether the document will conform to the Document URS.</li> </ul>

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Flow Item	Description	Responsible Person (s)	Activities
			The respective PPM shall manage the contractual requirements to ensure documentation delivery from the Contractor.
3.4.3	Consolidate handover matrix	DC	Upon receiving matrices from various PPM/LDE of different systems, the DC shall collate information to deliver one overall Handover matrix.
3.4.4	Review and approve hand over matrix.	IL / Gx	The Integration Lead (IL) reviews the handover matrix compiled by the LDE to confirm whether the quality and quantity of the information is sufficient. The Handover Matrix shall be approved by Client.
3.4.4.1	If rejected		The handover matrix will be sent back to be updated/ adjusted
3.4.4.2	If approved		The handover matrix will be submitted to the DC
3.4.5	Submit Hand Over Matrix to Document Controller.	IL/DC	The Integration Lead submits the handover matrix to the DC. <ul style="list-style-type: none"> <li>The DC coordinates submission of Documentation Handover Packages for handover to the Client.</li> </ul>
3.4.6	Create and register a file for each package in an EDMS	DC	The DC will create and register a Dossier file number for each package.
3.4.7	Register documents in the electronic document management system.	DC	The DC will register each document listed in the Documentation Handover Matrix in the EDMS using the Eskom document numbers and link these documents to the Documentation Handover Package number and SPO Handover Dossier.
3.4.7.1	Receive As Built documentation from Contractor.	PPM / DC	As Built documentation from the Contractor are routed into the project via the DC. The PPM will be copied but distribution to intended recipients is done via the DC. Technical documents are to be received in: <ul style="list-style-type: none"> <li>Scanned Portable Document Format (PDF) in two part copies i.e. <ul style="list-style-type: none"> <li>Scanned PDF format of the signed As-Build document</li> <li>Autocad generated PDF of As-Build documentation</li> </ul> </li> <li>Native files.</li> </ul> When a document is issued for “handover”, <b>then provision of the original native file of the handover document (at the correct revision) is mandatory</b> especially if it is a technical drawing or document. Documents required for handover shall be submitted to the DC for processing. The DC captures the documents received on the Documentation Handover Matrix and updates the EDMS. <ul style="list-style-type: none"> <li>The scanned pdf copies will be available on the EDMS for general use and viewing.</li> <li>The native files will only be accessible on the EDMS by users with the correct permissions.</li> </ul> The hard copy documents are filed by the DC at the Project Documentation Centre until handover.
3.4.8	Manage / monitor documents received from Contractors.	DC / PPM	The DC shall compile and issue a monthly report indicating: <ul style="list-style-type: none"> <li>Missed delivery dates,</li> <li>Percentage completion of package.</li> </ul>

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Flow Item	Description	Responsible Person (s)	Activities
			This report shall be submitted to the PPM.
3.4.9	Check document readiness.	DC	Once the overall handover documentation status for a specific package reaches ninety percent (90%) – refer to Appendix B - on the agreed documents between LDE and Gx, the DC shall notify the relevant PPM of the system readiness for the Handover documentation review and request a documentation review date.
3.4.9.1	If ready		Pre-review shall begin
3.4.9.2	If not ready		The PPM shall follow up with relevant Contractors as to why the documents/drawings are late in terms of committed delivery.
3.4.10	Pre-Review - assessment	LDE	The LDE evaluates the completeness of the package. If the package is complete, the LDE then informs the CE that the package is ready for review.
3.4.11	Pre-Review – compile handover file.	DC / PPM / CE / LDE	<p>The CE provides DC with date &amp; time of the review, after which the DC books the review venue.</p> <p>The CE or LDE shall schedule the review &amp; ensure the availability of all relevant parties.</p> <p>The DC and PPM/LDE shall ensure that all handover documents for the package to be reviewed are available. This is done using:</p> <ul style="list-style-type: none"> <li>• A handover document review checklist compiled using the handover matrix. This is a checklist detailing all the documents to be reviewed. See Appendix C for typical information required.</li> <li>• A handover review sheet attached to the package.</li> <li>• The hard copy documents which must be available and reflect the document number in the EDMS for traceability.</li> </ul> <p>All this must be completed at least one day prior to the actual review session.</p>
3.4.12	Document Handover Review	CE	<p>The CE shall conduct the following:</p> <ul style="list-style-type: none"> <li>• Schedule the review.</li> <li>• Ensures relevant parties of the review team are available.</li> <li>• Avails all relevant documentation.</li> <li>• Ensures all reviewers present during the review sign the attendance register for auditing purposes.</li> <li>• Make sure that all documentation related issues and comments are clearly indicated and documented.</li> <li>• Ensures that handover document review checklist and sheet are completed.</li> <li>• Submits the updated review checklist and review sheet to the DC.</li> </ul> <p>The review of the handover documentation shall be done in accordance with the Design Review Procedure [3]</p> <p><b>Note:</b> <i>If there are any actions arising from the hand over documentation review, the package cannot be accepted.</i></p>
3.4.13	Accepted	PPM	To Close out.
3.4.14	Post review (if Rejected)	LDE, PPM	The PPM shall ensure that all actions raised during the review are addressed.

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Flow Item	Description	Responsible Person (s)	Activities
3.4.15	Close Out	DC	Once a package has reached a final status of "accepted" processing in preparation for handing over of the documentation package will be done. The DC shall scan and register the review checklist and review sheets in the EDMS. The DC shall update the Documentation Handover Matrix and make it available to all relevant parties.
3.4.16	Final Processing (Handover complete)	DC	Physical handover: <ul style="list-style-type: none"> <li>• Hardcopy documentation is provided to Client Document Management Centre for filling.</li> </ul> Electronic copies <ul style="list-style-type: none"> <li>• The ownership of the documentation is transferred in the EDMS from Engineering to the Client.</li> </ul>

**Note 1:** In case of non-compliance, the LDE must intervene and specify more elaborate requirements.

**Note 2:** Handover documentation package compilation shall be unique and distinctive to permit document handover for each unit, system, subsystem and disciplines. Grouping of several identical items into one handover package shall not be permissible without a written agreement from the Gx representative(s).

## 5. AUTHORISATION

This document has been seen and accepted by:

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## **6. REVISIONS**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
March 2017	0.1	T. Banda	Compiled the first draft
May 2017	0.2	T. Banda	Final Draft Document for Comments Review Process
June 2017	1	T. Banda	Final Document for Authorisation and Publication
May 2018	1.1	L. Koech	Updated draft for internal review
June 2018	1.2	L. Koech	Updated Comments from Internal Review
June 2018	1.3	L. Koech	Updated Additional Comments from Internal Review
22 June 2018	1.4	L. Koech	Final Draft Document for Comments Review Process
10 July 2018	1.5	L. Koech	Final Document for Authorisation and Publication
19 July 2018	2	L. Koech	Final Rev 2 Document for Authorisation and Publication

## **7. DEVELOPMENT TEAM**

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

- T. Banda
- L. Koech
- Simon Peter
- Linda Mchasa
- Benny Lesejane
- Siyasanga Dayile
- Solly Masina
- Kholo Silindana

## **8. ACKNOWLEDGEMENTS**

- N/A

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**Appendix B: HANDOVER MATRIX PERCENTAGES**

Category	Document Description	Percentages	Total
Engineering and Design	Specification	5%	<b>21%</b>
	Operating/Control Philosophy	5%	
	Design Docs	10%	
	Approvals	1%	
Documentation and Drawings	P&ID & Single Line Drawings	8%	<b>45%</b>
	System Drawings	5%	
	Cable Schedules	4%	
	GA's	4%	
	Diagrams and Layouts	4%	
	Schematics	4%	
	Maintenance Manuals	4%	
	Operating Manuals	4%	
	Technical Manuals	4%	
	Refurbishment Package Data Book	4%	
Commissioning	Commissioning Procedure	2,5%	<b>5%</b>
	Commissioning Certificate	2,5%	
Mechanical	Final Inspection	1,25%	<b>2,5%</b>
	Safety Clearance	1,25%	
C&I	Final Inspection	1,25%	<b>2,5%</b>
	Safety Clearance	1,25%	
Electrical	Final Inspection	1,25%	<b>2,5%</b>
	Safety Clearance	1,25%	
Civil	Final Inspection	1,25%	<b>2,5%</b>
	Safety Clearance	1,25%	
Test and Statutory	FAT	1,5%	<b>15%</b>
	SAT	1,5%	
	ITP's	1,5%	
	QCP & QIP's	1,5%	
	COC	1,5%	
	Electrical Tests	1,5%	
	Calibration Certificates	1,5%	
	Protection and Optimising Test Certificate	1,5%	
	Fire Protection Certificate	1,5%	
	Environmental Impact Assessments	1,5%	
Safety and Housekeeping	Housekeeping		
Defects List	Defects List		
Guarantees and Warrantees	Detail on Guarantees and Warrantees	1,5%	<b>3%</b>
	Special Test Required after Commissioning	1,5%	
Other	Plant Out of Normal Status Approved	0,5%	<b>1%</b>
	Proof of Training	0,5%	
	Provisional Handover Certificate		
	Handover Certificate		

**CONTROLLED DISCLOSURE**

## **APPENDIX C: DOCUMENTATION REQUIREMENTS FOR HANDOVER**

### **1. Engineering Documentation**

- 1.1. Specification (Employer's contract).
- 1.2. Engineering Change Process Reports.
- 1.3. Integrated Design Review Reports.
- 1.4. Pre-Commissioning Review Reports.
- 1.5. Handover Design Review Report.
- 1.6. Risk assessments
- 1.7. Non-Conformance Management
- 1.8. ECN/FCN/Engineering Instructions
- 1.9. Other Documentations and Reports

### **2. Final System Design Package (Including As-Built Plant and Control Room Drawings):**

- 2.1. System Overview/Description/Philosophy
- 2.2. Operating/Control philosophy
- 2.3. Original Equipment Manufacturer Manuals/Data
- 2.4. Hardware Configuration
- 2.5. Equipment List
- 2.6. Instrument Lists
- 2.7. Punch Lists
- 2.8. Buildings Lists
- 2.9. Signal List
- 2.10. Alarm List
- 2.11. Software listings;
- 2.12. Set Point and Parameter List
- 2.13. Bill of Quantities (including KKS & Descriptions)
- 2.14. Bill of Material
- 2.15. Cable Schedules
- 2.16. Cable layout
- 2.17. Equipment Detailed Drawings
- 2.18. As-Built Drawings/Diagrams to be prepared will include but not limited to:
  - 2.18.1. General Arrangement
  - 2.18.2. System/Network Topology
  - 2.18.3. Isometrics
  - 2.18.4. Piping and Instrumentations Diagrams (P&ID's)
  - 2.18.5. Electrical Single Line Diagrams (SLD)
  - 2.18.6. Electrical Schematics

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- 2.18.7. Connection Diagrams
- 2.18.8. Protection Diagrams
- 2.18.9. Cable Block Diagrams
- 2.18.10. Process Flow Diagrams
- 2.18.11. Logic And Functional diagrams
- 2.18.12. Site/Location Layout Drawing
- 2.18.13. Floor layout Drawings per Building
- 2.18.14. Room Layout Drawings
- 2.18.15. Air Duct Layout
- 2.18.16. Drainage layout
- 2.18.17. Earth Mat Layout
- 2.18.18. Wiring Diagrams
- 2.18.19. Circuit Diagrams
- 2.18.20. Loop Diagrams,
- 2.18.21. Termination Diagrams
- 2.19. Protection Settings
- 2.20. Material Specifications
- 2.21. Welding Specifications
- 2.22. Design Specifications
- 2.23. Design calculations
- 2.24. As-Commissioned & Calibration Settings (All programmable/logic devices, including instrumentation, protection, PLC's, HMI's, etc.)
- 2.25. Configuration & Development Software Backups, Programs, Diagnostic Tools and Licences for Operation and Maintenance
- 2.26. List of User Names and Passwords
- 2.27. Special Tools
- 2.28. Detailed Design Drawings
- 2.29. Load Schedules/Load List
- 2.30. Schematic Diagrams
- 2.31. Functional Descriptions (Control)
- 2.32. Alarm Response Procedures
- 2.33. Design Philosophy
- 2.34. Materials, Mass & Energy Balance Diagrams
- 2.35. Control System IT Architecture
- 2.36. Plant Protection Logics
- 2.37. Plant Systems/Process Description
- 2.38. Design Assumptions
- 2.39. Trade-offs

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- 2.40. Load Flows
- 2.41. Fault Studies
- 2.42. Cable Routing Software
- 2.43. CAD Software Data Files
- 2.44. Simulations
- 2.45. Other Documentation

**Notes:**

1. All drawings shall be prepared in accordance with the requirements as specified in the Engineering Drawing Office and Engineering Documentation Standard.
2. A Drawings Register which records the drawing's information shall be maintained, and this shall include the officially assigned Eskom Drawing number, including sheets and sub-sheets. The Register shall also document the various revisions received for each individual drawing (if relevant).
3. All electronic copies of documentation listed above is required in native document formats for future modification purposes, and is mandatory for supply once a document or drawing is declared to be ready for handover ("as built").
4. It should be noted that if the Contractor is not the OEM (or original creator/ design authority of the design and drawing/document artefact), Eskom cannot legally give these OEM's drawings to another Contractor. Only approved Eskom drawings can be shared with the Contractor.

**3. Construction, Commissioning and Hand-Over Requirements**

These include construction, testing, commissioning, operating and maintenance manuals as well as contractual and legislative documentation to be included in the functional specification of the project. They are listed as follows:

**3.1. Construction Manuals will include:**

- 3.1.1. Assembly/Erection Instructions
- 3.1.2. Method Statements
- 3.1.3. Risk Assessments
- 3.1.4. Inspection Reports
- 3.1.5. Cube Tests
- 3.1.6. Pressure Tests
- 3.1.7. NDT Reports
- 3.1.8. Weld Maps
- 3.1.9. Welding Procedure Specifications
- 3.1.10. Welder Qualifications
- 3.1.11. Material Test Certificates
- 3.1.12. Corrosion Protection
- 3.1.13. Erection/Construction check sheets
- 3.1.14. Erection/Construction Clearance Certificates
- 3.1.15. Quality Plan

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- 3.1.16. Quality Control Plans (QCP's)
- 3.1.17. Quality Improvement Plans (QIP's)
- 3.1.18. Health and Safety Plan

**3.2. Commissioning manuals will include:**

- 3.2.1. Commissioning Procedures (Including Functional, Pre-Commissioning, Hot/Integrated Commissioning, etc.)
- 3.2.2. Commissioning Checklists (Including Functional, Pre-Commissioning, Hot/Integrated Commissioning, etc.)
- 3.2.3. As Commissioned settings/Results
- 3.2.4. Commissioning/Safety Clearance Certificates
- 3.2.5. Handover Certificate

**3.3. Handover will include:**

- 3.3.1. Take Over Certificates
- 3.3.2. Defects Lists (pre and post takeover)
- 3.3.3. Handover Certificates

**3.4. Operating and maintenance manuals will include:**

- 3.4.1. Maintenance Manual
- 3.4.2. Maintenance Procedures
- 3.4.3. Safety Requirements during Operation and Maintenance
- 3.4.4. Operating Procedures/Work Instructions/Manuals
- 3.4.5. Maintenance strategies with frequencies
- 3.4.6. Operating Technical Specifications (OTS)
- 3.4.7. Detailed spares list and lists of any specialised equipment or tools required to execute the maintenance or operating task.
- 3.4.8. Safety Requirements during Operation and Maintenance
- 3.4.9. Maintenance Philosophy (Recommended Minor & Major inspection intervals and outage durations)
- 3.4.10. Original Equipment Manufacturer (OEM) manuals and part catalogues
- 3.4.11. Technical Manuals
- 3.4.12. Recommended Spares Lists
- 3.4.13. Commissioning Shutdown Procedures
- 3.4.14. Storage and Handling Instructions
- 3.4.15. Installation, Operating & Maintenance Manuals (IOM's)
- 3.4.16. Datasheets and Product Brochures

**3.5. Contractual documentation will include:**

- 3.5.1. Contracts (Signed copy) and Contract Data
- 3.5.2. Works Information

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- 3.5.3. Accepted Programme/Schedule (Final)
- 3.5.4. Completion and Defects Dates
- 3.5.5. Performance and Retention Bonds
- 3.5.6. Warrantees and guarantees
- 3.5.7. Client's Requirements Specification (URS)
- 3.5.8. Non-Conformance Reports (outstanding)
- 3.5.9. Modifications (outstanding or in progress)

**3.6. Legislative documentation :**

- 3.6.1. Hazardous Area Classification Designs and Reports
- 3.6.2. Hazard of Operation Study(HAZOP) Reports
- 3.6.3. FMECA and RAM Studies Reports
- 3.6.4. Fire Risk and Hazard Analysis Reports
- 3.6.5. Flammable Substance Certification/Fire Clearance
- 3.6.6. South African Grid Code Compliance
- 3.6.7. Pressure Vessel Certificates
- 3.6.8. RBI Risk Analysis, assignments and authorisation for implementation (in lieu of Vessels Under Pressure certificate)
- 3.6.9. Load Test Certificates
- 3.6.10. Occupancy certificates
- 3.6.11. Environmental certificates/licences/permits
- 3.6.12. Certificates of Compliance (COC's)
- 3.6.13. All other relevant Permits and Licencing
- 3.6.14. All Waivers and Exemptions granted on any equipment and/or system associated with the plant

**3.7. Test and Statutory Certificates**

- 3.7.1. Factory Acceptance Test (FAT)
- 3.7.2. Site Acceptance Test (SAT)
- 3.7.3. Inspection Test procedures (ITP's)
- 3.7.4. COC (Domestic Circuit)
- 3.7.5. QCP's/QIP's (Signed off)
- 3.7.6. Calibration Certificate
- 3.7.7. Load Test Certificate
- 3.7.8. Electrical Test (Motors)
- 3.7.9. South African Grid Code Tests, Results and Compliance
- 3.7.10. Calibration and Test Certificates
- 3.7.11. Type Test Certificates
- 3.7.12. Performance and Statutory Test Procedures and Results

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- 3.7.13. Erection Check Sheet
- 3.7.14. Protection and Optimising Test Certificates
- 3.7.15. Synchronisation Tests
- 3.7.16. Grid Code Compliance Certificate
- 3.7.17. Fire protection Certificates
- 3.7.18. Others (safety valves, Ventilation, Boiler Statuary Tests,
- 3.7.19. Certificates of Compliance (COC's)
- 3.7.20. Vessels Under Pressure Certificates
- 3.7.21. Material/Replica Testing Certificates
- 3.7.22. Inspection Certificates
- 3.7.23. Weld Plans & Welding QA

### **3.8. Safety and Housekeeping**

- 3.8.1. Safety signs and labels
- 3.8.2. Identification and Colour coding
- 3.8.3. Demarcation of Hazardous Areas ( Certificates and Reports)
- 3.8.4. Lightning
- 3.8.5. Safety and Housekeeping Certificate

### **4. Guarantees and warranties**

- 4.1. Related extract from Scope of Work (SOW) or Works Information indicating Plant area/Component
- 4.2. Guarantees and warranties Certificates from the Supplier stipulating the following:
  - 4.2.1. Period (an expiration date or period beyond which the guaranty is no longer enforceable)
  - 4.2.2. Contractor's "warrants" that its work will be performed in accordance with Eskom standards stated in the contract (e.g., in "a good and workmanlike manner") and otherwise be free of defects and in conformity with the design documents

### **5. Project Execution**

The following Engineering disciplines (Mechanical, Control & Instrumentations, Electrical and Civil) shall ensure issuance of the following for ensuring effective and efficient execution of projects:

- 5.1. Contractor's Application for Eskom's Inspection of the Works/Part of Works.
- 5.2. Data Pack (e.g. *Material Certificates, Qualifications, NDE& Welding Documentation, Cutting Instructions, Factory Design Review Reports, Material Safety Data Sheets (MSDS), Site Test Results, Isometrics Drawings, C&I Loop Checks.*
- 5.3. Partial/final Inspection Certificate
- 5.4. Defects Notification Certificate/Clearance
- 5.5. Safety and Housekeeping Certificate
- 5.6. Safety Clearance Certificate
- 5.7. Completion Certificate
- 5.8. Defects Certificate

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5.9. KKS and Labelling (Plant Identification ) Certificates (ideally per system)

5.10. Specific requirements.

5.11. Take Over Certificate

## **6. Special Tools List**

## **7. Insurance Cover**

## **8. Plant Out of Normal Status Approved**

## **9. Training Documentation**

9.1. Training programme/schedule

9.2. Training Manuals

9.3. Proof of Training

9.4. Evaluation Criteria

9.5. Plant Safety Regulations

9.6. High Voltage (HV) Regulations

9.7. Other

## **10. Provisional Handover Certificate**

## **11. Final Handover Certificate**

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