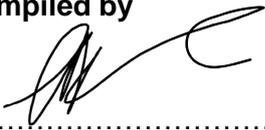


	<p align="center">Scope of Work</p>	<p align="center">Technology</p>
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Title:	Medupi Power Station Canteen Building Kitchen Hood Fire Suppression System Design, Construction, Documentation, Commissioning and Sign-off	Unique Identifier:	348-10014723
		Alternative Reference Number:	N/A
		Area of Applicability:	Engineering
		Documentation Type:	Scope of Work
		Revision:	0
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		Next Review Date:	As required
		Disclosure Classification:	CONTROLLED DISCLOSURE

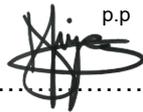
Compiled by



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Date: 2022/11/16

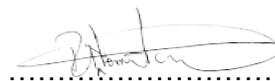
Functional Responsibility



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Date: 2022-11-16

Authorized by



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Date: 2022/11/16

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1. INTRODUCTION

The document outlines the installation of a kitchen hood fire suppression system which shall be installed under the kitchen hood at Medupi Power Station Canteen Building. The occupancy Classification of the Canteen Building is A1 as per SANS 10400-A part 20.

The kitchen hood is already installed at the Canteen Building.

This document details the requirements in terms of design and construction that is required to ensure the installation, commissioning and certification kitchen hood fire suppression system installations at Medupi Power Station Canteen Building.

NOTE: This scope of work applies to the Canteen Building kitchen hood fire suppression system installations at Medupi Power Station. The document and all appendixes need to be read in full to determine the full extent of the Scope of Work.

1.1 SCOPE

The scope of this document is to define the professional services and construction works that are required to install and certify the kitchen hood fire suppression system at Medupi Power Station Canteen Building. The following will be required for each of the installations:

1. Design kitchen hood fire suppression system to ensure compliance.
2. Construction of the kitchen hood fire suppression system.
3. Provision of data books for manufacturing, construction and commissioning as required.
4. Provide all relevant drawings including as-built status including as-built sign-off.
5. Commissioning and certification of Kitchen hood fire suppression system.

1.1.1 Purpose

The purpose of this document is to define the scope of work for the appointment of a Contractor to the design, construct and certify kitchen hood fire suppression system the Canteen Building at Medupi Power Station.

1.1.2 Applicability

/This document applies to the Canteen Building Kitchen Canopy at Eskom Medupi Power Station.

1.2 NORMATIVE/INFORMATIVE REFERENCES

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

1.2.1 Normative

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

- [1] ISO 9001 Quality Management Systems.
- [2] 240-123801640 Standard for Low Pressure Pipelines
- [3] 240-54937450 Fire Protection & Life Safety Design Standard
- [4] SSZ 45-17 Medupi Power Station Corrosion Protection Specification
- [5] ESKSCAAC6 Specification for the Identification of the Contents of Pipelines and Vessels
- [6] 200-5664 Medupi Project Engineering Change Management Work Instruction

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When downloaded from the EDMS, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

- [7] 200-16714 Commissioning and Completion of Medupi Power Station Works Instruction
- [8] 240-106628253 Standard for Welding Requirements on Eskom Plant
- [9] 240-83539994: Standard for Non-Destructive Testing (NDT) on Eskom Plant
- [10] 240-86973501 Engineering Drawing Standard – Common Requirements
- [11] SANS 14520 Part 1 gaseous fire-extinguishing systems – Physical properties and system design
Part 1: General requirements
- [12] 240-53113685 Eskom Design Review Procedure
- [13] 240-56356376 Site Commissioning for Low Pressure Services
- [14] Occupational Health and Safety Act, (Act No. 85 of 1993)
- [15] SANS 10108 – The Classification of Hazardous Locations and Selection of Equipment for Use in
Such Locations
- [16] 240-56536505 - Hazardous Location Standard
- [17] 240-55714363 - Coal-Fired Power Stations Lighting and Small Power Installation Standard
- [18] SANS 10400 - All Parts National Building regulations
- [19] SANS 121 - Hot dip galvanized coatings on fabricated iron and steel articles
- [20] SANS 0108-1974 Classification of hazardous locations
- [21] PAM/244/001 Management of Maintenance Waste to Minimise Environmental Impact
- [22] 32-245 Eskom Waste Management Standard
- [23] 32-421 Eskom Life Saving Rules
- [24] 240-150642762 Generation Plant Safety Regulations
- [25] 240-126468603 Operational Standard for Fire Management in Generation
- [26] 240-60490979 OHS Operational Plan
- [27] 240-61227631 Piping and Instrumentation Diagram (P&ID) Standard
- [28] KKS Key Part Fossil power station (NPSZ 45-45) – 200-18202
- [29] The application of KKS plant coding (NMP 45-7) – 200-4190
- [30] 200-133974 Medupi Power Station Canteen Building Rational Fire Design
- [31] Occupational Health and Safety Act (Act 85 of 1993)
- [32] 200-6166 Medupi Power Station Backfill Specification
- [33] 348-880042 Medupi Concrete specification for structural concrete (84CIVL053)
- [34] 240-57127955 - Geotechnical and Foundation Engineering Standard
- [35] 240-56364545 Structural Design and Engineering Standard
- [36] 240-58552870 Smart Plant for Owner Operators (SPO) Documentation Metadata Standard
- [37] 200-3340 Standard: KKS Coding and Labelling
- [38] 240-93576498 KKS Coding Standard
- [39] 200-5343 Medupi Power Station Project - List of Abbreviations
- [40] 200-94660 Issuing of KKS Certificate Work Instruction

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- [41] 240-53114186 Project/Plant Specific Technical Document and Records Management Procedure
- [42] VGB-S-811-01-2018-01-EN VGB Standard KKS Identification System for Power Stations
- [43] 240-60782552 Process Flow Diagram Standard
- [44] 240-53114026 Project Engineering Change Management Procedure
- [45] 240-56355754 Field Equipment Installation Standard
- [46] 240-56355815 Control & Instrumentation Field Enclosures and Cable Termination Standard
- [47] 240-56737448 Fire Detection and Life Safety Design Standard
- [48] 200-52757 Hazardous Area Classification for Medupi Water Treatment Plant and Laboratory
- [49] 200-44483 Hazardous Area Classification for Medupi Coal Plant
- [50] 200-11303 Medupi Occupational Health, Safety and Management Policy
- [51] 348-860843 Storage and Preservation Work Instruction
- [52] 200-45965 Medupi Manufacturing Inspection and Testing Procedure
- [53] 200-46362 Medupi Site Quality Assurance Control and Verification Procedure
- [54] 200-1689 Medupi Quality Specification
- [55] 240-61227631 Piping and Instrumentation Diagram (PID) Standard
- [56] 348-711703 (SSZ 200-207219) Medupi Power Station Safety, Health and Environmental Specification

1.2.2 Informative

- [57] 240 54937439 - Fire Protection/Detection Assessment Standard
- [58] 348-9981543 Medupi Power Station Scope of Work for the Appointment of a P08 main civil works construction contractor

1.3 DEFINITIONS

1.3.1 Disclosure Classification

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

1.4 ABBREVIATIONS

Abbreviation	Description
C&I	Control and Instrumentation
CBMS	Central Building Management System
CDSS	Contractor Documentation Submission Schedule
CM	Configuration Management
ECSA	Engineering Council of South Africa
EDWL	Engineering Design Work Lead
HVAC	Heating Ventilation and Air Conditioning
ICV	Isolating Control Valve
IT	Information Technology

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Abbreviation	Description
KKS	Kraftwerk-Kennzeichen System
LDE	Lead Discipline Engineer
m	Meters
MDL	Master Documentation List
N/A	Not applicable
NDT	Non-Destructive Testing
OEM	Original Equipment Manufacturer
P&ID	Piping and Instrumentation Diagram
PDF	Portable Document Format
PEC	Professional Engineering Certificate
PSA	Pressure Swing Adsorption
SANS	South African National Standards
VDSS	Vendor Document Submission Schedule

1.5 ROLES AND RESPONSIBILITIES

Person	Responsibility
Approved Inspection Authority (AIA)/Local Municipal Authority	The AIA is an external agent representing the Department of Labour (Pressure Equipment and Regulations), responsible for reviewing designs of all critical plant areas and ensuring compliance to government construction code. Local Municipal Authority for Certification.
CoE Engineering Practitioner	The CoE Engineering role is a domain knowledge expert focused on providing expert subject matter expertise to the engineering disciplines for Design Base Creation and maintenance. Clarification of scope, if required.
Contractor	The <i>Contractor</i> shall design (to the extent specified in the Contract), execute, and complete the Works in accordance with the Contract.
Engineering Design Work Lead (EDWL)	He/she co-ordinates the design work provided by the discipline Design Engineering roles and integrates this work into a final integrated design product. He/she is the custodian of the requirements set and the interface register between packages and part of his/her role is to maintain this information. He remains responsible for the integrity of the engineering product and is accountable for the overall management of interfaces and delivery of an integrated product.
Lead Discipline Engineer (LDE)	The role of the Lead Discipline Engineering role is to manage the technical integrity of the design and be accountable for the management of the interfaces within their specific engineering domain
Site Construction	The Site Construction Engineering role is part of the project engineering team and participates in conjunction with other team members of all disciplines to assure the technical integrity of a fully functional and operational plant that meets the user requirement and Eskom Engineering expectations and requirements. The Site

CONTROLLED DISCLOSURE

Engineering Practitioner	Construction Engineering role is a key link to facilitate and ensure that the plant, is built and commissioned, is fully aligned with the Design Base, Operating Technical Specifications, and the Maintenance Base. The role provides an assurance function. Quality inspections, Final acceptance, sign-off and approval.
Quality Management	Quality ensures Contractors build plant according to contractual specifications, and user requirements and codes. Quality is the custodian of the Quality Management System and quality records and facilitates the work of the Approved Inspection Authority (AIA). The Quality Function's responsibility is to ensure Contractors have a sound quality system in place. Quality checks these systems on behalf of the Employer.
Contracts Manager	The contracts manager is responsible to incorporate this Technical Specification into a contractual document.
Project Manager	The Project manager coordinates the execution of the Works to achieve the required cost schedule and quality objectives. The Project manager is delegated authority from the Eskom Employer Representative to manage the defined scope of work.

1.6 PROCESS FOR MONITORING

As per the Eskom Design Review Procedure 240-53113685.

1.7 RELATED/SUPPORTING DOCUMENTS

N/A

2. SCOPE OF WORK

This scope of work includes all Design, construction, commissioning and sign-off

NOTE: The scope of work is for the Canteen building kitchen hood fire suppression system only.

2.1 GENERAL REQUIREMENTS

2.1.1 Safety Requirements

The Contractor shall ensure compliance with all requirements of the Occupational Health and Safety Act no 85 of 1993 and its regulations to ensure the health and safety of persons carrying out the Works.

The Contractor shall comply with the latest revision of the Eskom Generation Plant Safety Regulations [24], site specific procedures, stipulations of the OHS Act, Safety health and environmental specification and all legal and other requirements [14], [50].

2.1.2 Environmental Requirements

The contractor shall comply with the following environmental legal requirements but not limited to.

- Compliance to all legal and other requirements.
- Compliance with the project environmental management system documentations.
- Implementation of the Medupi Approved Environmental Management Plan
- Ensure that all conditions in the project environmental authorisations, permits and licences.
- All potential environmental risks related to the scope must be identified and planned for.

The environment management file specific to the scope of work must be submitted for approval.

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- Aspect and impact register
- SHE/Q Policy
- Method statement including activities in sequence with environmental risks considered
- Environmental Management Plan addressing the significance risks.
- Environmental Incidents, Audit and Non-conformance process

2.1.3 Engineering Site Construction Monitoring

The Contractor shall provide engineering resource(s) for site construction monitoring. These engineering resource(s) shall be suitably qualified for assisting with design related construction challenges. The engineering site construction monitoring shall be done by a professionally registered engineer or technician, or suitably qualified engineering representative authorised to represent the professionally registered engineer or technician.

2.1.4 Kitchen hood installation

Any modification required to existing installations that could have an impact on the existing building structure shall be discussed and agreed upon between the Contractor and the Employer's appointed buildings professional. All changes that may include changes to the original design calculations, forces applied to building structures or other existing supporting structures and fixing details, shall be discussed with the Employer's engineering team. Where existing building structures have to be modified to accommodate changes to the existing installations the Contractor shall implement and follow the Medupi Project Engineering Change Management Work Instruction [6].

All new supporting structures shall be designed and certified by the Contractor's ECSA registered professional engineer.

All drawings and documentation shall comply with the requirements of section 2.1.6.

2.1.4.1 Piping

All piping shall be as per the requirements of the Eskom Standard for Low Pressure Pipelines [2] and the Eskom Fire Protection and Life Safety Design Standard [3].

The installation of grooved couplings instead of flanged piping will be required where the existing piping installation already consists of grooved & coupled piping when piping modifications are required. In the instances where the existing installations are flanged any modified piping on those systems shall also be required to be flanged. This applies to all steel piping larger than 50NB. Steel piping smaller than 50NB is required to be screwed.

All below ground piping shall be PVC-M piping which shall be as per the requirements of SANS 966-2 and shall be installed as per the manufacturer's recommendations.

Corrosion protection shall be as per the requirements of the Medupi Power Station Corrosion Protection Specification [4]. All steel piping shall be hot-dipped galvanised steel as per the requirements of SANS 121 except in instances where the existing design specifies that the piping shall not be galvanised (this is typically restricted to systems where firefighting foam is utilised).

Painting of fire system piping shall be as per the requirements of the Specification for the Identification of the Contents of Pipelines and Vessels [5]. All fire system piping shall be fully painted signal red as per the requirements of SANS 10140-2.

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2.1.4.2 Valves & Equipment

All valves and equipment shall be as per the requirements of the Eskom Fire Protection and Life Safety Design Standard [3].

2.1.4.3 Kitchen Hood Fire Suppression Systems

Kitchen Hood Fire Suppression Systems shall comply with the requirements of the Eskom Fire Protection and Life Safety Design Standard [3].

A kitchen hood fire suppression system shall be installed under the kitchen.

The kitchen hood fire suppression systems sprinklers shall be arranged to offer maximum coverage for all installations.

The contractor to design and install a kitchen hood suppression system complete to cover a hood with dimensions 6900mm (length) x 2760mm (width) with:

- Fusible link
- Detector bracket
- Mechanical release module (MRM)
- Nozzles
- Manual Pull Station
- Extinguishing agent
- Automatic fuel shut-off
- Automatic detection connection

The system shall be automated with a manual override.

The kitchen hood fire suppression system fire water will be connected to an existing fire water supply line inside the kitchen

2.1.4.4 Training on operation and maintenance of suppression system

The contractor to train the operators of the kitchen hood fire suppression.

After the training the system operators must:

- be able to understand the technician reports and advice.
- understand the configuration of fire systems
- be able to assess system designs and proposals
- be able to understand and implement the lockdown procedure

2.1.4.5 Lockdown procedure

The contractor must provide the lockdown procedure as per the regulations (OSH act) and Eskom standards and requirements.

2.1.4.6 Pressure Testing

Fixed fire protection systems and piping shall be pressure tested as per the requirements of the design standard of the system(s).

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2.1.4.7 Welding and Non-Destructive Testing

All welding (if any) shall be done according to a qualified WPS using a qualified welder as per the requirements of the Eskom welding Standard [8]. Welding Contractor should be as a minimum ISO 3834-3 certified as per the Eskom Welding Standard requirement. All welding and Non-Destructive Testing (NDT) shall be as per the Eskom Standard for Welding Requirements on Eskom Plant [8] and the Standard for Non-Destructive Testing (NDT) on Eskom Plant [9] respectively.

2.1.4.8 Flushing

All fire system piping shall be flushed prior to commissioning to ensure that there are no blockages or debris in the piping. Where applicable, the flushing requirements as per the design standard shall be followed.

2.1.4.9 Commissioning

Commissioning shall be done as per the Commissioning and Completion of Medupi Power Station Works Instruction [7] as well as Site Commissioning for Low Pressure Services [13]. The commissioning procedure shall be pre-approved and the designer or professionally registered individual doing design verification shall be present during the commissioning. The fixed fire protection systems shall be commissioned as per the acceptance criteria of the relevant design standard.

2.1.5 Design Work

All fire system designs shall be in-line with the Eskom Fire Protection and Life Safety Design Standard [3] requirements. Design documentation shall include the following as a minimum:

1. Design Report
2. Datasheets for sprinklers, control valves and firefighting equipment
3. Hydraulic Calculations
4. Drawings (P&ID, spray pattern drawing, Isometric, General Arrangement)

The designs shall comply with the requirements as set out in sections 2.1.4.1 to 2.1.4.9.

2.1.6 Documentation Management

The process of managing documentation for the project works will be supported by the following

2.1.6.1 Electronic Documentation Management System

Smart Plant Owner Operator (SPO) is the electronic documentation management system for the management of project documentation (Technical and Non-technical). It has the following capabilities:

1. Centralized and access-controlled database that maintains audit trail information of documentation based on the captured Meta data (documentation properties) and on automated captured information of user interaction within the system.
2. Multiple levels of access control to ensure appropriate level of security against documentation.
3. Workflow: - this refers to automation of business process where documentation is passed from one participant to another for action as per the set Documentation management governance.
4. SPO reports: - The system maintains audit trail of all user transactions against documentation stored in SPO, then that can be extracted into a report for progress management and quality assurance.

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5. Transmittal management: - SPO manages incoming and outgoing transmittals, to ensure proper tracking of all submission from the contractor and all documentation issued to the contractor.

2.1.6.2 Project Communication

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

1. Generic proxy email accounts: This refers to a group email account shared amongst authorised users. All project correspondences shall use the project proxy account(s) to ensure continuation of the project, to avoid the dependency on individual's availability and to ensure that all communications are received. The subject of the email shall as minimum contain package number and transmittal number. Electronic copies shall be submitted to Eskom Documentation Centre through generic email address, which Eskom shall provide to the contractor.
2. Large file transfer: Documentation submission with the file size that exceeds the outlook maximum size must be transferred via the Eskom large file transfer portal, CD/DVD, and/or hard drives to the Project Documentation Centre. A notification email, with the transmittal note attached, shall be sent to the project generic email address. The Representative shall be copied on the email as well.
3. Hard copies shall be submitted to the Eskom Representative accompanied by the Transmittal Note.
4. The format of the final documentation handover shall be specified in the Vendor Document Submittal Schedule.

2.1.6.3 Email Subject

The email subject shall as a minimum have the following:

(Tx number__ Contract number)

2.1.6.4 Document Submission

All documents shall be submitted to Project manager, the language of all documentation is required to be in English. The Contractor shall submit the Vendor Document Submission Schedule to the Project manager. The VDSS is revisable and changes shall be discussed and agreed upon by all parties and properly documented. Changes in the VDSS include: additional documentation to be submitted; changes in submission dates; corrections in documentation descriptions and document numbers; etc. The Contractor shall be responsible for the management of the schedule i.e. to create a document register that shall be used to track submission progress of documentation by the Contractor as per the committed dates on the VDSS.

2.1.6.5 Documentation Transmission

All documentation shall be submitted with a transmittal containing the submitter details and signature; the recipient must sign and send back the transmittal to the sender, to confirm receipts, within 14 working days. The Contractor shall receive the transmittal template from the Employer.

Walk in Hand delivery must be managed as follows:

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- Submission of Large number of arch files exceeding a quantity of three (3) must be packaged in an archive box for submission to Eskom.
- Every hardcopy submission shall be accompanied by a labeled CD.

A transmittal with have the following metadata fields:

1. Title of the document
2. Document Unique Identification number
3. Revision number
4. Name of Discipline
5. Reason for issuing/submission
6. Sender's detail
7. Sent date
8. Recipient's Details
9. Date received
10. Quantity of documentation referenced on the transmittal
11. Number of copies
12. Format/medium submitted (e.g.: paper, DVD, etc.)
13. Sender signature
14. Recipient signature, once submitted, to acknowledge receipt

2.1.6.6 Reporting

Exchange of documentation between contractor and Eskom must be tracked for progress and completeness as per the following tools.

1. Contractor Documentation Submission Schedule (CDSS):

The contractor is required to compile and maintain a documentation submission schedule of all required project documentation, which details when the documentation shall be submitted to Eskom. The template of the CDSS shall be reviewed and approved by Eskom.

The contract must submit a preliminary Contractor Documentation Submittal Schedule (CDSS) within 30 calendar days of contract award.

The contractor must ensure that the updated CDSS is communicated to Eskom at least once a month for review.

2. Master Documentation List (MDL):

The contractor shall maintain the MDL to record all documentation submissions to Eskom in line with the CDSS. The contractor must submit the updated MDL once a month for review.

2.1.6.7 Documentation Management Governance

The contractor shall manage documentation in line with the Eskom Documentation Management governance listed below (Including all reference documents that form part of the governance) after the contract is awarded.

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1. 348-883860: Medupi Format and Layout Specification
2. 348-883808: Medupi Document and Records Management Procedure
3. 240-86973501_Engineering Drawing Standard
4. 348-885429: Engineering Change Management Work Instruction
5. 36-943: Engineering Drawing Office and Engineering Documentation Standard
6. 240-53114186: Eskom Project/Plant Specific Technical Document and Records Management Procedure
7. 240-83561037: Reporting and Data Requirements Specification for Contractors.
8. 348-942820: Transmittal Template
9. 200- 616427 Data Book Checklist

2.1.6.8 Drawings

The creation and control of all Engineering Drawings shall be in accordance with the latest revision of the Engineering Drawing Standards – Common Requirements [10]. 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 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 all the new installation/modified parts as well as enough of the 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 be issued as a final black line version with “As-built” status clearly indicated on the drawing. All final “As-built” drawings shall be signed off by the Designer indicating the Designer’s name and ECSA registration details.

All drawings shall contain the following as a minimum:

- Description of component with KKS 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, otherwise provide larger size in case of legibility limitations. Electronic copies of the drawings must be provided in both pdf and .dgn format.

All required drawings shall comply with the Engineering Drawing Office and Engineering Drawing Standard [10]. 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.

The Contractor shall be required to update the existing documentation to the as-built status where required and provide new drawings & design documentation as per the minimum design documentation requirements specified in section 2.1.5 of this document.

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As a minimum the relevant design documentation and drawings should have an approved for construction status prior to any construction works starting on site.

P&ID's shall comply with the requirement of the Eskom Piping and Instrumentation Diagram (PID) Standard [55].

All drawings to be submitted in portable document format and native files. The contractor to submit an as-built 3D model as per specifications in section 2.1.7.

The Contractors Designer grants to the Employer an irrevocable, nonexclusive, royalty-free licence to utilize any intellectual property to the extent necessary for the operation, maintenance, repair or alteration to any works certified or that of the third party.

2.1.7 3D Model Submission and Review

3D Models shall be submitted in .dgn format.

3D Models shall be submitted, in phases, at the end of each month as well as end of each design phase. The submitted 3D models and P&IDs will be captured and consolidated/integrated into SmartPlant, by the Employer, using SmartPlant Interop Publisher.

The following 3D Model Reviews shall be performed by the Contractor in collaboration with the Employer:

- **30% Model Review**

Mainly, but not limited to, review equipment layout, routing of large bore piping, accessibility to equipment, safety, human factors Engineering and constructability.

- **60% Model Review**

To review actions from the 30% Model Review, and aims to review at a minimum the detailed plant design such as piping systems, underground facilities, cable trays, platforms and ladders, instrumentation, control panels, packaged equipment, etc.

The result of this review is recommendations for the final design of the plant and that the 3D model represents the completed design.

- **90% Model Review – Final 3D CAD Model Review**

- The Final Model Review is aimed at reviewing the actions from the 60% review to confirm and finalize a detailed plant design.

- **100% Model Review – Confirmation Review**

The confirmation review shall be performed to review the actions from the 90% review and to confirm that Client's comments are properly reflected in the final design.

2.1.8 Operating & Maintenance Manuals

The Contractor shall supply operating and maintenance manuals for all fire protection installations. This should include a list of critical spares and an inspection and test plan.

2.1.9 Quality

2.1.9.1 Quality Management System

Refer to Quality specification [54].

The Contractor shall be certified and demonstrate compliance to the latest version of the ISO 9001 Quality Management Systems standard. The Contractor shall implement the requirements of the latest revision of the Medupi Quality Specification, and have the following documented information as a minimum:

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- Quality Policy
- Project Quality Plan
- Operational procedures and work instructions (e.g. inspection and test plans, method statements, control of nonconformity, corrective action, risk management, etc.).

2.1.9.2 Inspection

Inspection activities during manufacturing shall be managed according to the Medupi Manufacturing Inspection and Testing Procedure [52].

Inspection activities during construction shall be managed according to the Medupi Site Quality Assurance Control and Verification Procedure [53].

The Contractor shall be required to maintain inspection databases where all records of inspection are maintained as required in the Medupi Quality Specification [54].

2.1.9.3 Data Books

The Contractor shall develop and implement a system for collation or quality verification records, including change management records, into Manufacturing, Construction and Commissioning Record Books (Data Books) as specified in the Medupi Quality Specification.

Data Books shall be maintained by the Contractor to substantiate conformance to product specifications and requirements. All records shall be safely stored (easily retrievable) following the final completion of the works at Takeover. The contractor shall not compile the electronic version of the data book into one PDF. The records included in data books shall be in stand-alone PDFs in line with the Data book index\table of content.

Contractor shall develop, document via procedure for Engineer approval and thereafter implement a system for collation or quality verification records, including change management records into Manufacturing, Construction and Commissioning Record Books.

Contractor shall review data book progressively during 30%, 70% and 100% of the completed work and provide valid comments in the form of comment sheet per each stage of review to the Employer prior Employer's review.

No data book shall be reviewed by the Employer without Contractor's reviewed evidence and comment sheet Indicating first review second review with addressed comments and final review.

The Contractor shall develop Data book Register and maintain for the duration of the project.

Said Procedure shall define format, content and structure of Record books and process of compilation and handover and shall, as a minimum, conform to the following:

Record Books shall be provided by the Contractor for;

- a) Manufacturing - Prepared for each individual "Purchase Order refer to 240-109836134 clause 3, Scope of work and employer requirements". Only manufacturing records per discipline e.g. Civil, structural steel, Mechanical, Electrical, C&I works etc.
- b) Construction/Erection - Prepared for Each Discipline as in bullet 1 , each geographical area for civil works and for systems/sub- systems for mechanical and electrical systems including C&I separately
- c) Commissioning - prepared for each commissioned system.

Note: Record books shall be not combined on Data Dossier. Manufacturing, Construction/Erection and Commissioning shall be separated.

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- d) The Contractor need not include documents and drawings etc. that have been approved by Engineer which are included in SPF and shall instead provide and include an index of such documents in the Record Books on the basis that the originals are in SPF and traceable via the "Index".
- e) Record Book shall be written in English or provided with an English translation
- f) The index of all Record Books shall be submitted to Engineer for approval.
- g) As the work progresses, Contractor shall compile Record Books progressively with the original material, installation, erection, testing, inspection and change management documents and shall verify continued and accurate updating via weekly review and spot checking against inspection performed that week.
- h) Contractor shall report the status of Record Book compilation progress at Weekly Progress / Quality Meetings together with the Data book Register.
- i) Record Books shall be endorsed by stamp, date and signature of the Contractor and the Engineer signifying completion and accuracy when complete.
- j) Each Record Book shall have cover sheet (With a Sleeve pocket to insert a cover sheet) of A4 size paper and a spine label on which is printed the following:
 - I. Title of Document
 - II. Contractor's company logo
 - III. Unique number/SPO
 - IV. Name of Project
 - V. Contractors' Job Code
 - VI. Contractor Document number
 - VII. Eskom Document Number
 - VIII. Unit Number
 - IX. System number
 - X. KKS code(s) {in line with the contents of the dossier}
 - XI. System Description
 - XII. Document type "Manufacturing or Construction or commissioning"
 - XIII. Contractor's number
 - XIV. Name of Contractor
 - XV. Volume Numbering (1 ofor 1/10)
 - XVI. Address of Contractor
 - XVII. Column for signature by Contractor Representative and Engineer's representatives.
- k) All manufacturing Record books shall be completed Approved and handed over to Eskom not later than 21 days after delivery Prior Installation/ construction phase
- l) All Construction Record books shall be Completed, Approved Safety Clearance and handed over to Eskom Prior Commissioning Phase
- m) All Commissioning Record books shall be Completed, Approved and handed over prior taking over of completed works (TOC)

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- n) Construction Record Book shall be compiled in A4 size with 4-post binders in loose-leaf form with numbered pages such as, Page 1 of 10 or 1/10 whichever sequential counting method that clearly identifies page numbering.
- o) Summary table of each volume's contents shall appear in all volumes. Volumes are to be numbered e.g. 1 of 3, 2 of 3, 3 of 3 etc both on spine and front cover.
- p) The binders are to be robust and not subject to distortion by impact during shipping. The binders shall not be over filled and contain only a suitable number of documents to enable convenient handling.
- q) Contents shall be sectionalized and separated by properly labelled dividers
- r) Contents shall be placed in the relevant sections and sections shall be separated by properly labelled section dividers / separator sheets easy referencing with going through the content.
- s) All section dividers / separator sheets shall be made of card and shall bear the Section Identifier - 1, 2, etc.
- t) The contents of each section, e.g. Section 1, Section 2, etc., of the Record Book shall be placed directly behind the relevant section dividers / separator sheets and each document shall be clearly marked with the following:
 - I. Relevant section letter
 - II. Page number - every document shall receive a page number.
 - III. In each section the page numbers shall run consecutively.
- u) Record Books shall contain as a minimum
 - I. Quality Management documentation as specified in the Medupi Quality Specification.
 - II. All material Reports and Certificates
 - III. All Inspection Reports
 - IV. All Test Reports
 - V. All Release Notes
 - VI. All Change Management Reports
 - VII. All drawings or an index of drawings identifying drawing No. and revision status
 - VIII. All Defect Reports
 - IX. All Procedures or an Index of Procedures
 - X. All Inspection and Test Plans if used as a Quality Verification Record or an Index of Inspection and Test Plans if used as an assurance and control document
 - XI. All Drawings or an Index of Drawings
 - XII. Safety clearances (to be granted prior commissioning)
 - XIII. Construction, layout and component approvals
 - XIV. Routine test certificates
 - XV. Approved for Construction Drawings and as-built drawings FAT, SAT and SIT Reports
 - XVI. Statutory certification

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- v) Contractor shall submit the following registers to the discipline Quality manager on the weekly basis:
- I. Data book register
 - II. ITP register Method statement Drawing register AFI register
 - III. MDL Equipment list register NCR register
 - IV. TOC register VO register
 - V. Statutory equipment register PE certificate register
 - VI. COC register
 - VII. Contractor shall compile a separate statutory file for all statutory equipment's including HAZLOC files

The Contractor shall compile databooks for all new passive fire protection installations.

2.1.9.4 Storage and Preservation

The Contractor shall implement storage and preservation requirements in accordance with the Storage and Preservation Procedure [51].

The contractor shall provide a storage and preservation procedure as per OEM for all equipment supplied.

2.1.10 CBMS Interface

Each of the sprinkler and deluge systems that form part of this scope of work shall have a CBMS interface. The contractor shall be responsible for the installation of the flow/pressure switches.

The connection to the CBMS system will be done by others. The following interfacing information shall be provided by the Contractor:

- Pressure/Flow switch (pressure switch is required for deluge valves & flow switch required for alarm valves)
- KKS coding including tag, etc.
- P & I Drawing indicating the location of the pressure/flow switch.

2.1.11 Configuration Management

2.1.11.1 Configuration Management Plan

The Contractor shall prepare a configuration management (CM) plan utilizing ISO 10007 as a reference guide for the scope of work. The CM plan shall include the following:

The process of managing documentation for the project works will be supported by the following:

- A complete and comprehensive description of the Contractor's document numbering conventions and revision schema;
- A description of the electronic data management system(s) that the Contractor will use for the management of documents and/or configuration items;
- A description of the configuration management activities which will be undertaken by the Contractor as well as a rough time-scale thereof;
- A description of the baselines that will be established and the content of these baselines;

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- The release procedure for product configuration information;
- The procedure for the control of changes prior to the establishment of baselines as well as after;
- The method for processing changes, emanating both internally and from sub-suppliers;
- The method for collecting, recording, processing and maintaining the data necessary for producing configuration status accounting records;
- The definition of the content and format for all configuration status accounting reports;
- A list of audits which will be conducted to ensure adherence to the CM plan.

2.1.11.2 Plant Designation

2.1.11.2.1 Plant Designation System

The Contractor shall apply the Kraftwerk-Kennzeichensystem (KKS) codification system to uniquely identify the systems, sub-systems and components constituting the Plant.

The Contractor shall apply the following guidelines and standards when codifying plant:

- The application of KKS plant coding [29]
- KKS Key Part-Fossil Power Station [28]
- Medupi Power Station Project - List of Abbreviations [39]
- Issuing of KKS certificates [40]
- VGB-B 106 E Part A-KKS Application Commentaries Part A_General
- VGB-B 106 E Part B1-KKS Application Commentaries Part B1_Mechanical Engineering
- VGB-B 106 E Part B2-KKS Application Commentaries Part B2_Civil Engineering
- VGB-B 106E Part B3-KKS Application Commentaries Part B3_Electrical and C&I Engineering.
- VGB-B 106E Part B4-KKS Application Commentaries Part B4 Identification of C&I and Control Tasks.

The Contractor shall identify all plant indicated or referenced by documentation by the plant's unique KKS codes within the documentation itself.

The Contractor shall ensure that the codification assigned to plant is consistently maintained throughout the design cycle, e.g. the KKS codes indicated in the O&M manuals are consistent with the KKS codes indicated in the original process and instrumentation diagram.

The Employer shall supply the Contractor with a system-level plant breakdown structure (PBS) of the existing plant at the Site, as well as a preliminary system-level plant breakdown structure of the plant within the Contractor's scope at contract initiation. The Contractor shall review the PBS to ensure alignment with the Contractor's design philosophy, and shall expand the PBS to the complete system level (Fn level of the KKS hierarchy). The Contractor shall provide a complete system-level PBS with the submission of the process flow diagrams [43] of the plant within the Contractor's scope.

KKS coding identification system shall be allocated according to their function, type, location in relation to the KKS Key Parts definitions and the VGB guideline. As a minimum, all plants shall be coded as follows:

- According to process functions: All plant shall be coded to KKS Breakdown Level 3.
- According to points of installations: Electrical and Instrumentation devices installation units (e.g. cabinets, panels, consoles) shall be coded to KKS Breakdown Level 3.

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- Location codes: Plant structures shall be coded to KKS Breakdown Level 2.
- Cables coding: Cables shall be coded with either source or destination equipment KKS code followed by sequential four-digit number and optional four alpha numeric characters.

The Contractor shall codify all equipment, and any components which are required to be codified as per the guidelines and standards referenced in this document. The Contractor shall indicate equipment and component codification in drawings and documents indicating or referencing such plant.

The Contractor shall submit all KKS codes designated by the Contractor in an Equipment List format with equipment descriptions, with the documents in which they were originally designated, to the Employer for review. Any description abbreviations shall be done according to the List of Abbreviations [39]. The Contractor will remain responsible for ensuring that the codes designated are unique, not duplicated and meet the requirements established by the various standards applicable to the project. Where any ambiguities or doubts with regards to KKS codification exist, the Contractor will engage the Employer for resolution.

2.1.11.2.2 Plant Labelling

The Contractor shall manufacture and install labels according to the Medupi KKS Coding and Labelling specification [37].

Any abbreviations to plant descriptions shall be prepared in accordance to the Employer's abbreviation standard [39].

Detailed name plate or label lists with the service legends and including the KKS Code shall be prepared by the Contractor and submitted to the Employer for review and comment before commencing the manufacture of the labels. On plant areas where labels do not make ergonomically sense please consult site configuration management for guidance.

2.1.11.2.3 Plant Designation within Documentation

The Contractor shall prepare a list of KKS designations allocated to components for each scope of delivery or system (this list will be referred to as equipment list in the rest of this document for simplicity's sake, but includes documents such as cable schedules, valve schedules, etc.). The equipment list shall be submitted with the original implementation documentation describing the design of the system (e.g. process and instrumentation diagram, single line diagram, etc.). The Contractor shall ensure that the equipment list accurately represents the implementation documentation which it accompanies. The content of the lists will be agreed to per discipline with the Employer. As a minimum, the equipment list shall include:

- The KKS designation of all components within the relevant scope of work or system.
- The full verbal description of each component, compiled according to the standards referenced in this document.
- The abbreviated description of the each component, utilising abbreviations as listed in the referenced project abbreviation list, and abbreviated to a number of characters as required by the project digital control system (DCS) and as per the label requirements in [37].
- The approval status of each component, in alignment with the list of approval statuses specified for document.

Table 1: Configuration Management Codes and Standards

Code	Description
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240-58552870	Smart Plant for Owner Operators (SPO) Documentation Metadata Standard
200-3340 240-93576498 200-5343 200-94660	Standard: KKS Coding and Labelling KKS Coding Standard Medupi Power Station Project-List of Abbreviations Issuing of KKS Certificate Work Instruction
240-53114186	Project/Plant Specific Technical Document and Records Management Procedure
VGB-S-811-01-2018-01-EN	VGB Standard KKS Identification System for Power Stations

2.1.11.3 Design review and baseline management

The Employer's procedure for design review and baseline management is defined in the Design Review Procedure [12]. The Contractor shall support this process and align the Vendor document submission schedule to suite the end of phase design review baseline schedule agreed with the Employer. The Contractor shall submit all documentation requested by the Employer to enable approval of the end of phase design reviews and release to the next phase of project execution.

2.1.11.4 Engineering Change Management

All design change management shall be performed in accordance to the latest revision of the Eskom Project Change Management Procedure [44] and the Employer shall ensure that Contractor is provided with latest revisions of this procedure. Any uncertainty regarding this procedure shall be clarified with the Employer and clarification updates should be reflected in updated versions of this procedure.

The Contractor shall address any outstanding Eskom comments on the design documentation as relevant to this scope of work that has not been previously addressed. The Contractor shall also be responsible to address any new comments as per the Design Review Procedure [12].

2.2 DETAILED REQUIREMENTS

This section details the fire protection systems that are included in this scope of work. Both the design requirements for areas where there are currently no designs as well as the existing installation and design information is shown.

3. CONCLUSION

This scope of work was developed to ensure the installation of the Kitchen hood fire suppression system for the Canteen Building at Medupi Power Station in terms of documentation, design, construction, commissioning and certification.

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4. AUTHORISATION

Name & Surname	Designation
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Waleed Moses	Arrangement Design LDE
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5. REVISIONS

Date	Rev.	Compiler	Remarks
October 2022	0	PV Mugwambane	Draft version

6. DEVELOPMENT TEAM

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

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7. ACKNOWLEDGEMENTS

- Hendrick Mathebula – LPS Project Engineer
- Nic du Toit – Fire Chief (Medupi power Station)

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