Esko	**Specification**	**Medupi Power Station Project**

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Content

1. Introduction

This Specification shall be read with reference to the Eskom Corporate Sustainability Supplier Quality Management: Specification 240-105658000, Alternative Reference Number: QM 58.

When read for Medupi Project, this Specification 200-1689 takes precedence over QM 58 where there is apparent conflict. This Specification outlines details of the quality assurance system that shall be deployed by the Contractor as required in FIDIC sub-clause 4.9 [Quality Assurance]/NEC applicable clause.

The Contractor's goal is to satisfy the Employer's contractual, technical integrity and quality management requirements in the design, manufacture and installation/construction, commissioning and start-up of Medupi Project at Lephalale in the Limpopo Province of South Africa.

Supporting this goal are a number of Project objectives to be achieved by Contractor including the following:

a) Satisfy safety and environmental requirements
b) Satisfy performance requirements
c) Satisfy technical integrity requirements
d) Satisfy maintainability and inter-changeability requirements
e) Achieve high reliability / operability
f) Achieve low lifecycle cost
g) Achieve overall Project schedule
h) Achieve low investment cost
i) Achieve good constructability
j) Achieve a high degree of automation / minimise manning levels
k) Achieve a high degree of commonality of components within Plant
l) Satisfy quality management system requirements

The Contractor shall ensure that quality; integrity, reliability, maintainability and interchange ability are built into every stage of the Works through design, manufacture, supply, installation, commissioning, operations, maintenance and service.

2. Supporting Clauses

2.1 Scope

The Contractor Quality Specification defines Employer's quality requirements that must be adhered to by all who are doing work for Group Capital Medupi Power Station Project.

2.1.1 Purpose

The intended purpose of this Specification is to ensure that the Contractor provides the Employer with the assurance that the Works and any associated or corollary obligations are designed, executed, completed or discharged as the case may be, in a manner so as to achieve the required Medupi quality.

To that end the basic principles that the Employer requires to be adhered to with respect to the management of quality are as follows.

a) Quality management shall ensure that the Employer's requirements as specified in the Contract are met in full, and verified as such to Employer satisfaction.

b) The Employer's requirements include compliance in full with the current revision of all relevant Eskom specifications contained in the Project User Requirements Specification (URS) and applicable procedures whether referred to in the Contract or not, to the extent that such documents are changed after the Base Date the consequences thereof shall be addressed through FIDIC Conditions of Contract Sub-Clause 13.7 [Adjustments for Changes in Legislation].

c) Where such procedures are written with reference to a form of Contract other than FIDIC then the procedure shall be read in accordance with the relevant terminology used in FIDIC.

d) Quality management shall be in accordance with ISO 9001:2015 and related ISO 9000 series of Standards, and is to provide full documentary and objective evidence that the Works have been designed, manufactured, executed, completed and maintained in accordance with the Contract.

e) The quality management system shall apply to the Contractor and all persons real or juristic working for or on behalf of the Contractor on or in connection with the Works and regardless of the form of employment contract.

f) Every process, task, or activity of whatever nature or description performed by the Contractor or on behalf of the Contractor or direction that affects or influences the meeting of the Employer’s requirements, including the risks associated therewith, shall be subject to a systematic documented approach that ensures that what the Contractor provides complies with the requirements of the Contract.

g) Quality management shall ensure that the Quality Control Plans, Inspection and Test Plans and procedures/instructions/method statements/ECNs/FCNs developed or adopted provide stages at which the Employer may witness what is being done or require what is being done to be subject to inspection before the execution continues.

h) The quality management system shall be:

- based on systems and procedures proven to be effective on projects of a similar nature, size and complexity and must be specifically designed or adapted to deal with the nature of the Works, and
- conceived, developed and deployed as an integrated whole.

2.1.2 Applicability

This document shall apply to all Contractors/ suppliers/sub-contractor doing work for the Medupi Power

Station Project and shall form part of all Medupi Power Station Project request for information (RFI)/ request for quotation (RFQ)/ request for proposal (RFP), including contracts for the procurement of products and services.

2.1.3 Integrity Management and Assurance

Integrity assurance and quality assurance shall be effected by the Contractor via:

a) implementation of a quality management system, with processes and procedures compliant with the ISO 9001:2015 QMS Standard

b) application and implementation of Quality Assurance, Configuration Management, Quality Control and Inspection.

c) classification of document deliverables and determination of review and verification levels

d) qualification of personnel.

e) development of a criticality rating system and criticality rating of equipment, materials and processes to define manufacturing, construction/installation and commissioning inspection levels.

f) supplier assessment

g) quality system audits, product audits and technical audits – internal, external and by Third Party

h) supplier and site inspection and testing

i) management review

j) defect management

k) measurement, analysis and continual improvement.

l) customer feedback

The Employer shall have the right to whatever access is needed to inspect and audit all quality system and technical documents and work faces at any time during normal working hours.

In relation to FIDIC Sub-Clause 7.3 [Inspection] and 7.4 [Testing] (or NEC Clause 4, sub-clause 40, inspection & testing) this shall include the Employer's access to facilities and places On Site, or Off Site, and the provision of such documents and procedures as are necessary for the effective review of the quality management system concerned, both before and during the Employer's visits.

The Employer's auditing may include monitoring the Contractor's adherence to the quality management system documentation and the ISO standards by review, surveillance, inspection and by quality system audits of the Contractor's activities and those of his Subcontractors, sub-consultants or suppliers. The Engineer monitoring of the Contractor's performance may further include reviews of the Contractor's documentation and records of achieved quality, and random sampling.

Access for audit by the Employer shall be provided by the Contractor within ten (10) days of receipt of Audit Notification

2.1.4 Effective date

The Authorisation Date in the Signature Page.

2.2 Normative/Informative References

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

2.2.1 Normative

ISO 9001:2015 and ISO 9000:2015, including all the documents referenced in their bibliographies shall apply, including the latest editions of the following:

[1] Act 85 of 1993 Occupational Health and Safety Act and Regulations.

[2] NEC and FIDIC family of contract documents, as applicable to the contract.

[3] Mines Health and Safety Act and associated Regulations

[4] ISO 10005 Guidelines for Quality Plans

[5] 200-15327 Control of Nonconforming Product Work Instruction

[6] 200-46362 Site Quality Assurance and Control Work Instruction

[7] 200-154209 Site Quality Control and Verification Level 2 Target Inspection Work Instruction

[8] 200-1682 Quality Management System Audits Work Instruction

[9] 200-45965 Manufacturing Inspection and Testing Work Instruction

[10] 200-129834 Storage and Preservation Work Instruction

[11] 200-1684 Corrective Action Request Work Instruction

[12] 348-883860 Medupi Power Station Documentation Format and Layout Specification

[13] 200-90604 Quality Clearing House Terms of Reference

2.2.2 Informative

[14] 240-105658000 QM58 Supplier Quality Management Specification

[15] 200-1682 Quality Management System Audits Work Instruction

[16] 200-45965 Manufacturing Inspection and Testing Work Instruction

[17] 200-129834 Storage and Preservation Work Instruction

[18] 200-1684 Corrective action Request Work Instruction

2.3 Definitions

The terminology used in this document is generally consistent with that defined in ISO 9000:2015 Quality Management Systems – Fundamentals and Vocabulary. However, specific guidance and interpretation is as follows:

Term	Definition
Quality	degree to which a set of inherent characteristics of an object fulfils requirements.
Requirement	need or expectation that is stated, generally implied or obligatory.
Quality management	coordinated activities to direct and control an organization with regard to quality.
Quality objective	result to be achieved related to quality
Quality Assurance	the part of quality management focused on providing confidence that quality requirements will be fulfilled.
Quality Control	the part of quality management focused on fulfilling quality requirements.
QMS	With regard to quality, the set of interrelated or interfacing elements of an organisation to establish policies objectives and processes to achieve those objectives.
Inspection	activity to find out one or more characteristics and their characteristic values of conformity to specified requirements
Verification	confirmation, through the provision of objective evidence that specified requirements
Certification	the issue of a statement of conformity assessment, i.e. it is the output of verification.
Supplier	subcontractors, sub-consultants or any person real or juristic that supplies, fabricates, manufactures or otherwise contributes materials, plant or services to the Contractor for fulfilling the Contract.
Procedure	a generic term to cover any document that provides work instructions for carrying out part, or all, of an activity or process.
Project Quality Plan	the document setting out the specific quality practices, procedures, resources and sequence of activities for the management of quality relevant to the project

	compiled in line with ISO 10005:2005 for conformity with ISO 9001:2015.
Quality Assurance Plan	the document setting out essential and compulsory quality assurance processes for a specific project phase that provide an assurance of quality and defines the specific quality processes, interfaces and coordination requirements of that phase.
Project Quality Control Plans	The document setting out essential and compulsory quality control processes for a specific project discipline that identifies the controls for quality, their sequence, interaction interfaces and coordination for a project discipline.
Inspection and Test Plan (ITP)	a tabulated activity specific document that plans the assurance, control and verification of quality during fabrication, installation, commissioning and testing that shall be compiled by Contractor, and approved by the Employer, for each unique activity, whether temporary or permanent works prior to activity commencement.
Quality Verification Record	a document detailing results achieved and / or providing evidence of activities performed
Quality Risk and Criticality Rating System	a system to define and document criticality of an item or process determined by assessing the potential likelihood of failure and the consequences of such failure and is used to assist determine appropriate inspection levels in the build process.
Inspection Level	a comparative indication of the intensity of the inspection program; • Inspection Level 1 - Full Stage Inspection: Inspection is carried out progressively from commencement of manufacturing to final acceptance. • Inspection Level 2 - Systematic Stage Inspection: Inspection is carried out at predefined stages, with specific hold and witness points. • Inspection Level 3 - Final Inspection: Inspection is carried out on the completed item section of the works. • Inspection Level 4 - Document Inspection: Inspection is carried out by review of Quality Verification Records (data packs or data books).
Audit Plan	a documented planned/schedule of audits to be undertaken during the design engineering, procurement, construction and commissioning phases of the works
Inspection Intervention	As documented in an ITP, an activity by either conducting an actual inspection (A), witnessing an inspection (W) or reviewing deliverables (R). • Actual Inspection (A) - as set out in an ITP means actual inspection or test. In such instances Engineer shall be notified in writing via a Contractor issued Inspection & Test Notification. • Witness Inspection (W) - as set out in an ITP means witness of inspection or test. In such instances Engineer shall be notified in writing via a Contractor issued Inspection & Test Notification. • Review (R) - as set out in an ITP means documents relevant to the process, inspection or test activity shall be reviewed. In such instances Engineer shall be notified in writing via a Contractor issued Inspection & Test Notification. Hold (H) - as set out in an ITP means that a hold shall be applied to the production schedule until that the process, inspection or test activity requiring actual or witness inspection is carried out and the quality documentation has been checked by the Employer's personnel and found to be complete. In such instances

	Engineer shall be notified in writing via a Contractor issued Inspection & Test Notification - Hold (H) will by default be suffixed with either “A”, “W”, ” or “R”
Inspection Schedule	a document to be issued by Contractor (in a format to be approved by Employer) on a monthly basis (one week before the end of the month for the preceding month) identifying the inspections and tests, as defined in Inspection and Test Plans, to be performed by Contractor and Employer at manufacturers premises and site.
Inspection & Test Notification	a documented request issued by Contractor to the Employer identifying the planned occurrence of an inspection or test during manufacturing and installation/construction and commissioning identified in an Inspection and Test Plan as requiring Employer attendance.
Performance Improvement Program	a program that plans for the measurement, analysis and trending of quality metrics against defined quality performance standards and targets with the aim of determining and facilitating continuous quality improvement.
Performance Metric (PM)	a measure of system or product quality performance.
Performance Standard (PS)	a set performance standard level for a Performance Metric against which actual performance will be compared.
Performance Target (PT)	a set performance target level for a Performance Metric against which actual performance will be compared - the target will be more stringent than the standard with the aim of improving upon the standard.
Site Work Approval System	the system implemented by Contractor that ensures any new work activities commence only after it has been verified that access, approvals, personnel, materials, equipment and documentation, etc. are in place to ensure it commences in a manner consistent with SHEQ and specifications requirements.
Learning from Incidents	a review of data to ensure that the potential for defective product or nonconforming processes, services and product, are analysed and mitigated to prevent their re-occurrence during the project lifecycle.
Continuous Improvement	Periodical verification of the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.
Defect	a product related non-fulfilment of a requirement related to an intended or specified use.
Nonconformity	a system or process non-fulfilment of a requirement related to an intended or specified use.
Repair	the process of correcting a defect subject to Employer acceptance pf the method and verification of the corrected works.
Product	Output of the Works, including as the context requires, all materials, plant or goods incorporated or contained therein and all services performed in relation thereto.
PVP	a Product Verification Plan, a document produced by AIA to define precisely the extent and type of inspection and testing during manufacture and erection of statuary operating plant equipment and components by Contractor and AIA.

2.4 Abbreviations

Abbreviation	Explanation
AIA	Authorised Inspection Agency
ECN	Engineering Change Note
FCN	Field Change Note
TPIA	Third Party Inspection Agency

2.5 Roles and Responsibilities

The Quality roles and responsibilities of the Contractor and the Employer Team are as specified in the applicable FIDIC, or such other applicable, form of contract.

For FIDIC the QA roles and responsibilities are summarised in the 348-916764 Quality Assurance Process Flow Map, in conformity with Sub-Clause 4.9 of the FIDIC Conditions of Contract for Construction for the Medupi Power Station Project. The Process Map ultimately outlines the sequence and interactions of the

Contractor's QMS deliverables with the Engineer and Employer's monitoring and measurement activities.

2.6 Related/Supporting Documents

The following appendices provide guidance for the Contractor on documenting the Quality deliverables specified in this Specification:

[1] Appendix 01 – Criticality Assessment

[2] Appendix 02 – Criticality Assessment Scoring Criteria

[3] Appendix 03 – Criticality Assessment Rating Register

[4] Appendix 04 – Inspection and Test Plan

[5] Appendix 05 – Inspection and Test Notification (Manufacturing)

[6] Appendix 06 – Inspection and Test Notification (Construction / Installation)

[7] Appendix 07 – Application for Final Inspection

[8] Appendix 08 – QA Process Flow Map

[9] Appendix 09 – Document Classification List

3. Document Content

3.1 Quality Management System and its Processes

The Contractor shall address the requirements of ISO 9001:2015 Section 4 in its entirety as illustrated in below:

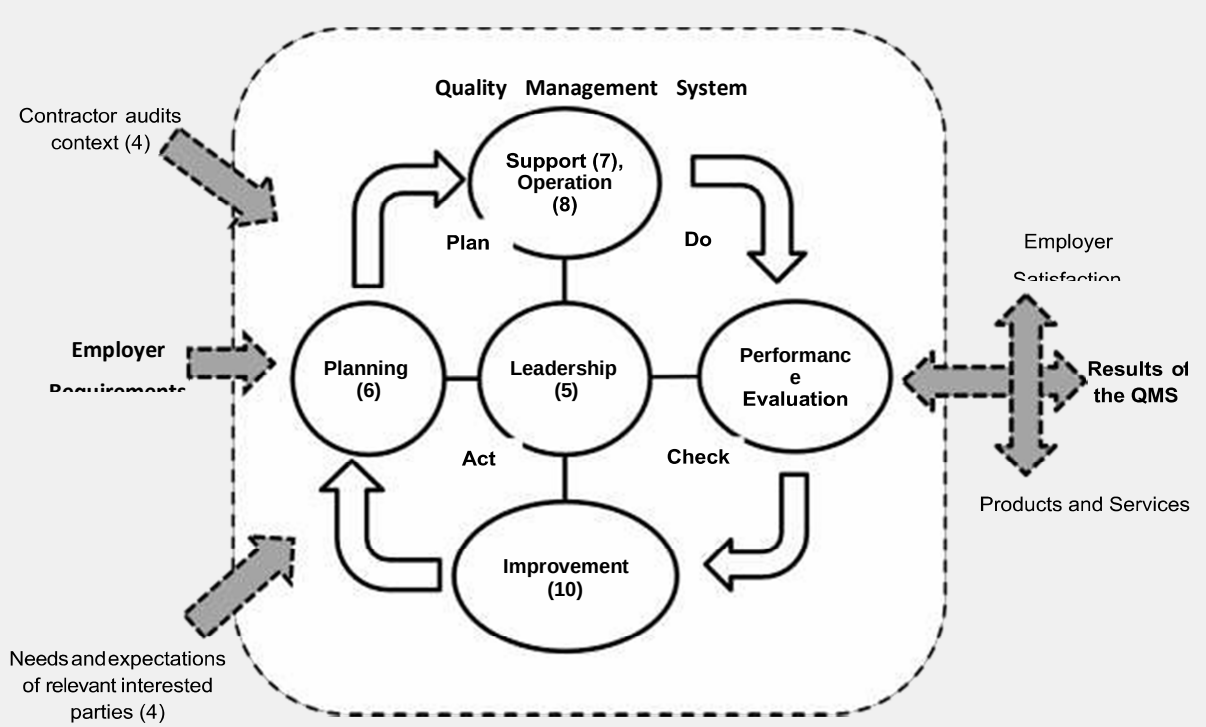

Figure 1

The Contractor shall identify, develop, document for the Engineer approval and thereafter implement those management systems needed to direct and control the work and the Contractor's organization in an effective manner. In doing so the Contractor shall adhere to the principles expounded in the standards and guidelines listed under Item 5 of this section of the Employers Policies and Procedures.

The Contractor shall develop, document and implement a formal quality management system that conforms to the latest ISO 9001 standard or any applicable standard of quality management system (latest applicable revision) in for all phases of the Work relevant to the Medupi Power Station Project. The QMS shall be:

a) Project specific

b) Conformant and compliant to ISO 9001:2015

c) Inclusive of the project specific requirements defined in this section of Employers Policies and Procedures.

d) Summarized in a Project Quality Management Plan, and further detailed in Project Quality Assurance Plans, Quality Management Procedures and Process Control documents such as Inspection and Test Plans, Method Statements, Work Procedures and Work Instructions.

The Contractor's quality management system shall identify the processes, plans and procedures needed to realise the project and shall:

a) Define the sequence and interaction of the processes and procedures.

b) Define the criteria and methods needed to ensure the operation and control of the processes and procedures are effective and integrate all these requirements to facilitate a smooth and defect free project implementation.

c) Ensure the continued availability of resources and information necessary to support the operation and monitoring of these processes and procedures

d) Integrate all these requirements to facilitate a smooth and defect free project implementation.

Where the Contractor chooses to outsource any process that affects product conformity, the Contractor shall ensure control over such processes. Control of such outsourced processes shall be identified within the QMS Plans and Procedures.

The Contractor shall provide evidence of the project QMS conformance to contract requirements and ISO 9001:2015 implementation conformance via an independent audit by an ISO 9001 Certification Body (to be approved by the Engineer) during both design and installation / construction phases. The required audits shall be completed prior to fifty percent (50%) completion of each specified phase and the subsequent Audit Report shall be issued to the Engineer.

The Contractor shall inform Eskom of any proposed changes to the quality management system or staff that will affect the quality system prior to implementation of these changes.

3.2 Leadership

3.2.1 Leadership and Commitment

The Contractor shall address the requirements of ISO 9001:2015 Section 5 and 6 in its entirety.

The Contractor's top management consisting, as a minimum, of the Contractor's Project Representative and Quality Manager shall commit to, and ensure implementation of, the effective promulgation and dissemination of the Contractor's quality policy and quality objectives. The Contractor shall ensure provision of quality management system orientation and induction sessions for all Contractors' personnel mobilised to the Project, relative to:

a) the awareness and familiarization of the quality strategy, quality policy and quality objectives
b) operation of the Quality Management System (QMS)
c) applicable codes, standards, statutory requirements and project specifications
d) internal communication
e) the Employer / the Engineer requirements and interfaces

3.2.2 Customer Focus

The Contractor's top management, consisting as a minimum of the Contractor's Project Representative and Quality Manager, shall:

a) Identify, document and obtain the Engineer approval of Key Performance Metrics, Performance Standards and Performance Targets against which the metrics shall be measured.
b) Measure, analyse and trend the Metrics.
c) Submit to the Engineer, on a monthly basis recorded metrics and resultant analysis and trends and proposed quality improvement measures.

d) Instigate a process for obtaining, on a regular basis, feedback from the Engineer on the operation and performance of Contractors quality management system and satisfaction of Engineer.

The Contractor shall ensure that all complaints from the Engineer, including but not limited to, “Notice of Defect Reports”, “Corrective Action Requests”, “Audit Findings”, “Inspection Reports” are responded to in a positive manner within Engineer’s Performance Standard of 7 working days and shall make a conscious effort to respond within Engineer’s Performance Target of four (4) working days.

The Contractor shall trend complaints from the Engineer and utilise the outcome to aid determine corrective actions, identify and mitigate/employ the risks/opportunities that affect conformity of the works.

3.2.3 Policy

Contractor’s quality policy and quality objectives shall be established and documented at all relevant functions and levels within the organization to provide a focus to direct and assist Contractor to apply its resources to achieve required results for the duration of the project.

The quality policy shall provide a framework for establishing and reviewing quality objectives.

Contractor top management consisting as a minimum, of Contractor’s Project Representative and Quality Manager shall demonstrate their commitment to the success of the project by addressing the following management principles in the quality policy:

a) Customer Focus

b) Leadership

c) Engagement of people

d) Process approach

e) Improvement

f) Evidence based decision making

g) Relationship management

3.2.4 Organisational roles, responsibilities and authorities

Contractor shall ensure that responsibilities, accountabilities and authorities of all Contractor project personnel are defined and communicated to all those within his organization and the Engineer.

Contractor shall document the aforementioned via Plans, Procedures and RACI diagrams and more specifically Project Job Descriptions.

Project Job Descriptions for all of the Contractor personnel shall be provided to the Engineer.

3.3 Planning

3.3.1 Actions to address risks and opportunities

The Contractor shall address the requirements of ISO 9001:2015 Section 6.1 in its entirety.

3.3.2 Quality Objectives and planning to achieve them

The quality objectives shall be consistent with the quality policy and the commitment to continual improvement, and their achievement shall be measurable to facilitate an effective and efficient review by management and to allow confirmation that Engineer's requirements have been achieved.

Contractor shall initiate a reward and incentive program for individuals and teams who are adjudged to demonstrate added value in optimizing project goals and objectives with regard to quality. This shall interface directly and in conjunction with Contractors Quality Improvement Program

Contractors Quality Policy and Quality Objectives shall be communicated to all Employees upon mobilization to the project as a consequence of their quality management system orientation and induction sessions and a copy of the Contractor's Quality Policy, signed by each employee, shall be retained in their personnel file as a record of top management communication of and employee understanding of the Contractors Project Quality Policy

3.3.3 Management Representative

Contractor's Project Representative shall appoint a member of management as Project Quality Manager who shall report to, and be directly responsible to, the Contractor's Project Representative and who irrespective of other responsibilities, shall have responsibility and authority for managing Contractors QMS that includes:

a) Ensuring that processes, plans and procedures needed for the QMS are established, implemented and maintained and the integrity of the QMS is maintained when changes are implemented.

b) Ensuring that Quality Assurance and Quality Control Depts. are sufficiently manned with competent resources to effectively implement quality requirements.

c) Reporting to top management on the performance of the quality management system and any need for improvement.

d) Ensuring the awareness of customer requirements throughout Contractors organization.

Where Contractor splits the quality function and appoints a Quality Assurance Manager and a Quality Control Manager Contractor shall clearly identify and document their relationship relative to management of the quality management system, their reporting route to Contractor Representative and to Engineer. Should Engineer withdraw his consent to the Quality Manager the Contractor shall promptly nominate a replacement.

3.4 Support

3.4.1 General

The Contractor shall address the requirements of ISO 9001:2015 Section 7 in its entirety.

The Contractor shall ensure, via objective documentary evidence that all project personnel are:

a) Verified as competent relevant to their intended work function.

b) Trained in project quality strategy, policy, objectives and requirements.

c) Employed in adequate number for all required disciplines.

d) Motivated to assure, perform and verify quality activities.

Where services of Independent Inspection Agencies or Regulatory Body are used for the Work, the scope and reporting relationship of subcontracted or hired services shall be clearly defined.

The Contractor shall employ, at all times, qualified and knowledgeable quality assurance, quality control and inspection staff to assure, to control and to verify the quality of manufacturing, construction and commissioning activities. The said staff shall be independent from those responsible for construction and commissioning activities and shall be directed by, and report to, the Site Quality Department Manager.

The Contractor shall ensure that personnel to be assigned to quality control and verification tasks are familiar with the applicable codes and specifications and the process assurance, control and verification

3.4.2 Organisational Chart

The Contractor shall prepare, and submit for the Engineer approval, an overall Medupi Power Station Project Organisation Chart, that includes their Quality resources, depicting names, titles, and the reporting relationships and inter-relationships of all key-personnel.

3.4.3 Competence Assessment

The organization shall:

a) determine the necessary competence of person(s) doing work under its control

b) that affects the performance and effectiveness of the quality management system

c) ensure that these persons are competent on the basis of appropriate education, training, or experience;

d) where applicable, take actions to acquire the necessary competence, and evaluate the effectiveness of the actions taken;

e) retain appropriate documented information as evidence of competence.

NOTE Applicable actions can include, for example, the provision of training to, the mentoring of, or the re- assignment of currently employed persons; or the hiring or contracting of competent persons.

Personnel performing work affecting QMS or product conformity to quality requirements shall be competent on the basis of appropriate education, training, skills and experience.

The Contractor shall collate for all personnel assigned to the Quality Dept. and / or responsible for verifying quality during all phases of the project a “Competency File” consisting of:

- A resume identifying qualifications and all past experience
- A Job Description
- An Interview Questionnaire
- A Competency Assessment Interview Checklist

The Competency File shall be maintained by the Contractor Quality Manager and further supplemented with the Project Orientation, Induction and Training Records as and when appropriate. Said Report shall be made available to Engineer upon request.

For the Contractor’s guidance the following list indicates Engineer’s view regarding personnel who are assigned to the Quality Dept. or responsible for verifying quality and for whom a “Competency File” must be maintained.

- Quality Assurance Manager
- Quality Control Manager
- Quality Assurance and Quality Control Engineers / Coordinators
- Lead Engineers and Discipline Engineers
- Welding Engineers
- Quality Auditors
- Discipline Inspectors – Civil, Painting, Welding, Mechanical, Electrical, Instrumentation, NDE/PWHT etc.
- Material Controllers
- Discipline Supervisors

3.4.4 Infrastructure and environment

The Contractor shall determine, provide and maintain the infrastructure needed to achieve conformity to product requirements. Infrastructure includes, as applicable:

a) buildings, workspace and associated utilities,
b) process equipment (both hardware and software), and
c) supporting services (such as transport or communication).
d) work environment

3.4.5 Document Information

Contractor shall list all documents needed for the effective implementation of the project quality management system (QMS) and shall, as a minimum, prepare, maintain and implement throughout the life cycle of the project, as part of the project quality management system, the following individual project specific documents:

a) Project Quality Policy
b) Project Quality Strategy
c) Project Quality Objectives
d) Project Quality Management Plan.
e) Project Organisation Chart.
f) Project RACI Matrix – may be split by Dept. /Phase/Discipline as required.
g) Job Descriptions including performance requirements and measurements.
h) Equipment and Process Criticality Ratings,
i) Project Quality Assurance Plans – per project phase:
    1. Design
    2. Manufacturing, Inspection and Testing
    3. Construction, Inspection and Testing
    4. Commissioning and Taking-Over
j) Project Quality Control Procedures - per discipline:
    - Civil and Structural works.
    - Mechanical, Piping, Painting and Insulation works.
    - Electrical works.
    - Control and Instrumentation works.
k) Project Quality Control Procedures per individual activity identifying specific inspection and test methods and acceptance criteria.
l) Project Inspection and Test Plans (ITP's) per individual activity that plan and assure quality and define inspection intervention levels.
m) Project Quality Verification Records per individual activity - as referenced in ITP's.
n) Manufacturing, Construction and Commissioning Record Books.

Except where otherwise stated, all documents that constitute the Quality Management System, including proforma Quality Verification Records, shall be complete, in accordance with the Contract, and ready for use and submitted to Engineer not less than 30 days before the work governed by the documents is planned to start.

The Contractor`s shall develop, document for the Engineer approval a “Master Document List”. Each document on the Master Document List shall have the following marked against it:

- The planned and actual date of submittal to the Engineer
- The classification of documents (for approval, for review, or for reference) based upon the classification guidelines as follows and further defined in Appendix 01 of this document.
    - **Class 1** - for the Engineer’s approval - where the Contractor may not proceed with the Works that are the subject of the document until it has been approved by the Engineer.
    - **Class 2** - for the Engineer’s Review - where the Contractor may proceed with the works that are the subject of the document if the Engineer has made no comment after twelve (12) working days from the receipt by the Engineer
    - **Class 3** - for the Engineer’s Reference - where the Engineer reserves the right to comment, but the Contractor may proceed with the works that are the subject of the document.

Where there is an ambiguity within Appendix 01 or where a document is produced that is not referenced therein clarification as to classification shall be sought from the Engineer.

Said Master Document List shall be submitted to the Engineer electronically via email in native file format on a monthly basis.

3.4.6 Control of Documented Information

Documents when communicated between parties shall preferably be via an Electronic Data Management System (EDMS) with appropriate interface arrangements for both the Engineer and the Contractor interfaces regarding submittal, review and approval.

However, in the absence of an effective EDMS documents, with one exception, shall be communicated under cover of a letter.

The exception is the “Inspection & Test Notification” for both manufacturing activities and for construction / installation and commissioning activities. These shall be issued by the Contractor electronically via email to the Engineer as defined in section 13.0 of this section of document.

The Contractor documents shall be optimised by ensuring that they:

a) Contain a document number and revision.

b) Contains only the information that is needed specific to their objective.

c) Present that information is a readily comprehensible manner.

d) Are contained in a database that facilitates document retrieval.

e) Can, where required, facilitate easily the measurement, analysis and trending of data.

Irrespective of the requirement for the Contractor to develop and maintain a "Master Document List" (MDL) the Contractor's Quality Management system shall include a management approved, stand alone, revision controlled "QMS Index".

Said QMS Index shall identify;

a) The document Title, Number and Revision status.

b) The Contractor / the Engineer review and approval status.

c) Be submitted to the Engineer on a monthly basis in electronic "native copy" format.

The Contractor shall develop, documented via procedure for the Engineer approval and thereafter implement a process to define;

the types of documents applicable to the Contractor's quality management system. The format, structure and content of documents.

The document numbering and revision system.

The controls needed to:

a) approve documents for adequacy prior to issue.

b) review and update as necessary and re-approve documents.

c) ensure that changes and the current revision status of documents are identified.

d) ensure that relevant versions of applicable documents are available at points of use.

e) ensure that documents remain legible and readily identifiable.

f) ensure that documents of external origin are identified and their distribution controlled.

g) prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose

Documents shall be submitted to the Engineer for review / approval, as appropriate, in electronic native file format.

3.4.7 Contractor Quality Management Documentation

3.4.7.1Project Quality Plan

The Contractor shall prepare, in line with the requirements of ISO 10005:2005 and conformant ISO 9001:2015, and formally submit, a Medupi Project-specific Quality Management Plan and for the Engineer's approval.

The intent of the Project Quality Plan is to act as a route map of the Contractor's overall Project Quality Management System and shall include and plan the following information for all phases of the work:

a) Context of the Project

b) Leadership

c) Planning

d) Support

e) Operation including, Mechanical Completion Testing

f) Performance Evaluation

g) Improvement including, Punch List Management

The Project Quality Plan shall consist of two distinct parts:

a) A narrative summarising management and process controls to be executed to assure, manage and verify the work making reference to applicable procedures and personnel responsible per process and activity and include or make reference to quality policy, quality objectives, organisation charts, RACI matrix and quality control plans.

b) A cross reference tabulation of the contractors activities, processes, plans and procedures written against the corresponding paragraphs of the relevant clauses of:

- Quality management system ISO 9001:2015
- Environmental management system ISO 14001
- Occupational health and safety management system specification OHSAS 18001

The Project Quality Plan is considered a dynamic document and shall be subject to internal review every six months accounting for audit management, defect management and learning from Incidents to determine its continued suitability with a view to update as part of the continuous improvement process.

3.4.8 Project Quality Control Procedures

Project Quality Control Procedures shall be developed during the project, each as an adjunct to the overall Project Quality Plan, to focus on and address particular phases and disciplines (QC Procedures) of the Contract in more detail and shall detail the specific quality objectives to be achieved, the resources needed, the accountabilities and responsibilities the control mechanisms, the time constraints that apply, the processes, inspections and tests needed to be performed to provide objective evidence of compliance and the procedures to be used (the what, who, when, where and how) in detail for a project phase and discipline respectively.

All portions of the Works including the services that must be provided have to be included in Quality Control Procedures.

In general, each QC Plan shall include (direct or by detailed reference) but not be limited to the below listed:

a) Quality Objectives

b) Scope of activities.

c) Detailed and specific references to all requirements relevant for the scope of the

plan; organization charts illustrating the parties involved, their roles, main tasks and their sub-division, responsibilities of key personnel, the reporting structure and the quality management arrangements, including quality assurance and quality control supervision.

d) Descriptions of what is to be done, how, by whom, with what and by when.

e) Definition of the interfaces within the team, including interfaces between design, construction, subcontractors (if any) and suppliers.

f) Description of the interrelations with other projects, contracts, processes or activities.

g) A risk analysis identifying, classifying, and quantifying risks and mitigation measures.

h) Direct reference to general and specific safety plans.

i) Definition of what records are produced, when, by whom and how these records are controlled and maintained, and a plan for inspecting and testing what has been done to determine if the objectives have been achieved together with a method of utilizing such information to improve quality.

The intent is to define in detail the minimum essential and compulsory quality processes and activities to be implemented during a project phase or process. It is intended to supplement, enhance and further define the quality control requirements documented via the Project Quality Plan.

3.4.8.1Inspection and Test Plans

Inspection and Test Plans are the activity specific documents that plan the assurance, control and verification of quality during fabrication, installation and testing and shall be compiled by the Contractor for each unique manufacturing, construction/installation and commissioning activity, whether temporary or permanent works, or as required by the Engineer, and shall describe in the following order:

a) Process, inspection and testing activities in chronological order.

b) Process control (Method Statements / Procedures) and quality control procedures.

c) Method Statement

d) Applicable design or contract specification.

e) Inspection intervention requirement.

f) Quality verification records (by document number) used to provide objective evidence that the specified quality characteristic has been achieved.

g) Inspection / defect identification status.

h) Traceability to the works and work commencement / completion date.

i) Contractor verification and Engineer endorsement.

For manufacturing activities, the Contractor may utilise their own, or their Suppliers, standard Inspection and Test Plan format, provided they account for identification of the above requirements and facilitate documenting inspection intervention requirements of Sub Suppliers, Supplier, the Contractor, the Engineer and AIA. Alternatively, the Contractor may utilise the Engineers Inspection and Test Plan format.

For construction, installation and commissioning activities at Site the Contractor shall utilise the Engineers Inspection and Test Plan format included as Appendix 02 to this document or may utilise their own format provided it contains the tabular headings contained in the Engineer Inspection and Test Plan.

Inspection and Test Plans are to be submitted (with Quality Verification Records referenced in and appended) to the Engineer for approval and insertion of the Engineer and AIA inspection requirements and acceptance of proposed Quality Verification Records prior to their implementation.

Submittal dates of Inspection and Test Plans to the Engineer shall be documented in the Contractors Level 4 Manufacturing and Construction Schedules coincident with the activity portrayed but 30 days prior to activity commencement date. Work associated with an Inspection and Test Plan shall not commence until the inspection and Test Plan is approved by the Engineer.

A “Register” of Inspection and Test Plans shall be developed, documented and maintained by the Contractor throughout the lifetime of the project identifying individual:

a) ITP Document Nos.

b) ITP titles.

c) ITP planned and actual submittal status to Engineer.

d) Engineer approval status.

e) ITP revision status.

The said register shall be provided in hardcopy and electronic “native copy” format to the Engineer on a weekly basis.

3.4.9 Quality Verification Records

Where the Contractor’s document management system is hardcopy based, the Contractor shall establish a “Records Office” with a controlled environment to securely store and protect the documents from deterioration

A controlled environment shall incorporate access and security control, air conditioning, humidity control and fire protection and shall be suitable (re, furniture, light and air conditioning levels) to accommodate the Engineers personnel to undertake reviews of the Contractors documents.

Records shall be stored in the Records Office in a filing and archive system subdivided and structured to suit the different types of work and activities of the Contractor.

Records shall be structured and indexed so that they can be readily retrieved for the purpose of demonstrating to the Engineer that the Permanent Works or Goods comply with the Contract.

All paper hard copies shall be scanned and stored on computer disk (CD) with a guaranteed data storage life of not less than five years.

All CDs shall be recopied every four years and before the issue of any associated Taking Over Certificate.

All CD shall be stored at two locations at one of which the storage facilities shall be designed to be secure from theft, fire and flood damage.

Supplier, Subcontractor, sub-consultant or laboratory testing Records shall form part of the records system and aforementioned control requirements, and although there may be a complete set of these records maintained by the testing or originating organisation, the Contractor shall ensure that appropriate records needed for review are:

a) verified as complete and accurate on a continuous on-going basis.

b) promptly submitted to Contractor as work is completed.

c) readily available to the Engineer for review at any time.

Where the Engineer requires that any data be compiled and collated in a particular manner not set out in this document or in the Eskom standards then the Engineer shall be entitled to so instruct under Sub Clause 13.1 [Variations and Adjustments].

3.5 Operation

3.5.1 General

Contractor shall address the requirements of ISO 9001:2015 Section 8.1 & 8.2 in its entirety.

3.5.2 Operational Planning and Control

The primary processes, subsidiary processes, activities, tasks and actions of whatever nature or description that influence or affect the quality or risk of the design, execution, completion or maintenance of the Works shall be competently identified, planned and documented.

These documents shall form the Contractors QMS and shall be submitted for review as the Contractor's documents when so required by the Engineer and shall be addressed in Quality Plans (see section 7.0 of this section of the Employers Policies and Procedures) in such time that the realization of the product can be achieved in an informed and orderly manner.

For effective and practical realization the Contractor shall develop, document via procedure for the Engineer approval and thereafter implement a risk based approach during design, manufacture and installation / construction phases by implementing a "criticality assessment" program in line with Appendix 03 to this document.

Said program shall evaluate the combined effect of the likelihood of failure, and its consequence i.e. financial, safety or environmental risk etc. to the project with the intention of determining level of quality assurance, control and inspection to assist in the identification, management and control of hazards and risk and avoid the application of "blanket" requirements, thus optimising activities so as to make the most effective use of available resources.

All equipment, instruments, piping and civil/structural items and processes on the Medupi project shall be assigned a Criticality Rating. This shall include items of equipment or systems to be procured from suppliers and each separate hardware package to be designed, constructed, installed and tested by the Contractor.

The technique of Criticality Rating shall be applied by systematically considering each of the following criteria for equipment, materials and processes being evaluated:

a) Safety
b) Fluid Characteristics
c) Operational Significance
d) Availability and Accessibility for Repair / Replacement
e) Design Maturity
f) Complexity of Manufacture / Construction / Installation
g) Economics
h) Environmental Impact

and scoring them in line with Appendix 04

Subsequent to determination of criticality levels the Contractor shall document the scores on Contractor's Criticality Rating Record, Appendix 05 and thereafter determine and document corresponding levels for:

a) The level of documentation reviews to be applied to all documents – Contractor and Supplier
   - for approval, for review and comment, for information etc.
   - self, check, higher discipline check, inter-discipline check, independent check etc.
b) The level of material certification to be provided.
   - 3.1c, 3.1b, 2.2, 2.1, Certificate of Conformity etc.
a) The level of traceability to be provided
   - to source material, to fabricated item to installed item etc.
c) The inspection levels to be implemented during manufacturing, installation and construction
   - Hold and Inspect Hold and Witness, Witness, Review, Surveillance etc.
d) The level of meeting interventions to be conducted prior to manufacture and installation
   - Post Award Clarification, Pre Manufacturing, Pre Inspection etc.
e) Necessity for AIA involvement

The Contractor shall communicate quality requirements to Suppliers using their standard Purchase Order system. Each Purchase Order, including initial enquiries, shall identify the conditions to be met as a result of the Criticality Rating process.

As a minimum:

a) Post-award quality clarification meetings shall be held between the Contractor and his nominated Supplier for equipment with a Criticality Rating of I or II. The requirement for post-award quality clarification meetings for suppliers of Criticality III equipment shall be reviewed following bid evaluation. The Engineer's Project Quality Assurance Engineer shall be invited to participate in all post-award meetings.

b) Design Review and Design Verification Plans shall be provided for Criticality I and II Suppliers. The Engineer's Project Quality Assurance Engineer shall be invited to participate in all design reviews.

c) The Contractor / Supplier shall hold pre-production / pre-inspection meetings for all Criticality I and II systems and items of equipment before any physical work commences. Pre-production meetings may be held both at Supplier's works and at the Contractor's fabrication yard and / or site. The Engineer's Project Quality Assurance Engineer shall be invited to attend all Pre- Production Meetings.

d) All Suppliers and Sub-contractor of Criticality I and II equipment and piping shall have a compliance audit performed on them by the Contractor, except where the Contractor can provide documented evidence of recent satisfactory audit or performance.

Furthermore, Suppliers and Sub-contractor of Criticality I and II equipment must have previous audit records or quality verification evidence satisfactory to the Engineer's Project Quality Assurance Engineer before award of the Purchase Order.

Where a Supplier / Sub-Supplier proposes to subcontract more than 25% of any stage of the actual work (i.e. design, procurement, manufacturing or construction stages), the same criteria as above shall be applied, except that the audit shall be a joint exercise with the main Supplier / Sub- Supplier.

The Contractor's Criticality Rating Record shall be provided to Engineer in native file format on a Monthly basis.

Where required by the Engineer the Contractor shall provide "workshop' sessions to the Engineer personnel to clearly and unambiguously identify the Contractor process control and inspection control processes and systems to facilitate the Engineer understanding with the intention of ensuring smooth operation of the same at manufacturers premises and at site during the contract.

3.5.3 Interface Management and Co-ordination

The Contractor shall identify all external interfaces requiring communication and coordination with third parties.

Procedures for dealing with these interfaces and management of the coordination processes shall be established and maintained.

3.5.4 Customer Related Processes

The administrative, liaison and communication requirements of the Engineer shall be incorporated by Contractor into the Contractor's Quality Management Plan and further detailed in a Communication Procedure which shall be submitted to the Engineer for approval.

3.5.5 Permits, Licenses and Statutory Provisions

The Contractor shall establish and maintain procedures and time schedules for his dealings with authorities regarding permits and licences for which he is responsible.

Such procedures shall include a requirement that copies of correspondence, minutes of meetings and other documents relating to the Contractor's permits and licences are to be sent to the Engineer without delay, when so requested.

The Contractor shall establish and maintain procedures for identifying and implementing provisions contained in approvals, permits and licences. These procedures shall describe how the Contractor will ensure that the provisions are adhered to during the design, execution and completion of the Works.

3.5.5.1Hazardous Location (HAZLOC)

All mechanical and Electrical Equipment installed in Hazardous Location shall be HAZLOC compliant.

All Records including Inspection reports and AFI shall be signed by the contractor HAZLOC competent Person.

3.5.6 Plant Codification

The Project shall adopt the KKS coding system, as developed by VGB, for plant structures, systems and components as identified in Section 2 and Section 17 of the Employers Requirements. All designs, testing, commissioning, operation maintenance and training documentation and databases shall be suitably and comprehensively marked, cross referenced and indexed with the allocated KKS codes.

3.5.7 OHSA Certified Equipment, Inspection Authority and Product Verification Plan

The Contractor shall identify to the Engineer their preferred "Authorized Inspection Authority" (AIA) for performance of statutory inspections of certified equipment.

The AIA, operating internally inside of South Africa, or externally outside of South Africa, shall conform to SANS 10227. Where the Contractor intends to utilise the services of a non-South African registered AIA then the Contractor shall be responsible for obtaining the South African Department of Labour (DOL) approval of the AIA prior to use.

The Engineer shall approve the Contractor identified Authorized Inspection Authority prior to their being contracted by the Contractor.

To facilitate AIA activities during the contract the Contractor shall submit:

a) All information and documentation requested by the AIA directly to AIA.

b) Copies of the same information and documents to the Engineer

c) Inspection and Test Notification for manufacturing activities directly to AIA

At medupiinspection@eskom.co.za

d) However, for site activities Inspection and Test Notifications for AIA activities are to be processed via Engineer electronically via email to medupiqaonsite@eskom.co.za and medupiqa@eskom.co.za by 15.00hrs for that nights and the proceeding day's activities and the Engineer shall coordinate all inspection and tests required to be attended by the AIA.

The Authorized Inspection Authority shall, as a consequence of its duties, prepare a Product Verification Plan (PVP) in line with VUP / EN, as appropriate, requirements and shall submit the same to the Engineer for approval.

The approved Authorized Inspection Authority shall verify conformity of the design, manufacture, construction, erection, commissioning, maintenance, or repair and testing of pressure vessels, the pressure systems of boilers and high pressure / temperature pipe work and associated material.

Inspection activities shall meet the requirements of SANS 10227 and shall include, but are not limited to the following:

a) Witness and verification of inspections and tests.

b) Monitoring of the Contractor's quality function.

c) Sample checks against the Contractor's records.

d) Record verification.

and shall meet the requirements of SANS 10227

Said conformity and approval duties shall, where required, be performed in accordance with the provisions of the Occupational Health and Safety Act (OHSA), Act 85 of 1993, Construction Regulations (latest issue), and the contract / design specification.

The Authorized Inspection Authority is responsible for issuing the Final Certificate of Inspection and Tests as prescribed.

The Contractor shall be responsible for demonstrating proof of compliance to the AIA produced and Engineer approved PVP via compilation and thereafter submittal of appropriate Quality Verification Records in a PVP Record Book compliant with the provisions of the Occupational Health and Safety Act (OHSA), Act 85 of 1993 and associated regulations. As an interim measure an "index" of the aforementioned records produced per month shall be submitted to Engineer by the Contractor on a monthly basis.

The works shall not be considered completely commissioned until such time as all required information and documentation in the form of PVP Record Books have been verified and approved by the Engineer and the Authorized Inspection Authority.

3.6 Design and Development of Products and Services

3.6.1 General

Contractor shall address the requirements of ISO 9001:2015 Section 8.3 in its entirety.

3.6.2 Design and Development Planning

To ensure adherence to the design policy, design objectives and all statutory and technical requirements of the Work all aspects of ISO 9001:2015 (Design and development) for Engineering work including, but not limited to, design development, design review, design checking and design verification, interfaces responsibilities and resources shall be analysed, planned and documented within an Engineering Quality Assurance Plan.

The scope of work for each Engineering office shall have an organizational interface between them and Site shall be defined in the Engineering Quality Assurance Plan.

The competency, responsibility and authority of personnel conducting design and development activities shall be defined and assessed

3.6.3 Design and Development: Inputs and Outputs

The Contractor shall ensure that the Work is consistent with all design inputs in accordance with the relevant Codes, Standards and Project Specifications. All design inputs shall be controlled and maintained and be readily available for review by all parties concerned including the Engineer.

Calculations, Data Sheets, Drawings, Specifications, Studies, Technical Data and all other design deliverables shall be checked and approved by authorised personnel to confirm compliance with the relevant Codes, Standards, Project Specifications and Procedures. Level of checking and approval shall be dependent upon the deliverable criticality as determined by the Contractor.

All design deliverables shall be controlled and maintained and be readily available for review by all parties concerned including the Engineer.

No work shall commence without the approved drawings by the Engineer or his/her representative.

3.6.4 Design and Development Controls

Project specific procedures for design review, design verification and design validation of engineering work shall be in place and approved by the Contractor and the Engineer.

The Contractor shall document all formal design review activities, including HAZOPS, HAZANS etc. in a Design Review Schedule which shall be submitted to the Engineer for information.

Design reviews shall be conducted by the Contractor in line with the Design Review Schedule and in compliance with relevant Codes, Standards, Specifications and Procedures. Design review meeting minutes shall be made available to the Engineer upon request.

Design verification and validation of critical work elements may involve personnel other than those having direct responsibility for the design work. The Contractor shall identify those work elements defined as critical and requiring alternative verification.

3.6.5 Change Control and Configuration Management

The Contractor shall develop, document for the Engineer approval and thereafter implement a Change Control and Configuration Management Plan for all phases of the work in adherence with ISO 10007: Quality Management – Guidelines for Configuration Management.

Configuration management processes and controls shall be applied to all appropriate systems, subsystems and products to ensure that design and manufacturing variations are properly notified and authorised, and that re-validation by test or analysis, if necessary, is implemented and reported to the Engineer.

This applies equally to original equipment and to field modifications or subsystem replacement as a consequence of repetitive failures.

Software configuration management shall be rigorously enforced and maintained throughout the test and acceptance process, and any in-service modifications.

The Engineer requires that configuration management shall be implemented consistently from the Contractor down to the Subcontractor and Supplier level. Controls shall include identification, documentation, change management, status accounting and configuration auditing.

3.7 Control of Externally Provided Processes, Products and Services

3.7.1 General

The Contractor shall address the requirements of ISO 9001:2015 Section 8.4 in its entirety.

3.7.2 Type and Extent of Control

The Contractor shall ensure all Suppliers operate a quality management system that complies with requirements of ISO 9001:2015 and additional project specific requirements as detailed in this document.

The Contractor shall document the process for their evaluation (and re-evaluation) and selection of Suppliers and shall provide Supplier Assessment Reports and Re-Evaluation Reports to the Engineer for each and every Supplier (including Sub Contractors at Site) contracted to work on the Medupi Power Station project.

The Contractor shall define within his quality management documentation the following:

a) The roles and responsibilities of the Contractor’s Inspection Coordinator and Inspectors
b) Qualification and selection method of Third Party Inspection Companies
c) Qualification process / requirements of “in house” inspection personnel to ascertain how proposed candidate skills match the assignment competency requirements.

d) How inspection and testing requirements are verified as acceptable in Material Requisitions

e) The method of allocating an inspection assignment to Inspectors to ensure competency is sufficient for the task.

f) How contractor's inspection personnel are made thoroughly familiar with the relevant Purchase Order and aware of any special inspection and / or testing requirements.

g) Distribution and control of Purchase Order amendments.

h) Distribution and control of correspondence affecting design / specification changes

i) The need for attendance at Pre-Award Clarification, Kick Off and Pre Inspection Meetings with Suppliers and roles and responsibilities for the same.

j) Equipment / materials and inspection criticality assessment process.

k) The system of establishing inspection intervention requirements in Inspection and Test Plans based on a criticality assessment process.

The Contractor shall develop, document via Procedure for the Engineer approval and implement a process to review its Inspector's performance and shall critique their Inspection Reports on a bi-monthly basis and take appropriate action for training/re-training as necessary. Results of the review / critique process shall be provided to the Engineer.

3.7.3 Information for External Providers

The Contractor shall ensure the adequacy of requirements prior to their communication to the external provider.

"Un-priced" Purchase Orders shall be provided to the Engineer when issued to Suppliers

3.7.4 Manufacturing Records and Product Release

The Contractor shall ensure that a Manufacturing Record Book (draft or final) is available at the time of final inspection at Suppliers / Contractors premises of manufactured equipment to facilitate a review of applicable Quality Verification Records for the manufactured component or sub-component.

The Contractor shall ensure that he has obtained and reviewed final inspection and test records and / or "equipment / material release" certificates for all Materials and Plant before incorporating such items into the Works. Contractor shall insert these certificates into his records system

A copy of the Final Inspection Report, Release Note and Manufacturing Record Book shall be shipped with the equipment or material to the delivery destination.

Contractor shall hand over Manufacturing Record books to the Employer not latter that 21 days after delivery of goods to site.

3.8 Manufacturing, Construction and Commissioning

3.8.1 General

Contractor shall address and implement the requirements of ISO 9001:2015 Section 8.5 & 8.6 in their entirety

3.8.2 Control of Product and Services Provision

The Contractor shall plan, document via Procedure for the Engineer approval and thereafter implement manufacturing and construction to occur under assured and controlled conditions determined as a consequence of Contractors “criticality assessment” for equipment, materials and processes.

Assured and controlled conditions shall necessitate Contractor developing, documenting via procedure for the Engineer approval and thereafter implementing a “Work Commencement Approval System”.

Said system shall ensure that all process and inspection activities commence only after verification by the Suppliers Quality Dept. (during manufacture) and by Contractor’s Quality Dept. (during site construction) of the availability of:

a) Safe access and egress for personnel and equipment / materials

b) An Engineer approved Inspection and Test Plan (ITP) and Construction / Testing Procedures and Records identified therein.

c) The necessary “approved for construction” drawings

d) Trained and competent construction personnel.

e) Qualified and competent quality control and inspection personnel.

f) Calibrated Inspection, Measuring and Test Equipment supported with current calibration certificates.

g) Suitably certified and released materials / equipment.

Such verification shall be documented via a “Work Commencement Approval Checklist” which shall be made available to the Engineer for review when requested. Contractor shall maintain a Work Commencement Approval Register of all Checklists which shall be provided to the Engineer in native file format on a monthly basis.

The “Work Commencement Approval Checklist” shall clearly and unambiguously identify whether work can proceed or not and, if not, what corrective measures are required before re-verification and validation is to proceed.

Work shall not proceed in the absence of an approved Checklist.

3.8.3 Inspection and Test Schedule

The Contractor shall prepare and issue to the Engineer on a monthly basis, before the 27th of each month for the preceding month, an “Inspection & Test Schedule” for both manufacturing inspections and tests offsite and construction / installation inspections and tests on site.

The manufacturing “Inspection & Test Schedule” shall be inclusive of all Suppliers both inside and outside of South Africa and shall be issued electronically via email, in native file format, to medupiinspection@eskom.co.za.

The construction / installation “Inspection & Test Schedule” shall be inclusive of all Sub Contractors on site and shall be issued electronically via email, in native file format, to medupiqaonsite@eskom.co.za.

Said Inspection and Test Schedule shall be supplemented by Inspection and Test Notification by the Contractor as verification of planned arrangements

3.8.4 Inspection and Test Notification

Relative to Sub-Clause 7.3 [Inspection] and 7.4 [Testing] the Contractor shall notify the Engineer of all the Engineer, AIA / TPIA or Design Authority inspection and test interventions documented in Contractor’s, Engineer approved, Inspection and Test Plans in a timely manner to facilitate the Engineer’s organisation of suitable inspection resources.

In all instances notification shall be made to the Engineer electronically, via email of the Inspection & Test Notification (I&TN) in native file format, to the Engineers Inspection Coordinator.

3.8.4.1 Inspection & Test Notification – During Manufacturing Activities

During off site manufacturing activities the submittal of the I&TN’s shall be effected by the Contractor using the I&TN document included as Appendix 06 of this document:

a) Electronically via email to medupiinspection@eskom.co.za and medupiqa@eskom.co.za

b) 7 days prior to the meetings and inspections and / or tests where conducted in South Africa.

c) 21 days prior to the meetings / inspections and / or tests where conducted outside of South Africa.

3.8.4.2 Inspection & Test Notification – During Site Construction Activities

During installation / construction and commissioning works at site submittal of the I&TN’s shall be effected by the Contractor using the I&TN document included as Appendix 07 to this section of the Employers Policies and Procedures:

a) Electronically, via email, to medupiqaonsite@eskom.co.za.

b) By 14.00hrs for that nights and the proceeding days activities.

Work registered by Engineer as defective or incomplete shall be recorded by Engineer on the Inspection and Test Notification and returned to Contractor for actioning of defective / incomplete work.

3.8.5 Inspection and Report

3.8.5.1 General

The Suppliers, the Contractor and the Engineer shall undertake in-process, stage and final inspections and / or tests, in accordance with Contractor's, Engineer approved, Inspection & Test Plans and Quality Control Procedures to:

a) Verify that materials, equipment and constructed items comply with the applicable Project Specifications and are suitable for the intended purpose.

b) Verify ongoing construction methodology is suitable and achieving a quality product.

c) Comply with statutory requirements.

d) Satisfy insurance requirements.

e) Verify traceability of materials.

f) Ensure operability and maintainability requirements and facilitate obtaining permits for the start-up and operation of the Plant.

In-process inspection and verification may be performed by Supplier/Contractor Supervisory personnel, as required, provided they are independent of the work being performed and suitably trained in the appropriate inspection and verification process.

However, Formal "stage" and final product conformity verification and release for further processing shall be completed by Suppliers/Contractor Quality Dept. personnel (who are to be independent of the construction personnel) via Quality Verification Records.

3.8.5.2 Inspection and Report during Manufacturing Activities

In-process, stage and final inspection of manufactured items by Contractor shall be documented via Inspection Reports which shall address the following topics:

a) Purchase Order, Supplier name, description of material / equipment and manufacturing location.

b) Inspector name, date of visit, purpose of visit and activities performed.

c) Inspection and Test Plan and activity therein action by inspector.

d) Results of inspection.

e) Actions required and target dates (if any).

f) Non-conformance Reports initiated

g) Release Notes signed

h) Conclusions.

and which shall be submitted to Engineer, with all necessary and referenced supporting documentation, including Non-conformance Reports, electronically via email in native file format to medupiinspection@eskom.co.za and to medupiqa@eskom.co.za.

Where defects are identified a "Flash" Inspection Report shall be issued to the Engineer in advance of the Contractors final Inspection Report and Non-conformance Report.

In-process verification of:

(i) on-going build quality;

(ii) suitability of supplier and/or manufacturing methodology;

(iii) personnel employed;

(iv) stage and final inspection;

shall be undertaken by Engineer's Third Party Representatives at manufacturing facilities as and when required by the inspection intervention requirements documented in ITP's. Statutory inspections shall be performed by Engineer approved AIA as appropriate. For manufacturing verification activities the I&TN shall be issued by the Contractor direct to AIA and copied to the Engineer.

Defective product identified by AIA shall be documented via AIA Non-conformance Reports which shall be issued directly to the Contractor by the AIA and copied to the Engineer for information and follow up.

Defective product identified by Engineer's TPIA shall be documented via Notice of Defect Reports which shall be issued to the Contractor by the Engineer.

3.8.5.3 Inspection and Reporting during Site Construction Activities

In-process verification of on-going build quality, of suitability of Contractors manufacturing methodology, of personnel and of stage and final inspection will be undertaken by Engineer's at site as and when required by ITP's or as directed by Engineer's Package QA Engineers

On site verification of day to day build quality shall be undertaken by Engineer's Supervisors on a daily basis and documented via Contractors quality verification records to avoid reliance on, and reduce, where applicable, Engineer's formal stage and final inspection.

Inspection and/or test documentation shall be maintained at site by the Contractor to facilitate both:

a) In process verification of build quality.

b) Stage and final inspection and test.

Stage and final inspections by Contractor Quality Dept. personnel shall be effected prior to requesting the formal involvement of Engineer's inspection/engineering personnel via issuance of an Inspection and Test Notification form. The only variance to the aforementioned shall be for in-process/special process inspection and testing where prior inspection and verification of conformity or re-testing by Contractor cannot be undertaken.

At the time of the Engineer's stage and/or final verification involvement the Contractor shall provide the relevant original quality verification records to the Engineer's inspection/engineering personnel at the location of the inspection and or test for review and completion. Engineer's inspection/engineering personnel shall:

a) sign and date the quality verification records.

b) Identify conformity/non conformity and percentage of work sampled.

c) Document any defects noted and identified to Contractor Quality Dept. personnel.

Defective product identified by AIA shall be documented via AIA Non-conformance Reports which shall be issued directly to the Contractor by the AIA and copied to the Engineer for information and follow up.

Defective product identified by Engineer shall be documented:

a) via the Inspection and Test Notification Report which shall be issued to the Contractor the day following the inspections and/or test or, as required,

b) via Notice of Defect Reports which shall be issued to the Contractor by the Engineer.

In case the Contractor fails to demonstrate compliance with the requirements additional tests or rework shall be undertaken until compliance has been demonstrated. In those cases Engineer reserves the right to request additional test / inspections by notice in writing as required.

Inspection Report:

A detailed inspection report for QCI or whoever conducts inspections to be provided with photos attached to this report.

3.8.6 Traceability

The Contractor shall develop, document via procedure for the Engineer approval and thereafter implement traceability of equipment and materials for incorporation in the Works to the extent required by Specification and Code. Where traceability is a requirement the Contractor shall control and record the unique identification of the product and source materials.

3.8.7 Inspection and Test Status

The Contractor shall develop, document via procedure for the Engineer approval and thereafter implement a process that clearly and unambiguously identifies product inspection, test and conformity status at all stages of manufacture, installation, construction and commissioning via appropriate inspection and test verification records which shall be summarized via an inspection and test database.

The Contractor shall ensure that any equipment or materials identified as defective subsequent to inspection are readily identifiable via:

a) Segregation from conforming product into selective quarantine areas.

b) Quarantined in-situ and identified as quarantined via tagging / colour coding etc. to prevent incorporation into the final product.

c) Non-conformance Report and identifiable via Unit, Area, Subsystem, KKS No.

Identification of inspection and test status and level of conformity, especially nonconformity, shall be readily identifiable to the Contractor and the Engineer personnel to ensure defective items are not inadvertently incorporated into the final works.

The Contractors Inspection Database shall be submitted to the Engineer electronically, via native file for on a bi- weekly basis or alternatively shall be made available for review and interrogation by the Engineer as and when required.

The inspection and test status database shall, as a minimum, identify:

3.8.7.1 Manufacturing Inspection Database

a) Item being manufactured and country of manufacture.
b) Main Supplier and Sub Supplier names and address.
c) Purchase Order Numbers material and equipment descriptions, criticality rating and inspection level.
d) Contractor assigned inspector.
e) Pre/Post Award Clarification, Kick off Meeting and Pre Inspection Meeting dates
f) Applicable ITP's.
g) Contractor "Inspection and Test Notifications" issued to Engineer by No. & Date.
h) Inspection and defect status.

3.8.7.2 Construction/Installation Inspection Database

a) Item description.
b) Unit No.
c) Geographical Area.
d) Sub System.
e) KKS No.
f) Applicable ITP's.
g) Contractor "Inspection and Test Notifications" issued to Engineer by No. & Date.
h) Inspection and defect status.

3.8.8 Quality Verification Records

A Quality Verification Record is a record document that records results achieved or provides objective evidence of activities performed and verifies conformity to stated aims.

The Contractor shall ensure Quality Verification Records are:

a) provided to the Engineer as a quality assurance provision as templates in the Procedures and ITP's they are referenced in to verify adequacy before their use.
b) so formatted to provide objective evidence of conformity in accordance with the contract, specification, statutory and insurance requirements and, where applicable, identify Non-conformance and Notice of Defect Reports initiated.
c) in a form suitable for incorporating the verification and endorsement requirements of Engineer and AIA/TPIA where appropriate.
d) made available by the Contractor at the time of inspection to facilitate the Engineer verification of the inspection result or within 24hrs of completion of the activity verification if Engineer was not party to the inspection or test.

e) traceable to the plant, material and/or activities to which they pertain.

f) collated, indexed, registered into the Contractors electronic records database system and progressively collated into Manufacturing, Construction and Commissioning Record Books as the work is completed and securely stored in a controlled environment in such a manner that they are secure and readily retrievable.

g) retained until such time as the Defects Liability Period has lapsed and thereafter are submitted to the Engineer as original records in Manufacturing, Construction and Commissioning Record Books

To verify that the work for which payment is claimed in any monthly Statement by the Contractor is complete and conformant to project requirements the Contractor shall provide to the Engineer a summary statement of all the necessary records required for the work, (with diagrams, schedules or tables as appropriate) identifying inspections, tests, approvals, changes, As-Built details and clearance of defects / omissions and the like as are required to demonstrate compliance to the Contract of every part of the Works for which payment is sought.

3.8.9 Preservation

The Contractor shall determine, document via procedure for the Engineer approval and thereafter implement any special requirements for equipment / material preservation including:

a) Identification.

b) Handling and packing.

c) Storage and protection.

d) Shelf life duration.

e) Safe handling.

The Contractor shall develop, implement and maintain for equipment and material that requires preservation until the time of Taking Over:

a) An “Equipment / Material Preservation Schedule” identifying type and frequency of preservation inspections. This shall be provided to Engineer, after initial issue, each and every time it is updated with additional equipment / material.

b) An “Equipment / Material Preservation Register” wherein results of preservation inspections are recorded. This shall be provided to Engineer on a Monthly basis on the first day of every month.

The Contractor’s “Equipment / Material Preservation Schedule” shall be provided to Engineer, after initial issue, each and every time it is updated with additional equipment / material.

The Contractor’s “Equipment / Material Preservation Register” shall be provided to Engineer on a Monthly basis on the first day of every month.

The Contractor preservation programme scope includes, but is not limited to, the following:

3.8.9.1 Engagement of personnel suitably qualified for oversight of, and (as required) direct implementation of, preservation programme requirements;

3.8.9.2 Development and implementation of preservation programme training appropriate to

work need

3.8.9.3 Eskom may make use of its appointed service provider tasked to provide a full suite of services encompassing an online monitoring system and asset tracking during at least, but not limited to, the following stages:

3.8.9.4 inspections, testing, shipping, transportation, storage, and commissioning.

3.8.9.5 The Contractor is to enable full access during all of these stages in order to allow the installation of the devices on Eskom-identified products and equipment, which include the sub-supplier's testing facilities, processing plant, and any other processes deemed important towards effective and efficient quality control.

3.8.9.6 Eskom seeks cooperation between the supplier's designers and those of Eskom's service provider in ensuring seamless installation of the device and other associated installations. Moreover, there is also a need to integrate data flows and systems between Eskom and the supplier. Further details are included in the Eskom specifications and works information.

3.8.9.7 Review and tracking of compliance with Eskom and supplier engineering specification of preservation requirements.

3.8.9.8 Review and tracking of compliance with sub-supplier provided preservation requirements and recommendations

3.8.9.9 Evaluation of prospective temporary and longer-term material storage sites for consistency with preservation programme expectations.

3.8.9.10 Preservation work plan development and plan execution performance evaluation of all

3.8.9.11 parties engaged for provision of material transportation, handling, or storage services.

3.8.9.12 Oversight of material quality preservation plan preparation and plan execution performance at all work locations.

3.8.9.13 Development of a preservation programme records management process, in compliance with Eskom information management requirements, which comprehensively addresses generation, maintenance, and ready access by Eskom to all preservation programme records.

3.8.9.14 The Contractor shall deploy a clearly defined documented programme providing for identification of all physical asset pre-operation preservation of quality requirements. In this reference, the term "physical assets" should be understood to include bulk materials, including consumable items, equipment systems, system components, and any other procured or supplied materials or equipment transferred to project control, but not yet deployed for operational purposes.

3.8.9.15 Where the project responsibility for equipment and materials management has been formally delegated, the supplier's preservation programme shall ensure clear and unambiguous communication of pre-operation preservation of goods quality requirements to sub-contractor.

3.8.9.16 The supplier's preservation programme shall clearly and unambiguously document processes and procedures for efficient and effective monitoring of compliance with

programme requirements.

3.8.9.17 Compliance monitoring shall commence with ensuring comprehensive consideration of preservation requirements in the engineering instruction and subsequent inclusion of said instruction in procurement documentation and shall be applicable until such time as equipment or materials have been incorporated in an operating or operational system or structure.

3.8.9.16 Compliance evaluation frequency shall anticipate transfer of tactical-level responsibility for management of preservation responsibilities between project functional areas, for example, procurement to logistics, logistics to fabrication, fabrication to logistics, logistics to construction, etc., and shall, in similar fashion, anticipate transfer of support for tactical-level responsibility between various subcontracted service providers.

3.8.9.17 Supplier engineering shall ensure that preservation requirements for scope of work systems, system components, equipment, materials, and other procured goods are clearly and unambiguously documented and that preservation requirements are efficiently and effectively communicated to project procurement, logistics, construction management, quality, security, and other project functional areas, as required, for efficient and effective implementation of preservation requirements. This shall take the form of a preservation programme applicable to all systems, system components, equipment, materials, customer supplied materials, and other goods procured or managed under the scope of work.

3.8.9.18 The supplier's preservation management programme shall encompass identification, planning, acquisition of materials and services, and performance monitoring of all preservation management systems, processes, procedures, methods, work practices, etc.

3.8.9.19 The supplier's preservation management programme shall clearly and unambiguously address temporary, long-term, and in-transit preservation requirements, including, but not limited to:

- requirements for protection against, or insulation from, atmospheric conditions, sunlight, temperature, soil, dust, humidity, salt spray, corrosive atmospheres, or other physical environment conditions;
- detailed procedures for application, use, monitoring, and maintenance of coatings, coverings, fasteners, lines, and other components for internal and external weather proofing;
- requirements for electrical grounding or isolation;
- requirements for internal or external environment creation, for example, inert gas charging,
- heating, cooling, etc., inclusive of gas storage, electric power supply, etc.;
- detailed procedures for initial set-up, charging, activation, and maintenance of internal atmosphere generation, regeneration, monitoring, and relieving systems, for example, inert gas management systems;
- requirements for protection against, or insulation from, vibration or long-period cyclical motion in transit, for example, wave-generated movement during sea transport;
- internal and external structural integrity protection, for example, internal and external

bracing, padding, framing, chocking, etc.;

- support structure requirements, for example, stools, pads, or other devices, substrates, or support required to ensure in-storage and in-transit stability of systems, system components, equipment, and material, or other discrete units or items; of blast aggregate into vessels or machinery, etc.;
- provision for, and final disposition of, temporary and longer-term storage or transit required supports and related binding devices, for example, stools, stands, sea fasteners, platforms, chocks, spacers, cabling, etc.;
- provision of requirements for temporary work platforms or other support structures required to ensure provision of preservation services, for example, provision of a self-elevating work platform for periodic access to elevated fittings, gauges, man ways, etc.;
- requirements for protection against, or insulation from, contact with other objects, for example, padding or other protection for external tubing, fittings, or other impact-sensitive structures or components;
- clear physical delineation of temporary and longer-term storage areas supplemented by hard and soft barriers, as required, to maintain a protective perimeter;
- documented agreements with storage facility and transportation provider management regarding security management, including, but not limited to, facility access and egress control and control of access to project goods and materials within facility boundaries or aboard vehicles or vessels; and
- detailed procedures for inspection and testing to verify performance of preservation procedures and to provide for timely notice and corrective action to maintain preservation status.
- The supplier’s preservation management programme scope shall encompass management of preservation requirements, from initial transfer of ownership or management responsibility to project scope of responsibility, through any period of temporary or longer term storage and through any period of transit, including transit for final delivery at point of active use or installation.
- The supplier’s preservation management programme shall clearly and unambiguously address processes and procedures to ensure that storage and control of materials are accomplished in accordance with manufacturer recommendations, specifications, and project-specific requirements.
- The supplier’s preservation management programme shall incorporate special precautions to address preservation and control of valves, electrical motors and components, mechanical and rotating equipment, piping and fittings, instrumentation, flange faces, gaskets, coatings,
- insulation, and other materials. Special precautions include, but are not limited to, supplier-specified maintenance procedures related to engines, electric motors, pumps, compressors, etc., such as periodic shaft rotation, engine turnover, lubrication, etc.
- The Contractor shall ensure that clear and unambiguous requirements for preservation of the system, system components, equipment, materials, and other procured goods are clearly and unambiguously documented in purchase orders, work authorisations, and other

communications between The Contractor and sub-contractor.

- Where sub-supplier expertise is utilised in determination of the preservation protocol, supplier procurement processes shall ensure clear and unambiguous documentation of sub-supplier input into preservation management programme requirements.
- Supplier procurement shall ensure that preservation requirements for scope of work systems, system components, equipment, materials, and other procured goods are clearly and unambiguously documented and that preservation requirements are efficiently and effectively communicated to project logistics, construction management, quality, security, and other project functional areas, as required, for efficient and effective implementation of preservation requirements.
- The Contractor shall ensure comprehensive, clear, and unambiguous designation of sub-supplier responsibility for execution of all preservation management programme elements, including, but not limited to, all systems, processes, procedures, methods, ready access to records, and provision of equipment, tools, or services essential to efficient and effective execution of the preservation management programme.
- The Contractor shall ensure that preservation management programme responsibilities are clearly and unambiguously defined within the project team and efficiently and effectively implemented at all project scope of work locations. Inclusion of supplier and sub-supplier scope of work in the development and implementation of a preservation management programme shall be considered essential to efficient and effective preservation management programme execution.
- The Contractor shall ensure clear and unambiguous designation of project team responsibility for oversight and management of preservation management programme elements during every stage of project development.
- The Contractor shall ensure that Eskom has free and unrestricted access to all preservation records for inspection and audit.

3.8.10 Registers during manufacturing, Construction and Commissioning Phase

Contractor shall submit the following registers to the discipline Quality manager on the weekly basis:

a) Data book register
b) ITP register
c) Method statement
d) Drawing register
e) AFI register
f) MDL Equipment list register
g) NCR and Defects register
h) Take Over Certificate register
i) Variation Order register
j) Statutory and HAZLOC register indicating Plant Area
k) PE and Stability certificate register indicating Plant Area

l) COC register indicating Plant Area

m) Contractor shall compile a separate statutory file for all statutory equipment's per Plant Area.

n) Contractor shall compile a separate HAZLOC files per plant Area.

3.8.11 Records Books

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:

a) Record Books shall be provided by the Contractor for;

- 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.
- 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
- Commissioning - prepared for each commissioned system.

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

a) 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".

b) Record Book shall be written in English or provided with an English translation

c) The index of all Record Books shall be submitted to Engineer for approval.

d) 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.

e) Contractor shall report the status of Record Book compilation progress at Weekly Progress / Quality Meetings together with the Data book Register.

f) Record Books shall be endorsed by stamp, date and signature of the Contractor and the Engineer signifying completion and accuracy when complete.

g) 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:

- Title of Document
- Contractor's company logo
- Unique number/SPO
- Name of Project
- Contractors' Job Code
- Contractor Document number
- Eskom Document Number
- System KKS number
- System Description
- Document type "Manufacturing or Construction or commissioning"
- Contractor's number
- Name of Contractor
- Volume Numbering (1 of ….or 1/10) xv. Address of Contractor
- Column for signature by Contractor Representative and Engineer's representative
- All Construction Record books shall be Completed, Approved Safety Cleared and handed over to Eskom not later than 21 days after Final inspection (AFI) Prior Commissioning Phase.
- For other civil / Earthwork, All Construction Record books shall be Complete, Approved and handed over to Eskom prior taking over section of works.
- All Commissioning Record books, Operating , maintenance and training manuals shall be Completed, Approved and handed over to Eskom not later than 21 days after the last test prior taking over of completed works (TOC)
- 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.
- 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.

- 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.
- Contents shall be sectionalized and separated by properly labelled dividers
- 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.
- All section dividers/separator sheets shall be made of card and shall bear the Section Identifier - 1, 2...
- 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:

  - Relevant section letter
  - Page number - every document shall receive a page number.
  - In each section the page numbers shall run consecutively.
- Record Books shall contain as a minimum
  - All material Reports and Certificates
  - All Inspection Reports
  - All Test Reports
  - All Release Notes
  - All Change Management Reports
  - All drawings or an index of drawings identifying drawing No. and revision status
  - All Defect Reports
  - All Procedures or an Index of Procedures
  - 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
  - All Drawings or an Index of Drawings

3.8.11.1 Statutory Records

1. The Contractor shall submit a statutory compliance file containing minimum documents as follows:

a) Electrical Equipment
- Statutory register
- COCs

b) Civil Structure
- Statutory register
- Professional Engineering Certificates
- Glazing Certificates
- Sewer Certificates (subjected to exemption)

c) Pressurised Equipment
- Statutory register
- Certificate of Conformance for PER equipment
- Inspection and Hydraulic Pressure Test Certificate for PER equipment

d) Lifting Equipment
- Statutory register – lifting equipment (DMR)
- Statutory register – passenger conveyance lifts (LEPCR)
- Load test certificates for all lifting equipment

e) Transformer Impact Recording

f) Boiler Registration

g) Functional safety clearances for all equipment

h) Operating procedures

i) Maintenance procedures

j) Permanent KKS certificates (no temporary labels to be allowed at take-over)

k) Software and applications to interrogate the equipment, i.e. power electronics

l) All the configuration files and settings implemented.

m) FAT, SAT and SIT Reports

n) CEMS, Dust and gaseous emission correlation tests to be completed.

3.8.11.2 Handing over of Record books/Data Books by Contractor

QA Completeness review

After addressing all comments given during QC 100% review of data books, the contractor shall request QA to perform completeness review of the record data books,

The contractor shall request QA to perform completeness review of the record books /Data books prior handing over to the Employer.

QA will also make reference to the data book checklist (200-616427) for compliance of format and lay out of the Record Book / Data Book.

3.8.12 Taking Over

3.8.12.1 Contractor Initiated

The Contractor shall implement a process for effectively taking over the work as set forth in the contract, free of defects (NODs, NCRs, punch items, etc.)

Contractor shall complete the defined and contractually agreed work scope and thereafter shall

a) Verify work is complete and conformant.

b) Ensure that a complete set of quality verification records, demonstrating compliance with Contract, is compiled and incorporated into Manufacturing, Construction and Commissioning Data Books.

c) Produce an “Index” of applicable data books

d) Apply via letter, including the “Index” for a taking Over Certificate from the Engineer.

In order to establish conformity with stated aims and shall either accept or reject the request for Taking Over based on the review process, the Engineer shall undertake a sample review of:

a) The completed work and as built documentation.

b) The applicable quality verification records contained in the data books.

c) The change management documentation

d) The defect management documentation

to establish conformity with stated aims and shall either accept or reject the request for Taking Over based on the review process.

Where rejected the Contractor shall undertake the necessary rework and re-apply for Taking Over as per the contract.

Where accepted the Engineer shall issue a “Taking Over” Certificate.

Contractor shall be responsible for retaining the original records contained in the Record Books until such time as the defect liability period has expired but shall during that time make available to Engineer the records as and when required. At the time of formal handover of the Record Books the Contractor shall submit one (1) hard copy and one (1) soft copy (CD) of Construction Record Books to the Engineer, One (1) CD per book.

3.8.12.2 Engineer Initiated "Taking Over"

Where Engineer requires to "Take Over" the Works, or a portion of the Works, without the agreed schedule for Taking Over, the Engineer shall identify the portion of the work to be Taken Over and shall proceed as defined in FIDIC clause 10.2 of the contract.

Thereafter, when the agreed portion of work is complete and conformant the Contractor shall proceed as identified in 3.8.11.1 above and submit a letter application for Taking Over accompanied by an "Index" of applicable quality verification records and a "Warranty Certificate" verifying completeness and conformity of that portion of the works

3.8.11.2.1 The Engineer shall undertake a sample review of 10% per system for completeness check:

- The completed work and as built documentation.
- The applicable quality verification records contained in the Record books.
- The change management documentation
- The defect management documentation

to establish conformity with stated aims and shall at the same time compile a photographic journal of the work to record its state of conformity with stated aims and shall either accept or reject the request for Taking Over based on the review process.

Where rejected the Contractor shall undertake the necessary rework and re-apply for Taking Over as per the contract.

Where accepted the Engineer shall issue a "Taking Over" Certificate.

Contractor shall be responsible for retaining the original records contained in the data Books until such time as the defect liability period has expired but shall during that time make available to Engineer the records as and when required. At the time of formal handover of the Record books the Contractor shall submit one (1) hard copy and one (1) soft copy (CD) of Construction Record Books to the engineer, One (1) CD per Record book/Data book.

3.9 Performance Evaluation

3.9.1 General

Contractor shall address the requirements of ISO 9001:2015 Section 9 and 10 in its entirety.

3.9.2 Customer Satisfaction

The Contractor shall establish, document via procedure for Engineer approval and thereafter implement a Customer Satisfaction / Complaints system as part of the quality management system and performance improvement initiative and shall collate, analyse and trend feedback from the Engineer as a method for measuring of Customer satisfaction.

The Contractor shall also develop a “Customer Satisfaction Questionnaire” that shall be issued to the Engineer for completion on a bi-annual basis and shall be included as part of the Contractor management review process.

Additionally, the Contractor shall make careful assessment of the documents listed below to determine trends and opportunities for corrective action, preventative action and/or process redesign.

a) Management Review Reports
b) Audit Reports
c) Design Review Reports
d) Defect Reports
e) Technical Queries
f) Design Change Requests / Instructions
g) Inspection Reports - Manufacture and installation / Erection
h) Engineer feedback and complaints
i) Engineer Document Reviews
j) Learning from Incidents.

Corrective Action Requests shall be issued by the Engineer to the Contractor and shall be responded to by the Contractor on the Engineers original documents within seven (07) days. Failure by the contractor to respond within specified period, the Engineer shall apply penalties as per contractual provisions.

The Contractor shall trend the Contractor, Suppliers and the Engineer Corrective Action Requests and Preventive Action Requests as identified in section 3.10.1 above.

The Contractor shall maintain and provide an electronic native file copy on a weekly to the Engineer of Contractor’s

a) Corrective Action Requests Register.
b) Corrective Action Requests trend analysis documented both numerically and graphically.

Said Registers shall account for Contractor’s, Supplier’s and The Engineers Corrective Action Requests

Corrective Action Requests shall form part of the permanent quality records and shall be included in Manufacturing, Construction and Commissioning Record Books by the Contractor.

3.9.3 Measurement and Analysis

The Contractor shall develop, document via procedure for the Engineer approval, and thereafter maintain a “Performance Improvement” program with the aim of continually improving processes, services, procedures and personnel through the use of quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

The Contractor shall identify metrics to be measured and the Performance Standards and Performance Targets they are to be measured against. Said metrics, standards and targets shall be documented and submitted to the Engineer for approval. Furthermore, the Contractor shall utilize additional metrics, standards and targets and/or revise existing metrics, standards and targets upon request from the Engineer where further measurement, analysis and improvement is required.

The Contractor shall analyse the data collected for the issues being measured and identify potential for improvement and shall also consider the continued suitability of the project quality policy, quality strategy, quality objectives, Plans, Procedures etc. and revise the same as appropriate.

Priorities of potential improvements shall be identified to determine the order of action required. The assessment of priorities shall include consideration of the risks and the potential losses if an issue causes nonconformity or detriment to the Works, personnel or environment

Types of improvements considered shall include product and process control, control of non-conformities, corrective actions, preventative actions, audit findings, decisions made in management review meetings, changes in policies and objectives, opportunities for improvement (not related to non-conformities), loss prevention measures and beneficial relationships.

The Contractor shall provide an electronic native file copy of the Lessons Learn database to the Engineer for information on a month basis.

3.9.4 Auditing

The Contractor shall develop, document via procedure and implement for the duration of the project:

a) The process defining the control mechanisms for;
   - internal and external audits
   - QMS audits
   - technical/product audits

b) A planned schedule of internal and external audits to be undertaken during the design, procurement, construction and commissioning phases of the works and a corresponding Audit Register recording audit results.

3.9.4.1 Contractor Audits

The Contractor's project Audit Schedule shall cover a calendar year and shall be formally revised and re- issued every year and shall be issued to the Engineer

The Contractor shall schedule and conduct quality management system audits covering all elements of their respective project quality management systems based on the status of importance of activities. The audits shall be timed to provide maximum benefit to the process and product being audited

Audits shall be planned and reported in accordance with the guidelines in ISO 19011:2018 and conducted by qualified auditors

The Contractor's project Audit Register shall be maintained accurate and shall record all project audit data inclusive of:

a) Audited process/subject,
b) Auditors
c) Auditees
d) Audit type
e) Audit Date
f) Audit Location
g) Audit Findings, Corrective Action Reports and Observation Reports
h) Deltas between planned and actioned dates

The Contractor's project Audit Register shall be issued to the Engineer in electronic native file format on a monthly basis.

If the results of audits identify non-conformances to process, procedure, code or contract then defect correction and corrective action shall be taken immediately by the Contractor thereby minimising adverse effects downstream.

In the event any activity during routine works is found to be adversely affecting the quality requirements of the work the Engineer shall have the right to require the Contractor to audit that area of activity on a priority basis and not later than seven working days subsequent to the Engineer's notification. In the event that the Contractor fails to conduct an audit subsequent to the Engineer request, then the Engineer shall conduct the audit at a time and with resources of his choosing and the Contractor shall take all necessary measures to facilitate the successful completion of the audit.

The Engineer may elect to attend internal and external Supplier audits / assessments or reviews conducted by the Contractor. Consequently, the Contractor is required to provide written notice of all planned internal and external audits in writing seven (7) working days in advance of the audit.

The Contractor shall ensure that their Audit Findings are recorded, issued within five days of audit completion and followed up until required correction and corrective action is verified as complete.

The Engineer shall be provided with a copy of all Audit Reports and Audit Finding Reports within seven (7) working days of audit close out meeting.

As an independent measure of the Contractor's quality management system conformity to ISO 9001:2015 requirements and its effectiveness in realising project quality requirements the Contractor shall arrange for their project quality management system to be audited during design / procurement phase and during the construction/installation phase by an (Engineer approved) independent Quality System Certification Body.

The said audit should be conducted prior to 50% completion of the individual project phases or when requested by the Engineer.

3.9.4.2 Engineer Audits

The Engineer shall audit the Contractor's quality management system as and when required. Notification shall be provided to the Contractor ten (10) working days in advance of any planned audit.

The Engineer's Audit Report and Audit Findings shall be issued to the Contractor within seven (7) working days of the completion of an audit.

Audit findings will be risk ranked by the Auditor and the Auditee as high, medium or low and shall be responded to by the Contractor within five, ten and twenty days respectively from the date of issue.

3.9.4.3 Trending of Audit Findings

The Contractor shall trend Audits and Audit Findings on audits conducted internally; by the Engineer, and other third parties, as well as audits conducted by the contractor on their suppliers, on a weekly basis.

Trending shall be displayed numerically and pictorially, as agreed with the Engineer, on a weekly basis and shall identify weekly and cumulative trends on the basis of:

a) Defect type.

b) Project phase: design, manufacturing and construction / installation. c) Status: issued, answered, actioned and closed.

c) Risk ranking: High, Medium or Low.

d) Ratios: Suppliers versus the Contractor and the Contractor versus the Engineer.

The Contractor shall maintain, and provide on a weekly basis to the Engineer, an electronic native file format The Contractor shall develop and implement a performance management programme for their

Sub s contractor/s. The programme shall include, but not limited to:

- Verification of the QMS;
- Audits and surveillances;
- Regular assessment of the CQPs and reviews of QCPs;
- NC and Defect Management;
- Inspections and tests; and
- Risk management

3.9.5 Management Review

Contractor shall establish a schedule of management reviews of the quality management system.

Management Reviews, due to the dynamic and fast changing pace of a project, shall be scheduled to be held at intervals of not more than six (6) months until project completion.

Management Reviews shall be chaired by the Contractors Project Representative and attended by Contractor Quality Assurance and Quality Control Managers (as applicable) and other senior management (as appropriate) to;

a) assess the effectiveness and efficiency of the Quality Management System in meeting stated aims and objectives.

b) to provide a basis for continuous improvement to the works and the processes, the resources and infrastructure affecting the works.

c) to assess product quality statistics.

d) to assess the level of Engineer satisfaction.

e) A record of all Management Reviews shall be documented and shall be made available to the Engineer once documented.

Management Reviews shall assess:

a) follow up from previous Management Reviews.

b) the results of audits and analysis of associated corrective and preventative actions.

c) analysis of non-conformance, deviation, change request and technical query statistics.

d) QMS orientation, induction and training, competency assessments and incentive programme.

e) the achievement of the Contractor resource planning for quality.

f) complaints and feedback from the Engineer, Suppliers or other Third Parties / AIA.

g) key performance metrics.

h) learning form incidents program.

i) changes that could affect the quality management system.

j) recommendations for improvement.

Where recurring systematic problems are identified the Contractor shall investigate with detailed analysis techniques and establish root causes for actions to mitigate re-occurrence.

Risk ranking shall be applied to documented actions to determine action completion times.

3.10 Improvement

The Contractor shall develop, document via procedures for the Engineer approval and thereafter implement an improvement process needed

a) To demonstrate conformity of the product,

b) To ensure conformity of the quality management system, and

c) To continually improve the effectiveness of the quality management system.

This shall include determination of applicable methods, including statistical techniques, and the extent of their use.

The Contractor shall develop, document and implement a system inclusive of plans and procedures for monitoring, measuring, analysing and improving performance in relation to objectives, product conformity and the satisfaction of interested parties

The Procedures shall identify the issues for measurement and what the needs are, and translate them into requirements. They shall identify what criteria are applicable, what measurements are made and the methods of analysing the data. The issues for assessment shall include both achievement of performance objectives and satisfaction of interested parties.

The Contractor shall identify actions for improvement from the monitoring and analysis of his performance, and implement actions for continual improvement.

The Contractor's monthly progress report shall include a summary of the monitoring activities and results with an analysis of any trends and identification of improvement actions.

Contractor's Performance Improvement Program is to be linked to Contractor Quality Incentive Programme and the link is to be defined within the subject Plans/Procedures.

3.10.1 Nonconformity and Corrective Action

The Contractor shall develop, document via procedure for Engineer approval and thereafter implement a process for identifying, documenting, resolving product related defects and quality management system nonconformities.

The controls, related responsibilities and authorities for dealing with nonconforming product, whether identified by the Contractor, Suppliers or the Engineer, shall be identified.

The Contractor shall develop, document and maintain for the duration of the project a Non-conformance Register which shall record all necessary data inclusive of:

a) Non-conformance Report No.
b) Defect description
c) Project Phase
d) Traceability
e) Failure Mode
f) Date issued
g) Answer Date – required and actual
h) Action Date – planned and actual
i) Close out date

The Contractor shall develop a numerical risk ranking scoring system for defects based on Schedule, Safety, Functionality, Performance, Operability and Serviceability and shall ensure that work does not proceed where the risk ranking identified unacceptable risk to the product, personnel or environment.

3.10.1.1 Nonconformity Identified by Contractor

Defective product and Nonconforming systems identified by the Contractor shall be documented via a “Non- conformance” Report.

The Contractor Non-conformance Reports shall be issued to the Engineer within 24hours of initiation initially for information purposes and thereafter re- issued to the Engineer within seven (07) days of initiation identifying Contractor’s proposed defect correction details and risk ranking for:

a) Information - where nonconforming product is to be scraped or reworked to conformity

b) Approval - where nonconforming product is to be repaired or used as is

The Contractor Non-conformance Reports shall:

a) Be uniquely numbered.

b) Trace the nonconforming product by Unit, Area, KKS and Item description.

c) Be disposition as rework, scrap, repair or use-as-is.

d) Identify defect correction measures.

e) Risk ranks the impact of the non-conformance relative to Schedule, Safety, Functionality, Performance, Operability and Serviceability.

f) Facilitate the Engineer:

- Endorsement of proposed disposition and defect correction prior to implementation.
- Verification of completion of proposed defect correction.

g) Be signed by the Contractor technical and quality authorities verifying accuracy of detail and defect correction measures prior to actioning and after actioning.

All work shall stop immediately on any nonconforming product disposition as “Repair” or “Use As Is” or where risk ranked as “unsafe” to proceed until the Contractors proposed disposition and defect correction measures are accepted by the Engineer and the relevant authorities (which may include the Supplier, the Contractor, the Design Authority, the Authorized Inspection Authority and the Engineering Authority).

The Contractor’s completion of proposed, and the Engineer agreed, defect correction measures shall be identified to the Engineer via issue of an Inspection and Test Notification by the Contractor. The Engineer’s verification of the completion of proposed defect correction measures shall be documented on the Inspection and Test Notification Report and Contractors Non-conformance Report.

The Contractor shall identify repeat defects and nonconformity as systematic failures of their quality management system and shall initiate a Corrective Action Report and undertake Root Cause Analysis. In such cases Quality Management System rectification measures shall be introduced immediately.

3.10.1.2 Nonconformity Identified by Engineer

Defective product and nonconforming systems identified by the Engineer shall be documented via a "Notice of Defect" Report, see Appendix 9 of this document, which shall be issued to the Contractor.

In such instances the Contractor shall investigate the matter and respond in writing to the Engineer on the original Notice of Defect Report within seven (7) days identifying:

a) Proposed disposition, or alternatively, document reasons why it is not a nonconformity,

b) Proposed defect "correction" measures and proposed correction date.

c) Traceability of nonconforming product by Unit, Area, KKS and Item description

d) Risk ranking of the impact of the non-conformance relative to Schedule, Safety, Functionality, Performance, Operability and Serviceability.

e) Technical and quality authorities' verification of accuracy of detail and defect correction measures. The Engineer shall coordinate internal review of Contractor proposed defect correction measures.

The Contractor's completion of proposed, and the Engineer agreed, defect correction measures shall be identified to the Engineer via issue of an Inspection and Test Notification by the Contractor.

The Engineer's verification of the completion of proposed defect correction measures shall be documented on the Inspection and Test Notification Report and the original Notice of Defect.

The Contractor shall identify repeat nonconformities as systematic failures of their quality management system and shall initiate a Corrective Action Report and undertake Root Cause Analysis. System rectification measures shall be introduced immediately.

3.10.1.3 Trending of Nonconformities

The Contractor shall trend defects initiated by the Contractor, Suppliers and the Engineer on a weekly basis.

Trending shall be displayed numerically and pictorially on a weekly basis and shall identify weekly and cumulative trends on the basis of:

a) Defect type

- Including, but not limited to: Material, Traceability, Workmanship, Dimensional Test Failure, Damage, Documentation and Procedural.

b) Project phase

- Manufacture, construction/installation or commissioning.

c) Status
- Issued, answered, actioned and closed and time delays for dispositioning and resolution

d) Risk ranking
- Relative to Schedule, Safety, Functionality, Performance, Operability and Serviceability.

e) Ratios
- The Contractor versus the Engineer
- Per Manufacturer
- Per Sub Contractor
- Per Unit, Area and / or Sub system

Where Notice of Defect Reports issued by Engineer exceeds ten percent of the Contractors Non-conformance Reports recorded within the Contractors defect management system the Contractor shall undertake and document:

a) Formal root cause analysis of defects and identify corrective and preventive action

b) an internal review of the quality management system with

Construction/Managers/Supervisors/QC Engineers/Inspectors

to identify why defects are not being accounted for during construction by Supervisors and during inspection activities by inspectors.

3.10.1.4 Reporting of Nonconformity Statistics

The Contractor shall maintain and provide an electronic native file copy on a weekly basis to the Engineer, of Contractor's

a) Non-conformance Register.

b) Non-conformance trend analysis documented both numerically and graphically.

The said Registers shall account for Contractor's, Supplier's and The Engineers Non-conformance Reports.

Non-conformance Reports and Notice of Defect Reports shall form part of the permanent quality records and shall be included in Manufacturing, Construction and Commissioning Record Books by the Contractor.

3.10.2Learning from Incidents/Lesson Learnt

The Contractor shall establish, document via procedure for the Engineer approval and thereafter implement a process to learn from incidents as the basis for identifying and implementing preventive actions.

A database of Lessons Learnt shall be established by the Contractor and shall include the lessons learnt from the Contractor's previous two project and those learnt form the Medupi Power Station project to ensure that the potential for defective processes, services and product, are analysed and preventive actions implemented to prevent their occurrence during the project lifecycle

A formal Lessons Learnt review shall be conducted by the Contractor, with the participation of the Engineer, on a quarterly basis to describe what happened, what the issues were, what went well and what could have improved in relation to such issues and what preventive actions can be implemented as a result.

The Contractor shall incorporate Lessons Learned into the Works where appropriate.

The Contractor shall provide an electronic native file copy of the Lessons Learn database to the Engineer for information on a monthly basis.

4. Process for Monitoring

4.1 Revision Period

All QMS Documents shall undergo a 3-yearly compulsory revision.

4.2 Training

No project specific training required to implement the process documented in this document beyond normal job function.

5. Acceptance

This document has been seen and accepted by:

Name	Designation
Phillip Dukashe	Project Director
Zandi Shange	Senior Construction Manager
Barry Janse van Rensburg	Senior Construction Manager
Nthabiseng Malebo	Employer's Representative
Freddie Els	Commissioning Manager
Jacky Mathobela	Engineering Manager
Thelma Madzhiga	Documentation Management Manager
Moses Sinobolo	Offsite Quality Control Manager
Emile Marell	Environmental Manager

6. Revisions

Date	Rev.	Compiler	Remarks
March 2019	04	S Mlobeli	Updated the contents to align with the requirements of ISO 9001:2015
February 2011	02	I Gough	Modified to match user requirements
September 2007	1.1	P Newman	Reissued conformant to SPF numbering system; modified to match requirements

7. Development Team

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

- Simphiwe Mlobeli
- Moses Sinobolo
- Raymond Tshotheli

8. Appendix 01 Criticality Assessment

All equipment, instruments, piping and civil/structural items and processes on the Medupi project shall be assigned a Criticality Rating. This shall include items of equipment or systems to be procured from suppliers and each separate hardware package to be designed, constructed, installed and tested by the Contractor.

The technique of Criticality Rating is applied by systematically considering each of the following criteria for equipment, materials and processes being evaluated:

a) Safety

b) Fluid Characteristics

c) Operational Significance

d) Availability and Accessibility for Repair/ Replacement

e) Design Maturity

f) Complexity of Manufacture / Construction / Installation

g) Economics

h) Environmental Impact

Points are awarded against each of the above referenced criterion by qualitatively considering the relative effects of a failure.

Each criterion is divided into five levels with increasing number of points based upon relative criticality.

The maximum number of points available for each criterion is "weighted" effectively giving a higher Criticality Rating for HSE-related criteria. An appropriate level is selected for each criterion. **See Appendix 04.**

Summation of the points for all criteria gives a total that defines the Criticality Rating.

The total number of points determined by summation of the individual criterion points will result in classification of an equipment item on one of the following Criticality Ratings:

Criticality Total Points	Rating	Description
43 to 56	I	Item quality is vital and must not be compromised
29 to 42	II	Item quality is of significant importance
15 to 28	III	Item quality is of moderate importance
0 to 14	IV	Normal commercial quality is acceptable

Once determined, the Criticality Rating shall be recorded on the Equipment List.

9. Appendix 02 Criticality Assessment and Scoring Criteria

1 - Safety		
Failure would result in...		Score
A	No risk to the health and safety of the operating personnel	0
B	Limited risk to the health and safety of the operating personnel	3
C	Significant risk to the health and safety of operating personnel	6
D	Undue risk to the health and safety of operating personnel and/or limited risk to the public	9
E	Undue risk to the health and safety of operating personnel and the public	12
2 - Fluid Characteristics (Mechanical Equipment)		
Fluids contained are judged to be...		Score
A	Completely harmless	0
B	Unlikely to present a hazard under normal conditions	2
C	Low hazard, toxicity, pressure or temperature	4
D	Medium hazard, toxicity, pressure or temperature	6
E	High hazard, toxicity, pressure or temperature	8
3 - Operation Significance		
Failure would result in...		Score
A	No operational consequences	0
B	Use of an installed spare, by-pass of failed item, or change-out without difficulty	2
C	Reduction in operational efficiency without loss of plant integrity	4
D	By-pass or change-out of failed item with loss of plant integrity	6
E	Plant operation jeopardized, with serious consequences	8
4 - Availability/Accessibility for Repair / Replacement		
Item is ...		Score
A	Easily accessible, spared and replaced from normal spares inventory	0
B	Easily accessible and replaceable from normal spares inventory	1
C	Difficult to access for repair or replacement, but parts are readily available	2
D	Inaccessible during operation, not spared, requires special purchase and/or plant shutdown	3

E	Long lead item, protracted delivery, requires plant shutdown, difficult replacement	4
5 - Design Maturity		
Design is ...		Score
A	Proven by frequent previous use	0
B	Combination of proven design elements for same application	1
C	Modification of proven design for a different application	2
D	Redesign of existing item for a different application	3
E	New design from first principles	4
6 - Complexity of Manufacture / Construction / Installation		
Manufacture / construction / Installation process requires...		Score
A	A few simple processes	0
B	A significant number of simple processes	1
C	A few complex processes	2
D	A significant number of complex processes	3
E	A large number of complex processes	4
7 -Economic Impact		
Failure results in...		Score
A	N eligible le inconvenience and/or cost	0
B	Limited direct and/or consequential costs	2
C	Significant direct and/or consequential costs	4
D	Serious direct and/or consequential costs	6
E	Extreme direct and/or consequential costs	8
8 - Environmental Impact		
Failure results in...		Score
A	No environmental l consequences	0
B	Minimal environmental damage	2
C	Environmental consequences restricted to on-plant vicinity	4
D	Potential damage to the local environment	6
E	Catastrophic damage to the Site and local environment	8

10. Appendix 03 Criticality Rating Register

Item No.	Description	Safety (0,3,6,9,12)	Fluid Character (0,2,4,6,8)	Operations Significance (0,2,4,6,8)	Access for Repair (0,1,2,3,4)	Design Maturity (0,1,2,3,4)	Manufacture / Installation Complexity (0,1,2,3,4)	Economic Impact (0,2,4,6,8)	Environmental Impact (0,2,4,6,8)	Criticality Total Rating

11. Appendix 04 Inspection and Test Plan

Eskom	**Medupi Power Station Project** **Inspection and Test Plan**	**Template Identifier**	**348-64756**	**Rev**	**0**
		Document Identifier	**xxx-xxxx**	**Rev**	**0**
		Effective Date	**January 2019**		
		Review Date	**December 2021**		

Insert ITP Title/Description for the Works herein:

Package Number:

Approved for implementation by Contractor Engineering and Quality				ITP Document Number: Drawing Number: KKS Number: Area & Section: Activity start date: End date:	**Approved for implementation by Eskom Engineering and Quality**			
	Engineering		**Quality**			**TM Engineering**		**TM Quality**
Name		Name			Name		Name	
Signature		Signature			Signature		Signature	
Date		Date			Date		Date	

Contractor to utilise this row to define any requirements specific to this ITP

A – Actual Inspection; **W** – Witness of Inspection; **R** – Review Document; **H** – Hold Point **1 –** 100% **2** – 10% minimum, (Hold point not to be exceed until verified and must proceed the inspection requirement eg: H/A1")

No.	Process Inspection and for Test Activity	Responsible	Controlling Procedure Doc No.	Controlling Specification Doc No.	Inspection Requirement						Quality Verification Record Doc. No	NCR / NOD
									Eskom			
					BC	IC	AIA	OTHER	ENGINEERING	QAQC		

Work endorsed as Complete and Conformant	Contractor Engineering Signature		Date		Team Medupi Engineering Signature		Date	
	Contractor Quality Signature		Date		Team Medupi QA / QC Signature		Date	