

	<b>Specification</b>	<b>Group Capital</b>
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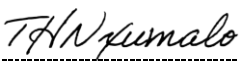


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## **1. Introduction**

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

When read for FGD Project, this Specification (348-930500) takes precedence over QM 58 where there is apparent conflict.

This Specification outlines the details of the quality assurance system to be deployed by the DP and *Contractor* as required by Eskom

The DP'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 the Medupi FGD Retrofit Project at Lephalale, in the Limpopo Province of South Africa.

Supporting this goal are a number of Project objectives to be achieved by the DP/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 DP shall ensure that quality Integrity, reliability, maintainability and interchangeability are built into every stage of the Works through design, manufacture, supply, installation, commissioning, operations, maintenance and service.

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## 2. Supporting Clauses

### 2.1 Scope

#### 2.1.1 Document Scope

This document specifies the requirements for the DP Quality Management System (QMS) to be established, implemented, maintained, and continually improved for the duration of the Medupi FGD Retrofit Project.

#### 2.1.2 Project Scope

The Project includes the provision of a fully functional and seamlessly integrated FGD System at Medupi Power Station. The Project is required to yield desulphurisation systems that provide removal efficiency solutions based on meeting South African Minimum Emission Standard (MES) for new power plants, the *Employer* expects a guaranteed emission limit of 800 milligrams per normal cubic metre (mg/Nm<sup>3</sup>) normalised to 10 % oxygen (O<sub>2</sub>) at standard temperature and pressure.

Eskom's principal generation technology is pulverised coal with approximately 90% of its current generating capacity relying on coal-fired power stations. One such power station is the Medupi Power Station (MPS) situated in Lephalale, Limpopo Province.

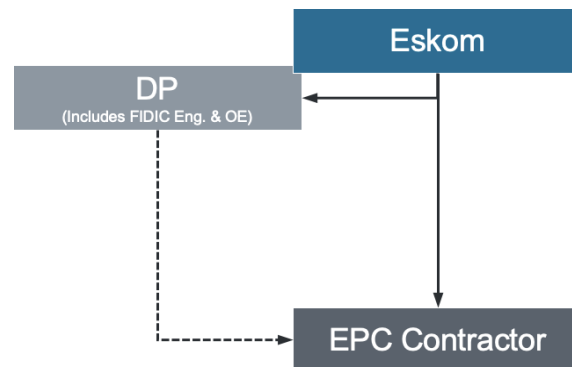
Medupi Power Station is earmarked for a Flue Gas Desulfurisation (FGD) retrofit to comply with the South African Minimum Emissions Standards (MES) by 31 March 2030. Medupi Power Station operates under an atmospheric emission license (AEL) issued to provide the Employer with operational conditions to adhere to in terms of the National Air Quality Act 39 of 2004 as amended, Eskom is aiming for a limit of 400 mg/Nm<sup>3</sup> (dry, 10% O<sub>2</sub>) to ensure continuous performance without contravening the Atmospheric Emission License. The FGD retrofit project addresses these regulatory demands, promoting environmental compliance, public health protection, and sustainable energy production.

The Retrofit Project works will be procured through the appointment of an Engineering, Procurement and Construction (EPC) Contractor under the framework of a FIDIC Yellow Book contract as amended, This Contract is produced by the *Employer* using elements of the Conditions of Contract for Plant and Design-Build 1999 published by FIDIC. This Contract is produced under license No.134892 from and with the permission of FIDIC. Consequently, no part of this Contract may be copied, translated, stored, reproduced, or distributed in any form except in accordance with the terms of that license. This Contract is not endorsed by FIDIC and FIDIC takes no responsibility for the accuracy, completeness, adequacy or otherwise of this Contract. As part of execution of this project, Eskom as the Employer is seeking a delivery partner (DP) that must come and co-operate with Eskom by leading the EPC *Contractor* as per the *Employers* requirements under the EPC contract and mitigate risks and opportunities. The DP's role will encompass the Owners Engineer, which is a team of technical expertise required for effective execution and supervision of the project; and act as a FIDIC Engineer (FE). As such, the use of the Owners Engineer's (OE) and Delivery Partner will be synonymous in this document. Refer to *Figure 1* below that shows the various interaction within the Delivery Partner:

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**Figure 1 Model Structure showing interaction between Eskom, DP & EPC**

The Delivery Partner will play a dual role, supporting and guiding the *Employer* in their capacity as the Delivery Partner for the works, and act as the FIDIC Engineer to manage the EPC contract. This will require delivering services across various capacities, utilising a diverse set of professional skills and expertise, as outlined herein.

In terms of the scope of the EPC, the *Contractor* is expected to submit a main tender proposal based on a wet FGD system, specifically the limestone forced oxidation open spray tower configuration. Additionally, the EPC Contractor has the option to submit an alternative tender, which may include a different configuration of wet FGD or an entirely alternative FGD technology.

The Retrofit Project will comprise of the following systems:

- Sorbent and waste handling systems and, environmental systems.
- Reagent preparation systems and dewatering systems.
- Absorbers and auxiliaries.
- Integration with the existing Distributed Control System (DCS).
- Integration with the existing Centralised Building Management System (CBMS).
- Electrical (supply of electrical equipment and integration with existing electrical system).
- Raw water treatment plant, FGD wastewater treatment plant, and FGD Laboratory.
- Site services and facilities.

As such, the DP needs to be fully competent in supporting the delivery of the EPC scope. The services required by the Employer during the FGD Retrofit Project at Medupi Power Station from the Delivery Partner are categorized in the following five sub-areas:

- Project Management Services – to include, inter alia, developing and managing an integrated program scope, schedule, costs and project assurance.
- Engineering Services – to include technical planning and delivering by the Delivery Partner as both an Owners Engineer and an Architect Engineer. Quality services in various areas of technical specialization as included under Engineering services.

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- Procurement and Commercial Services – to include procurement services, negotiations, strategy, and commercial services during execution such as legal and contract management.
- Construction Management Services – primarily responsible for integrating the works during manufacturing, construction, commissioning and handover phase.
- FIDIC Engineer – to provide a nominated individual(s) and supporting team who will assume the role of the FIDIC Engineer in line with FIDIC Yellow Book (as amended), once the EPC contractor is appointed.

The DP will thus be expected to carry out tasks in the five Prime Activity areas (PA) as outlined below:

- PA 1 Project Management including Quality Management
- PA 2 Engineering Services
- PA 3 Procurement and Commercial support services
- PA 4 Construction Management
- PA 5 FIDIC Engineer

The DP will be integrated within Eskom's operational model, fostering shared ownership of delivery and aligning incentives with project outcomes.

The DP will also be required to transfer skills and mentorship to enable the *Employer's* personnel to possess similar level of competency upon completion of the project.

### **2.1.3 Purpose**

The intended purpose of this Specification is to ensure that the DP provides the *Employer* with the assurance that the Works, and any associated or corollary obligations are designed, executed, completed, or discharged in a manner so as to achieve the required 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 described or specified in the Contract are met in full and verified as such to *Employer* satisfaction.
- b. The *Employer's* requirements include full compliance with the current revision of all relevant Eskom specifications contained in the Project User Requirements Specification (URS) and 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 NEC PSC Conditions of Contract Clause [Adjustments for Changes in Legislation].
- c. Where such procedures are written with reference to a form of Contract other than NEC then the procedure is to be read to accord with the relevant terminology used in NEC.

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- d. Quality management shall be in accordance with International Organisation for Standardisation (ISO) 9001 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 DP and all persons real or juristic working for or on behalf of the DP 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 DP or on the DP's behalf or direction that affects or influences the compliance to DP requirements, including the risks associated therewith, shall be subject to a systematic documented approach that ensures that what the DP provides complies with the requirements of the Contract.
- g. Quality management shall ensure that the Quality Assurance Plans, Inspection and Test Plans and procedures developed or adopted provide stages at which the DP (appointed) 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 must 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.

#### **2.1.4 Applicability**

This document shall apply to all Contractors doing work at Medupi FGD Retrofit Project.

#### **2.1.5 Effective date**

The last date of authorisation as per the signature page.

#### **2.1.6 Integrity Management and Assurance**

Integrity assurance and quality assurance shall be affected by the DP via:

- a. Implementation of a quality management system, with processes and procedures compliant with ISO 9001:2015.
- 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 and construction/installation inspection levels.
- f. Supplier assessment.

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- 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. Defects management.
- k. Measurement, analysis and continual improvement
- l. Customer feedback.

The DP 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 Inspection and 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 are necessary for the effective review of the quality management system concerned, both before and during the *Employer's* visits.

The DP auditing may include monitoring the DP's adherence to the quality management system documentation and the relevant ISO standards by review, surveillance, inspection and by quality system audits of the DP's activities and those of his Subcontractors, sub-consultants or suppliers. The DP 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 DP /Client representative shall be provided by the *Contractor* within ten (10) days of receipt of Audit Notification.

## **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] FIDIC family of contract documents, as applicable to the specific contract.
- [3] Mines Health and Safety Act and associated Regulations
- [4] ISO 10005 Guidelines for Quality Plans
- [5] ISO 10007 Guidelines for Configuration Management
- [6] ISO 3834 Part 1 to 6 Quality Requirements for Fusion Welding of Metallic Materials

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[7] 240-105658000 QM58 Supplier Quality Management Specification

### **2.2.2 Informative**

[8] 348-883902 Medupi Project Quality Plan

[9] 348-106670 Site Quality Assurance and Control Work Instruction

[10] 348- 688660 Quality Clearance House Terms of Reference

[11] 348-890104 Control of Nonconforming Outputs Work Instruction

[12] 348-106620 Site Quality Control and Verification Level 2 Target Inspection Work Instruction

[13] 348-80423 Quality Management System Audits Work Instruction

[14] 348-860842 Manufacturing Inspection and Testing Work Instruction

[15] 348-860843 Storage and Preservation Work Instruction

[16] 348-883554 Corrective Action Request Work Instruction

[17] 348-883860 Medupi Power Station Documentation Format and Layout Specification

Note: DP and Contractors are required to comply with all *Employers'* requirements as per contract.

### **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:

<b>Term</b>	<b>Explanation</b>
Quality	Means the degree to which a set of inherent characteristics fulfils requirements.
Requirement	Means the need or expectation that is stated, generally implied or obligatory.
Quality Management	Means coordinated activities to direct and control an organization with regard to quality.
Quality Objective	Means something sought, or aimed for, related to quality.
Quality Assurance	Means part of quality management focused on providing confidence that quality requirements shall be fulfilled.
Quality Control	Means that part of quality management undertaken by Contractor focused on fulfilling quality requirements.
QMS	Means the quality management system complying with the requirements of ISO 9001 and the specific requirements of the Project Manager/ Delivery Partner applied by the Contractor for the Contract to direct and control and organisation with regard to quality.
Inspection	Means conformity evaluation by observation and professional judgement accompanied by measurement, testing or gauging as appropriate.

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<b>Term</b>	<b>Explanation</b>
Verification	Means documented confirmation, through the provision and review of objective evidence, that specified requirements have been fulfilled.
Certification	Means the issue of a statement of conformity assessment, i.e., it is the output of Verification.
Supplier	Means Subcontractors, sub consultants or any person real or juristic that supplies, fabricates, manufactures or otherwise contributes Materials, Plant or services to the Contractor in furtherance of the Contract.
Procedure	Is a generic term to cover any document that provides work instructions for carrying out part, or all, of an activity or process.
Project Quality Management Plan	Means the document setting out the specific quality practices, procedures, resources and sequence of activities for the management of quality relevant to the project conformant to ISO 9001 and ISO 10005.
Quality Assurance Plan	Means 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	Means 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)	Means 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 Project Manager for each unique activity, whether temporary or permanent works prior to activity commencement.
Quality Verification Record	Means a document stating results achieved and / or providing evidence of activities performed.
Quality Risk and Criticality Rating System	Means 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 further determine appropriate inspection levels.
Inspection Level	Means a comparative indication of the intensity of the inspection program; <ul style="list-style-type: none"><li>• Inspection Level 1 - Full Stage Inspection: Inspection is carried out progressively from commencement of manufacturing to final acceptance.</li><li>• Inspection Level 2 - Systematic Stage Inspection: Inspection is carried out at predefined stages, with specific hold and witness points.</li><li>• Inspection Level 3 - Final Inspection: Inspection is carried out on the completed item.</li><li>• Inspection Level 4 - Document Inspection: Inspection is carried out by review of Quality Verification Records.</li></ul>
Audit Plan	Means a documented planned schedule of audits undertaken during the design Engineering, procurement, construction and commissioning phases of the works.

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<b>Term</b>	<b>Explanation</b>
Inspection Intervention	<p>As documented in an ITP means intervention in an activity by either conducting an actual inspection (A), witnessing an inspection (W) or reviewing deliverables (R).</p> <ul style="list-style-type: none"> <li>Actual Inspection (A) - as set out in an ITP means actual inspection or test. In such instances DP shall be notified in writing via a Contractor issued Inspection &amp; Test Notification.</li> <li>Witness Inspection (W) - as set out in an ITP means witness of inspection or test. In such instances DP shall be notified in writing via a Contractor issued Inspection &amp; Test Notification.</li> <li>Review (R) - as set out in an ITP means documents relevant to the process, inspection or test activity shall be reviewed. In such instances DP be notified in writing via a Contractor issued Inspection &amp; Test Notification.</li> <li>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 <i>Employer's</i> personnel and found to be complete. In such instances DP shall be notified in writing via a Contractor issued Inspection &amp; Test Notification - Hold (H) shall by default be suffixed with either "A", "W" or "R"</li> </ul>
Inspection Schedule	Is a document to be issued by Contractor (in a format to be approved by DP on a monthly basis (one week before the end of the month for the preceding month) identifying the <i>inspections and tests, as defined in Inspection and Test Plans, to be performed by Contractor</i> and DP at manufacturers premises and site.
Inspection & Test Notification	Is a document issued by <i>Contractor</i> to DP 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 Project Manager / Delivery Partner attendance.
Performance Improvement Program	Means 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)	Is a measure of system or product quality performance.
Performance Standard (PS)	Means a set performance standard level for a Performance Metric against which actual performance shall be compared.
Performance Target (PT)	Means a set performance target level for a Performance Metric against which actual performance shall be compared - the target shall be more stringent than the standard with the aim of improving upon the standard.
Site Work Approval System	Is the system implemented by Delivery Partner/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 QHSE and specifications requirements.
Learning from Incidents	Means a review of data to ensure that the potential for defective product or nonconformant processes, services and product, are analysed and mitigated to prevent their re-occurrence during the project lifecycle.
Continuous Improvement	Means continuous improvement 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	Means a product related non-fulfilment of a requirement related to an intended or specified use.
Nonconformity	Means a system or process non-fulfilment of a requirement related to an intended or specified use.

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<b>Term</b>	<b>Explanation</b>
Repair	Means the process of correcting a defect subject to the Project Manager / Delivery Partner's agreement and prior approval.
Product	Means the Works, including as the context requires, all Materials, Plant or Goods incorporated or contained therein and all services performed in relation thereto.
PVP	Means a Product Verification Plan which is a document produced by AIA to define precisely the extent and type of inspection and testing during manufacture and erection of statutory operating plant equipment and components by Contractor and AIA.
MITN	Manufacturing Inspection Test Notification.

## **2.4 Abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
AFI	Application for Final Inspection
AIA	Authorised Inspection Agency
CQP	Contract Quality Plan
DP	Delivery Partner
EDMS	Electronic Document Management System
EN	European Norms
FGD	Flue Gas Desulphurisation
FIDIC	Federation Internationale Des Ingenieurs-Conseils
ISO	International Organisation for Standardisation
ITP/QCP	Inspection and Test Plan / Quality Control Plan.
I&TN	Inspection and Test Notification
KKS	Kraftwerk Kennzeichen System (German for Power Plant Classification System)
NEC	New Engineering Contract
NCR	Non-conformance Report
NDE	Non-Destructive Examination
NOD	Notice of Defect
OHSA	Occupational Health and Safety Act
PER	Pressure Equipment Regulation
PWHT	Post Weld Heat Treatment
PSC	Professional Services Contract
PVP	Product Verification Plan
QA	Quality Assurance
QC	Quality Control
QMS	Quality Management System
SPO	Smart Plant Operator
SANS	South African National Standard.
TPIA	Third Party Inspection Agency
TOC	Take Over Certificate
VuP	Vessels under Pressure

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## **2.4.1 Roles and Responsibilities**

### **a) Responsible**

Those who do the work to achieve the task. There is at least one role with a participation type of responsible, although others can be delegated to assist in the work required.

### **b) Accountable (also approver or final approving authority)**

The one ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those responsible. In other words, an accountable must sign off (approve) work that responsible provides. There must be only one accountable specified for each task or deliverable.

### **c) Consulted (sometimes counsel)**

Those whose opinions are sought, typically subject matter experts; and with whom there is two-way communication.

### **d) Informed**

Those who are kept up-to-date on progress, often only on completion of the task or deliverable; and with whom there is just one-way communication.

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

For NEC QA roles and responsibilities are summarized in the 348-916764 Quality Assurance Process Flow Map, in conformity with a relevant Clause of the NEC PSC Conditions of Contract for Construction of the Medupi FGD Retrofit Project. The Process map ultimately outlines the sequence and interactions of the Contractor's QMS deliverables with the Employer's monitoring and measurement activities.

## **2.4.2 Related/Supporting Documents**

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

[1] Appendix 1 – Criticality Assessment

[2] Appendix 2 –Application for Final Inspection

[3] Appendix 3 - Inspection & Test Plan

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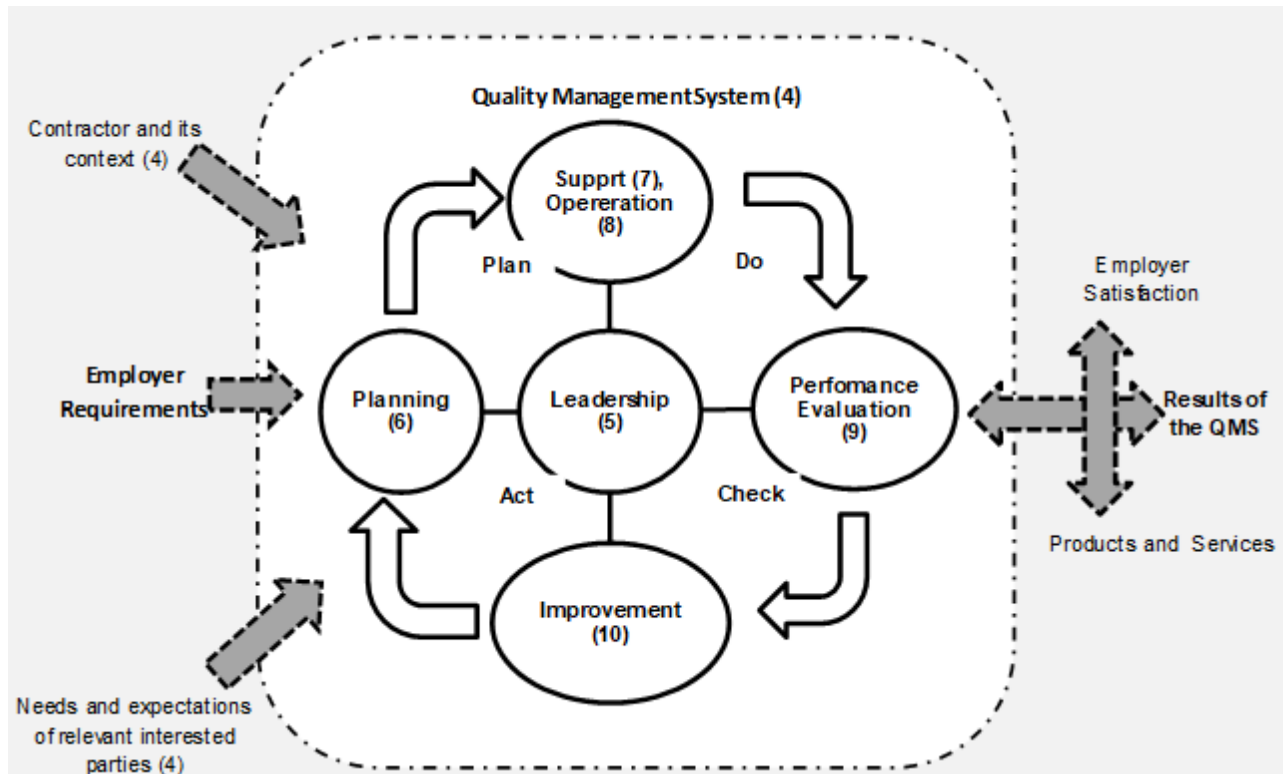
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### 3. Document Content

#### 3.1 Quality Management System and its Processes



**Figure 2: Quality Management System Chart**

The DP shall identify, develop, document for the DP /Client representative approval and thereafter implement those management systems needed to direct and control the work of DP's organization in an effective manner. In doing so the DP shall adhere to the principles expounded in the standards and guidelines listed under Item 5(Figure1) of this section of the *Employers Policies and Procedures*.

The DP shall develop, document and implement a quality management system (QMS) for all phases of the Work relevant the Medupi Station Project. The QMS shall be:

- Project specific
- Conformant and compliant to ISO 9001:2015
- Inclusive of the project specific requirements defined in this section of Employers Policies and Procedures.
- 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.

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The DP'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.
- 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.

### **3.1.1 Leadership**

### **3.1.2 Leadership and Commitment**

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

The DP top management consisting, as a minimum, of the DP Project Representative and Quality Manager shall commit to, and ensure implementation of, the effective promulgation and dissemination of the DP's quality policy and quality objectives and ensure provision of quality management system orientation and induction sessions for all the DP 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* requirements and interfaces

### **3.1.3 Customer Focus**

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

- a. Identify, document and obtain the *Employer's* approval Key Performance Metrics, Performance Standards and Performance Targets against which the metrics shall be measured.
- b. Measure, analyse and trend metrics.
- c. Submit to the *Employer* on a weekly 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 DP on the operation and performance of DP quality management system and satisfaction of DP.

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

The DP shall trend complaints and utilise the outcome to aid and determine corrective/ future preventive actions and lessons to be learned of similar scope of work.

#### **3.1.4 Policy**

DP’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.

DP top management consisting as a minimum, of DP’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

#### **3.1.5 Organisational Roles, Responsibilities and Authorities**

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

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

Project Job Descriptions for all of the DP personnel shall be provided to the *Employer*.

### **3.2 Planning**

#### **3.2.1 Actions to address Risks and Opportunities**

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

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### **3.2.2 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 Employer's requirements have been achieved.

DP 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 DP Quality Improvement Program.

DP 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 DP's Project Quality Policy.

### **3.2.3 Management Representative**

DP'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 Departments 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 DP. Should DP withdraw his consent to the Quality Manager the Contractor shall promptly nominate a replacement

## **3.3 Support**

### **3.3.1 General**

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

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

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- a. Verified as competent relevant to their intended work function.
- b. Trained in project quality strategy, policy, objectives and requirements.
- c. Employed at an adequate number in 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 DP shall employ, at all times, sufficiently qualified and knowledgeable quality assurance, quality control and inspection staff to assure, to control and to verify the quality of manufacturing and construction. 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 DP 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

### **3.3.2 Organisational Chart**

The DP shall prepare, and submit for the Employer's approval, an overall Project Organisation Chart and a Quality Department Organisation Chart of the planned organisation for the Work, depicting names, titles, and the reporting relationships and inter-relationships of all key-personnel, Quality Department personnel and Supervisory personnel assigned for all phases of the Work.

### **3.3.3 Competency Assessment**

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

The DP 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) A resume identifying qualifications and all past experience
- b) A Job Description
- c) An Interview Questionnaire
- d) A Competency Assessment Interview Checklist

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

For the DP's guidance the following list indicates *Employer's* view regarding personnel who are assigned to the Quality Department or responsible for verifying quality and for whom a "Competency File" must be maintained.

- a) Quality Assurance Manager

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- b) Quality Control Manager
- c) Quality Assurance and Quality Control Engineers / Coordinators
- d) Lead Engineers and Discipline Engineers
- e) Welding Engineers
- f) Quality Auditors
- g) Discipline Inspectors – Civil, Painting, Welding, Mechanical, Electrical, Instrumentation, NDE/PWHT etc.
- h) Material Controllers
- i) Discipline Supervisors
- j) Data Captures.

### **3.3.4 Infrastructure**

The DP 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

### **3.3.5 Documented Information**

DP shall list all documents needed for the effective implantation of the project quality management system (QMS) and shall, as a minimum, prepare, maintain and implement throughout the life 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:
  - Design.
  - Manufacturing, Inspection and Testing.
  - Construction, Inspection and Testing.

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- Commissioning and Taking-Over.
- j) Project Quality Control Plans - 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 the Employer not less than 30 days before the work governed by the document is planned to start.

The DP shall develop, document for the *Employer's* approval a Vendor Documentation Submission Schedule (VDSS) and a Master Documentation List (MDL).

- Each document on the VDSS shall have marked against it the planned date of submittal to the Employer.
- Each document on the MDL shall have marked against it the actual date of submittal to the Employer.
- The classification of documentation (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 *Employer's* approval - where the DP may not proceed with the Works that are the subject of the document until it has been approved by Employer.
  - **Class 2** - for the *Employer's* Review - where the DP may proceed with the works that are the subject of the document if the Employer has made no comment after twelve (12) working days from the receipt by the DP.
  - **Class 3** - for the *Employer* - where the *Employer* reserves the right to comment, but the DP 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 *Employer*.

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

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### **3.3.6 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 *Employer* and DP 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 pre-commissioning activities. These shall be issued by the DP electronically via email to the *Employer* as defined in section 3.8.4. of this section of document.

The DP'S 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 in 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 DP to develop and maintain a Vendor Documentation Submission Schedule (VDSS) and the "Master Document List" (MDL) the DP's Quality Management system shall include a management approved, stand alone, revision controlled "QMS Index".

The QMS Index shall identify;

- a) The document Title, Number and Revision status.
- b) The DP review and approval status.
- c) Be submitted to the *Employer* monthly in electronic "native copy" format.

The DP shall develop, documented via procedure for the Employer's approval and thereafter implement a process to define:

- a) The types of documents applicable to the DP's quality management system
- b) The format, structure and content of documents.
- c) The document numbering and revision system.

Including the controls needed to;

- a) Review and update as necessary and re-approve documents.
- b) Ensure that changes and the current revision status of documents are identified.
- c) Ensure that relevant versions of applicable documents are available at points of use.
- d) Ensure that documents remain legible and readily identifiable.
- e) Ensure that documents of external origin are identified and their distribution controlled.
- f) Prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

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Documents shall be submitted to the *Employer* for review and approval, as appropriate, in electronic native file format.

### **3.3.7 Project Quality Management, Quality Assurance, Control and Inspection & Test Plans**

#### **3.3.7.1 Project Quality Plan**

The DP shall prepare, in line with the requirements of ISO 10005 and conformant ISO 9001:2015, and formally submit, a Medupi FGD-specific Quality Management Plan and for the *Employer's* approval.

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

- a) Context of the Organisation
- b) Leadership
- c) Planning
- d) Support
- e) Operation
  - Including completion testing across all disciplines.
- a) Performance Evaluation
- b) Improvement
  - Including defect/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 DP's activities, processes, plans and procedures written against the corresponding paragraphs of the relevant clauses of the ISO 9001 QMS.

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.

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### **3.3.8 Project Quality Assurance and Quality Control Plans.**

Project Quality Assurance and Quality Control Plans shall be developed during the project, each as an adjunct to the overall Project Quality Management Plan, to focus on and address particular phases (QA Plans) and disciplines (QC Plans) 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 Assurance and Quality Control Plans.

In general, each QA and 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 assurance and quality control requirements documented via the Project Quality Management Plan.

Project Quality Assurance and Quality Control Plans shall be developed during the project, each as an adjunct to the overall Project Quality Management Plan, to focus on and address particular phases (QA Plans) and disciplines (QC Plans) 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.

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In general, each QA and 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 assurance and quality control requirements documented via the Project Quality Management Plan.

#### **3.3.8.1 Inspection 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 DP for each unique manufacturing, construction/installation and commissioning activity, whether temporary or permanent works, or as required by the *Employer*, 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) Applicable design or contract specification.
- d) Inspection intervention requirement.
- e) Quality verification records (by document number) used to provide objective evidence that the specified quality characteristic has been achieved.
- f) Inspection / defect identification status.

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- g) Traceability to the works and work commencement / completion date.
- h) DP verification and *Employer* endorsement.

For Manufacturing activities, the DP 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 DP and AIA. Alternatively, the Contractor may utilise the DP Inspection and Test Plan format.

For construction, installation and commissioning activities at Site the DP shall utilise the Inspection and Test Plan format included as Appendix 04 to this document or may utilise their own format provided it contains the tabular headings contained in the 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 DP throughout the lifetime of the project identifying individual:

- a) ITP Document Number.
- b) ITP titles.
- c) ITP planned and actual submittal status to *Employer*.
- d) Employer’s approval status.
- e) ITP revision status.

Said Register shall be provided in hardcopy and electronic “native copy” format to *Employer* on a weekly basis.

### **3.4 Operation**

#### **3.4.1 General**

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

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### **3.4.2 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 DP QMS and shall be submitted for review as the DP's documents when so required by the *Employer* and shall be addressed in Quality Plans in such time that the realization of the product can be achieved in an informed and orderly manner.

For effective and practical project execution the DP shall develop, document via procedure for the *Employer's* 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 01 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 FGD 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 02

- a) Subsequent to determination of criticality levels the DP shall document the scores on DP's Criticality Rating Record, Appendix 03 and thereafter determine and document corresponding levels for:
- b) The level of documentation reviews to be applied to all documents – DP and Supplier
  - for approval, for review and comment, for information etc

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

The DP 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 DP 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 *Employer's* Project Quality Assurance 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 DP's Project Quality Assurance Engineer shall be invited to participate in all design reviews.
- c) The DP / 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 *Employer's* Project Quality Assurance Engineer shall be invited to attend all Pre- Production Meetings.
- d) All Suppliers and Sub-Suppliers of Criticality I and II equipment and piping shall have a compliance audit performed on them by the DP, except where the DP can provide documented evidence of recent satisfactory audit or performance.

Furthermore, Suppliers and Sub-Suppliers of Criticality I and II equipment must have previous audit records or quality verification evidence satisfactory to the Engineer's Project Quality Assurance 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 DP's Criticality Rating Record shall be provided to Engineer in native file format on a Monthly basis.

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Where required by the *Employer*, the DP shall provide “workshop” sessions to the *Employer* personnel to clearly and unambiguously identify the DP process control and inspection control processes and systems to facilitate the *Employer* understanding with the intention of ensuring smooth operation of the same at manufacturers premises and at site during the contract.

### **3.4.3 Interface Management and Co-ordination**

The DP 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.

### **3.4.4 Customer Related Processes**

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

### **3.4.5 Permits, Licenses and Statutory Provisions**

The DP 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 DP/Contractor's permits and licences are to be sent to the *Employer* without delay, when so requested.

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

## **3.5 Hazardous Location (HAZLOC)**

All mechanical and Electrical Equipment installed in Hazardous Location shall be HAZLOC compliant. The DP HAZLOC Competent Person (Master Installation Electrician) shall sign all records including Inspection reports and Application for Final Inspection (AFI).

### **3.5.2 OHSA Certified Equipment, Inspection Authority and Product Verification Plan**

The DP shall identify to the *Employer* 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 DP intends to utilise the services of a non-South African registered AIA then the DP shall be responsible for obtaining the South African Department of employment & Labour (DOEL) approval of the AIA prior to use.

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The *Employer* shall approve the DP identified Authorized Inspection Authority (AIA) prior to their being contracted by the DP.

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 *Employer*
- c. Inspection and Test Notification for manufacturing activities directly to AIA and to [medupiinspection@eskom.co.za](mailto:medupiinspection@eskom.co.za) and [medupiqasite@eskom.co.za](mailto:medupiqasite@eskom.co.za).
- d. However, for site activities Inspection and Test Notifications for AIA activities are to be processed via *Employer* electronically via email to [medupiqasite@eskom.co.za](mailto:medupiqasite@eskom.co.za) and [medupiqasite@eskom.co.za](mailto:medupiqasite@eskom.co.za) by 15.00hrs for those nights and the proceeding days activities and the Employer and DP 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 *Employer* and DP 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.

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 DP shall be responsible for demonstrating proof of compliance to the AIA produced and Employer's 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 Employer by the DP Monthly.

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 *Employer*/DP and the Authorized Inspection Authority.

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The DP shall develop a statutory register and submit it to the *Employer* Monthly or as and when required.

### **3.6 Design and Development of Products and Services**

#### **3.6.1 General**

DP 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 and organizational interfaces between them and Site, shall be defined and addressed 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 DP 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 *Employer*.

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 DP.

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

No work shall commence without approval of these drawings approved by the Engineering representative of the *Employer*

#### **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.

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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.

### **3.7 Manufacturing and Construction**

#### **3.7.1 General**

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

#### **3.7.2 Control of Production and Service Provision**

The Contractor shall plan, document via Procure for the DP's 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 DP's 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) DP 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. The *Contractor* shall maintain a Work Commencement Approval Register of all Checklists which shall be provided to the DP in native file format on a monthly basis or as when required.

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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.

### **3.7.3 Inspection and Test Schedule**

The DP shall refer to 348-106670 Site Quality Assurance and Control Work Instruction and 200-45965 Manufacturing Inspection and Testing Work Instruction for details on the inspection processes.

The *Contractor* shall prepare and issue to the DP and Employer 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](mailto:medupiinspection@eskom.co.za) and [medupiq@eskom.co.za](mailto:medupiq@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 [medupiq@eskom.co.za](mailto:medupiq@eskom.co.za) and [medupiq@eskom.co.za](mailto:medupiq@eskom.co.za)

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

### **3.7.4 Inspection and Test Notification**

Relative to Inspection and Testing the DP shall notify the *Employer* 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 *Employer* electronically, via email of the Inspection & Test Notification (I&TN) in native file format.

### **3.7.5 Inspection & Test Notification - During Manufacturing Activities**

During off site manufacturing activities, the submittal of the I&TN’s shall be effected by the DP using the I&TN document included as Appendix 05 of this document:

- a. Electronically via email to [medupiinspection@eskom.co.za](mailto:medupiinspection@eskom.co.za) and [medupiq@eskom.co.za](mailto:medupiq@eskom.co.za)
- b. 7 days prior to the meetings and inspections and / or tests were conducted in South Africa.
- c. 21 days prior to the meetings / inspections and / or tests were conducted outside of South Africa.

Note: Unless specified in the contract.

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### 3.7.6 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 06 to this section of the *Employers Policies and Procedures*:

a) Electronically, via email, to [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) and [medupiga@eskom.co.za](mailto:medupiga@eskom.co.za)

a) By 14.00hrs for those nights and the preceding 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.

### 3.7.7 Inspection and Reporting

#### 3.7.7.1 General

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

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 / DP* Quality Dept. personnel (who are to be independent of the construction personnel) via Quality Verification Records.

#### 3.7.7.2 Inspection and Reporting during Manufacturing Activities

Refer to 348-106670 Site Quality Assurance, Control and Verification Work Instruction

In-process, stage and final inspection of manufactured items by DP shall be documented via Inspection Reports

#### 3.7.8 Application for Final Inspection (Pre-Safety Clearance)

To finalise completion of construction inspection activities by Team Medupi and thereafter progress the "Safety Clearance" activity by TM Commissioning Department, DP shall complete and issue an Application for Inspection (AFI) included herein as Appendix 08, accompanied by Contractor's signed Punchlist (devoid of below referenced category 1 and 2 items) by :

- a) obtaining Unit Manager (UM), or designee, signature and identification of the responsible DP/TM UCS on the AFI confirming the installation is complete.
- b) referencing the AFI No. and final inspection activity in the Daily I&TN and emailing both (I&TN and AFI) to;
- c) [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) as documented in this procedure.
- d) Engineers Assistant via the package proxy email address.

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### **3.7.9 Traceability**

The DP shall develop, document via procedure for the *Employer's* 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 DP shall control and record the unique identification of the product and source materials.

### **3.7.10 Inspection and Test Status**

The DP shall develop, document via procedure for the *Employer's* 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 DP 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 DP and the *Employer's* personnel to ensure defective items are not inadvertently incorporated into the final works.

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

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

### **3.7.11 Manufacturing Inspection Database**

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

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### 3.7.12 Construction / Installation Inspection Database

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

### 3.7.13 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 DP shall ensure Quality Verification Records are:

- a) In a form suitable for incorporating the verification and endorsement requirements of DP and AIA / TPIA where appropriate.
- b) Made available by the DP the inspection result within 24hrs of completion
- c) Traceable to the plant, material and / or activities to which they pertain.
- d) Retained until such time as the Defects Liability Period has lapsed and thereafter are submitted to the *Employer* 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 DP shall provide to the *Employer* 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.

### 3.7.13 Preservation

Refer to Storage and Preservation procedure number **348-860843**

The DP shall determine, document via procedure for the *Employer's* approval and thereafter implement any special requirements for equipment / material preservation including:

- a) Identification.
- b) Handling and packing.
- c) Storage and protection.

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- d) Shelf-life duration.
- e) Safe handling.

#### **3.7.14 Record Book**

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

*The 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 DP prior Employer's review.

No data book shall be reviewed by the DP 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 not be combined on Data Dossier. Manufacturing, Construction/Erection and Commissioning shall be separated. In each section the page numbers shall run consecutively.

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

- b) The *Contractor* need not include documents and drawings etc that have been approved DP which are included in SPO and shall instead provide and include an index of such documents in the Record Books on the basis that the originals are in SPO and traceable via the "Index".
- c) Record Book shall be written in English or provided with an English translation.
- d) The index of all Record Books shall be submitted to DP for approval.
- e) 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.
- f) The *Contractor* shall report the status of Record Book compilation progress at Weekly Progress / Quality Meetings together with the Data book Register.
- g) Record Books shall be endorsed by stamp, date and signature of the *Contractor* and the DP signifying completion and accuracy when complete.

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h) 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
- Name of Project
- Contractors' Job Code
- Contractor Document number
- Eskom Document Number
- System number
- KKS number
- System Description
- Document type "Manufacturing or Construction or Commissioning"
- Contractor's number
- Name of Contractor
- Volume Numbering (1 of .... or 1/10)
- Address of Contractor
- Column for signature by Contractor Representative and FIDIC Engineer/ Delivery Partner's representatives.

### **3.7.15 Statutory Records**

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) Pressurized 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

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- i) Maintenance procedures
- j) Permanent KKS certificates (no temporary labels to be allowed at takeover)
- 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 complete

The *Contractor* shall compile a separate HAZLOC files per plant Area environment creation, for example:

- a) Inert gas charging, Heating, cooling, etc., inclusive of gas storage, electric power supply, etc.
- b) 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;
- c) Requirements for protection against, or insulation from, vibration or long-period cyclical Motion in transit, for example, wave-generated movement during sea transport;
- e) Internal and external structural integrity protection, for example, internal and external.

### **3.7.16 Handing over of Record books/Data Books by Contractor**

The *Contractor* shall ensure that the following has been concluded:

- a) QA Completeness review
- b) 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,
- c) The contractor shall request QA to perform completeness review of the record books/Data books prior handing over to the Employer.
- d) QA shall also make reference to the data book checklist (200-616427) for compliance of format and lay out of the Record Book/Data Book

Furthermore, the following should be noted:

- a) All manufacturing Record books shall be completed Approved and handed over to Eskom Prior Installation/ construction phase
- b) All Construction Record books shall be Completed, Approved Safety Clearance and and handed over to Eskom Prior Commissioning Phase
- c) All Commissioning Record books shall be Completed, Approved and handed over prior taking over of completed works (TOC)
- d) 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.
- e) 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.

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- f) 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.
- g) Contents shall be sectionalized and separated by properly labelled dividers
- h) 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.
- i) All section dividers / separator sheets shall be made of card and shall bear the Section Identifier - 1, 2, etc.
- j) 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.
- k) 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
  - All Statutory Reports

### **3.7.17 Registers during manufacturing, Construction and Commissioning Phase.**

*The 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

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- 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.

### 3.7.18 Taking Over

#### 3.7.18.1 DP Initiated "Taking Over"

Where DP requires to "Take Over" the Works, or a portion of the Works, out with the agreed schedule for Taking Over the DP shall identify the portion of the work to be Taken Over.

DP 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 DP the records as and when required. At the time of formal handover of the data books the DP shall submit one (1) hard copy and one (1) soft copy (CDs) of data books to the *Employer*.

## 3.8 Performance Evaluation

### 3.8.1 General

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

### 3.8.2 Customer Satisfaction

The DP shall establish, document via procedure for *Employer's* 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 *Employer* as a method for measuring of Customer satisfaction.

The DP shall also develop a "Customer Satisfaction Questionnaire" that shall be issued to the *Employer* for completion on a bi-annual basis and shall be included as part of the DP management review process.

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

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- 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) *Employer* feedback and complaints
- i) *Employer* Document Reviews
- j) Learning from Incidents.

### **3.8.3 Measurement and Analysis**

The DP shall develop, document via procedure for the *Employer* 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 DP shall identify metrics to be measured, the Performance Standards and Performance Targets they are to be measured against. Said metrics, standards and targets shall be documented and submitted to the *Employer* for approval. Further the DP shall utilize additional metrics, standards and targets and / or revise existing metrics, standards and targets upon request from the *Employer* where further measurement, analysis and improvement is required.

The DP 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 DP shall provide an electronic native file copy of the Lessons Learned database to the *Employer* for information on a monthly basis.

### **3.8.4 Auditing**

The DP shall develop, document via procedure and implement for the duration of the project, a process defining the control mechanisms for;

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- a) Internal and external QMS audits
- b) Technical / product audits
- c) 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 result.

### **3.8.5 Delivery Partner Audits**

The DP 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 DP'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 shall 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.

### **3.8.6 Trending of Audit Findings**

The DP shall trend Audits and Audit Findings on audits conducted by the DP, and other Third-Parties, as well as audit conducted by the DP on their Sub-Contractors and Suppliers on a weekly basis.

Trending shall be displayed numerically and pictorially, as agreed with the *Employer*, on a weekly basis and shall identify weekly and cumulative trends.

### **3.8.7 Management Review**

DP 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 DP Project Representative and attended by DP 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 DP satisfaction.

Record of all Management Reviews shall be documented and shall be made available to the DP once documented.

Management Reviews shall assess:

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- 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 DP resource planning for quality.
- f) Complaints and feedback from the DP, Suppliers or other Third Parties / AIA.
- g) Key performance metrics.
- h) Learning from incidents program.
- i) Changes that could affect the quality management system.
- j) Recommendations for improvement.

Where recurring systematic problems are identified the DP 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.

### **3.9 Improvement**

The DP shall develop, document via procedures for the *Employer* 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.

#### **3.9.1 Nonconformity and Corrective Action**

The DP shall develop, document via procedure for *Employer* 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 *Employer*, shall be identified.

The DP 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

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- e) Failure Mode
- f) Date issued
- g) Answer Date – required and actual
- h) Action Date – planned and actual
- i) Close out date

The DP 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.

Corrective Action and Preventative Action Requests shall be issued by the *Employer* to the *Contractor* shall be responded to by the DP on the *Employer* original documents within seven (07) days by the DP.

The DP shall trend the Sub-Contractor and Suppliers, and the *Employer* shall action Corrective Action Requests and Preventive Action Requests.

The DP shall maintain and provide an electronic native file copy on a weekly basis to the *Employer* as follows;

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

Said Registers shall account for DP's, Supplier's and The *Employer* 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 DP.

### **3.9.2 Nonconformity Identified by DP**

Defective product and nonconforming systems identified by the DP shall be documented and managed through SAP QIM and a notification of the nonconformity shall be issued to the Contractor.

In such instances the Contractor shall investigate the matter and respond in writing to the DP on the original nonconformity report (NCR) 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 DP shall coordinate internal review of *Contractor* proposed defect correction measures.

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

The *Employer'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 DP 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.

### **3.9.3 Trending of Nonconformities**

The DP shall trend defects initiated by the DP, Suppliers and the *Employer* 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 DP versus the *Employer*, Per Manufacturer, Per Sub Contractor, Per Unit, Area and /or Sub system

Where NCRs issued by *Employer* exceeds ten percent of the DP's Non-conformance Reports recorded within the DP defect management system the DP 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.

### **3.9.4 Reporting of Nonconformity Statistics**

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

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

These registers shall account for DP's, Supplier's and the *Employer* Non-conformance Reports.

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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*.

### 3.9.5 Learning from Incidents / Lessons Learnt

The DP shall establish, document via procedure for the *Employer* 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 DP and shall include the lessons learnt from the DP's previous two project and those learnt from the Medupi Power Station projects 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 DP, with the participation of the *Employer*, 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 DP shall incorporate Lessons Learned into the Works where appropriate.

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

## 4. Process for Monitoring

### 4.1 Key Performance Areas and Indicators

The DP shall be accountable and assign the responsibility at the frequency documented as part of the QMS measurement, analysis and improvement initiative.

### 4.2 Document Review and Self-Assessment

#### 4.2.1 Document Self-Assessment

The DP identified on the front page of this document along with departmental personnel and the project QMS Engineer shall undertake a "self-check" review of the process defined in this document at six monthly intervals, commencing from the effective date of this document, to check:

- a) the process / procedure operational integrity
- b) process efficiency
- c) the level of stakeholder knowledge and implementation.

Participants and results of the "self-check" review shall be documented by the DP in the "Self-Assessment Checklist" (**Template No. 348-655890**) included as an Appendix to this document which shall be submitted via SharePoint to Medupi Documentation Department Help Desk by the DP once completed.

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DP shall proceed with any revision requirements in line with Medupi Procedures, **348-653867** "Development and Change of Medupi QMS Documents" and **348-883808** "Document and Record Management".

#### **4.2.2 Review Period**

All QMS documents shall undergo a 3-yearly compulsory review.

#### **4.3 Training Requirements**

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:

<b>Name</b>	<b>Designation</b>
Zandi Shange	General Manager Projects (Medupi and Kusile)
Thabisile Biyela	Senior Manager Project Portfolio Delivery
Elvis Modise	Employer's Representative
Howard Matsepe	Project Commissioning Manager
Rofhiwa Nemutandani	Project Engineering Manager
Joseas Seabela	Document and Records Project Manager
Ntali Molapo	SHE Project Manager
Brenda Mgidlana	Project Quality Manager

### **6. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
August 2025	2	Moses Sinobolo	Revised to Remove FIDIC Engineer terminology, NEC by Delivery Partner and to be consistent with the use of NEC PSC terminology
July 2022	1	Moses Sinobolo	New document.

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## **7. Development Team**

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

- Moses Sinobolo
- Respect Sekhu
- Lesiba Masekela
- Themba Nxumalo
- Thabo Mokgomole
- Bheki Tembe
- Ephraim Mokgothu
- Virginia Meremi

## **8. APPENDICIES**

- [1] Appendix 1 – Criticality Assessment
- [2] Appendix 2 – Criticality Assessment Scoring Criteria
- [3] Appendix 3 – Criticality Assessment Rating Register
- [4] Appendix 4 – Inspection and Test Plan
- [5] Appendix 5 – Inspection and Test Notification (Manufacturing)
- [6] Appendix 6 – Inspection and Test Notification (Construction / Installation)
- [7] Appendix 7 – Application for Final Inspection
- [8] Appendix 8 – QA Process Flow Map
- [9] Appendix 9 – Document Classification List
- [10] Appendix 10 – Self-Assessment Checklist

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## **Appendix 1- 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 I Construction I 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 4.**

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 shall result in classification of an equipment item on one of the following Criticality Ratings:

<b>Criticality Total Point</b>	<b>Rating</b>	<b>Description</b>
43 to 56	I	Item quality is vital and must not be compromised
29 to 42	II	Item quality is of significant importance

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15 to 28	III	Item quality is of moderate importance
0 to 14	IV	Normal commercial is acceptable.

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

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## Appendix 2 – Application for Final Inspection

<b>Contractor:</b>										<b>Inspection Details, Plant Identification, Location, Description and Confirmation to Proceed</b>										
<b>Pkg. #: e.g.: P1</b>				<b>Contractor: e.g.: MHPSA</b>						<b>Contract Title: e.g.: Turbine Works</b>										
<b>Inspection YYYY/MM/DD</b>				<b>Date:</b>		<b>Inspection Time: 24Hr Format</b>				<b>Meeting Location: e.g.: Control Room</b>										
<b>Generic Plant Process</b>						(Circle as Appropriate)	Plant Area Unit		U4		U3		U2		U1		BOP			
<b>No</b>		<b>Description</b>					<b>KKS</b>													
2.1		e.g.: Steam Piping System					e.g.: LB		Plant Discipline		Boiler		Turbine		Elec		C&I		Mech / Piping	
As per GGG 0806 – Page 7 & Annexure A																				
<b>HAZLOC Area</b>		<b>Yes</b>		<b>No</b>			Full System Inspection				Partial System Inspection									
<b>Plant Description (as per GGG 0806 Annexure B)</b>																				
<i>Signature herein verifies that construction is complete, except for those items documented via Contractor Punchlist, (to be attached) relevant Quality Records are available and a Documentation Package (containing P&amp;ID, Isometric / Single Line Diagrams etc.) is available against which inspection can proceed</i>										<b>Punchlist No / Rev.: XXXXXXXX / A</b> <b>Doc. Pkg. Available: Yes / No</b>										
<b>Contractor Construction Mgr.</b> Name: Sign: Date:						<b>Contractor Quality Mgr.</b> Name: Sign: Date:						<b>DP/Employer Unit Mgr. (or designee)</b> Name: Sign: Date:								
<b>Email Distribution by Contractor :</b>						<b>Original To: <a href="mailto:medupigaonsite@eskom.co.za">medupigaonsite@eskom.co.za</a> / Copy To: Package proxy email address</b>														

<b>Employer :</b>	<b>Inspection Assignment and Verification Details</b>
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Assigned QCI: <b>e.g.: P. Boats</b>		I&TN No & Activity No.: <b>e.g.: 1235 / 54</b>		
DP/Employer Final inspection Participants (tick as appropriate)	<b>Walk down Inspection</b>	<b>NOD/NCR Review</b>	<b>ECN &amp; FCN Review</b>	<b>%.Databook Review</b>
DP/TM Quality Dept. Rep. (including AIA if appropriate)	PR	PR		PR
DP/TM Engineering Dept. Rep.	PR		PR	SR
DP/TM Construction Dept. Rep.	PR			
DP/TM Commissioning Dept. Rep (C&I and Electrical)	PR			
<b>Prime / Secondary Responsibility</b>	<b>Insert Name &amp; Date against applicable inspection activity after inspection and inclusion of any necessary items on the P/L</b>			

<b>HAZLOC Areas</b>			
All required records available and signed by relevant parties related to HAZLOC	<b>Contractor Rep</b>	<b>HAZLOC</b>	<b>DP/TM Engineering Rep</b>
	PR		PR
			<b>DP/TM Quality Rep</b>
			SR

<b>Punchlist No.: e.g.: 1235 / 54</b>	No. of Cat 1: <b>02</b>	<b>28</b>	<b>Inspection Disposition (System Engineer to Tick as applicable)</b>		
	No. of Cat 2: <b>14</b>		<b>Proceed to Safety Clearance</b>	<b>Do not proceed (Category 1 &amp; 2 Punchlist items to be eliminated)</b>	
	No. of Cat 3: <b>12</b>				
<b>DP Discipline Quality Manager Verification (Name, Signature &amp; Date)</b>			<b>DP/ Systems Engineer Verification (Name, Signature &amp; Date)</b>		

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<b>Notes</b>	<ul style="list-style-type: none"><li>• QCI to scan hardcopy of AFI and Punchlist, hand original to Contractor Supervisor and a copy to Eskom's Quality Dept. Inspection Coordinator.</li><li>• QCI to enter P/L items to WISPA Inspection Punchlist database.</li><li>• If AFI is accepted with nil Punchlist items or category 3 Punchlist items Contractor is to submit the signed AFI to Eskom's Medupi Commissioning Dept. at the Site daily Start Up Meeting to generate Safety clearance inspection and rework category 3 items obtaining TM QC Close out via I&amp;TN</li></ul>
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### Appendix 3 – Inspection and Test Plan

Insert ITP Title/Description for the Works <u>herein</u> :												
Package Number:												
Approved for implementation by Contractor Engineering and Quality				ITP Document Number:		Approved for implementation by Eskom Engineering and Quality						
Engineering				Drawing Number:		TM Engineering						
Quality				KKS Number:		Quality						
Name:				Name:				Name				
Signature:				Signature:				Signature				
Date:				Date:				Date				
				WBS:								
				Area & Section:								
				Activity start date:      End date:								
Contractor to utilise this row to define any requirements specific to this ITP												
<b>A</b> – Actual Inspection; <b>W</b> – Witness of Inspection; <b>R</b> – Review Document; <b>H</b> – Hold Point <b>1</b> – 100% <b>2</b> – 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			Date	Quality Verification Record Doc. No	NCR / NOD
			BC				IC	A/A	OTHER			
								ENGINEERING				

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

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