	<b>Work Instruction</b>	<b>Department</b>
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Functional Area: **Quality Management**





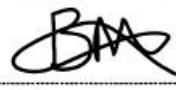
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## **1. Introduction**

Contractors are responsible and accountable for:

- a) Quality Assurance as part of their quality management focus on providing confidence that quality requirements will be fulfilled; and
- b) Quality Control as part of their quality management focus on fulfilling quality requirements.

As a consequence of their contractual responsibilities for quality during the Power Station build process as defined in 348-389557& 348-225142 "**Contractor Quality Requirements for Engineering and Construction Works**".

Eskom's Medupi Project Execution Team (TM) shall undertake quality assurance, quality control and verification activities where:

- c) Required by Specification and / Code;
- d) Processes and activities are unique or the product is critical or complex; and
- e) An additional level of independent quality checking is required over and above that provided by Contractor during the build process and at final build completion especially where;
  - Contractor planned quality control activities are considered insufficient
  - Contractor service provision is considered inconsistent with defined objectives

However, the aforementioned does not detract from contractual responsibility of Contractor for effective quality management.

## **2. Supporting Clauses**

### **2.1 Scope**

This document covers all quality assurance and verification activities during site construction, erection, testing and document compilation activities performed by Contractors at Eskom's Medupi Power Station Project in Lephalale.

Excluded from the scope of this Work Instruction are those offsite quality control, assurance and verification activities at Contractor / sub-contractors premises which are conducted by SHEQ Panel Inspectors on behalf of TM and Storage and Preservation Inspection for which the process protocols are defined in Project Work Instruction **348-860842 "Manufacturing Quality Control and Assurance"** and **348-860843 "Equipment Storage & Preservation Inspection"**.

#### **2.1.1 Purpose**

The Purpose of this Work Instruction is to outline the process steps and control mechanisms for:

- a) Defining TM quality management intervention requirements,
- b) Completing intervention and verification activities,
- c) Reporting responsibilities,
- d) Measurement and analysis activities relative to,

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- The technical integrity of product,
  - The effectiveness and efficiency of work processes and personnel,
  - Potential schedule delays,
- e) Final (pre safety clearance) inspection, and
- f) Stopping the work.

### **2.1.2 Applicability**

This document shall apply throughout Eskom's Medupi Project Execution Team.

### **2.1.3 Effective date**

Date of authorisation of the Work Instruction.

## **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**

- [1] ISO 9001: 2015 Quality Management Systems – Requirements.
- [2] ISO 9000 Quality management Systems – Fundamental and Vocabulary.
- [3] 348-961711 Project Execution Plan
- [4] 348-883902 Project Quality Plan
- [5] 348-684505 Quality Control Enhancement Paper
- [6] 348-653867 Development and Change of Medupi QMS Documents
- [7] 348-883808 Document Management Work Instruction
- [8] 348-890104 Defect Management Work Instruction
- [9] 348-883554 Corrective and Preventive Action Work Instruction
- [10] 348-389557 Medupi Power Station Project Contractor Quality Specification

### **2.2.2 Informative**

Not Applicable

## **2.3 Definitions**

Term	Definition
Defect	Non-fulfilment of a requirement related to an intended or specified use
Engineer	Engineer as defined in FIDIC

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Inspection	Conformity evaluation by observation and judgement of Contractor activities and control processes accompanied, if appropriate, by measurement, testing or gauging
Nonconformity	Non-fulfilment of a requirement
Process	Set of interrelated or interacting activities which transforms inputs into outputs
Product	Result of a process – software, hardware, materials or processed materials
Quality	Degree to which a set of inherent characteristics fulfils requirements
Quality Control	Part of quality management focussed on fulfilling quality requirements
Quality Assurance	Part of quality management focused on providing confidence that quality requirements will be fulfilled
Verification	Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

## **2.4 Abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
AIA	Authorised Inspection Agency
AFI	Application for Final Inspection
CL	Check List
DQM	Discipline Quality Manager
EA	Engineer's Assistant
ECN	Engineering Changes Notice
I&TN	Inspection and Test Notification
I&TR	Inspection and Test Report
IC	Inspection Coordinator
ITP	Inspection and Test Plan
LDE	Lead Discipline Engineer
MS	Method Statement
NCR	Nonconforming Report
NOD	Notice of Defect
P/L	Punchlist
QCI	Quality Control Inspector
QE	Quality Engineer
QMS	Quality Management System

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SE	Site Engineer
SHEQ	Safety, Health, Environment and Quality
SPO	Smart Plant Owner Operator
TC	Test Certificates
TM	Team Medupi
UCS	Unit Construction Supervisor
UM	Unit Manager
WISPA	Web Integrated System of Process and Applications

## 2.5 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.

Process Step	Contractor	EA	UM	DQM	LDE	IC	QCI	AIA
Prepare and submit to <b>TM</b> an Index of project <b>ITPs</b> and Method Statements ( <b>MS</b> )	R	A						
Ensure ITPs are planned to control all necessary inspection and testing activities		A	C	R	R*		C	
Prepare and submit activity specific ITP and MS to <b>TM</b> for approval one month in advance of planned work commencement	R	A						
Determine conformity of ITP to specification and code		A	C	C,I	R			R*
Determine suitability of Contractor planned interventions			C	C,A	R			C*
Identify <b>TM</b> intervention and verification activities in Contractor ITP		A	C	R	R			R*
Issue ITP annotated with <b>TM</b> intervention requirements to Contractor		R						

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Process Step	Contractor	EA	UM	DQM	LDE	IC	QCI	AIA
Conduct pre activity commencement kick off meeting per new activity / new ITP for documentation		A	R	C	C			I*
Undertake in process build quality monitoring activities	A		R	C*			C*	
E-mail Inspection and Test Notification (I&TN) to TM Quality Department via <a href="mailto:medupigaonsite@eskom.co.za">medupigaonsite@eskom.co.za</a>	R	A						
Register and file Contractor I&TN				A		R		
Compile and issue a (Package combined) daily I&TN				A		R		
Identify QCIs responsible for intervention and verification activities in daily I&TN	I	I	I	A,R	I	R	I	I
Undertake inspection activities and document status in Contractor CLs, TCs & ITP			R*	A	R*		R	R*
Initiate NOD (NCR applicable to AIA) as required using "NOD Work Instruction			R*	A			R	R
Complete daily feedback for I&TR			I	A	R*	I	R	R*
Register, file and distribute I&TN	I	I	I	A,I	I	R	I	I
Analysis and trending of quality performance				A,R		R		
Identification of activities to be targeted based on I&TR data analysis			R*	A,R	R			R*
NOD / NCR processing		A		R				
NOD / NCR follow up		A		R*	R			R*
Email final Application for Inspection (AFI) to TM quality department via <a href="mailto:medupigaonsite@eskom.co.za">medupigaonsite@eskom.co.za</a>	A	R						
In process Data book reviews at 30% & 70% work Completion	A				R*		R	R*
Final employer / engineer (pre safety clearance) construction inspection and Databook review				C, I	A*		R	R*
Punch listing of final inspection			C	A,R	C		R	C
Signing of P/L, if applicable and completed application for final inspection form (AFI)	A				R		R	R
Issue of final AFI, Punchlist (if applicable) and signed AFI to Contractor with reference being IT&N and Item No.		A		R*			R	R*
Clearance of P/L items and notification of clearance to <a href="mailto:medupigaonsite@eskom.co.za">medupigaonsite@eskom.co.za</a>	A			R	R	I	C	R*
Follow up and close out of Punchlist items	A			R*	R		C	R*

**Table 1: RACI Matrix**

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## **2.6 Related/Supporting Documents**

Forms and Templates:

- [1] 348-185881 Application for Final Inspection.
- [2] 348- 74846 Data Book Verification Record.
- [3] 348-655890 Document Self-Assessment Checklist.
- [4] 348-885610 Final Inspection / Punchlist Inspection.
- [5] 348-323258 Site Inspection and Test Notification.

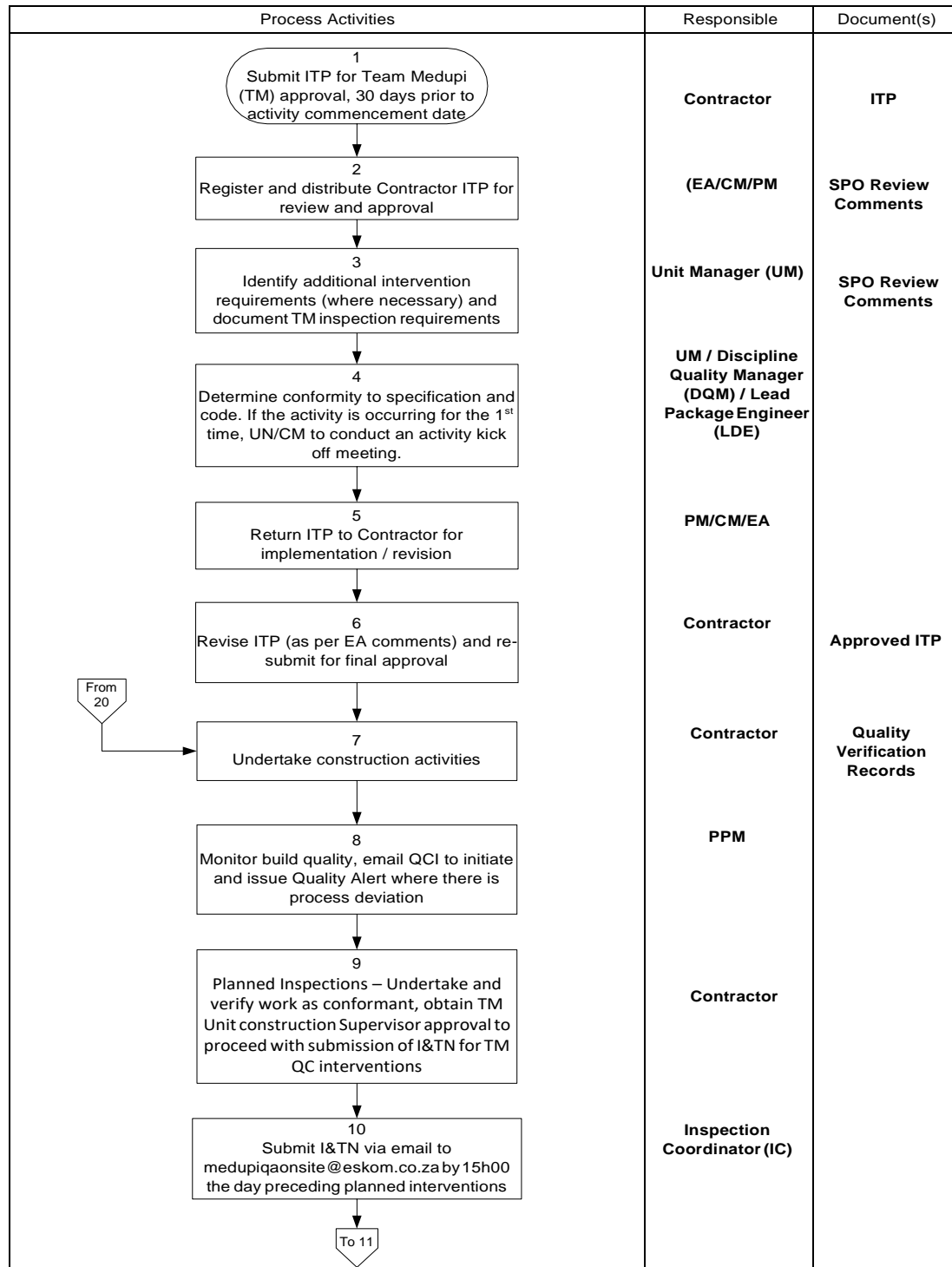
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### 3. Process definition

#### 3.1 Flow diagram



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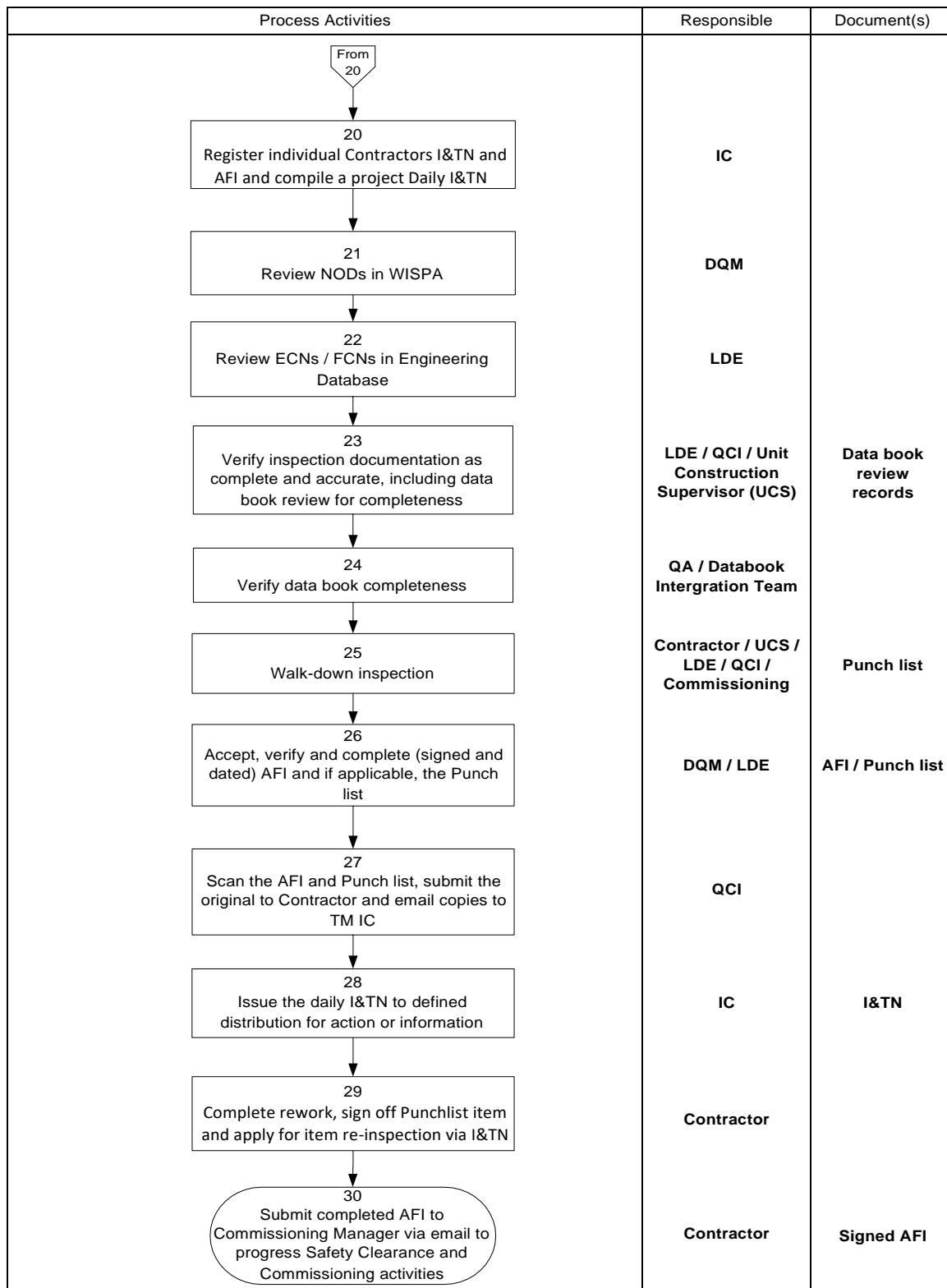
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Process Activities	Responsible	Document(s)
<p>From 10</p> <p>11 Register individual Contractor I&amp;TNs and compile a project daily I&amp;TN</p> <p>12 Assign inspection responsibility to individual QC Inspectors</p> <p>13 Conduct inspection and verification activities</p> <p>14 Complete the I&amp;TR by specifying the results of inspection and any additional information / reference documents; Issue to medupigaonsite@eskom.co.za</p> <p>15 Where product is deemed not accepted or nonconforming, refer to the Control of Nonconforming Product Procedure 200-15327</p> <p>16 Issue to Contractor as per the identified distribution list.</p> <p>17 Rework incomplete / nonconforming item(s)</p> <p>18 Construction complete?</p> <p>No To 7</p> <p>Yes 19 Verify work per system or part thereof, complete AFI form and request for final inspection by submitting the I&amp;TN (with AFI reference) to medupigaonsite@eskom.co.za</p> <p>To 20</p>	<p>IC</p> <p>IC</p> <p>QCI / AIA / LDE</p> <p>QCI / AIA</p> <p>QCI / DQM / LDE / AIA</p> <p>EA/CM/PM</p> <p>Contractor</p> <p>Contractor / Unit Manager</p> <p>Contractor</p>	<p>I&amp;TN Plan</p> <p>Quality Records</p> <p>ITP</p> <p>Application for Final Inspection (AFI) Form / I&amp;TN</p>

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**Figure 1: Site Quality Assurance, Control and Verification Process Flow**

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### **3.2 General**

Contractor shall, in line with 348-389557 & 348-225142 “**Contractor Quality Requirements During Construction and Commissioning**”, submit for **TM** approval an Inspection and Test Plan (ITP) Index identifying ITPs to be utilised on the project for;

- a) Construction / Installation; and
- b) Commissioning

Thereafter, Contractor shall submit, taking cognisance of schedule and contractual document review periods, individual ITPs for each activity for TM approval ensuring the approval process can be enacted prior to work commencing.

All Contractor ITPs shall be approved by TM prior to Contractor being allowed to commence the applicable work activity at site as defined in 200 1689 & 200 2086.

### **3.3 Inspection Resources and Responsibilities**

Quality inspection and verification is by definition and a consequence of applicable Work Task Order, the responsibility of the FIDIC Engineer/Contracts Manager/Project Manager and shall be conducted and reported for the FIDIC Engineer via Engineer’s Assistants, or reported to Contracts Manager or Project Manager using Discipline Quality Managers and Quality Control Inspectors assigned to, and managed by, TM Quality Department in general and the Project / Site Quality Managers in particular.

The above notwithstanding, in process inspections shall be undertaken on behalf of TM and signed for on the ITP and supporting protocols documents – Checklists and Test Certificates etc. by:

- a) Unit Construction Supervisors (UCSs) on behalf of Employer reporting to UMs;
- b) Quality Control Inspectors (QCs) on behalf of the FIDIC Engineer reporting to DQM
- c) Discipline Engineers on behalf of the Employer reporting to LDEs
- d) AIA

However, the final construction stage inspection “sign off” of the ITP and the Application for Final Inspection (AFI) and release of the activity shall be undertaken by TM DQMs and / or their respective Quality Control Inspectors (QCs).

To cater for specific technical issues or additional inspection activities out with that capable of being performed by the TM site team in the timeframes required additional resources may be procured on a temporary basis via Engineering Department or via Work Task Order through the relevant SHEQ Panels contracted to Eskom’s Medupi Project.

### **3.4 Determination of Engineer / Employer Intervention Activities**

#### **3.4.1 Intervention Types**

Inspection activities shall be “planned” based on code / specification or “targeted” based on previous inspection results or “surveillance” activities that are the day to day role of UCSs.

Planned inspections shall be defined in the applicable ITP as:

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- **“A” – Actual inspection/Test** - meaning actual inspection or test.
- **“W” – Witness** - meaning witness of Contractor inspection and / or test.
- **“R” – Review** - meaning review of documents relevant to the process, inspection or test activity.
- **“M” – Monitor** - Meaning on site day to day overview of ongoing works.
- **“H” - Hold point** – see Note below.

**Note:-** Hold “H” - meaning that a hold shall be applied to the process activity until the “actual inspection” or “witness of an inspection” or “review of documentation” is completed and the quality documentation verified and the process activity is released as conformant by TM may be applied as applicable. Hold (H) shall in all instances, by default, be prefixed with either “A”, “W” or “R” or a combination thereof by Engineer / Employer during the review process.

### **3.4.2 Determination of Intervention Type**

TM intervention and type of intervention shall be determined by TM’s Lead Discipline Engineer (LDE), DQM and Unit Manager (UM) to occur where:

- a) Required by Specification and / or Code;
- b) Processes and activities are unique or the product is critical or complex; and
- c) An additional assurance of quality is required over and above that provided by Contractor documentation.

Where, during review and approval of Contractor ITPs, it is deemed no added value is required over and above that which will be provided by Contractor documentation then no intervention requirement shall be documented in Contractor ITPs and the rule of ongoing surveillance shall be implemented by UCSs and QCIs.

TM decision to attend or not to attend (waive) an intervention activity that is planned via an ITP shall be:

- g) Based on previous and continued satisfactory performance – not time constraints;
- h) Determined by the DQM; and
- i) Documented in the daily I&TN – as notification to LDE, UM and Contractor.

Intervention requirements shall be increased or decreased as and when required relative to Contractor performance as determined by DQM. In such instances the ITP will not be revised but the requirements shall be notified to Contractor and LDE, DQM and UM via correspondence from the DQM via the EA.

Out with “planned” inspections documented via ITPs the DQMs shall define activities to be targeted for specific attention where the planned inspection interventions have identified there is an issue with product quality, process adherence or service provision.

Such inspections shall be assigned primarily to Snr. QC Inspectors (SQCIs) and Discipline Engineers to undertake a forensic review of the product and / or process and establish root cause analysis and therefore identify corrective action requirements.

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Additionally, DQMs will ensure regular weekly QC surveillance is undertaken by QCIs utilising predefined quality surveillance “QC Scorecards” as part of the Quality Departments flawless start up (FSI) initiative.

### **3.4.3 ITP Approval**

Engineers Assistants shall workflow received ITPs via Smart Plant Owner Operator (SPO) to generate technical and inspection intervention review comments from LDEs, DQMs, UMs and where applicable AIA. However, squad check sessions may be implemented if considered timelier and the final commented version of the ITP entered to SPO thereafter thus negating individual upload of multiple review comments.

During the review process LDEs shall ensure ITPs are clearly annotated to cater for:

- a) Identification of the item or activity to be inspected or tested;
- b) Sequence of operations prior to, during, and after inspections and tests;
- c) Identification of the code, contract specification and drawing or Work Instruction for each of the above operations;
- d) Acceptance criteria, with reference to the appropriate technical specification, in-house, national or international standard and relevant clause number for each of the above operations;
- e) Inspection and test activities the Contractor has nominated for his intervention points;
- f) Inspection and test records to be generated for each operation; and
- g) Inspection and test interventions of TM.

### **3.4.4 Activity Kick Off Meetings**

Activity Kick Off Meetings shall be initiated by TM Unit Managers (UMs) prior to each new activity to provide assurance that all material, documentation, personnel, equipment and access approval requirements have been planned for, reviewed and endorsed as suitable to commence the activity. Said meetings shall be chaired by UMs and attended by TM DQM, LDE and DQM assigned QCIs.

## **3.5 Inspection and Test Notifications**

### **3.5.1 Contractor Notification of Inspection and / or Test Activity**

Contractor, as per contract requirements, shall:

- a) Be responsible for notifying TM of the opportunity to action planned intervention requirements documented (as either A, W, R and H) in Contractors ITPs;
- b) Ensure that all work has been fully inspected, accepted and documented by Contractor personnel prior to requesting an inspection by TM.

Notification shall be effected using an I&TN, included as **Appendix 02** to this Work Instruction identifying:

- j) Items to be inspected;
- k) ITP reference and operation number;
- l) Location of operation (Unit, Area, System or Sub-system and KKS No.); and

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m) Time and date of inspection and if it's an initial or repeat inspection – wherein they must reference the previous I&TN No.

By 15:00 hours on a daily basis via email to the package proxy email address and [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) and DQM as and when an item has been inspected, accepted and documented as conformant by Contractor – excepting where an activity is an “in process” activity and in such situations inspection occur jointly by Contractor and TM.

TM shall undertake inspections and document inspection results within 24 hours of notification.

### **3.5.2 TM Registration, Filing and Distribution of Inspection and Test Notification**

**I&TNs** received from Contractor at [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) shall be processed by TM IC shall:

- a) Register and file all received Contractor **I&TNs**;
- b) Formulate, from the individual daily **I&TNs** received from Contractors, a “**Daily I&TN**” and file or register and password protect it on the shared network's Drive at (G:\MedupiSite\Quality\Daily\ I&TN) allowing read only access to all TM personnel;
- c) Identify in the “daily I&TN”
  - The individual QCIs and any other personnel responsible for performance, witnessing or reviewing inspections and / or test activities
  - Waived inspections
- d) Issue the Daily I&TN via [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) to **LDEs, UMs** and **CM/PM/Engineer Assistants** and Contractor for information regarding the day's planned inspections and tests. -

## **3.6 Inspection Activities by TM**

### **3.6.1 Monitoring Inspections**

Day to day build quality surveillance and planned monitoring activities defined in ITPs as “M – Monitoring” shall be undertaken by TM Unit Construction Supervisors (UCS) as the first line of quality control checks.

Conformity acceptance shall be documented by UCSs via signature in Contractors ITP protocol documents (Checklists) that accompany the ITP.

Oversight of day to day quality control surveillance and monitoring shall be undertaken by QCIs who shall liaise with TM UCSs and Contractor personnel on a day to day basis as to any concerns noted and, where required, document such concerns for Contractor / UCS actioning via “Quality Alerts” which shall be actioned by Contractor & UCS and returned to QCI by UCS verifying due attention has been paid to the quality issue.

### **3.6.2 Planned Inspections**

QCIs assigned as responsible for performing actual inspections, witnessing of inspections or reviewing inspection data and / or tests shall:

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- a) Attend all inspections, tests and/or reviews on time to ensure there is no undue delay to Contractor.
- b) Utilise the documents or drawings of Contractor available at the workplace during the inspection test and/or review.
- c) On instances of final visual inspection, review of documentation (Risk Assessment of NDT) must be conducted for ensuring NDT or test for ensuring compliance are completed.

Where QCI experiences the:

- d) Unavailability of Contractor documents or the incorrect revision of Contractor documents;
- e) Unavailability or un-calibrated Contractor inspection and test equipment; and
- f) Access restrictions to perform the inspection and/or test.

Against which to process the inspection, test or review activity assigned QCI shall inform the Contractor and the relevant TM UCS ad request a “temporary halt” to the inspection and verification activity until the Contractor provides the necessary correct documents, equipment or access.

Where the necessary correct documents, equipment or access cannot be made available by Contractor the inspection and/or test activity shall be considered as “rejected” with a comment included in the Daily I&TN that:

**“The inspection is rejected and conformity is considered indeterminate due to unavailability of documentation or equipment or access against which to conduct the requested or planned inspection”**

Until such time as Contractor reschedules the intervention to a time when all necessary requirements are available.

Inspection, test and/or review activities completed against Contractors documents shall verify the product or processes as conformant or non-conformant to specification and or code.

Product conformity shall require the assigned **QCIs** to;

- g) Complete, date and sign the relevant Contractor process or inspection control documentation (CLs, TCs, etc.) and ITP intervention requirement, if applicable, at the time and location of the inspection and/or test.

Product nonconformity shall require assigned **QCIs** to;

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- h) Cease the inspection activity and inform Contractor representative and UCS at the inspection test and/or review that the inspection is unsuccessful and needs repeating after rework is completed.
- i) Initiate and issue a “**Notice of Defect**” (NOD) – see Work Instruction **348-890104 “Control of Nonconforming Product”** and attach photographs to the NOD.
- j) Certain situations such as failed construction tests and incomplete work may not require the issuance of an NOD; such instances must be at the discretion of the DQM.
- k) Identify the product as non-conformant in writing on Contractor process or inspection control documentation (ITP, CLs, TCs, etc.) by documenting the following:
  - The date of the inspection
  - Rejected or inspection to be repeated
  - NOD No.
- l) Request Contractor and UCS to physically identify the nonconforming product to prevent unauthorised and inadvertent usage.

**Note:-** planned inspections also include the review of Data books at 30% and 70% completion stages and Engineers Assistant or UM are required to instruct Contractors at the appropriate juncture to initiate I&TNs for this activity. Such interim Databook reviews shall be completed as a joint review by QCIs, LDEs and UCSs and all comments noted on a Punchlist which shall be provided to and issued by the Engineers Assistant to Contractor for completion – follow up will occur at final inspection stage.

A CAR shall be raised for nonconforming Data books where the Contractor and TM have signed a declaration of missing records. The CAR shall be closed upon acceptance of such data book by the TM Engineer and the Contractor.

Data book completeness check is carried out on a sample of 10% and comments are recorded on a QA Data book Verification record – 348 74846 before data books are signed off for archiving.

### **3.6.3 Registration of Attended Inspections**

TM personnel responsible for conducting planned and/or targeted quality interventions shall complete the Daily I&TN on the same day as the intervention.

Individual shall access the Daily I&TN at G:\MedupiSite\IM\Quality\Daily\ I&TN and document therein:

- a) The inspection, test and/or review result as accepted, rejected, waived or cancelled;
- b) The initiation of any NOD (if applicable);
- c) The availability and completion of Contractors quality records; and
- d) Any relevant comments.

And thereafter email the completed I&TN to TM IC at [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za).

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### **3.7 I&TN Registration and Issue by TM**

TM IC shall compile all emailed data into the Daily I&TN the morning following the inspection activities and shall, with DQM, review the Daily I&TN and ensure correction of any missing or ambiguous data, or errors and validate it via electronic signature and thereafter issue it via [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) to:

- a) Contractors as advance information for actioning of;
  - Cancelled or rejected inspections
  - Unavailability of documentation, equipment or access
- b) Engineers Assistants for formal issue to Contractor for action or information as appropriate;
- c) UMs for follow up relating to schedule issues caused by cancelled or waived inspections and nonconformity; and
- d) DQMs for follow up of quality issues and identification of trends to determine “target” inspection requirements.

Upon receipt of the completed Daily I&TN TM DQM and SQCI, along with assigned Discipline Engineer, as appropriate, shall daily, review and verify the content of the actual records produced and verify their completeness and accuracy and inclusion into the appropriate Data books or Quality Dossiers.

### **3.8 Re-inspection by TM**

Re-inspection of previously documented:

- a) Cancelled inspections;
- b) Nonconforming product

Shall necessitate Contractor initiation of another I&TN clearly defining the inspection as a 2<sup>nd</sup> inspection and the implementation of the inspection and verification process as defined in 3.5 to 3.7 of this Work Instruction.

### **3.9 Final TM Inspection Prior to Safety Clearance**

#### **3.9.1 Planning Final Inspection**

To finalise completion of construction inspection activities by TM and thereafter progress the “Safety Clearance” activity by TM Commissioning Department. Contractors shall complete and issue an Application for Inspection (AFI) included herein as **Appendix 03** to this Work Instruction, accompanied by Contractors 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 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:
  - [medupigaonsite@eskom.co.za](mailto:medupigaonsite@eskom.co.za) as documented in 3.5 of this Work Instruction
  - Engineers Assistant/CM/PM via the package proxy email address

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The exception to the rule is where Contractor has completed and verified work during night shift operations and may request final (pre safety clearance) inspection at the morning MPIC meeting. If resources or workload allow TM will comply and in such instances Contractor shall proceed with the issuance of I&TN and AFI 348-185881 immediately thereafter and shall allow sufficient time for TM DQM to organise the resources for the inspection.

**Note – TM DQM** shall coordinate the final inspection with Discipline Engineer, UCS, Commissioning Engineer and Contractor Representative but will do so only if the AFI has been signed by UM, or designee, as it is this signature that verifies the day to day build quality is considered conformant and the installation is ready for final inspection.

### **3.9.2 Final Inspection**

DQM shall notify Contractor, LDE, QCI, Commissioning Engineer, and UCS of the pre inspection meeting location (generally the inspection location) and provide QCI with the applicable AFI identifying required inspection parties and a numbered Final Inspection Punchlist pro forma, included herein as **Appendix 04**, numbered per I&TN No & I&TN Activity number.

At the pre inspection meeting location the QCI shall ensure the required build documentation (including, but not limited to, P&IDs, General Arrangement, Single Line Diagrams, etc.) is available and marked up by Contractor to identify inspection boundaries and any open ECNs / FCNs and NODs.

Availability of documentation shall ensure:

- a) A walkdown inspection of the installation is conducted to determine completeness and conformity of the completed work to specification and code.
- b) A final review of the Quality Dossiers or Data books is conducted to verify their completeness and accuracy.
- c) A review of NODs in WISPA by DQM and ECNs or FCNs in Engineering Database is conducted by LDE to determine if any remain unanswered or un-actioned out with that identified by Contractor which shall result in the assigned QCI and QE.
- d) Completing, signing and dating the AFI.
- e) Documenting any incomplete or nonconforming work and any unanswered and / or un-actioned NODs, ECNs, FCNs, etc., on the Punchlist which shall be individually categorised by the personnel completing the inspection on the basis of:
  - Category 3 – minor non safety related incomplete work which is deemed suitable for completion after Safety Clearance via the process identified in section 3.5 of this Work Instruction
  - Category 2 – major incomplete work which must be complete before Safety Clearance and requires Contractor's reapplication for Final Inspection
  - Category 1 – Incorrect / nonconforming work which must be subject to Contractor NCR and requires TM Engineering review of Contractor proposed disposition and Contractor reapplication for Final Inspection when closed by Contractor and TM

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f) Completing the daily I&TN.

Where the necessary equipment, access or documents are unavailable, incomplete or at the incorrect revision against which to proceed the final inspection activity the activity shall be considered by TM as “rejected” with a comment included in the Daily I&TN and AFI Form 348-185881 that:

**“The inspection is rejected and conformity is considered indeterminate due to unavailability of documentation, equipment or access against which to conduct the requested or planned inspection”.**

In such instances Contractor shall reschedule the intervention as defined in section 3.9.1 above. However, due cognisance shall be taken of the scale of the issue and a decision taken as to whether or not to wait for correction of the equipment, access or document issue before cancelling the final inspection.

### **3.9.3 Reporting Final Inspection**

Uploading and retrieval of original Punchlist and AFI on WISPA shall be carried-out as follows;

- a) QCI to scan hardcopy of AFI and Punchlist, hand original to Contractor Supervisor and a copy to Eskom’s Quality Dept. Defects management team.
- b) Defect management team upload P/L on WISPA Inspection Punchlist database

Thereafter, scanned copies of both Punchlist and AFI shall be issued via mail to TMs DQM, UM and Commissioning Manager and Contractors Site / Project Quality Managers to generate rework.

Re-inspection of Punchlist items shall occur as defined in 3.5 to 3.8 above which requires Contractor to initiate and issue I&TNs to generate re-inspection.

AFI Forms signed by TM DQM and QCI verifying completeness and conformity shall be submitted to the Commissioning Manager as advance information and the original shall be handed to the same by Contractor at Daily Commissioning Start Up Meetings to generate Safety Clearance Inspection.

### **3.10 Stop Work Order**

Where quality and / or technical integrity are uncontrolled or nonconforming to the point of potentially or continually producing nonconforming product TM, via DQM, shall initiate and issue a STOP WORK ORDER to Engineers Assistant for issue to Contractor.

Thereafter a halt will be placed on Contractor activities until mitigation is agreed and verified by TM as complete.

Contractor shall, in line with 348-389557 & 348-225142 **“Contractor Quality Requirements During Construction and Commissioning”**, submit for TM approval an Inspection and Test Plan (ITP) Index identifying ITPs to be utilised on the project for;

- a) Construction / Installation; and
- b) Commissioning

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Thereafter, Contractor shall submit, taking cognisance of schedule and contractual document review periods, individual ITPs for each activity for TM approval ensuring the approval process can be enacted prior to work commencing.

All Contractor ITPs shall be approved by TM prior to Contractor being allowed to commence the applicable work activity at site as defined in 348-389557 & 348-225142.

#### **4. Process for Monitoring**

##### **4.1 Key Performance Areas and Indicators**

The following Key Performance Areas / Indicators (KPA's / KPIs) shall be measured, analysed and reported. The Process Owner shall be accountable, and assign the responsibility at the frequency as indicated below, documented as part of the QMS measurement, analysis and improvement initiative.

**Table 2: KPA's/KPIs**

<b>Key Performance Area</b>	<b>Key Performance Indicator</b>	<b>Target</b>	<b>Measure Frequency</b>	<b>Responsible</b>	<b>Record</b>
Quality Planning	Availability of Contractor ITP Register and Contractor approved ITPs status	30 days prior to work commencing	Weekly	QE	Weekly report
Inspections	Number of Planned Inspection carried out by TM	≥ 95 %	Weekly	DQM / IC	Weekly report
	Number of Planned Inspections cancelled by Contractor.	< 10%	Weekly	DQM / IC	Weekly report
	Number of Planned Inspections Waived by TM.	< 5%	Weekly	DQM / IC	Weekly report
	Number of Planned Inspections Rejected by TM.	< 5%	Weekly	DQM / IC	Weekly report
Nonconformity	Nonconformity types and status.	< 5%	Weekly	DQM / IC	Weekly report

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## **4.2 Document Review and Self-Assessment**

### **4.2.1 Document Self-Assessment**

The “Process Owner” identified on page 1 of this document along with departmental personnel, supported by project QMS Engineer shall undertake a “self-check” review of the process defined in this Work Instruction document every six months, commencing from the effective date of this document, to check:

- a) The process or Work Instruction operational integrity;
- b) Process efficiency; and
- c) The level of stakeholder knowledge and implementation.

Participants and results of the “self-check” review shall be documented by the Process Owner in the “Self-Assessment Checklist” included as **Appendix A** to this Work Instruction which shall be issued to [medupiga@eskom.co.za](mailto:medupiga@eskom.co.za) by the Process Owner once completed and filed in WISPA.

Process Owner shall proceed with any revision requirements identified as a result of “self-assessment” in line with Medupi Work Instructions 348-653867 “Development and Change of Medupi QMS Documents” and 348-883808 “Document and Records Management”.

### **4.2.2 Revision Period**

All QMS document shall undergo a 3 yearly compulsory revision period.

## **4.3 Training Requirements**

Personnel implementing this Work Instruction require the following training interventions:

- a) **ICs** shall be trained in the operation of this Work Instruction by **TM DQM** and **QMS Engineer**.
- b) **DQMs** and **IC** shall train **QD QCIs** and shall thereafter train **UCSs**, and **Contractor** personnel in the operation of this Work Instruction.

## **4.4 Stakeholders**

The personnel identified in the Document Control Page have reviewed and, via signature, approved and accepted this Work Instruction for implementation at Eskom’s Medupi Power Station project new build site in Lephalale.

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## **5. Acceptance**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
Dr. Andre Venter	FIDIC Engineer
Thabisile Biyela	Senior Construction Manager
Rofhiwa Nemutandani	Project Engineering Manager
Elvis Modise	Employer's Representative

## **6. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
May 2021	06	L. Zamxaka	Changes to template and SPO alignment
April 2018	05	P. Lubisi	Including the latest revision of AFI form and Punchlist form, and 5.9.1 reference instead of 3.9.1 amendment made.
September 2017	04	P. Lubisi	Changes made to address ISO 9001:2015 requirements.

## **7. Development Team**

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

- Eugene Memela
- Lwandiso Zamxaka
- Raymond Tshotheli
- Grant Shabangu
- Hannes Beukes
- Choene Komape
- Dingindhlela Magazi


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## Appendix A – Process Self-Assessment Checklist: 348-655890

	<b>MEDUPI POWER STATION PROJECT</b>	Template Identifier	348-655890	Rev	1
		Document Identifier	348-9985492	Rev	0
		Effective Date	25 June 2019		
		Next Review Date	25 June 2022		
TITLE: Document Self-Assessment Checklist					

Discipline: Quality		Applicable Document No.:348- 106670 Site Quality Assurance, Control and Verification Work Instruction				Self-Assessment Date:	
Item No	Ref Section	Self-Assessment Question	Compliant			Comment	
			Yes	Part	No		
1	3.2	Has DQM ensured contractor establishment of ITP submittal Schedule or Register?					
2	3.4.3	Has DQM managed the review contractor ITPs included LDEs, Ums and AIA personnel review comments?					
3	3.6.1	Are intervention point defined in ITPs for both TM Construction supervisors and TM QC Inspectors?					
4	3.4.2	Are TM intervention points adding value or merely duplication those of contractor?					
5	3.4.1	Are all Intervention Points suffixed with the either A, W,R or H ?					
6	3.5.1	Are Contractors submitting I&TNs by 15:00 Hrs the day preceding the planned conformity evaluation?					
7	3.5.2	Are Contractors I&TNs compiled into a Project Daily I&NT?					
8	3.5.2	Is Project Daily I&TN filled in WISPA or Network Drive for access by all?					
9	3.5.2	Are the initials of the assigned inspector in the Project Daily I&TN?					
10	3.7	Are inspection that are planned to be waived also identified to Contractor?					
11	3.6.2	Are Inspections being attended as planned?					

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File Name: 348-655890 Document Self-Assessment Checklist Rev 1

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	<b>MEDUPI POWER STATION PROJECT</b>	Template Identifier	348-655890	Rev	1
		Document Identifier	348-9985492	Rev	0
		Effective Date	25 June 2019		
		Next Review Date	25 June 2022		
TITLE: Document Self-Assessment Checklist					

12	3.6.2	Is non-conformant work being identified on Contractor Quality Verification Records?				
13	3.6.2	Is non-conformant work being identified on Project Daily I&T?				
14	3.6.2	Is non-conformant work being documented via NODs?				
15	3.6.2	Is non-conformant work being identified on Contractor Quality Verification Records?				
16	3.6.3	Is the completed Project Daily I&TN filed in WISPA or network Drive.				
17	3.7	Is the Project Daily I&TN Issued to Contractor on a daily basis.				
18	4.1	Do DQMs and PMs identify defect status to Contractor at weekly quality meetings.				
19	3.8	Is Contractor issuing additional I&TNs for corrected work.				
20	3.9.2	Is the TM Defect Register maintained as a "live" document.				
21	4.1	Are KPAs / KPIs being reported by assigned personnel at the right frequency.				
22	4.1	Are KPIs being reported by assigned personnel to UM and SQCM.				
23	3.9.3	Are Punchlist being produced / Issued and traceability.				
24	3.9.2	Are Punchlist Identifying Issue by category.				
25	200-46362	Do TM personnel understand the aims and requirements of this Work Instruction sufficiently to negate further training or is additional training required				

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File Name: 348-655890 Document Self-Assessment Checklist Rev 1

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	<b>MEDUPI POWER STATION PROJECT</b>	Template Identifier	348-655890	Rev	1
		Document Identifier	348-9985492	Rev	0
		Effective Date	25 June 2019		
		Next Review Date	25 June 2022		
TITLE: Document Self-Assessment Checklist					

Comments:				
Self-Assessment by:	Name:	Position:	Revision Required. (Yes / No)	Planned Revision Date:

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File Name: 348-655890 Document Self-Assessment Checklist Rev 1

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## Appendix B: Inspection and Test Plan


[illegible]

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## Appendix C: Punch List

	ESKOM GROUP CAPITAL MEDUPI POWER STATION PROJECT PUNCHLIST		Form No.: SPF 200 108399
			Rev: 5 (13.09.2016)
Division:	Unit:	Area:	KKS #:
Sub System/Room:	Pkg. #:	Contractor:	Contract Title:
I&TN No & Activity No.:	AFI SPF No.:	Initiator:	Stamp #:

Item #	Internal / External	Cat 1,2,3	Description of nonconformity or incomplete work	Initiator & Date	Close-out Date and Signature


The above items have been determined applicable after inspection and/ or review, agreed by all parties and classified as per below requirements			
Contractor Name / Sign / Date:	Employer Unit Supervisor Name / Sign / Date:	FIDIC QC Inspector Name / Sign / Date:	Employer Engineer Name / Sign / Date:
PTM Name / Sign / Date: N.A.	Commissioning Name / Sign / Date: N.A.	N.A.	Initiator to mark the not applicable parties with an "N/A" to eliminate confusion with signing off the Punch List.
Category 3 - Minor Incomplete / Damaged Work or Equipment – Can complete after Safety Clearance	Category 2 - Major Incomplete Work or Damage to Equipment - Must complete before Safety Clearance	Category 1 - Nonconforming Work - Contractor NCR to be raised / actioned before Safety Clearance	Page 1 of 1

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## Appendix D: Contractor's application for inspection of The Works / Part of the Works

	<b>Medupi Power Station Project</b> <b>"Application for Final Inspection" of The Works/Part of The Works</b>		Form SPO No:		200-20381	Rev	4			
			AFI SPO No.		e.g.: 348-123456					
			Effective Date		02 November 2017					
			Review Date		April 2018					
Contractor :                      Inspection Details, Plant Identification, Location, Description and Confirmation to Proceed										
Pkg. #: e.g.: P1		Contractor: e.g.: MHPSA			Contract Title: e.g.: Turbine Works					
Inspection Date: YYYY/MM/DD			Inspection Time: 24Hr Format			Meeting Location: e.g.: Control Room				
Generic Plant Process			(Circle as Appropriate)	Plant Area / Unit	U4	U3	U2	U1	BOP	
No.	Description	KKS		Plant Discipline	Boiler	Turbine	Elec	C&I	Mech / Piping	Civil
2.1	e.g.: Steam Piping System	e.g.: LB								
As per GGG 0806 – Page 7 & Annexure A										
HAZLOC Area		Yes		No	Full System Inspection			Partial System Inspection		
Plant Description (as per GGG 0806 Annexure B)										
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&ID, Isometric / Single Line Diagrams etc.) is available against which inspection can proceed						Punchlist No / Rev.: XXXXXXX / A		Doc. Pkg. Available: Yes / No		
Contractor Construction Mgr.			Contractor Quality Mgr.			Employer Unit Mgr. (or designee)				
Name:			Name:			Name:				
Sign:			Sign:			Sign:				
Date:			Date:			Date:				
Email Distribution by Contractor :			Original To: medupiqaonsite@eskom.co.za / Copy To: Package proxy email address							
Employer :			Inspection Assignment and Verification Details							
Assigned QCI: e.g.: P. Boats					I&TN No & Activity No.: e.g.: 1235 / 54					
Employer Final inspection Participants (tick as appropriate)			Walk down Inspection		NOD Review		ECN & FCN Review		% Databook Review	

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TM Quality Dept. Rep. (including AIA if appropriate)		PR	PR		PR
TM Engineering Dept. Rep.		PR		PR	SR
TM Construction Dept. Rep.		PR			
TM Commissioning Dept. Rep (C&I and Electrical)		PR			
Prime / Secondary Responsibility		Insert Name & Date against applicable inspection activity after inspection and inclusion of any necessary items on the P/L			
HAZLOC Areas					
All required records available and signed by relevant parties related to HAZLOC	Contractor HAZLOC Rep		TM Engineering Rep		TM Quality Rep
	PR		PR		SR

<b>Punchlist No.:</b> <b>e.g.: 1235 / 54</b>		No. of Cat 1: <b>02</b>	<b>28</b>	<b>Inspection Disposition (<i>System Engineer to Tick as applicable</i>)</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>Discipline Quality Manager Verification (Name, Signature &amp; Date)</b>				<b>Systems Engineer Verification (Name, Signature &amp; Date)</b>		
<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 E: QA Data Book Verification Record

	ESKOM GROUP CAPITAL MEDUPI POWER STATION PROJECT QA Data Book Verification Record	Template Identifier	348-64756	Rev	0
		Document Identifier	348-74846	Rev	0
		Effective Date	November 2017		
		Review Date	October 2020		

SPO No:		Verification Date:		Data Book Description:			
KKS No:		Unit No:		Data Book No:			
Package No:		Data Book Classification:		Volume:		Copy/Original:	
Contractor's Name & Signature:				Verifier Name & Signature:			
Item #	Description of nonconformity	TM System Engineer			QA Reviewer		
		Accept As Is	Correct (Contractor)	Sign & Date	Archive	Sign & Date	

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