Eskom	Work Instruction	Medupi Power Station Project

Title: **Issuing of KKS Certificate Work Instruction**

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Compiled by	QA, Interface & Governance Review	Functional Responsibility	Authorized by
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Date: 30-03-2021	Date: 30-03-2022	Date: 30-03-2022	Date: 2022/04/04

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Figures

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1. Introduction

This document aims to establish a detailed work instruction to be used to issue a KKS certificate The KKS certificate is an additional measure within the project environment to ensure that the as-build status of the plant reflects the design documentation.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to define the process to be followed when issuing a KKS certificate.

2.1.2 Applicability

This document is applicable to engineers, contractors and subcontractors on the Medupi build project.

2.1.3 Effective date

Date of authorisation of the document.

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] 200-18202 KKS Key part - Fossil Power Station, N.PSZ 45-45

[2] 200-4190 The Application of KKS Plant Coding, NMP 45-7

[3] 200-3340 KKS Plant Labelling and Equipment Descriptions Standard, Alpha KKS01

[4] 200-5343 Abbreviation Standard , Alpha KKS02

[5] 200-16714 Commissioning Procedure

[6] 200-11947 Medupi Configuration Management Plan

[7] 200-46006 KKS and Labelling Certificate

[8] 200-5664 Medupi Engineering Change Management Procedure

2.2.2 Informative

[9] 348-961711 Project Execution Plan

[10] 348-883902 Project Quality Plan

[11] 348-653867 Development and Change of Project QMS Documents Work Instruction

[12] 348-883808 Document and Record Management Work Instruction

2.3 Definitions

Term	Explanation
Configuration Management	Ensure that a product/equipment meets its specified performance requirements and those changes to these requirements and product design as reflected in its documentation is strictly controlled.
Configuration Management Plan	Document defining how configuration management will be implemented (including policies and procedures) for a particular project.
Configuration Control	Process that ensures that changes to released configuration documentation are properly identified, documented, evaluated, for impact, approved by an appropriate level of authority, incorporated and verified.
Engineering Change Process	Process of requesting, determining attainability, planning, implementing and evaluating changes to a plant and its components.
Engineering Change Notice	An engineering change proposal originating from the designing party which can be external to the technology engineering division in cases where detailed design has been contracted out (e.g. FIDIC Yellow book) or from GTE if the detail design is done in-house (e.g. FIDIC Red book) submitted to the project for review and impact assessment
Engineering Change Proposal	A documented request for a change to a base-lined design which is to be managed according to the engineering change process.
Field Change Notice	A document describing an engineering change implemented on site which is submitted to the Project for review and impact assessment.
Plant Breakdown Structure	A hierarchical breakdown of the plant, i.e. a parent / child relationship down to the configuration item level.
Physical configuration audit	A formal examination to verify that a configuration item has achieved the physical characteristics specified in its product configuration information.
Plant	The power station as represented by its physical infrastructure and assets.
Project Lifecycle Model	A model representing the progressive development of project, from conception through to termination.
Label	Identification of process, structure, point of installation, component or equipment by means of approved fixing methods, materials and ergonomic requirements
KKS (Kraftwerk Kennzeichen System)	The Identification System for Power Stations "KKS" serves to identify plants, sections of plants and items of equipment in any type of power station according to task, type and location.
Certificate	It is an acknowledgement of authenticity, a document certifying the authenticity of system, equipment or plant.

2.4 Abbreviations

Abbreviation	Explanation
CAR	Corrective Action request
CM	Configuration Management

Abbreviation	Explanation
CMP	Configuration Management Plan
CR	Change Request
C&I	Control and Instrumentation
DPI	Digital Pixel index
EDMS	Engineering Documentation Management System
ECN	Engineering Change Notice
ECP	Engineering Change Proposal
FCN	Field Change Notice
FIDIC	Fédération Internationale Des Ingénieurs-Conseils
GTE	Group Technology Engineering
GA	General Arrangement
IT&P	Inspection Test Plan
IDR	Integrated Design Review
I&TN	Inspection and Test Notification
KKS	Kraftwerk Kennzeichen System
LDE	Lead Design Engineer
PE	Professional Engineering
PCR	Pre Commissioning Review
P&ID	Piping and Instrument Diagram
PBS	Plant Breakdown Structure
PLCM	Project Lifecycle Model
SPF	Smart Plant Foundation
URS	User Requirement Specification

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.

Table 1: RACI Matrix

Process Step	**Contractor Applicant**	**System Engineer**	**Construction Supervisor**	**Configuration Manager**
Apply for KKS Certification	**R**	**I**	**I**	**A**
Prepare/Review Documentation For Site Safety Clearance/Inspection	**C**	**R**	**I**	**A**
Perform plant walk down and verify KKS codes on design vs Plant	**A**	**R**	**R**	**R**
Issue a KKS certificate if the label is permanent and the KKS code and description reflects the design document. (Refer to 200-46006). Tick off the status of all plant items within the scope of the audit in the appropriate boxes on the KKS certificate	**C**	**C**	**C**	**R/A**
Initiate & Complete ECM process if required after inspection	**A**	**R**	**I**	**R**
Link KKS Certificate to the relevant PBS in SPF	**I**	**I**	**I**	**R/A**
Updating of KKS Database	**I**	**I**	**I**	**R/A**

2.6 Related/Supporting Documents

Documents superseded by this work instruction

[1] 200-94660 Issuing of KKS Certificate Procedure Rev 06

Forms and templates

[2] 200-46006 KKS Certificate Template

[3] Certificate Verification Template

[4] 200-75592 Document Self-Assessment Template

Records

[5] Document Self-Assessment Checklist (Hyperwave)

3. Process Definition

3.1 Application for KKS Certificate

On completion of the construction phase the contractor will apply for a KKS certificate. This certificate is required in order to move into the safety clearance/commissioning phase of the project life cycle.

The inspection must be booked via the I & T N process. The relevant design documentation required to perform the inspection, i.e. P&ID, GA, Cable schedule, Equipment List etc., must be attached to the e-mail application and the relevant CM Technician must be copied. Alternatively, the documentation must be sent directly to the relevant CM technician when the booking is done.

3.2 Steps to follow to issue a KKS Certificate

NOTE: All this information should be available from the completed IDRs and PCR s per system

3.2.1 Mechanical KKS Certificate

a) Prepare and prioritise the issuing of KKS certificate in line with the commissioning schedule.

b) Attend PCR meetings.

c) Identify systems to be commissioned.

d) Compile information pack containing latest revisions of P&IDs, Equipment list, General Arrangement drawings and other documentation. Ensure that all documents have been accepted by all parties.

e) Perform a physical audit with the compiled information pack checking the following: plant KKS code versus design paperwork, descriptions versus equipment list and label type & position against KKS 01.

f) Record any discrepancies between the design configuration and physical configuration of the plant as indicated by the plant labels. The following needs to be considered:

- Whether all equipment that should be labelled has been labelled;
- Whether the code and description indicated by the label match the design;
- Whether the label is installed at a suitable location as per specification;
- Whether the label is manufactured from the correct material and is the correct size as per specification.

3.2.2 Electrical KKS Certificate

a) Prepare and prioritise the issuing of KKS certificate in line with the commissioning schedule.

b) Attend PCR meetings.

c) Identify systems to be commissioned.

d) Compile information pack containing latest revisions of single lines, load schedules, cable schedules, board GA, board parts lists, cable block diagram, termination diagram and drive & actuator schedule.

e) Perform a physical audit with the compiled information pack checking the following: single versus plant, load schedules versus plant, cable schedule versus plant (to – from coding), board GA versus plant (check point of installation and process), board parts list versus plant, drive & actuator schedule versus plant and label type & position against KKS 01.

f) Record any discrepancies between the design configuration and physical configuration of the plant as indicated by the plant labels. The following needs to be considered:

- Whether all equipment that should be labelled has been labelled;
- Whether the code and description indicated by the label match the design;
- Whether the label is installed at a suitable location as per specification;
- Whether the label is manufactured from the correct material and is the correct size as per specification.

3.2.3 C&I KKS Certificate

a) Prepare and prioritise the issuing of KKS certificate in line with the commissioning schedule.

b) Attend PCR meetings.

c) Identify systems to be commissioned.

d) Compile information pack containing latest revisions of C&I architecture drawing for relevant systems, board GA, board part lists, instrument schedules, alarm lists, loop diagrams, signal lists, cable block diagrams, schematic diagrams, termination diagrams, logic diagrams, list of remote control stations and cable schedule.

e) Perform a physical audit with the compiled information pack checking the following: instrument schedule versus plant, board GA versus plant, cable schedule versus plant, rack layout versus plant and label type & position against KKS 01.

f) Record any discrepancies between the design configuration and physical configuration of the plant as indicated by the plant labels. The following needs to be considered:

- Whether all equipment that should be labelled has been labelled;
- Whether the code and description indicated by the label match the design;
- Whether the label is installed at a suitable location as per specification;
- Whether the label is manufactured from the correct material and is the correct size as per specification.

3.2.4 Civil KKS Certificate

a) Prepare and prioritise the issuing of KKS certificate in line with the commissioning schedule.

b) Attend PCR meetings.

c) Identify systems to be commissioned.

d) Compile information pack containing latest revisions of site layout, building layout, building sectional layout, building floor plan per level, underground services layout, cable rack & support and building list (including room equipment list). Ensure that the PE certificate has been signed and it forms part of the documentation.

e) Perform a physical audit with the compiled information pack checking the following: site layout versus plant, building layout versus plant, building floor plan per level versus plant, room equipment list per building versus plant and label type & position against KKS 01.

f) Record any discrepancies between the design configuration and physical configuration of the plant as indicated by the plant labels. The following needs to be considered:

- Whether all equipment that should be labelled has been labelled;

- Whether the code and description indicated by the label match the design;
- Whether the label is installed at a suitable location as per specification;
- Whether the label is manufactured from the correct material and is the correct size as per specification.

3.3 Issuing of a KKS Certificate

a) Perform a physical audit by verifying plant against design (approved drawings).

b) Issue a KKS certificate if the label is permanent and the KKS code and description reflects the design document. (Refer to 200-46006). Tick off the status of all plant items within the scope of the audit in the appropriate boxes on the KKS certificate.

c) On completion of the physical audit and signing of all paperwork load KKS certificate on SPF and link to relevant level of the PBS on SPF. Send a scanned copy (300DPI or better pdf) to the KKS database administrator to upload the label status information to the database.

d) Deviations from the design must follow an approved Medupi change management process. A KKS certificate will be issued if the change document is registered in SPF.

e) If the plant does not reflect the design no KKS certificate will be issued.

f) Notifications of defects are to be registered as per the results of the comments made on the KKS certificate. All defects have to be cleared before hand over takes place.

g) Communicate all deviations or defects to responsible system engineer or project manager.

h) All parties involved sign the KKS certificate.

i) Record any discrepancies between the design configuration and physical configuration of the plant as indicated by the plant labels. The following needs to be considered:

- Whether all equipment that should be labelled has been labelled;
- Whether the code and description indicated by the label match the design;
- Whether the label is installed at a suitable location as per specification;
- Whether the label is manufactured from the correct material and is the correct size as per specification.

NOTE: If the same discrepancies occur more than once in the same system the configuration Technician shall issue a CAR (Corrective Action request).

3.3.1 Updating the KKS Database

a) Copy and paste the information from the configuration item list (equipment list, load list, etc.) used for the physical audit to the *Certificate Verification* template.

b) Verify the data against the KKS database to see if there are any discrepancies.

c) Update the label statuses taking into consideration and discrepancies detected during the physical audit.

d) Update the KKS database with the label statuses (refer.to the attached *Certificate Verification* template for more detail).

4. Process for Monitoring

4.1 Key Performance Areas and Indicators

The following Key Performance Areas / Indicators (KPAs / 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 3: KPAs/KPIs

Key Performance Area	Key Performance Indicator	Target	Measure Frequency	Responsible	Record
KKS codes on design/ project document	Review KKS codes design/ projects	Within 10 working days	Weekly	CM	SPF & KKS Database
Labelling on structures, systems, equipment and components on plant	Review labelling on structure, systems, equipment and components on plant.	Within 10 working days	Weekly	CM	SPF & Plant
KKS Certification	Issue a KKS certificate if the label is permanent and the KKS code and description reflects the design document. (Refer to 200-46006). Tick off the status of all plant items within the scope of the audit in the appropriate boxes on the KKS certificate	Within 24 hours after Conformant inspection	Weekly	CM	SPF & Plant

4.2 Document Review and Self-Assessment

4.2.1 Document Self-Assessment

The “Process Owner” 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 / work instruction 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 Process Owner in the “Self-Assessment Checklist” *(Template No. 348-655890)* included as an Appendix to this procedure which shall be submitted via SharePoint to Medupi Documentation Department Help Desk by the Process Owner once completed.

Process Owner shall proceed with any revision requirements in line with Medupi Work Instructions, 348-653867 “Development and Change of Medupi QMS Documents” and 348-883808 “Document and Record Management”.

4.2.2 Revision Period

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

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:

Name	Designation
Rofhiwa Nemutandani	Acting Project Engineering Manager
Bruce Tyson	Lead Project Engineer - Low Pressure Services
Rohan Slabbert	Lead Project Engineer - Turbine
Bathandwa Cobo	Lead Project Engineer - Chemical
Kgaugelo Shebe	Lead Project Engineer - C&I
Mpho Ramunenyiwa	Lead Project Engineer - Electrical
Tau Chokoe	Lead Project Engineer - Civil
Zak Jiyane	Lead Project Engineer - BMH
Elaine van der Westhuizen	Manager Design & Specifications (Gx)

6. Revisions

Date	Rev.	Compiler	Remarks
March 2022	08	M. Dhlamini	• 3 yearly revision • Updated document in line with the latest Document Template
October 2017	07	L. Cingo	• Updated document to indicate Revised KKS Certificate Template. • Updated document to clarify Application for KKS Certificate. • Updated document to indicate issuing of CAR's. • Added KPA Targets • Added process Self-assessment Reference section
November 2015	06	F. Jansen van Vuuren	• Updated document to indicate Revised KKS Certificate Template. • Updated Table 1 – RACI Matrix

7. Development Team

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

- Mduduzi Dhlamini

Appendix A – Process Self-Assessment Checklist

Discipline: **Configuration Management**	Applicable Document No.:	Self-Assessment Date: / /

Item No	Ref Section	Self-Assessment Question	Compliant			Comment
			Yes	Part	No	
1	**3.1**	On completion of the construction phase, is the application for KKS Certificate submitted?				
2	**3.1**	Are the inspections booked via the I & T N process and the relevant design documentation required to perform the inspection, i.e. P&ID, GA, Cable schedule, Equipment List etc. sent to the relevant CM Technician?				
3	**3.2.1**	Are the steps for issuing Mechanical KKS certificate followed?				
4	**3.2.2**	Are the steps for issuing Electrical KKS certificate followed?				
5	**3.2.3**	Are the steps for issuing C&I KKS certificate followed?				
6	**3.2.4**	Are the steps for issuing Civil KKS certificate followed?				
7	**3.3**	Is the issuing of KKS certificate work instruction adhered to?				
8	**3.3.1**	Are the steps to update the KKS database being followed?				

Comments:

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

Attendees:

A.1 KKS Certificate Template

Eskom	**MEDUPI PROJECT**	**Doc No:**	**Rev:**
		Template No: 200-46006	**Rev: 13**
		Doc Type:	**EQI**
		February 2012	**Page: 1 of 1**

TITLE: CONFIGURATION KKS AND LABELING INSPECTION CERTIFICATE

ORIGINAL TO:	Commissioning File	**KKS CERTIFICATE No: KKS**
COPIES TO:	SPF, Configuration Management File	

PLANT AREA	**U1**	**U2**	**U3**	**U4**	**U5**	**U6**	**BOP**

PLANT	**CIVIL**	**MECHANICAL**	**ELECTRICAL**	**C & I**	**Package No:**
PLANT SYSTEM (as per PBS)				**All PBS No's**	
PLANT SPECIFIC					

PLANT DRAWINGS	**DRW No.**		**Rev**		**Status**	
EQUIPMENT LIST	**SPO No.**		**Rev**		**Status**	
KKS CERTIFICATE STATUS	**Accepted**					

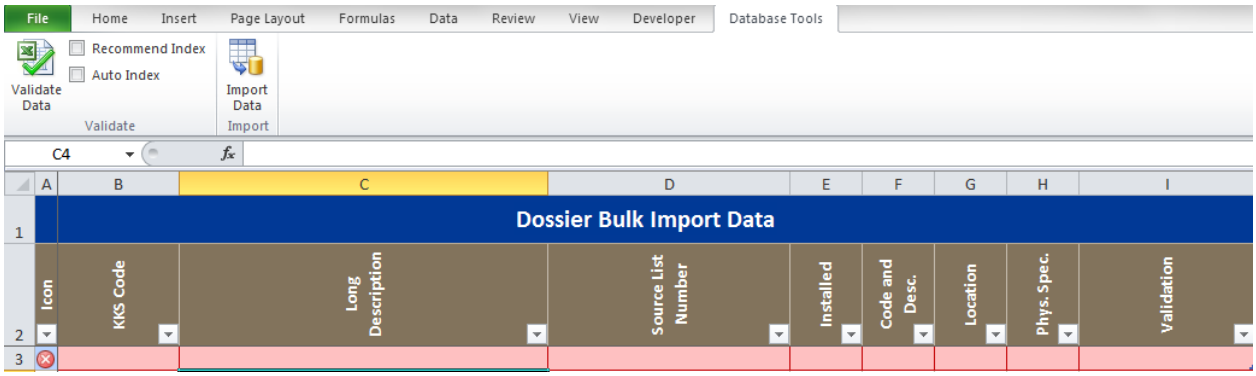
The above-mentioned plant was checked against the above-mentioned drawing :

Inspection Results:

The above items to be added to safety clearance and commissioning defect list

	Print Name	**Signature**	**Date**
Contractor Applicant			
System Engineer			
Construction Supervisor			
Configuration Technician			

A.2 Certificate Verification Template



To verify the codes for a specific certificate, follow these steps:

1. Copy the KKS codes from the source configuration item list which were verified during the physical audit to the *KKS Code* column
2. Copy the long descriptions from the source list to the *Long Description* column.
3. Enter the SPF document number for the source list in the *Source List Number* column for all records.
4. Click the *Validate* button. The data will be compared to the KKS Database, and the *Validation* column will list any differences between the list and the KKS Database.
5. Complete columns E to F (the label status columns).
6. Click *Import Data* to import the label statuses to the KKS Database.
7. Action any discrepancies between the source list and the KKS Database (as were identified when the data was validated) to ensure that the list and KKS database align.