

	<b>ADMINISTRATIVE PROCEDURE</b>	<b>Allocation Centre 38A</b>	<b>Reference Number KAA-501</b>	<b>Rev 11</b>
<b>NNR: NO No.:</b>	<b>PROJECT MANAGEMENT PROCESS FOR KOEBERG NUCLEAR POWER STATION MODIFICATIONS</b>			<b>PAGE 1</b>
<b>KORC YES</b>	<b>ACCESS Nuclear Restricted</b>	<b>IMPORTANCE CATEGORY CSR</b>	<b>NEXT REVIEW DATE 2022-09-23</b>	<b>DATE AUTHORISED 2019-09-23</b>

<b>COMPILED / REVISED</b>	<b>REVIEWED</b>	<b>AUTHORISED</b>
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SENIOR ADVISOR PROJECTS	SENIOR MANAGER NUCLEAR PROJECTS (ACTING)	GENERAL MANAGER KOEBERG NUCLEAR POWER STATION
<b>DATE</b> 2019-09-12	<b>DATE</b> 2019-09-12	<b>DATE</b> 2019-09-23

**THIS PROCEDURE HAS BEEN SEEN AND ACCEPTED BY:**

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Z Qabaka	Systems Engineering
S Fisa	Maintenance Execution
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<b>FCA</b>  NUCLEAR PROJECT MANAGEMENT	<b>ALARA REVIEW</b> YES 2019-04-10	<b>SUPERSEDES</b> KAA-501, Rev 10 dd. 2013-01-30 FULL REVIEW
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## **1.0 PURPOSE**

- 1.1 To describe the processes and responsibilities for project management of modifications at the Koeberg Nuclear Power Station plant.
- 1.2 To ensure that modifications are implemented in a systematic and controlled manner in accordance with the principles of the authorised Project Life Cycle Model.
- 1.3 To ensure that all modification related configuration and quality requirements are met.

## **2.0 SCOPE**

### **2.1 Applicable to:**

- 2.1.1 Modifications related to plant or plant structures, systems or components.
- 2.1.2 Set point or critical operating parameter changes.
- 2.1.3 Modifications related to the physical security system.
- 2.1.4 Modifications related to any packaging for the transport of radioactive material.
- 2.1.5 New and/or changes to existing building and civil structures that are linked to the operation of the plant.
- 2.1.6 Modifications to software or software systems related to the plant.

### **2.2 Not applicable to:**

- 2.2.1 Desktop software changes/non-plant software changes.
- 2.2.2 Plant changes governed by other authorised procedures.
- 2.2.3 Maintenance refurbishments.
- 2.2.4 Changes to operational parameters that are within the analysed design limits.

## 3.0 DEFINITIONS AND ABBREVIATIONS

### 3.1 Definitions

- 3.1.1 **Client/Owner** – The department, business unit or group where the expenditure of the project will be entered into the books of account as an asset or operational expenditure.
- 3.1.2 **Critical Operating Parameter** – A component, system, software logic, radiation level, alarm or control setting that, if modified, will place the plant in an unanalysed condition that is not within the analysed plant design basis envelope which has been demonstrated to be safe.
- 3.1.3 **Design Engineer** – The engineer assigned to the project with the prime responsibility for the technical integrity of the project. The engineer is responsible for all the aspects of the design of the project as expressed in the performance or technical specifications, quality specifications and engineering design.
- 3.1.4 **Design Field Change** – A change to a design change package during the implementation phase of a modification that does not change or has no impact on the design intent.
- 3.1.5 **Design Revision Change** – A change to a design before or during the implementation phase of a modification where there are changes to the design intent.
- 3.1.6 **Functional Line Groups** – Appropriate representatives identified as part of the project team (based on the nature of the project).
- 3.1.7 **Modification** – Any change to, removal of, or addition to structures, systems, or components or part thereof, or changes to operating parameters that affect the design or operation of Koeberg Nuclear Power Station.
- 3.1.8 **Orientation Training** – Training conducted before modification implementation that provides an overview of the existing design, problems with the existing design, a description of the new design and how the new design addresses issues related to the existing design.
- 3.1.9 **Project Engineer** – The person responsible for engineering execution on a project, organising the engineering work to support the programme schedule/plan, providing technical leadership and guidance and day-to-day direction of the assigned personnel.
- 3.1.10 **Project Initiator/Originator** – Any person who identifies a need for a change and initiates the change process.

- 3.1.11 **Project Manager** – The person who has been assigned the responsibility to ensure that the objectives of the concept, definition, execution and finalisation phases of the project (as expressed in money/cost, completion dates/time, technical and quality requirements/specifications/performance) are achieved.
- 3.1.12 **Project Sponsor** – The person or group that provides the financial resources for the project and who takes ultimate responsibility for the project.
- 3.1.13 **Project Stakeholders** – Individuals or groups that are actively involved in the project or whose interest may be positively or negatively affected as a result of project execution. They may also exert influence over the project and its results.
- 3.1.14 **System Engineer** – Individual who is responsible for the SSC, i.e. the responsible engineer (system engineer/civil engineer/RFE physicist/IPD(K) engineer).

## **3.2 Abbreviations**

- 3.2.1 **AR** – Availability Related
- 3.2.2 **BOM** – Bill of Materials
- 3.2.3 **CE** – Component Engineering
- 3.2.4 **CMG** – Configuration Management Group
- 3.2.5 **COC** – Certificate of Compliance in accordance with SANS 10142 for Electrical Installations
- 3.2.6 **CRA** – Concept Release Approval
- 3.2.7 **CSC** – Construction Status Certificate
- 3.2.8 **CSR** – Critical Safety Related
- 3.2.9 **DCIF** – Documentation Change Identification Form
- 3.2.10 **DCP** – Design Change Package
- 3.2.11 **DCR** – Document Change Request
- 3.2.12 **DDR** – Document and Drawing Change Request
- 3.2.13 **DE** – Design Engineering
- 3.2.14 **DFC** – Design Field Change
- 3.2.15 **DRA** – Definition Release Approval
- 3.2.16 **DRC** – Design Revision Change

- 3.2.17     **EBOM** – Engineering Bill of Materials
- 3.2.18     **ECMC** – Engineering Change Management Committee
- 3.2.19     **ECO** – Engineering Change Order
- 3.2.20     **ECR** – Engineering Change Request
- 3.2.21     **EPD** – Engineering Programmes Department
- 3.2.22     **ERA** – Execution Release Approval
- 3.2.23     **FAT** – Factory Acceptance Testing
- 3.2.24     **FRA** – Finalisation Release Approval
- 3.2.25     **HBS** – Hardware Breakdown Structure
- 3.2.26     **IRAF** – Investment Release Approval Form
- 3.2.27     **IPD** – Integrated Plant Design
- 3.2.28     **IPD(K)** – Integrated Plant Design (Koeberg)
- 3.2.29     **IT** – Information Technology
- 3.2.30     **KIT** – Plant Computer System
- 3.2.31     **KNLD** – Koeberg Nuclear Licensing Department
- 3.2.32     **KNPS** – Koeberg Nuclear Power Station
- 3.2.33     **KPMC** – Koeberg Portfolio Management Committee
- 3.2.34     **KORC** – Koeberg Operations Review Committee
- 3.2.35     **M&TE** – Measuring and Testing Equipment
- 3.2.36     **MBOM** – Maintenance Bill of Materials
- 3.2.37     **MRC** – Management Review Committee
- 3.2.38     **MTG** – Maintenance Training Group
- 3.2.39     **NEC** – New Engineering Contracts
- 3.2.40     **NNR** – National Nuclear Regulator
- 3.2.41     **NPM** – Nuclear Project Management
- 3.2.42     **NSA** – Not Safety or Availability Related

- 3.2.43     **OEM** – Original Equipment Manufacturer
- 3.2.44     **OH & S** – Occupational Hygiene and Safety
- 3.2.45     **OPG** – Operating Procedures Group
- 3.2.46     **OPS** – Operating Department
- 3.2.47     **OTG** – Operator Training Group
- 3.2.48     **OTS** – Operating Technical Specifications
- 3.2.49     **PDRA** – Project Definition Readiness Assessment
- 3.2.50     **PEE** – Production Equipment Expenditure
- 3.2.51     **PHC** – Plant Health Committee
- 3.2.52     **PQE** – Procurement Quality Engineering
- 3.2.53     **PSA** – Probabilistic Safety Assessment
- 3.2.54     **PTW** – Permit To Work
- 3.2.55     **QA** – Quality Assurance
- 3.2.56     **QC** – Quality Control
- 3.2.57     **QCP** – Quality Control Plan
- 3.2.58     **RE** – Reliability Engineering
- 3.2.59     **RFE** – Reactor Fuel Engineering
- 3.2.60     **RI** – Receipt Inspection
- 3.2.61     **SAC** – Station ALARA Committee
- 3.2.62     **SAP** – Systems, Applications and Products
- 3.2.63     **SAR** – Safety Analysis Report
- 3.2.64     **SAT** – Site Acceptance Testing
- 3.2.65     **SCC** – Safety Clearance Certificate
- 3.2.66     **SFT** – Sanction For Test
- 3.2.67     **SHE** – Safety, Health, and Environment
- 3.2.68     **SI** – Specific Instruction

- 3.2.69 **SOW** – Statement of Work
- 3.2.70 **SPC** – Single Point Contact
- 3.2.71 **SR** – Safety Related
- 3.2.72 **SSC** – System, Structure, and Component
- 3.2.73 **TA** – Test Application
- 3.2.74 **TAF** – Temporary Alteration Form
- 3.2.75 **TCR** – Training Change Request
- 3.2.76 **TD & RM** – Technical Documentation and Records Management
- 3.2.77 **TMG** – Training Material Group
- 3.2.78 **TOI** – Temporary Operating Instruction
- 3.2.79 **TRS** – Technical Requirements Specification
- 3.2.80 **TTG** – Technical Training Group
- 3.2.81 **TTY** – Training Technology Group
- 3.2.82 **URS** – User Requirement Specification

## **4.0 REFERENCES**

### **4.1 Referenced Documents**

- 4.1.1 240-129883544, Rev 1: Procurement Quality Engineering Requirements
- 4.1.2 240-95232993, Rev 1: Eskom Reference Project Life Cycle Model [PLCM]
- 4.1.3 331-83, Rev 1: Requirements for Plant Changes Affecting the Design of Koeberg Nuclear Power Station
- 4.1.4 335-2, Rev 4: Koeberg Nuclear Power Station Management Manual
- 4.1.5 KAA-771, Rev 7c: Outage Scope Control Process
- 4.1.6 KSA-011, Rev 14: The Requirements for Controlled Documents

**4.2 Applicable Documents**

- 4.2.1 238-181/239-QEF-002: Service Level Agreement between Nuclear Project Sourcing and Nuclear Project Management
- 4.2.2 240-101866232: Nuclear Statement of Work
- 4.2.3 240-101866424: Nuclear Investment Release Approval Form (IRAF) for CRA/DRA/ERA/FRA
- 4.2.4 240-101866564: Nuclear Project Change Request Form
- 4.2.5 240-101867884: Nuclear Project Management Plan (PMP)
- 4.2.6 240-101868186: Nuclear Project Stakeholder Matrix and Organogram and Member Appointment (SMA)
- 4.2.7 240-101871085: CRA Nuclear Stage Gate Review Checklist
- 4.2.8 240-101871091: DRA Nuclear Stage Gate Review Checklist
- 4.2.9 240-101871099: ERA Nuclear Stage Gate Review Checklist
- 4.2.10 240-101871121: FRA Nuclear Stage Gate Review Checklist
- 4.2.11 240-102714621: KOU Portfolio Management Committees – Consisting of KPMC and MRC TORs
- 4.2.12 240-114901099 Terms of Reference for the Configuration Management Operational Forum
- 4.2.13 240-119091754: Management and Control of Operating Experience
- 4.2.14 240-119092296: NPM Work Management Process
- 4.2.15 240-132469022: Nuclear PLCM Hyperwave and SharePoint Taxonomy Structure Procedure
- 4.2.16 240-136815819: Procedure for Project Definition Readiness Assessments
- 4.2.17 240-140110851: Environmental Impact Screening Form
- 4.2.18 240-84975495: Engineering Change Management Committee for Koeberg Operating Unit
- 4.2.19 240-85549806: Governance Standard for Gate Management in Eskom
- 4.2.20 240-95405347: Control of Procurement of Goods and Services
- 4.2.21 32-1034: Eskom Procurement and Supply Management Procedure

- 4.2.22 331-148: Programme Engineers Guide
- 4.2.23 331-342: Integrated Plant Design Process for Changes to Systems, Structures or Components at Koeberg Operating Unit
- 4.2.24 331-85: Design Basis Documentation Change Process
- 4.2.25 331-86: Design Changes to Plant, Plant Structures, or Operating Parameters
- 4.2.26 GGW1064: The Use of Licensing Frameworks at Koeberg Nuclear Power Station
- 4.2.27 KAA-500: The Process for Controlled Documents
- 4.2.28 KAA-614: Control of Spares Assessments and New Stock Applications
- 4.2.29 KAA-632: ALARA Programme
- 4.2.30 KAA-641: Control and Receipt of Materials
- 4.2.31 KAA-647: Control of Non-routine Testing and Infrequently Performed ActivitiesControl of Non-Routine Testing
- 4.2.32 KAA-648: Administration and Responsibilities for Requalification Testing
- 4.2.33 KAA-664: Issuing a Construction Status Certificate/Safety Clearance Certificate
- 4.2.34 KAA-679: Control and Operation of the Measuring and Test Equipment at Koeberg Nuclear Power Station
- 4.2.35 KAA-709: Process for Performing Safety Evaluations, Screenings, and Safety Justifications
- 4.2.36 KAA-721: Online Work Management ProcessPlanning Scheduling and Execution of Production Activities
- 4.2.37 KAA-733: Monitoring of the Receipt Inspection Processes
- 4.2.38 KAA-831: Koeberg Nuclear Licensing Processes
- 4.2.39 KAB-018: The Operating Department Procedure Change Process
- 4.2.40 KAM-038: Process for Repair/Replacements of Installed Mechanical Components
- 4.2.41 KFA-002: Nuclear Project Management Work Plan Form
- 4.2.42 KFA-006: Testing Procedure for Plant Modifications
- 4.2.43 KFA-035: Design Change Package Implementation Approval Form
- 4.2.44 KFU-PE-007: Project Finalisation Certificate

- 4.2.45 KFU-PE-008: Plant Handover Certificate
- 4.2.46 KFZ-IO-010: Application for Cataloguing and New Stock Application
- 4.2.47 KLA-023: Outage Preparation Milestone Check List
- 4.2.48 KSA-038: Requirements for Quality Records
- 4.2.49 KSA-049: Koeberg Training Standard
- 4.2.50 LD-1012: Requirements in Respect of Proposed Modifications to the Koeberg Nuclear Power Station
- 4.2.51 NIL-01 Var 19: Nuclear Installation Licence no. Nil-01 (Variation 19)

## 5.0 RESPONSIBILITIES

**NOTE:** *The following responsibilities are a framework of the main responsibilities for the different project team members and project stakeholders. Additional responsibilities may be included in Appendix 1 – Work Flow Responsibility Matrix. Project-specific responsibilities are captured in the project stakeholder matrix.*

### 5.1 The Programme Management Manager

- ensures that the process described in this procedure is correctly implemented and maintained.

### 5.2 Project Initiator/Originator

- identifies the problem or opportunity and the desired end state.

### 5.3 System Engineering

- evaluates the validity of the problem;
- compiles the SOW;
- ensures the CURA risk for the project remains updated until implementation;
- decides on an appropriate resolution process;
- motivates for the modification through ECMC / MRC;
- perform CSC inspection and identify reservations;
- provides technical support to the project team (system specific support); and,
- supports the project manager in approval processes/effectiveness review as a client representative.

#### **5.4 Design Engineering**

- compiles documents as defined in 331-86;
- reviews and accepts designs on behalf of Eskom;
- supports verification and acceptance of material arriving on site;
- ensures compliance to all standards and statutory programmes;
- initiates new functional plant locations;
- ensures configuration control between the design change, plant documents, and applicable drawings;
- perform CSC inspection and identify reservations;
- evaluates the impact of the modification on the KIT, full scope simulators, and relevant plant software changes;
- designs and implements changes in accordance with relevant procedures; and,
- provides technical support to the project team.

#### **5.5 Functional Line Groups**

- provide technical input with respect to maintenance/testing requirements;
- assist in work plan preparation, implementation, and PTW inputs;
- update MBOMs, and SAP service notifications;
- identify and update procedures and draft new procedures if required;
- identify training needs and specialised training equipment;
- identify the required minimum spares stock levels;
- perform CSC inspection and identify reservations;
- perform and assist in commissioning as required;
- verify training complete for appropriate personnel;
- identify special tool requirements;
- assign a line project lead;
- ensure design is consistent with plant maintenance philosophy;

- provide input to the design to minimise the diversity of spares required for the plant;
- provide input to the design to promote a design that is as simple as possible to install, maintain and eventually decommission;
- provide input to the design considering human factors engineering in maintenance practices.

#### **5.6 Work Control/Outage Control Centre**

- incorporates the work plan into the production or outage schedule.

#### **5.7 Operating (Shift)**

- reviews control room packages;
- plays a support role with respect to commissioning and PTWs.

#### **5.8 Operations Support**

- develops isolation plans;
- signs-off the CSC process on behalf of the PSM;
- accepts handover of the modification;
- plays a support role with respect to commissioning;
- ensures design is consistent with plant operating philosophy;
- ensures correct colour coding of new plant after modification;
- provides input to the design to promote a design that is as simple as possible to operate;
- provides input to the design considering human factors engineering for Operating.

#### **5.9 OPG**

- identifies and updates or creates relevant operating procedures (including TOIs).

#### **5.10 Chemistry**

- develops isolation plan when applicable;
- concurs on applicable CSCs;

- provides specialist advice to project team when required;
- identifies and updates or creates relevant procedures.

#### **5.11 Training (OTG, TTY, TTG, MTG and TMG) as applicable**

- forms part of the project team to identify training requirements/changes;
- develops, compiles, reviews, updates, and modifies training material in conjunction with team members;
- facilitates training on new and/or modified plant installations to applicable plant staff.

#### **5.12 Reliability Engineering**

- assesses the impact of modifications on the maintenance basis;
- implements relevant changes to the maintenance basis;
- develops maintenance bases if none exist.

#### **5.13 Nuclear Sourcing**

- facilitates a procurement strategy based on contract strategy;
- provides project sourcing services;
- identifies potential vendors;
- purchases material and services in accordance with the purchase request;
- facilitates obtaining market intelligence, including budget quotes.

#### **5.14 PQE**

- performs supplier approval;
- performs supplier document review prior to contract award;
- performs receipt inspection verification.

#### **5.15 CMG**

- ensure all groups involved in configuration management changes comply with 240-114901099;
- co-ordinates and reports on all the configuration management identified changes across KOU line groups;
- updates documents and drawings;

- releases documents in accordance with the project work plan;
- allocates new trigrammes and bigramme numbers;
- updates the HBS and BOM in SAP;
- activates HBS and BOM in SAP once equipment has been installed on the plant.

#### **5.16 TD & RM**

- issues controlled documents to controlled copy holders;
- retain the records generated within the project activity.

#### **5.17 FRM, OH & S, RP**

- provides specialist input to the project team;
- provides specialist input into the work plan;
- FRM to scrutinise all proposals for building renovations to ensure that they meet the requirements of Annex A of SANS 10400 Regulation T1 (1) (a) to (e) as well as Paragraph (2);
- provides support during installation, testing, and commissioning;
- identifies, updates or creates relevant procedures.

#### **5.18 Environmental**

- provides specialist input to the project team during the environmental impact screening;
- provides specialist input into the work plan;
- provides support during implementation;
- identifies and update or create relevant procedures.

#### **5.19 KNLD**

- liaises with the NNR and facilitates regulatory approval;
- assists with licensing frameworks and SPCs.

#### **5.20 Project Accounting**

- reviews and provides guidance with economic evaluations;
- facilitates and supports investment approvals;

- releases funds after investment approvals;
- monitor and report on expenditure against approved investment document and budgets submitted.

**5.21 QC**

- reviews the DCP, the work plan, the supplier's installation QCP, and assigns hold points;
- performs CSC inspections.

**5.22 QA**

- provides independent review and assessment of modifications and related documents (adherence to processes and procedures).

**5.23 Component Engineering**

- provides technical input with respect to equipment selection;
- provides specialist equipment advice.

**5.24 Engineering Programmes**

- assesses the impact of modifications on Engineering Programmes listed in 331-148;
- implements relevant changes to listed Engineering Programmes.

**5.25 Nuclear Project Management**

- establishes a project team;
- implements the ten project management principles with the assistance of the project team:
  - Time Management
  - Cost Management
  - Quality Management
  - Human Resources Management
  - Stakeholder Management
  - Procurement Management
  - Risk Management

- Communication
- Scope Management
- Integration
- ensures supervision of work during implementation and performs dose management where applicable;
- ensures that all reservations are effectively resolved and closed out before project finalisation;
- continuously reviews the roles and responsibility of each member of the project team;
- manages contracts in accordance with NEC contract conditions;
- compiles and maintains a project management plan and its associated artefacts.

#### **5.26 Information Management/Group IT**

- evaluate computing infrastructure requirements;
- data backup and storage requirements;
- manage software approval and licensing requirements;
- hardware and software life cycle management;
- provisioning of computing infrastructure;
- support services to Engineering and project teams;
- ensure IT governance is followed in technology alignment standardisation.

#### **5.27 Project Engineering**

- Responsible for engineering execution on a project;
- Organises the engineering work to support the programme schedule/plan;
- Provides technical leadership and guidance;
- Provides day-to-day direction of the assigned engineering personnel;
- provides engineering support during Project Sourcing;
- provides tender technical documentation;
- performs tender technical evaluations;

- provides technical input for contract award and thereafter;
- ensures engineering participation in the investment approval;
- provides engineering input during manufacturing;
- provides engineering input to Project Quality Management Strategy and Plan;
- provides reviews and engineering input to Manufacturer's Quality Plan;
- reviews Manufacturer's Quality Control and Test Plan;
- performs Engineering oversight during manufacturing by performing Hold, Witness and Surveillance interventions;
- requests technical inspections and/or tests to be performed by utilising the Verification & Validation (V&V) capability;
- reviews and approve the manufacturer's documentation in terms of completeness and accuracy of content, and satisfaction of requirements as contracted;
- identifies project oversight requirements;
- closes-out technical quality activities for projects;
- performs plant walk-downs and the review and acceptance of the Contractor's handover documentation;
- provides Technical Assurance before and during Commissioning;
- assists with the Nuclear Licensing Framework for each project and the obtaining of regulatory approval.

## **5.28 Gate Review Team**

- conducts review activities on the project;
- consists of the necessary specialist expertise in project definition, key disciplines and implementation as well as project and business leadership;
- has the authority to decide whether the project is ready to proceed through the decision point to the investment review/committee and next phase of the project.

## **6.0 PROCESS**

### **6.1 Detailed Process**

6.1.1 The Work Flow Responsibility Matrix (Appendix 1) consists of:

A – Pre-Project Planning Phase

B – Concept Phase

C – Definition Phase

D – Execution Phase

E – Finalisation Phase

F – Post Project Phase

### **6.2 Process Notes**

6.2.1 The KAA-501 process is still to be followed for modifications even if the investment approvals come from different spheres (such as PEE, Corporate approvals, etc.).

6.2.2 The KAA-501 process is to be used without reference to the PLCM as the minimum requirements are built in. Should additional requirements over and above those required by this procedure be needed for the proper management of a modification, then the relevant PLCM artefacts should be utilised.

## **7.0 RECORDS**

7.1 Documents generated as a result of this procedure must be kept as permanent records in accordance with KSA-038.

## **8.0 ATTACHMENTS**

Appendix 1 – Work Flow Responsibility Matrix

Appendix 2 – Justification

WORK FLOW RESPONSIBILITY MATRIX						APPENDIX 1								
R – Responsible A – Approve F – File • – Outside Matrix Scope Y/N or N/Y – Decision C – Concur I – Informed S – Service [] – Mandatory Requirement ( ) – As Appropriate/Required Flow Path: <div><div></div><div></div></div>	ORGANISATION / FUNCTION												NOTES & REFERENCES	
	PROJECT INITIATOR				PROGRAMME MANAGER / GATE REVIEW TEAM	PROJECT MANAGER	INVESTMENT COMMITTEE / DELEGATED APPROVAL AUTHORITY	PROJECT ACCOUNTING						
Main Flow      Secondary Flow														
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12		
A. PRE-PROJECT PLANNING PHASE														
1. Is the ECR for this project approved by the ECMC?		Y/N											Ensure there is an ECR before proceeding. Refer to 240-84975495.	
2. Is the project released by the MRC/KPMC?		Y/N											Ensure the project is released before proceeding. Refer to 240-102714621.	
3. Is the project statement of work (SOW) authorised by MRC?		Y/N											Ensure the SOW is authorised by MRC. Refer to 240-101866232.	
4. Appoint a project manager.					[R]									
5. Prepare a preliminary project stakeholder matrix and organogram.		[S]				[R]							Refer to 240-101868186.	
6. Compile an IRAF (CRA) document.		[S]				[R]							Refer to 240-101866424.	
7. Conduct PDRA 1 as required.						[R]							Refer to 240-136815819.	
8. Compile and present the CRA checklist for stage gate review.					[A]	[R]							Refer to 240-101871085 and 240-85549806.	
9. Present the IRAF (CRA) to the relevant investment committee/delegated approval authority.		[S]				[R]	[A]							
10. Release funds.						[S]		[R]					Go to B – Concept Phase.	

WORK FLOW RESPONSIBILITY MATRIX						APPENDIX 1							
<p>R – Responsible</p> <p>A – Approve</p> <p>F – File</p> <p>• – Outside Matrix Scope</p> <p>Y/N or N/Y – Decision</p> <p>C – Concur</p> <p>I – Informed</p> <p>S – Service</p> <p>[ ] – Mandatory Requirement</p> <p>( ) – As Appropriate/Required</p> <p>Flow Path:</p> <p>↔      ↔</p> <p>Main Flow      Secondary Flow</p>	ORGANISATION / FUNCTION												NOTES & REFERENCES
	PROJECT MANAGER	PROJECT ENGINEER	DESIGN ENGINEER (DE)	PROJECT TEAM MEMBERS	HEADS OF GROUPS	PROGRAMME MANAGER / GATE REVIEW TEAM	INVESTMENT COMMITTEE / DELEGATED APPROVAL AUTHORITY	PROJECT ACCOUNTING	ENVIRONMENTAL SPECIALIST				
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
<b>B. CONCEPT PHASE</b>													
1. Establish the project team.	[R]				[S]								
2. Facilitate a project kick-off meeting.	[R]			[S]	[S]								
3. Prepare a preliminary project management plan and relevant artefacts.	[R]			[S]									Refer to 240-101867884.
4. Initiate a Pre-Feasibility Study (if project is sufficiently large to justify this).	[R]	[S]		[S]									Refer to 331-342.
5. Initiate a Feasibility Study.	[R]	(S)	[S]	[S]									Refer to 331-86. Utilise the Request For Information process to obtain market intelligence if required.
6. Identify long lead items.	[R]	(S)	[S]										
7. Perform environmental impact screening.	[R]								[S]				Refer to 240-140110851.
8. Update the project management plan and artefacts.	[R]			[S]									
9. Compile an IRAF (DRA) document.	[R]			[S]									Refer to 240-101866424.
10. Conduct PDRA 2 as required.	[R]			[S]									Refer to 240-136815819.
11. Compile and present the DRA checklist for stage gate review.	[R]			[S]		[A]							Refer to 240-101871091 and 240-85549806.
12. Present the IRAF (DRA) to the relevant investment committee/delegated approval authority.	[R]												
13. Release funds.	[S]							[R]					Go to C – Definition Phase.

WORK FLOW RESPONSIBILITY MATRIX							APPENDIX 1								
<div>R – Responsible</div> <div>A – Approve</div> <div>F – File</div> <div>• – Outside Matrix Scope</div> <div>Y/N or N/Y – Decision</div> <div>C – Concur</div> <div>I – Informed</div> <div>S – Service</div> <div>[ ] – Mandatory Requirement</div> <div>( ) – As Appropriate/Required</div> <div>Flow Path:</div> <div><div></div><div></div></div> <div>Main Flow Flow</div> <div>Secondary</div>	ORGANISATION / FUNCTION														NOTES & REFERENCES
	PROJECT MANAGER	PROJECT TEAM MEMBERS	DESIGNATED ENVIRONMENTAL OFFICER	KNLD	NNR	DESIGN ENGINEER (DE)	PROJECT SOURCING	PROGRAMME MANAGER / GATE REVIEW TEAM	INVESTMENT COMMITTEE / DELEGATED APPROVAL AUTHORITY	PROJECT ACCOUNTING	HEADS OF GROUPS	ENVIRONMENTAL SPECIALIST	OTG / TTY / TTG / TMG	PROCUREMENT COMMITTEE	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
C. DEFINITION PHASE															
1. Initiate an Environmental Impact Assessment.	(R) —	(S) —	(S)												
2. Prepare a licensing framework.	(R) —	(C) —		(S) —	(I)										For complex projects with a phased installation over an extended period, it is prudent to obtain regulatory concurrence. Prepare a licensing framework in accordance with GGW1064, liaising with KNLD. Refer to KAA-831.
3. Obtain concurrence on the licensing framework.	(R) —	(C) —		(S) —	(C) —	(C)									
4. Initiate a detailed contracting and procurement strategy and plan.	[R] —	[S] —				(C) —	[S] —							[A]	Refer to 32-1034. Note that the Procurement Strategy must be approved prior to IRAF (ERA) approval.
5. Initiate compilation of a Technical Requirement Specification.	[R] —	[S] —				[S]									Only relevant when outsourcing.
6. Obtain costing and timelines for project scope.	[R] —					[S] —	[S]								
7. Update the project stakeholder matrix and organogram.	[R] —	[S] —									[S]				
8. Update the project management plan and artefacts.	[R] —	[S]													

WORK FLOW RESPONSIBILITY MATRIX							APPENDIX 1								
<div>R – Responsible A – Approve F – File  • – Outside Matrix Scope Y/N or N/Y – Decision C – Concur I – Informed S – Service  [ ] – Mandatory Requirement ( ) – As Appropriate/Required Flow Path: <div><div></div><div></div></div><div>Main Flow Flow      Secondary</div></div>	ORGANISATION / FUNCTION														NOTES & REFERENCES
	PROJECT MANAGER	PROJECT TEAM MEMBERS	DESIGNATED ENVIRONMENTAL OFFICER	KNLD	NNR	DESIGN ENGINEER (DE)	PROJECT SOURCING	PROGRAMME MANAGER / GATE REVIEW TEAM	INVESTMENT COMMITTEE / DELEGATED APPROVAL AUTHORITY	PROJECT ACCOUNTING	HEADS OF GROUPS	ENVIRONMENTAL SPECIALIST	OTG / TTY / TTG / MTG / TMG	PROCUREMENT COMMITTEE	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
9. Compile an IRAF (ERA) document.	<div>↓</div> <div>[R]</div>	[S]											(C)		Include 36 months time contingency allowance for Execution changes considering the outage philosophy.  Refer to 240-101866424.
10. Conduct PDRA 4 as required.	<div>↓</div> <div>(R)</div>	(S)													Refer to 240-136815819.
11. Compile and present the ERA checklist for stage gate review.	<div>↓</div> <div>[R]</div>	[S]						[A]							Refer to 240-101871099 and 240-85549806.
12. Present the IRAF (ERA) to the relevant investment committee/delegated approval authority.	<div>↓</div> <div>[R]</div>								<div>[A]</div>						Once the ERA is approved, any change to the project content, costs, timing or quality requirements shall be managed through the Nuclear Project Change Request Form, 240-101866564.
13. Release funds.	[S]									<div>↓</div> <div>[R]</div>					Go to D – Execution Phase.

WORK FLOW RESPONSIBILITY MATRIX						APPENDIX 1									
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	COMPONENT / RELIABILITY ENGINEERING	PROJECT MANAGER	DESIGN ENGINEER (DE)	PROJECT TEAM MEMBERS	ORIGINATOR	OPERATIONS SUPPORT	MAINTENANCE GROUPS	QUALITY CONTROL	PROJECT SOURCING	OPG	TTG / OTG / TMG / TTY / MTG	CMG	TD & RM	ENGINEERING PROGRAMMES	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
<b>D. EXECUTION PHASE</b>															
1. Initiate project sourcing as planned for.		[R]	—	[S]	—				[S]						Refer to 238-181 and 32-1034.
2. Initiate detailed design package compilation.	[C]	[R]	[S]	[S]	[I]						[I]				Refer to 331-86.
3. Initiate the compilation of a commissioning/testing procedure; include FAT/SAT requirements where applicable.		[R]	[S]	[S]		[S]	(S)			(S)				[S]	Refer to 331-86 and KFA-006. Ensure KAM-038 requalification requirements are included, if applicable.
4. For all contracted designs, initiate acceptance review.		[R]	[S]												Refer to 331-86.
5. Perform environmental impact screening.		(R)													Refer to 240-140110851.
6. Request updates to documentation and databases in accordance with the DCIF and submit TCRs for training material to TMG.		[R]	[S]				[S]			[S]	[S]	[I]	[I]	[I]	Consider any procedures and plant documents affected by the changes. DCRs and TCRs must be submitted at this stage. Refer to 331-85, KAB-018, KAA-500, KSA-049 and 240-114901099.  <b>Note:</b> TCRs to be submitted on first review of the design. Work on the TCR will commence upon completion of installation design. Refer to KLA-023 (installation design complete milestone).
7. Produce a work plan.		[R]	[S]	[S]	[C]	[C]	[C]	[C]						[I]	Refer to KFA-002. Define all operations (activities) to be performed, the systematic sequence of installation, and personnel or group responsible for each activity (for complex installations, consider the OEM as part of the installation team). Adequate cross-referencing shall be provided to SAP orders, contractor quality control plans (QCP).

WORK FLOW RESPONSIBILITY MATRIX						APPENDIX 1									
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	COMPONENT / RELIABILITY ENGINEERING	PROJECT MANAGER	DESIGN ENGINEER (DE)	PROJECT TEAM MEMBERS	ORIGINATOR	OPERATIONS SUPPORT	MAINTENANCE GROUPS	QUALITY CONTROL	PROJECT SOURCING	OPG	TTG / OTG / TMG / TTY / MTG	CMG	TD & RM	ENGINEERING PROGRAMMES	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
8. Initiate all relevant training in accordance with training processes and ensure that it is scheduled.		<div>↓</div> <div>[R]</div>									[S]				Consult OTG, TTG, TMG, MTG and TTY.
9. Complete the design change package implementation approval form.		<div>↓</div> <div>[R]</div>		[C]		[C]	[C]	[C]			[C]			[C]	The team ensures that a review was conducted in accordance with the design change package implementation approval form. Training only concurs with training impact decisions. Refer to KFA-035.

[illegible]

[illegible]

WORK FLOW RESPONSIBILITY MATRIX										APPENDIX 1				
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	OPG	PROJECT MANAGER		PROJECT TEAM MEMBERS	RP ALARA	PROJECT ENGINEER	KNLD	CMG	TD & RM	OCC	WORK CONTROL GROUP	TMG / TTG / TTY / OTG / MTG	NNR	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	
16. Review the modification package for validity of documents and specifications.						[R]								If DCP is older than two years, or will be older than two years at the time of implementation, full review of the package must be performed. If there is a significant change go to D2. If additional funds are required go to C9.
17. Schedule the work according to the work plan.		[R]		[S]	(I)			[I]		[S]	[S]			Refer to KAA-721 and KLA-023.
18. Ensure all plant documents, procedures and relevant training materials are sufficiently progressed to be in line with the target release date.		[S]	[R]		[S]			[S]	[S]			[S]		Refer to 331-85, KAB-018, KAA-500, KSA-049 and 240-114901099.  <b>Note:</b> Training to be informed six (6) months prior to modification implementation date. CMG to be notified 3 months before the target implementation date.
19. Initiate notification to NNR at latest three months prior to implementation.		[R]						[S]					[I]	In accordance with LD-1012 or licensing framework after a readiness review.
20. Submit control room package.		[R]												Ideally, two months before implementation.
		</												

WORK FLOW RESPONSIBILITY MATRIX								APPENDIX 1										
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	PROJECT MANAGER	PROJECT TEAM MEMBERS	DESIGN ENGINEER (PROJECT ENGINEER)	KNLD	OPS SUPPORT	WORK CONTROL GROUP	OPERATING	CMG	TTG / OTG / TTY / TMG / MTG	MAINTENANCE GROUPS	ACCREDITED SPECIALIST	QUALITY CONTROL	SDE	OPERATING PROCEDURE GROUP	RELIABILITY ENGINEERING	MATERIALS MANAGEMENT	PQE	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
21. Initiate an inspection of all material; perform FAT/SAT where applicable.	↓ [R]	[S]	[S]													(S)	[S]	Refer to KAA-641, KAA-733. Ensure procured items are correct prior to installation.
22. Inform project stakeholders that implementation has started.	↓ [R]	[I]	[I]		[I]	[I]	[I]	(I)	[I]	[I]				[I]	[I]			
23. Verify orientation training has been scheduled/completed.	↓ [R]								[S]	[I]								KSA-049.
24. Inform the relevant parties of impending configuration changes for updating of HBS, EBOM, and MBOM on SAP.	↓ [R]	[I]	[I]			[S]		[S]		[S]					[S]	[S]		KAA-614, KFZ-IO-010,
25. Review relevant OE with the project team prior to the start of the implementation.	↓ [R]	[S]	[S]		[S]					[S]		[S]						
26. Initiate implementation of the design change package according to the work plan.	↓ [R]	[S]	[C]						[I]	(S)		[S]	(S)	(S)				A workmanship inspection by an authorised QC inspector shall be performed.
27. Are changes to the design required?	Y/N	→																
28. Using the definition in Section 3.1, decide whether to use a DFC or DRC.			↓ [R]															331-86.
29. Before implementation of DFC obtain all relevant signatures as required by the DFC Form.	↓ [R]								[S]					[S]				Submit a TCR for training material, referencing original TCR.
30. Submit all applicable DFCs or DRCs to KNLD.	↓ [R]		[S]															For projects selected by the NNR for a review of the design.
31. Initiate implementation of the DFCs or DRCs.	↓ [R]	[S]	[C]		[I]				[I]	(S)		[S]	(S)	(S)				
	←																	

WORK FLOW RESPONSIBILITY MATRIX									APPENDIX 1										
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	PROJECT MANAGER	PROJECT TEAM MEMBERS	DESIGN ENGINEER (PROJECT ENGINEER)	KNLD	OPS SUPPORT	WORK CONTROL GROUP	OPERATING / CHEMISTRY	CMG	TD & RM	TTG / OTG / TTY / TMG / MTG	MAINTENANCE GROUPS	ACCREDITED SPECIALIST	QUALITY CONTROL	SDE	OPERATING PROCEDURE GROUP	RELIABILITY ENGINEERING	MATERIALS MANAGEMENT		ENGINEERING PROGRAMMES
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
32. Initiate validation of the as-built status of plant and that all document changes have been updated.	↓ [R]	(S)	[S]					(S)	(S)		(S)			(S)	(S)		(S)	(S)	Documents are maintained to represent the as-built status of the plant. Contractor QC and contractor to walk down the plant before CSC.
33. Obtain SCC and CSC as required.	↓ [R]	[S]	[S]		[S]						[S]		[S]	[S]					KAA-664 to be followed. Delegation for approval set out in KAA-664.
34. Release updated operational documents.	↓ [R]							[S]		[I]									Documents must be with controlled copy holders before PTW is cleared.
35. Suspend the PTW if dynamic tests are required and perform the required testing and commissioning.	↓ [R]		[S]		[S]		[S]				[S]								KAA-647. KAA-648. KFA-006.
36. Obtain the COC from an accredited person where applicable.	↓ [R]		[S]								(S)	[S]							KAA-664. Applicable to electrical installations.
37. Issue plant hand-over certificate.	↓ [R]																		Plant Hand-over Certificate KFU-PE-008. The plant is taken over by Koeberg in terms of operating and first line maintenance within the warranty/defects period.  Issue completion certification within two weeks according to NEC.

WORK FLOW RESPONSIBILITY MATRIX								APPENDIX 1											
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	PROJECT MANAGER	PROJECT TEAM MEMBERS	DESIGN ENGINEER (PROJECT ENGINEER)	KNLD	OPS SUPPORT	WORK CONTROL GROUP	OPERATING / CHEMISTRY	CMG	TD & RM	TTG / OTG / TTY / TMG / MTG	MAINTENANCE GROUPS	ACCREDITED SPECIALIST	QUALITY CONTROL	SDE	OPERATING PROCEDURE GROUP	RELIABILITY ENGINEERING	MATERIALS MANAGEMENT		ENGINEERING PROGRAMMES
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
38. Clear the PTW.	↓ [R]						[S]												Inform Unit SSS to log completion of modification.
39. Capture implementation history and any M&TE used in implementation and/or testing/commissioning on SAP.	↓ [R]	[S]									[S]								240-119092296 KAA-679.
40. Release all non-operational and as-built documents and update all configuration documentation and confirm HBS to CMG for activation in SAP.	↓ [R]							[S]		[S]	[S]					[S]			Within 90 days of PTW clearance.

WORK FLOW RESPONSIBILITY MATRIX						APPENDIX 1							
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		PROJECT MANAGER	PROJECT TEAM MEMBERS	SYSTEM ENGINEER	PROJECT ACCOUNTING	MAINTENANCE GROUPS	OPERATING	TD & RM	PROJECT SOURCING	PROJECT INITIATOR/ORIGINATOR	RELIABILITY ENGINEERING	PROGRAMME MANAGER / GATE REVIEW TEAM	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
E. FINALISATION PHASE													
1. Verify that all actions according to the work plan and schedule were completed.		[R] — [S]											
2. Verify closure of all CSC reservations.		[R] — [S]											
3. Remove the control room package from control room.		[R] — [I]											Within 30 days of implementation completion.
4. Conduct a post implementation review and compile a post implementation review report.		[R] — [S] — [S] — [S] — [S] — [S]											In accordance with 240-119091754.
5. Compile close-out package.		[R] — [S]											In accordance with 240-132469022.
6. Prepare an IRAF (FRA) document.		[R] — [S]											At the end of the defects period of the contract.
7. Close project out financially and commercially.		[R] — [S] — [S]											If components were replaced, stores stock need to be scrapped as part of project cost.
8. Compile the project finalisation certificate.		[R] — [S] — [C] — [C] — [C] — [C]											Project Finalisation Certificate KFU-PE-007.
9. Compile and present the FRA checklist for stage gate review.		[R] — [A]											Refer to 240-101871121 and 240-85549806.
10. Present the close-out package to the Programme Manager for a decision on close-out.		[R] — [A]											At the end of the defects period all outstanding actions should be complete and all documentation should have been updated.

[illegible]

WORK FLOW RESPONSIBILITY MATRIX						APPENDIX 1							
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	SYSTEM ENGINEER			MRC	MAINTENANCE GROUPS	OPERATING	PROJECT INITIATOR/ORIGINATOR	TD & RM	PROJECT MANAGER	NNR	KNLD	ECMC	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
<b>F. POST PROJECT PHASE</b>													
1. Co-ordinate the effectiveness review.		[R]			(S)	(S)	(S)						<p>Verify the assumptions made for motivating the project were realised and that the performance of the new plant is exceeding or meeting the requirements.</p> <p>The project objectives are checked against the installed plant to verify whether the original problem was solved or opportunity realised.</p> <p>Also take into account any affected procedures such as Operating, Maintenance, etc.</p>
2. Report findings on the completed project.		[R]		[I]			[I]		[I]			[I]	Report deviations from project objectives set.
3. Have expectations been met?				N/Y									Minutes of MRC to be recorded on project tracking database.
4. Decide on actions to be taken.		(S)		[R]			[I]						<p>Example:</p> <ul style="list-style-type: none"> <li>Rectification of issues with regard to project audited.</li> <li>Preventative measures to prevent re-occurrence in future projects.</li> </ul>
5. The report shall be archived with the modification package.		[R]						[S]	[I]				
6. For modifications approved by the NNR, an effectiveness report shall be submitted to the NNR for information.		[R]								[I]	(S)		Within 24 months of completion of implementation.

## **APPENDIX 2**

### **JUSTIFICATION**

#### **Revision 10**

1. To align the process with stakeholder expectations.
2. To incorporate new process requirements resulting from the following corrective actions: CA 25191, CA 25577.
3. To correct typographical errors.
4. To incorporate a requirement to verify resolution of CSC reservations before project closure.
5. To incorporate the requirement to use the Project Change Request Form to manage changes to the project.
6. To incorporate requirements in NNR correspondence k10000663N.

#### **Revision 11**

1. To align the process with the Eskom Reference PLCM.
2. To incorporate new requirements resulting from the following corrective actions and general action:  
CA 32036, CA 32985, CA 87963-003, GA 98870-003.
3. To incorporate the remaining requirements in NNR correspondence k10000663N (CA 31527) and NIL-01 (Var. 19) Appendix A.
4. To incorporate improvements proposed during the Business Efficiency Project.