| Eskom | Procedure | Nuclear Engineering |
|---|---|---|

Title: **Processing Minor Modifications**

Document Identifier: **240-86502715**

Alternative Reference Number: **KAA-803**

Area of Applicability: **Nuclear Engineering**

Functional Area: **Design Engineering**

Revision: **3**

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Disclosure Classification: **Controlled Disclosure**

| Compiled by | Functional Responsibility | Authorized by |
|---|---|---|
| **SL Swartz** | **L Thomas** | **R Goldstein** |
| **Technologist** | **Specification Engineering Manager** | **Design Engineering Manager** |
| Date: 2021-05-25 | Date: 2021-05-25 | Date: 2021-05-28 |

## Nuclear Additional Classification Information

| | |
|---|---|
| Business Level: | **3** |
| Working Document: | **2** |
| Importance Classification: | **CSR** |
| NNR Approval: | **No** |
| Safety Committee Approval: | **No** |
| ALARA Review: | **No** |
| Functional Control Area: | **Design Engineering** |

## Content

Page

# 1. Introduction

This procedure governs changes that are made to structures, systems, components and operating parameters at Koeberg Nuclear Power Station that are deemed as minor modifications.

# 2. Supporting Clauses

## 2.1 Scope

Applicable to modifications, structures, systems, components or part thereof and set point or operating parameter changes that comply with the following attributes:

- The outcome of the safety screening (KAA-709) must be that a safety evaluation is not required (i.e. the proposed modification to plant screens out),
- The design is sufficiently simple to allow the use of the minor design template. (Discuss with DE Plant Support Manager).
- The modification installation is sufficiently simple so that installation and commissioning can be carried out by the relevant Maintenance group without the use of a Project Manager,
- The cost should be reasonably low and the responsible group is willing to provide funding from their current or future operating budget.
- Risks associated with the modification could not cause any threats to approved budgets, the modification implementation plan, outage durations, production or allocated dose.

In cases where one (or more) of the above attributes are not met, but the originator still feels the change can be safely implemented as a minor modification, it may still be performed using this procedure provided that there is consensus amongst the Engineering Change Management Committee (ECMC) Principals that it is safe and practical to do so.

### 2.1.1 Purpose

This procedure is required to:

- Describe the processes and responsibilities for minor modifications to structures, systems or components or operating parameters that do not affect the design base or nuclear safety.
- Ensure that minor modifications are assessed, approved and implemented in a systematic and controlled manner.
- Ensure that minor modifications are performed in terms of business priorities.
- Ensure that all configuration and quality requirements are met.

### 2.1.2 Applicability

This document shall apply to Nuclear Engineering and all other Koeberg Power Station departments that interface with the minor modification process.

### 2.1.3 Effective date

This document will be effective from authorisation date.

## 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] 240-102714621 KOU Portfolio Management Committees – Consisting of KPMC and Management Review Committee Terms of Reference Management Review Board Constitution

[2] 240-107383803 Quality Assurance Data Package Checklist

[3] 240-86501702 Minor Modification Package

[4] 240-95405347 Control of Procurement of Items and Services

[5] 331-148 Programme Engineer's Guide

[6] 331-212 Documentation Change Identification Form

[7] 331-313 Design Field Change

[8] 331-497 Minor Modification User Requirement Specification

[9] 331-83 Requirements for Plant Changes affecting the Design of Koeberg Nuclear Power Station

[10] 331-85 Design Basis Documentation Change Process

[11] 331-86 Design Changes To Plant, Plant Structures Or Operating Parameters

[12] 331-94 Importance Category Classification Listing

[13] 335-2 Koeberg Nuclear Power Station Management Manual

[14] KAA-500 The Process for Controlled Documents

[15] KAA-501 Project Management Process for Koeberg Nuclear PowerStation Modifications

[16] KAA-614 Control of Spares Assessments and New Stock Applications

[17] KAA-641 Control of Receipt Materials

[18] KAA-664 Issuing a Construction Status Certificate / Safety Clearance Certificate

[19] 240-143604773 [KAA-709] Safety Evaluation Process

[20] KAA-721 Planning, Scheduling and Execution of Production Activities

[21] KAB-018 The Operating Department Procedure Change Process

[22] KFT-004 Training Change Request Form (TCR)

[23] KFZ-IO-010 Application for Cataloguing and New Stock

[24] KGA-040 Management of Outages

[25] KGU-002 Guide for System Engineers

[26] 238-6 Nuclear document and records management requirements

[27] KSA-139 Initiating a Maintenance Work Request

[28] KSA-913 Maintenance Basis Determination, Documentation and Change Control

[29] KSU-008 Nuclear Design Standard for Koeberg Nuclear Power Station

[30] LD-1012 Requirements in Respect of Proposed Modifications to the Koeberg Nuclear Power Station

[31] NIL-01 Nuclear Installation Licence No. NIL 01

### 2.2.2 Informative

[32] N/A

## 2.3 Definitions

**2.3.1 Accelerated Minor Mod:** A minor mod which by the sole discretion of the Design Engineering Manager is simple enough to proceed directly to the design package compilation phase.

**2.3.2 Design Engineer:** The engineer assigned to the project with the prime responsibility for the technical integrity of the project.

**2.3.3 Minor Modification:** Any change to, removal of, or addition to structures, systems, or components or part thereof, or changes to operating parameters that is sufficiently simple to be adequately described by the use of the minor design template, and installed by the relevant Plant Maintenance Group

**2.3.4 Originator:** Individual that identifies and describes the need for the minor modification.

**2.3.5 Owner:** Individual tasked with leading the minor modification. The owner may belong to any group, but is typically a member of the group that motivates for the requirement for the minor modification.

**2.3.6 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.

## 2.4 Abbreviations

| Abbreviation | Description |
|---|---|
| **AR** | Availability Related |
| **BOM** | Bill of Materials |
| **CMG** | Configuration Management Group |
| **COC** | Certificate of Compliance in accordance with SANS 10142 for |
| **CR** | Condition Report |
| **CSC** | Construction Status Certificate |
| **CSR** | Critical Safety Related |
| **DCIF** | Document Change Identification Form |
| **DCP** | Document Change Package |
| **DDR** | Document and Drawing Change Request |
| **DFC** | Design Field Change |
| **DRC** | Design Revision Change |
| **EA Type CR** | Engineering Action type Condition Report |
| **ECMC** | Engineering Change Management Committee |
| **ECR** | Engineering Change Request |

| Abbreviation | Description |
|---|---|
| **ER Type CR** | Reliability Engineering type Condition Report |
| **EWR** | Engineering Work Request |
| **FRM** | Fire Risk Management |
| **KNLD** | Koeberg Nuclear Licensing Department |
| **KORC** | Koeberg Operations Review Committee |
| **MBOM** | Maintenance Bill of Materials |
| **MMP** | Minor Modification Package |
| **MRC** | Management Review Committee |
| **NNR** | National Nuclear Regulator |
| **NSA** | Not Safety or Availability Related |
| **OH & S** | Occupational Hygiene and Safety |
| **OPG** | Operating Procedure Group |
| **OTG** | Operating Training Group |
| **PCR** | Procedure Change Request |
| **PHC** | Plant Health Committee |
| **PQE** | Procurement Quality Engineering |
| **QADP** | Quality Assurance Data Package |
| **QC** | Quality Control |
| **QCP** | Quality Control Plan |
| **RI** | Receipt Inspection |
| **RP** | Radiation Protection |
| **SAP** | Systems, Applications and Products in Data Processing |
| **SCC** | Safety Clearance Certificate |
| **DE** | Design<br>Engineering |
| **SR** | Safety Related |
| **STM** | Specific Topic Meetings |
| **TCR** | Training Change Request |
| **TD & RM** | Technical Documentation and Records Management |
| **TMG/TTG** | Training Material Group / Technical Training Group |
| **TOI** | Temporary Operating Instruction |
| **TTY** | Training Technology Group |
| **URS** | User Requirement Specification |

## 2.5 Roles and Responsibilities

The following is a framework of the main responsibilities for the different project team members and project stakeholders. Not all modifications require the entire range of stakeholders.

- The Design Engineering Manager
  - Ensures that the process described in this procedure is correctly implemented and maintained;
  - Ensures that the Requirements for Plant Changes affecting the Design of Koeberg Nuclear Power Station (331-83) is adhered to;
  - Maintains the minor modification design template;
  - Evaluates problem for Accelerated Minor Mod option.
- Originator
  - Identifies the problem or opportunity and the desired end state.
- Owner
  - Ensure that funding is available as discussed with the relevant group;
  - Establishes a project team;
  - Compiles a Minor Mod User Requirement Specification (URS);
  - Supervises work during implementation and performs dose management where applicable;
  - Ensures modification meets the quality requirements;
  - 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;
  - Ensures all documents are updated and actions completed prior to close-out of the modification;
  - Confirm correct and approve all DDR's associated with the modification;
  - Submit all documents after closeout for archiving;
  - Motivates the change through ECMC (initiation approval).

**NOTE:** If a system engineer is not involved in the modification, the owner becomes responsible for all the system engineer's tasks. A system engineer will still be required to assist with the process.

- System Engineer
  - Evaluates the validity of the problem;
  - Recommends possible solutions;
  - Provides technical support to the project team (system specific support);
  - Performs an effectiveness review in terms of KGU-002 - Guide for System Engineers.

  **NOTE:** If a system engineer is not involved in the modification, the owner becomes responsible for all the system engineer's tasks. A system engineer will still be required to assist with the process.

- ECMC

  ECMC to concur that:
  - The design is sufficiently simple to allow the use of the minor design template;
  - The modification installation is sufficiently simple so that installation and commissioning can be carried out by the Maintenance group without the use of a Project Manager;
  - Funding for the modification is available in approved operating budgets (investment approvals are not required);
  - The approval of the minor modification would not have an adverse impact on the MRC implementation plan;
  - Risks associated with the modification could not cause any threats to approved budgets, the modification implementation plan, outage durations, or production;
  - The appropriate team members have been identified and made available to the project team.

- Design Engineer
  - Compiles documents as defined in 331-86 - Design Changes To Plant, Plant Structures Or Operating Parameters;
  - Accepts designs on behalf of Eskom;
  - Supports verification and acceptance of spares 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;
  - Supplies owner and system engineer with component and part classifications, see 331-94 - Importance Category Classification Listing;
  - Ensures that the Nuclear Design Standard for Koeberg Nuclear Power Station (KSU-008) is adhered to;
  - Provides PCRs and marked up procedures.

- Functional Line Groups
    - Provides technical input with respect to maintenance / testing requirements;
    - Provide human factors engineering input to the design for optimal maintenance / usage human interaction;
    - Updates MBOMs, SAP service notifications;
    - Identifies and updates procedures;
    - Identifies training needs and submits a TCR, see KFT-004 - Training Change Request Form;
    - Identifies the required minimum spares stock levels;
    - Produces work plan, risk assessments, implementation plans;
    - Produce QCPs for all in-house services and manufacturing of equipment (For contractor services and manufacturing of equipment QCPs, see Procurement Quality Engineering (PQE) responsibility);
    - Implements plant changes (according to relevant procedures including PTW);
    - Performs and assists in commissioning as required;
    - Verifies training complete for appropriate personnel;
    - Assign a line project lead.
- Work Control/Outage Control Centre
    - Incorporates the work plan into the production or outage schedule, see KAA-721 - Planning, Scheduling and Execution of Production Activities and KGA-040 - Management of Outages.
- Operating (Shift)
    - Reviews control room packages;
    - Plays a support role with respect to commissioning and PTWs.
- Operations Support
    - Provide human interface input to the design for optimal operator interface;
    - Develops isolation plans;
    - Custodian of the CSC process;
    - Accepts handover of the modification;
    - Plays a support role with respect to commissioning.
- OPG
    - Updates or creates relevant operating procedures (including TOIs).
- Chemistry

- Gives input into suitability of chemicals used during the modification process;
- Develops isolation plan when applicable;
- Concurs on applicable CSCs;
- Provides specialist advice to project team when required;
- Identifies and updates or creates relevant procedures;
- Plays a support role with respect to commissioning and PTWs.

- Training (OTG, TTY, and TMG/TTG) as applicable
  - Forms part of project team to identify training requirements / changes;
  - Develops, compiles, reviews, updates, and modifies training material in conjunction with team members;
  - Provides training on new and / or modified plant installations to applicable plant staff.
- Reliability Engineering
  - Assesses the impact of modifications on the maintenance basis;
  - Implements relevant changes to the maintenance basis;
  - Develops maintenance bases if none exist;
  - Ensures adherence to KSA-913 - Maintenance Basis Determination, Documentation and Change Control.
- Procurement
  - Assists in determining a contracting strategy;
  - Provides and administers procurement services;
  - Identifies potential vendors;
  - Purchases spares in accordance with the purchase request.
- PQE
  - Compile and approve QCPs for all services and manufacturing of equipment by contractors and suppliers;
  - Performs supplier approval;
  - Performs supplier document review;
  - Performs supplier monitoring;
  - Performs receipt inspection verification;
  - Performs supplier control.

- Configuration Management Group
  - Manage changes to documents due to modification changes;
  - Process documents and drawing updates;
  - Releases documents in accordance with the project work plan.

  – **NOTE:** Configuration Management Group to be informed of modification implementation 3 months in advance as per 331-85 - Design Basis Documentation Change Process.

- TD & RM
  - Archival of minor modification package. On Archive the finalisation and effectiveness report after implementation is completed.

- FRM, OH & S, RP
  - Provides specialist input to the project team;
  - Provides specialist input into the work plan;
  - Provides support during installation, testing, and commissioning;
  - Identifies, and update or create relevant procedures.

- KNLD
  - Liaises with the NNR and facilitates regulatory approval;
  - Assists with licensing frameworks and STMs.

- QC
  - Reviews the DCP, the work plan, the QCP, and assigns monitoring requirements;
  - Performs CSC inspections as required.

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

- Component Engineering
  - Provides technical input with respect to equipment selection;
  - Provides specialist equipment advice.

- Engineering Programmes
  - Assesses the impact of modifications on Engineering Programmes, see 331-148 – Programme Engineer's Guide;
  - Implements relevant changes to listed Engineering Programmes.

Materials Planning

- Raises stock material numbers on SAP.
- Creates MBOM on SAP.

### 2.6 Process for Monitoring

N/A

### 2.7 Related/Supporting Documents

- 240-107383803– Quality Assurance Data Package Checklist
- 240-86501702 – Minor Modification Package

## 3. Process

### 3.1 Detailed Process

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

A – Problem Initiation

B – Problem Evaluation

C – Approval to Develop Detailed Concept

D – Produce Complete MMP

E – MMP Approval

F – Authorisation to Implement

G – Implementation

H – Finalisation

I – Effectiveness Review

## 4. Acceptance

This document has been seen and accepted by:

| Name | Designation |
|---|---|
| N Mtoko | Nuclear Technical Plan Manager (DE) |
| E Cornelissen | Nuclear Licensing Department |
| R Hermanus | Nuclear Engineering_DRM |
| M Scholtz | DE Document Custodian |
| Estorado Kemp | Operations Procedures Group |
| X Booi | Conventional System Engineering |
| M Wahl | System Engineering |

This document has been seen but no response received

| Name | Designation |
|---|---|
| E Shand | Training Material Group |
| P Xoteni | PQE Manager |
| L Nomganga | Nuclear Systems Engineering |
| S Cyster | Nuclear Support Manager |
| N Mpikashe | Work Control Manager |
| M Stwayi | Plant Chemistry |
| P Benade | Quality Control |
| E Lenders | Operations support |
| A van der Heyden | Operator training group |
| S Fisa | Maintenance Manager |
| M Valaitham | Plant Manager |

## 5. Revisions

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| Mar 2021 | 3 | S Swartz | 1) Change all references from “System Design Engineering” to “Design Engineering”<br>2) Updated Business level and working level<br>3) Updated functional location<br>4) Delete sentence (“Refer to k10000663N.”) through document.<br>5) ECR notification changed to EC type notification throughout.<br>6) Updated column A4 and B3 notification type<br>7) Added note C7: Signed URS must be submitted to DE<br>8) Updated Section F2 (notes and references)<br>For projects selected by the NNR and in accordance with KLA-023, LD-1012 and NIL-01 (latest revision) Appendix A as required.<br>9) Flow G: step 18 - Compliance to KAA 664 can be altered based of the complexity of the minor. Concurrence required by the entire project team and justification must be documented. |

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| Dec 2017 | 2 | SF Kriel | 1) Definition of Accelerated Minor Mod included in Section 2.3<br>2) Requirement included in matrix [C7] to close ECR on acceptance of minor mod, as minor mod is now tracked by number issued by ECMC.<br>3) CURA risk assessment requirement removed completely. This is no longer a pre-requisite for minor mods.<br>4) Requirement added in flow matrix [C8] – any changes to an approved URS must be sent back to ECMC for approval.<br>5) Accelerated Minor Mod option included in System Design Engineering Manager responsibilities and in flow matrix section [A3].<br>6) Requirement to complete Hardware Breakdown Structure (HBS) form has been removed from flow matrix section [G6].<br>7) PHC approval for AR & NSA minor mods are not required anymore and has been removed, normal work control processes are followed for implementation. |
| Dec 2016 | 1 | SF Kriel | 1. Reference Updates.<br>2. Work Flow Responsibility Matrix comments updated.<br>3. PHC and KORC implementation approval separated and moved prior to NNR approval (NNR requires implementation Safety Case).<br>4. NNR requirements stated more clearly.<br>5. Effectiveness review submission to NNR included.<br>6. QADP checklist (240-107383803) added at modification completion.<br>7. QCPs responsibilities changed. |
| March 2015 | 0 | SF Kriel | 1. Full Review.<br>2. Work Flow Responsibility Matrix comments updated.<br>3. Approval committee changes updated.<br>4. Document number change from KAA-803 to 240-86502715. |

## 6. Development Team

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

Melanie Wahl

Earvine Cornelissen

## 7. Acknowledgements

N/A.

## 8. APPENDIX 1

WORK FLOW RESPONSIBILITY MATRIX

| **WORK FLOW RESPONSIBILITY MATRIX** | **APPENDIX 1** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **ORGANISATION / FUNCTION** | | | | | | | | | | | | |
| R – Responsible<br>A – Approve<br>F – File<br>• – Outside Matrix Scope<br>Y/N or N/Y – Decision<br>C – Concur<br>I – Informed<br>S – Service<br>[ ] – Mandatory Requirement<br>( ) – As Appropriate/Required<br>Flow Path:<br>Main Flow ⟷ Secondary Flow | ORIGINATOR | OWNER | SYSTEM ENGINEERING | | | | | | | | | | **NOTES & REFERENCES** |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| **A. PROBLEM INITIATION** | | | | | | | | | | | | | |
| 1. Problem or opportunity for improvement identified. | [R] | | | | | | | | | | | | The Originator initiates the process for a new minor modification. |
| 2. Discuss problem with System Engineer and owner. | [R] | [I] | [I] | | | | | | | | | | Relevant information is to be provided as stipulated in 331-497 (Minor Modification initiation Package). |
| 3. Discuss Accelerated Minor Mod option with DE Manager. Has DE Manager agreed to Fast Track option? | N/Y → | | | | | | | | | | | | If a small change to the plant is required with minimal risk according to the DE Manager's discretion. The modification may be Accelerated. Go to D1. Obtain modification number from ECMC. |
| 4. Raise EC type notification. | [R] | | | | | | | | | | | | |
| 5. Submit problem / opportunity request for evaluation. | [R] → | | | | | | | | | | | | Go to *B – Problem Evaluation* |
| **B. PROBLEM EVALUATION** | | | | | | | | | | | | | |
| 1. Perform evaluation. | | [R] | [S] | | | | | | | | | | Refer to KGU-002. |
| 2. Is a modification required? | | | N/Y | | | | | | | | | | |
| 3. Close EC type notification. | [I] | [I] | [•] | | | | | | | | | | |
| 4. Perform assessment to identify if the modification can be classified as a minor modification. | | [R] | | | | | | | | | | | Criteria for a minor modification are defined in the Scope of this document. DE Manager to assist. |

| **WORK FLOW RESPONSIBILITY MATRIX** | | | | | | | | | | | | | **APPENDIX 1** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R – Responsible<br>A – Approve<br>F – File<br>• – Outside Matrix Scope<br>Y/N or N/Y – Decision<br>C – Concur<br>I – Informed<br>S – Service<br>[ ] – Mandatory Requirement<br>( ) – As Appropriate/Required<br>Flow Path:<br>Main Flow Secondary Flow | **ORGANISATION / FUNCTION** | | | | | | | | | | | | **NOTES & REFERENCES** |
| | ORIGINATOR | OWNER | SYSTEM ENGINEERING | | | | | | | | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 6. Complete Minor Mod URS. | | [R] | [S] | | | | | | | | As stipulated in 331-497, should the concept require a major investigation as with very large / complex projects, then 240-86502715 is not a suitable process, and the KAA-501 process should be followed.<br>For software modifications, refer to 331-399. | | |
| 7. Prepare the proposal for presentation to the ECMC. | | [R] | | | | | | | | | | | Go to *C – Approval to Develop Detailed Concept.* |

| **WORK FLOW RESPONSIBILITY MATRIX** | | | | | | | | | | | | | **APPENDIX 1** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R – Responsible<br>A – Approve<br>F – File<br>• – Outside Matrix Scope<br>Y/N or N/Y – Decision<br>C – Concur<br>I – Informed<br>S – Service<br>[ ] – Mandatory Requirement<br>( ) – As Appropriate/Required<br>Flow Path:<br>Main Flow Secondary Flow | **ORGANISATION / FUNCTION** | | | | | | | | | | | | **NOTES & REFERENCES** |
| | OWNER | SYSTEM ENGINEER | ECMC | PROJECT TEAM MEMBERS | MAINTENANCE MANAGER | OTHER MANAGER(S) | | | | | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| **C. APPROVAL TO DEVELOP DETAILED CONCEPT** | | | | | | | | | | | | | |
| 1. Ensure funding is available. | [R] | | | | ~~(C)~~ | (C) | | | | | | | Discuss with maintenance manager (or other managers as applicable) to ensure funding is available for the required hardware, installation, training, and other costs. Managers may consult with Management Accounting on funds available. |
| 2. Identify required project team members, and gain agreement from the respective managers for the use of these resources. | [R] | | | | ~~(C)~~ | (C) | | | | | | | Project team must as a minimum include the owner, system engineer and design engineer. If there is an implementation portion then the project team also to include Maintenance. If the minor modification involves renovations or extensions to buildings then project team to include FRM. Operating / RP / Chemistry / ALARA / Training / other plant groups to be considered depending on modification. |
| 3. Present proposal to ECMC. | [R] | [S] | [S] | | | | | | | | | | Proposal must include approved URS (approved by owner's group head), details of funding, project team, timelines (plus agreement from relevant group heads).<br>Refer to form 331-497.<br>The ECMC may request more information and representation to clarify any issues. |

| WORK FLOW RESPONSIBILITY MATRIX | | | | | | | | | | | | APPENDIX 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R – Responsible<br>A – Approve<br>F – File<br>• – Outside Matrix Scope<br>Y/N or N/Y – Decision<br>C – Concur<br>I – Informed<br>S – Service<br>[ ] – Mandatory Requirement<br>( ) – As Appropriate/Required<br>Flow Path:<br>Main Flow Secondary Flow | ORGANISATION / FUNCTION | | | | | | | | | | | |
| | OWNER | SYSTEM ENGINEER | ECMC | PROJECT TEAM MEMBERS | MAINTENANCE MANAGER | OTHER MANAGER(S) | ECMC CHAIRMAN | DE MANAGER | CONFIGURATION MANAGEMENT GROUP | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 4. ECMC to approve modification as a minor modification | [I] | [I] | [A] | | [C] | | | [C] | | | | ECMC to concur that:<br>• The design is sufficiently simple to allow the use of the minor design template,<br>• The modification installation is sufficiently simple so that installation and commissioning can be carried out by the Maintenance group without the use of a Project Manager,<br>• Funding for the modification is available in approved operating budgets (investment approvals are not required),<br>• The approval of the minor modification would not have an adverse impact on the MRC implementation plan<br>• Risks associated with the modification could not cause any threats to approved budgets, the modification implementation plan, outage durations, or production.<br>• The appropriate team members have been identified and made available to the project team. |
| 5. Approved by ECMC? | | N/Y | | | | | [A] | | | | | Go to D – *Produce Complete Minor Modification Package* |
| 6. Inform the client of outcome. | [R] | [I] | | | | | | | | | | If project was declined, the Owner shall re-open investigation if required. Go to *B – Problem Evaluation*. |

| WORK FLOW RESPONSIBILITY MATRIX | | | | | | | | | | | | | APPENDIX 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ORGANISATION / FUNCTION | | | | | | | | | | | | |
| R – Responsible<br>A – Approve<br>F – File<br>• – Outside Matrix Scope<br>Y/N or N/Y – Decision<br>C – Concur<br>I – Informed<br>S – Service<br>[ ] – Mandatory Requirement<br>( ) – As Appropriate/Required<br>Flow Path:<br>Main Flow Secondary Flow | OWNER | SYSTEM ENGINEER | ECMC | PROJECT TEAM MEMBERS | MAINTENANCE MANAGER | OTHER MANAGER(S) | ECMC CHAIRMAN | DE MANAGER | CONFIGURATION MANAGEMENT GROUP | | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 7. Close EC notification.<br>[•]<br>[R] | | | | | | | | | | | | | **APPROVED:**<br>Close EC notification with Minor Mod number. Minor Mod is now tracked with number issued by ECMC. Continue to section D. Signed URS needs to be submitted to Design Engineering and SE minor mod co-ordinator.<br><br>**NOT APPROVED:**<br>Close EC notification. Refer to KSA-139. The history of the ECR is to contain a brief explanation, stating the reason for cancelling the project. |
| 8. Changes to URS required?<br>N/Y → Return to C3<br>D | | | | | | | | | | | | | Any changes to the URS must be sent back to ECMC for approval. |

| WORK FLOW RESPONSIBILITY MATRIX | | | | | | | | | | | | APPENDIX 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R – Responsible<br>A – Approve<br>F – File<br>• – Outside Matrix Scope<br>Y/N or N/Y – Decision<br>C – Concur<br>I – Informed<br>S – Service<br>[ ] – Mandatory Requirement<br>( ) – As Appropriate/Required<br>Flow Path:<br>Main Flow Secondary Flow | ORGANISATION / FUNCTION | | | | | | | | | | | | NOTES & REFERENCES |
| | SYSTEM ENGINEER | DESIGN ENGINEER | PROJECT TEAM MEMBERS | OWNER | OPERATIONS SUPPORT | LINE MAINTENANCE GROUPS | QUALITY CONTROL | DE MANAGER | RELIABILITY ENGINEERING | CONFIGURATION MANAGEMENT GROUP | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| **D. PRODUCE COMPLETE MINOR MODIFICATION PACKAGE** | | | | | | | | | | | | | |
| 1. Produce minor modification design. | [S] | [R] | [S] | [S] | | | | [A] | | | | | Use the minor modification design template obtained from DE. Arrange kick-off meeting with project team. Liaise with DE, Maintenance, Operating, and other Team Members to provide inputs and produce parts of package as agreed.<br>Project team (led by Designer) to conduct 30% and 90% design presentations to senior designers.<br>Complete SAP update forms KFA-073 and KFA-074.<br>Open an EA type CR, and raise CAs as required for team members to complete their scope of work (e.g. red-line operating, maintenance, and chemistry procedures, provide training material, update maintenance basis, etc.).<br>Any changes in scope during this phase or realisations that original estimates that affect the concept, project cost, or project baselines were inadequate, are to be approved by the ECMC. These realisations could also result in a determination that the minor modification process is not adequate for the proposed change.<br>The minor modification design package must be independently reviewed then approved by the DE Manager or his delegate. |

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Flow Path:
Main Flow — Secondary Flow

**ORGANISATION / FUNCTION**

| **ACTIVITIES** | 1 SYSTEM ENGINEER | 2 DESIGN ENGINEER | 3 PROJECT TEAM MEMBERS | 4 OWNER | 5 OPERATIONS SUPPORT | 6 LINE MAINTENANCE GROUPS | 7 QUALITY CONTROL | 8 DE MANAGER | 9 RELIABILITY ENGINEERING | 10 CONFIGURATION MANAGEMENT GROUP | 11 | 12 | **NOTES & REFERENCES** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. Send DDRs to Configuration Management Group for storage. | | [R] | | | | | | | | | | | The DE document controller captures the DDRs on the DDR Location database , then sends the DDRs with a copy of the DCIF to CMG. Implementation to be confirmed by Owner. |
| 3. Initiate a new maintenance basis study, as required. | | (R) | | | | (S) | | | (S) | | | | KSM-017, KAA-614<br>Raise ER type CR on Devonway to Reliability Engineering. |
| 4. Send approved design to Configuration Management Group | | [R] | | | | | | | | [S] | | | For controlled copies and distribution in accordance with KSA-011. |
| 5. Produce testing procedure. | (C) | [R] | (C) | | (C) | (C) | | | | | | | Refer to 240-86501702 (Minor Modification Package). |
| 6. Raise SAP notifications to Line Groups. | | | | [R] | | (I) | | | | | | | Line Groups to Raise Work Orders. |
| 7. Produce Work Plan. | [C] | [C] | [S] | | | [R] | [C] | | | | | | Refer to 240-86501702. Define all operations (activities) to be performed, the systematic sequence of installation, and personnel or group responsible for each activity. Adequate cross-referencing is to be provided to SAP orders, QCPs (See step below) and Receipt and Inspection (RI) numbers to ensure the specified quality.<br>Use KSM-006, "Investigating and Compiling Maintenance Work Packages and Conducting Pre-Job Briefs"<br>Work plan approval: CSR & SR – KORC |

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| | SYSTEM ENGINEER | DESIGN ENGINEER | PROJECT TEAM MEMBERS | OWNER | OPERATIONS SUPPORT | LINE MAINTENANCE GROUPS | QUALITY CONTROL | DE MANAGER | RELIABILITY ENGINEERING | CONFIGURATION MANAGEMENT GROUP | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 8. Compile QCPs | [C] | | [S] | | | [R] | | | | [R] | | | Line Maintenance Groups are responsible to compile and approve QCPs for internal goods and services.<br>PQE is responsible to compile and approve QCPs for external goods and services (contracted work). Refer to 240-95405347 |
| 9. Request the relevant procedures and DDRs to be updated. | [I] | | [R] | [I] | [S] | | | [S] | [I] | | | | Project team member responsible for procedure updates to consider any procedures affected by the changes.<br>PCRs and red line procedure changes must be available at this stage, Refer to KAB-018, KAA-500. |
| 10. Request the relevant training to be updated. | [I] | | [R] | [I] | | | | | | | [I] | [I] | TCR to be submitted on design approval. |
| 11. Produce plant configuration & isolation requirements for implementation. | [S] | [S] | [S] | [S] | [R] | | | | | | | | |
| 12. Submit minor modification package for approval. | | | | [R] | | | | | | | | | Go to E – MMP Approval |

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Flow Path:
Main Flow — Secondary Flow

| ACTIVITIES | KORC | SYSTEM ENGINEER | NNR | PROJECT TEAM MEMBERS | OWNER | OPERATING PROCEDURE GROUP | LINE MAINTENANCE GROUPS | QUALITY CONTROL | DESIGN ENGINEER | CONFIGURATION MANAGEMENT GROUP | OPERATING SUPPORT | | NOTES & REFERENCES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ORGANISATION / FUNCTION** | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| **E. MMP APPROVAL** | | | | | | | | | | | | | |
| 1. Project team approves package. | | [C] | | [C] | [R] | [S] | | | | | [S] | | The team ensures that an integrated review was conducted in accordance with the Implementation Approval Checklist (240-86501702). |
| **F. AUTHORISATION TO IMPLEMENT** | | | | | | | | | | | | | |
| 1. Follow normal work control processes for AR and NSA modifications if NNR approval is not required.<br>**OR**<br>Obtain KORC approval to implement for SR, CSR and AR, NSA modifications with NNR requirements. | [A] | [S] | | [I] | [R] | | | | | | [S] | | Normal work control processes KAA-721 (online) or KGA-040 (outage) are followed for AR and NSA minor mods unless NNR approval is required. KORC approves SR and CSR as well as AR and NSA minor mods which require NNR approval for implementation and ensures the following is in place: Implementation safety case & checklist, updated procedures, training is requested, BOMs etc. are updated. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. NNR approval required?<br>All SR, CSR and Security related minor modifications shall be submitted.<br>Non-safety related minor modifications shall be submitted to the NNR in the following cases:<br>- Modifications that may incur dose to the public or personnel during implementation or operation.<br>- Modifications that are implemented in order to provide a mitigation function or impact on a mitigation function during beyond design accidents. | | | | | Y/N | | | | | | | | Owner submits completed design package which will include:<br>Detailed Design Package<br>Safety Screening, Probabilistic Safety Assessment<br>Manufacturing, Implementation and Procurement Specifications<br>Implementation Safety Case<br>Commissioning Procedures<br>Document Change Identification Form (DCIF 331-212)<br>Maintenance and Inspection Programme for New Components (ISI, IST, SRSM, Maintenance Basis)<br>Independent Review Report<br>Applicable for projects selected by the NNR in accordance with NIL-01 appendix A, KLA-023 and LD-1012 as required. |
| 3. NNR approval obtained? | | | Y/N | | | | | | | | | | D1 Address Comments. Raise new TCR, cancel old one. |
| 4. Request work to be scheduled. | | [I] | | [I] | [R] | | | | | | | | KAA-721, KSA-139, KGA-040 |

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Flow Path:
Main Flow — Secondary Flow

| ACTIVITIES | 1 OWNER | 2 PROJECT TEAM MEMBERS | 3 DESIGN ENGINEER | 4 TRAINING MATERIAL GROUP | 5 WORK PREPARATION & CONTROL GROUP | 6 SHIFT MANAGER | 7 CONFIGURATION MANAGEMENT GROUP | 8 OPERATIONS SUPPORT | 9 LINE MAINTENANCE GROUPS | 10 SYSTEM ENGINEER | 11 QUALITY CONTROL | 12 PROCESS COMPUTING | 13 OPERATING PROCEDURE GROUP | 14 COMPONENT ENGINEERING | 15 MATERIALS GROUP | 16 PQE | NOTES & REFERENCES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **G. IMPLEMENTATION** | | | | | | | | | | | | | | | | | |
| 1. Inform the necessary persons / groups of the intended changes. | [R] | [S] | [I] | [I] | [I] | [I] | [I] | [I] | [I] | [I] | [I] | [I] | [I] | [I] | | | Changes outside of this matrix scope to be implemented as planned (e.g. submit KAA-614 application). |
| 2. Check package for validity of documents and specifications | [R] | [S] | [A] | | | | | | | | [C] | | [S] | | | | If MMP is older than one year, a full review of the package must be performed. |
| 4. Procure and inspect equipment | [S] | [S] | [S] | | | | | | [R] | | | | | | | [S] | Refer to KAA-641. Ensure procured items are correct prior to installation. |
| 5. Inform project stakeholders that project implementation has started. | [R] | [I] | [I] | [I] | | [I] | [I] | [I] | [I] | [I] | | | [I] | [I] | | | |
| 6. Complete New Stock application forms and submit to Materials Planning. | [R] | [I] | [S] | [I] | [I] | | (I) | | | | | | | | [S] | | Follow KAA-614.<br>Materials Planning to raise Stock Material Numbers on SAP and create MBOM.<br>Refer to KFZ-IO-010 (Stock Application), KFZ-IO-017 (Stock Tracking) forms. |
| 7. The Project Team implements the minor modification changes according to the work plan. | [R] | [S] | [C] | | | | | (S) | (S) | | [C] | (S) | (S) | | | | A workmanship inspection by an authorised QC Inspector shall be performed. QC to verify traceability of spares or equipment. |
| 8. Are changes to the design required? | YN → Continue to G17 | | | | | | | | | | | | | | | | |

| | | |
|---|---|---|
| 9. Using the definition in 331-86, decide whether to use a DFC or DRC. | [R] | If DFC, use the Design Field Change Form 331-313.<br>If DRC, produce a design revision. |
| 10. Complete and obtain approval for the DFC or DRC. | (I) — [R] — [I] | Refer to 331-313. If the Design Package was approved by the NNR, submit the field change to the NNR for information prior to restarting the plant. If the change significantly changed the scope, intent or safety assessment, NNR approval of the design revision will be required prior to restarting the plant. Inform TMG/TTG and raise new TCR. |
| 11. Owner to update DCIF as required. | [R] | |
| 12. Send the new DDRs to Configuration Management Group for processing. | [I] — [R] — [S] | |
| 13. Send the new TCR's and PCR's to TD&RM, and the Owner. | [I] — [R] — [S] | |
| 14. Send DRCs and DFCs (and attachments) to Configuration Management Group and TMG/TTG | (I) — [R] — [I] — [S] | |
| 15. Make controlled copies of the DFCs or DRCs (as supplied). | [R] — [S] | |
| 16. Implement the DFCs or DRCs. | [R] | |
| 17. Validate the "as built" status of plant and that documentation has been updated. | [R] — (S) — [C] — (S) — (S) — [C] — [C] — (S) — (S) — (S) | Confirm correct and approve DDR's for issue. |
| 18. Ensure all required testing has been completed as indicated in MMP. Obtain CSC, SCC and COC. | [R] — [C] — [I] — [C] — [C] — [C] — [C] | KAA-664 to be followed. Delegation for approval set out in KAA-664. Compliance to KAA 664 can be altered based of the complexity of the minor. Concurrence required by the entire project team and justification must be documented. |

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Flow Path:
Main Flow ⟷ Secondary Flow

| ACTIVITIES | ORGANISATION / FUNCTION | | | | | | | | | | | NOTES & REFERENCES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OWNER | PROJECT TEAM MEMBERS | SYSTEM ENGINEER | MAINTENANCE | OPERATING SUPPORT | TD & RM | PROCUREMENT | OWNER / CLIENT | COMPONENT ENGINEERING | DESIGN ENGINEERING | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| **H. FINALISATION** | | | | | | | | | | | | |
| 1. Verify that all actions according to Work Plan and schedule were completed. | [R] | [S] | | | | | | | | | | |
| 2. Hand over to Plant Owner. | [R] | [S] | [I] | [C] | [C] | | | | [C] | | | See 240-86501702: Project Handover Certificate. |
| 3. Verify that the procurement of spares has been initiated where required. | [R] | | | [S] | | | | | | [S] | | Ensure SAP Numbers have been created (Liaise with Materials Planning).Ensure Stock Applications have been submitted. |
| 4. Verify that a Maintenance Basis impact review has been initiated. | [R] | | | [I] | | | | | [I] | | | Refer to KSM-017. |
| 5. Compile close-out package. | [R] | [S] | [I] | | | | | | | | | See 240-86501702. |
| 6. Project close-out review. | [R] | (S) | (S) | (S) | (S) | | (S) | (S) | (S) | | | See 240-86501702. |
| 7. Submit QADP for archiving. | [R] | [I] | [I] | | [I] | (S) | [F] | | | | | Compile Quality Assurance Data Package as per checklist 240-107383803. Submit package to TD & RM for archiving. |
| 8. Was the design package submitted to the NNR? | N/Y | | | | | | | | | | | |
| 9. Is an effectiveness review required? | Y/N | | [C] | | | | | | | | | End of Process. |
| 10. Raise EC notification to request assistance from System Engineering for effectiveness review. | [R] | | [I] | | | | | | | | | KSA-139 Effectiveness review may also be done as part of activity 5 above. |
| 11. Effectiveness review. | [R] | | [S] | | | | | | | | | Go to I – *Effectiveness Review* |

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| | OWNER | TD&RM | MAINTENANCE | OPERATING SUPPORT | SYSTEM ENGINEER | PROJECT MANAGER | | | | | | | |
| **ACTIVITIES** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| **I. EFFECTIVENESS REVIEW** | | | | | | | | | | | | | |
| 1. Co-ordinate the effectiveness review. | [R] | | (S) | (S) | [S] | | | | | | | | Evaluate that assumptions made for motivating the project were realised and that the performance of the new plant is exceeding / meeting the requirements.<br>The project objectives are checked against the installed plant to verify whether the original problem was solved or opportunity realised.<br>Also take into account any affected documents such as Operating, Maintenance, etc. |
| 2. Report findings on the completed project. | [R] | | | | [I] | [I] | | | | | | | Report deviations from project objectives set. |
| 3. Submit effectiveness review report to NNR. | [R] | | | | | | | | | | | | If the minor modification design package was sent to the NNR, it is required that the effectiveness review report is also submitted to the NNR. See letter NIL 01 appendix A. |
| 4. Have expectations been met? | N/Y | | | | [I] | | | | | | | | End of Process. |
| 5. Decide on actions to be taken, and load Corrective Actions (CA's) on DevonWay to correct and track open issues. | [R] | | | | | | | | | | | | Example:<br>– Rectification of issues with regard to project audited.<br>– Preventative measures to prevent reoccurrence in future projects. |
| 6. Submit effectiveness review report to TD&RM for archiving. | [R] | [F] | | | [S] | | | | | | | | |