Eskom	ADMINISTRATIVE PROCEDURE	Allocation Centre 38A	Reference Number KAA-721	Rev 11
NNR: NO No.:	ONLINE WORK MANAGEMENT PROCESS			PAGE 1

KORC	ACCESS	IMPORTANCE CATEGORY	NEXT REVIEW DATE	DATE AUTHORISED
NO	Nuclear Restricted	NSA	2024-02-26	2021-02-26

COMPILED / REVISED	REVIEWED	AUTHORISED
(sgd) K RANGIAH	(sgd) K LETSIKI	(sgd) N MPIKASHE
K RANGIAH	K LETSIKI	N MPIKASHE
SNR TECHNICIAN	SENIOR ADVISOR WORK CONTROL	WORK CONTROL MANAGER
DATE 2021-02-17	**DATE** 2021-02-26	**DATE** 2021-02-26

THIS PROCEDURE HAS BEEN SEEN AND ACCEPTED BY:

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FCA	ALARA REVIEW	SUPERSEDES
WORK MANAGEMENT	YES 2020-11-16	KAA-721, Rev 10 dd. 2019-12-19 FULL REVIEW

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8.0 ATTACHMENTS (Continued

1.0 PURPOSE

1.1 To define the roles and responsibilities for compiling, reviewing, executing and updating of the 10 Yearly Major Component Plan, 3 Yearly Preventive Maintenance Plan, 18 Week Work Management process, Weekly Integrated Schedules and the Plan of the Day.

2.0 SCOPE

2.1 Applicable to the production, implementation and control of the 10 Yearly Major Component Plan, 3 Yearly Preventive Maintenance Plan, 18 Week Work Management process, Weekly Integrated Schedules and the Plan of the Day for production Units 1/2 and 0/9/6.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

3.1.1 **Carry Over** – Work that was scheduled to finish in the current work week but was not completed and rolled into the following execution week.

3.1.2 **Corrective maintenance (CM)** - Represents a level of deficiency of a plant component that has failed or is significantly deficient such that failure is imminent (within its operating cycle/preventive maintenance interval) and it no longer conforms to or cannot perform its design function.

Corrective maintenance has three classifications:

- CC – corrective maintenance to be performed on critical components as defined by AP-913 CN – corrective maintenance to be performed on noncritical components as defined by AP-913
- CL – corrective maintenance to be performed on run-to-maintenance components as defined in AP-913 or critical and noncritical components of very low consequence if not corrected

3.1.3 **Critical (ER Classification Category)** – Critical components are those that can affect nuclear safety, plant reliability or power generation and therefore every effort must be made to maximise the reliability of these components. These components will have the most aggressive PM Strategies.

3.1.4 **Deep-in-Grace PM Task** – A preventive maintenance task where the planned date has exceeded or will exceed 50 percent of the grace period.

3.1.5 **Deferred PM Task** – A preventive maintenance task that will exceed its original planned date (last date of grace) with an approved engineering evaluation that determines the acceptability for extension to a new due date before the original late date (last date of grace) is exceeded.

3.1.6 **Deficient maintenance (DM)** - any work on a plant component that has a potential or actual deficiency that does not threaten the component's design function or performance criteria
Deficient maintenance has three classifications:

- DC – deficient maintenance to be performed on critical components as defined by
- DN – deficient maintenance to be performed on noncritical components as defined by
- DL – deficient maintenance to be performed on run-to-maintenance components as defined in or on critical and noncritical components of very low consequence if not corrected

3.1.7 **Delinquent PM Task (PM Non Compliance)** – A preventive maintenance task that exceeds late date (last date of grace) without sufficient technical basis.

3.1.8 **Economic (ER Classification Category)** – Economic components are those that will be considered for cost effective preventive maintenance, in order to preserve their integrity and extend their useful life. A cost effective effort should be made to maximise the reliability of these components.

3.1.9 **Emergent Work** – Work added to the schedule during execution week. Carry Over and FIN is not included in Emergent work.

3.1.10 **ER Classification** – Component ER Classification is a structured approach to evaluate the functional importance of each component within a system and forms part of the Integrated Equipment Reliability Process.

3.1.11 **Grace Period PM Task** – Any preventive maintenance task that is to be performed beyond its original due date (planned date) but before late date (last date of grace) of that activity. Normally, this period (due date to late date) is an additional 25 percent of the original schedule interval for the PM task. No engineering evaluation is required. This grace period is provided as a reasonable flexibility to allow for alignment with surveillance activities and functional equipment grouping and to better manage station resources use. Preventive maintenance tasks are expected to be scheduled based on their due dates (planned dates).

3.1.12 **On-line Maintenance** – Maintenance that will be performed with the main generator connected to the grid.

3.1.13 **Preventive Maintenance (PM)** – Includes actions that detect, preclude, or mitigate degradation of functional structures, systems, and components (SSC) to sustain or extend its useful life by controlling degradation and failures to an acceptable level. There are three types of preventive maintenance: periodic, predictive, and planned.

3.1.14 **Probabilistic Safety Assessment (PSA)** – A means of determining the risk impact of various combinations of equipment safety functions being unavailable due to maintenance during power operation. The risk measure for this analysis is core damage frequency. May also be referred to as Probabilistic Risk Assessment (PRA).

3.1.15 **Risk Significant Activity** – Any activity that may challenge a safety system's operation or that may lead to a loss of production or an activity that may threaten personnel safety, or increase environmental or radiological risk.

3.1.16 **SAP** – System Application Product (a computerised maintenance management system).

3.1.17 **Schedule** – A list of planned maintenance activities, periodic tests and surveillance requirements.

3.1.18 **Schedule freeze –** A predefined point in the process at which the schedule is locked/frozen. Changes to the locked/frozen schedule undergo a process that includes documentation and the required signatures needed to control the changes to the schedule for the workweek.

3.1.19 **Scheduling** – It is a process of setting the start time and duration for future maintenance work that allows an orderly progression of allocating labour, materials, and tools so that the work fits into the plant production schedule.

3.1.20 **Scope Freeze** – A predefined point in the process at which the scope is locked/frozen. Changes to the locked/frozen scope undergo the OSRB process which includes documentation and the required signatures to control the addition and deletion of scope from a given workweek.

3.1.21 **Scope selection** - A predefined point in the process at which the expected work scope for the execution week is selected based on input from engineering, operations, maintenance, cycle plan and resource availability.

3.1.22 **Significant (ER Classification Category)** – Significant components are those that can affect personnel, industrial, environmental or radiological safety, plant reliability, power generation or may lead to regulatory or insurance consequences. Substantial effort must be made to maximise the reliability of these components.

3.1.23 **Single Point Vulnerability** – A single component whose failure will result in an immediate automatic reactor trip, or an immediate production loss of greater than 20% power (components with an ER Classification of 'Critical', where the C1 or C2 criteria are met).

3.1.24 **Sponsored Work** – Work added after the scope freeze that the PHO/FIN meeting or Work Control Manager has determined requires a sponsor to ensure completion. This work must have a degree of impact on personnel safety, plant reliability, or capacity. Because the work already scheduled into the workweek has followed the process, it is necessary for the sponsor to engage in negotiating the support necessary to execute the work in an organised manner.

3.1.25 **Work Priority** – Predefined set of criteria to denote the level of urgency and importance of work deficiencies. Note: Work priority must be separate from classification.

3.2 Abbreviations

3.2.1 **AOT** – Available Outage Time

3.2.2 **BASC** – Business Application Solution Centre

3.2.3 **BOM** – Bill of Materials

3.2.4 **CHM** – Critical High Mild

3.2.5 **CHS** – Critical High Severe

3.2.6 **CLM** – Critical Low Mild

3.2.7 **CLS** – Critical Low Severe

3.2.8 **CM** – Corrective Maintenance

3.2.9 **DM** – Deficient Maintenance

3.2.10 **DNR** – Do Not Reschedule

3.2.11 **EHM** – Economical High Mild

3.2.12 **EHS** – Economical High Severe

3.2.13 **ELM** – Economical Low Mild

3.2.14 **ELS** – Economical Low Severe

3.2.15 **ERI** – Equipment Reliability Index

3.2.16 **FIN** – Fix It Now

3.2.17 **FLIP** – Flexi intelligent Log

3.2.18 **FTP** – File Transfer Protocol

3.2.19 **JSOM** – Joint System Operation Memorandum

3.2.20 **KORC** – Koeberg Operations Review Committee

3.2.21 **KOSC** – Koeberg Operability-Sub Committee

3.2.22 **LAN** – Local Area Network

3.2.23 **LAR** – Limited Access Register

3.2.24 **LCO** – Limiting Conditions of Operation

3.2.25 **LOSP** – Loss of Off Site Power

3.2.26 **LP** – Line Planner

3.2.27 **MESSO** – Major Equipment Shutdown and System Outages

3.2.28 **MRP** – Materials Requirements Planning

3.2.29 **MWC** – Main Work Centre

3.2.30 **NAL** – Network Application Launcher

3.2.31 **OPS** – Operating Department

3.2.32 **Ops Support** – Operations Support Group

3.2.33 **OSRB** – On-line Scope Review Board

3.2.34 **OTS** – Operating Technical Specifications

3.2.35 **PC** – Personal Computer

3.2.36 **PHC-S** – Plant Health Committee - Strategic

3.2.37 **PHO** – Plant Health Operational

3.2.38 **PM** – Preventive Maintenance

3.2.39 **POD** – Plan of the Day

3.2.40 **PRA** – Probabilistic Risk Analysis

3.2.41 **PSA** – Probabilistic Safety Assessment

3.2.42 **PSR** – Plant safety regulations

3.2.43 **PT** – Periodic Test

3.2.44 **PTW** – Permit to Work

3.2.45 **RP** – Radiation Protection

3.2.46 **RPC** – Radiation Protection Certificate

3.2.47 **RSA** – Risk Significant Activity

3.2.48 **RTM** – Run to Maintenance

3.2.49 **S** – Scheduler

3.2.50 **SCR** – Schedule Change Request

3.2.51 **SHM** – Significant High Mild

3.2.52 **SHS** – Significant High Severe

3.2.53 **SLM** – Significant Low Mild

3.2.54 **SLS** – Significant Low Severe

3.2.55 **SOW** – Scope of Work

3.2.56 **SPV** – Single Point Vulnerability

3.2.57 **SRSM** – Safety Related Surveillance Manual

3.2.58 **SSC** – Systems, Structures and Components

3.2.59 **SSS –** Senior Shift Supervisor

3.2.60 **UCLF** – Unplanned Capability Loss Factor

3.2.61 **W/O** – Work Order

3.2.62 **W/P** – Work Package

3.2.63 **WC** – Work Controller

4.0 REFERENCES

4.1 Referenced Documents

4.1.1 335-2, Rev 5: Koeberg Nuclear Power Station Management Manual

4.1.2 AP-913, Equipment Reliability Process (INPO)

4.1.3 AP-928: Online Work Management Process Description (INPO)

4.1.4 KAA-500, Rev 13: The Process for Controlled Documents

4.1.5 KAA-766, Rev 3: Fix It Now (FIN) Process

4.1.6 KAA-819, Rev 1: The Control and Flow of Work Packages

4.1.7 KGA-113, Rev 1: Integrated Operational Risk Management

4.1.8 KSA-011, Rev 14: The Requirements for Controlled Documents

4.1.9 KSA-139, Rev 2: Initiating a Work Request

4.1.10 KSA-147, Rev 2: Investigating Compiling and Issuing of Work Packages Including Post Maintenance Requalification Identification

4.1.11 KSA-913, Rev 1: Integrated Equipment Reliability Standard

4.2 Applicable Documents

4.2.1 240-119092296: NPM Work Management Process

4.2.2 KAA-690: Operability Determinations

4.2.3 KAA-765: Job Jar Work Process

4.2.4 KAA-820: Updating the Work Management Planning Database

4.2.5 KAA-835: Work Activity Monitoring Process

4.2.6 KAA-852: Equipment Reliability Index (ERI)

4.2.7 KAA-913: Integrated Equipment Reliability Process

4.2.8 KBA0022OTS: Operating Technical Specifications

4.2.9 KBA0022SRSM: Safety related Surveillance Manual

4.2.10 KSA-126: Control of Statutory and Non-statutory Work Activities

4.2.11 KSB-007: Interface with Eskom's Interconnected Power System (IPS)

4.2.12 KSM-015: Maintenance History Recording

4.2.13 KWB-OP-K0-007: Administrative Lockout Mechanism

5.0 RESPONSIBILITIES

5.1 The Work management manager is responsible for ensuring the implementation and compliance of the process described in this procedure.

5.2 The Work Control Manager is responsible for;

- The production and issuing of the 10 Yearly Major Component Plan, 3 Year Preventive Maintenance plan, Weekly Integrated Schedules and the POD.
- The execution of the schedule that relates to the work being performed during the assigned work weeks.

- To perform a review of the work activities in the event of a significant disruption to the schedule e.g. SDO, load reduction. A revised prioritised schedule should be presented to the production and outage meetings. All activities identified that pose a risk to any unit should be removed and re-scheduled as allowed by plant status in-line with the KAA-835 process.
- The Project Management and co-ordination of all major equipment outages.
- Planning and execution of pre-outage activities.
- The scheduling of defects that are coded “ready for scheduling”. “Ready for Scheduling” activities shall be scheduled at the first available opportunity taking into consideration plant conditions.
- Ensuring that SAP work notifications that are coded “DNR - Do Not Reschedule” are scheduled as intended and not rescheduled unless the PHC-S Chairperson gives approval for rescheduling.
- The Work Control Manager is the chair of the daily PHO meeting which is focussed on compliance to the POD, managing short term plant risks, evaluating deviations and evaluating priority work.
- WC must communicate with respective line groups to update SAP when planned work cannot take place due to plant in conservation or plant not available due to reasons communicated in the PHO meeting. WC will then raise a CR to capture learning and reschedule the work based on available tolerance.
- Producing a list of as found condition (damage code: 1,2,3,4) at T+03 and sending it to Reliability Engineering for review (proactive PM review process).

5.3 The RFE Manager is responsible for the issuing and executing of a flux map schedule as required by OTS.

5.4 The Materials Management Manager is responsible to ensure that all spares required are ready by the Scope and Freeze meeting. Any spares not ready at Scope and Freeze shall be communicated and added to the PHO issues list for tracking.

5.5 The Operations Support Manager;

- Is responsible for ensuring the review of PTW’s for all work in accordance to PSR as per the POD. He/She shall also ensure that UCLF risk factors and the risk classification figures as per KGA-113 are assigned to each activity on the schedule; ensure that reactivity risk is identified for each activity; ensure that activities with an OTS impact are identified at T-7 and reviewed at T-4; and correct LAR assignments as required.

- Shall monitor and record the cumulative duration of the replacement of an on-site electrical power source by 9LHS to either unit to not exceed 90 days over a 12-month period.
- Shall monitor and record the cumulative duration of inoperability of the two on-site electrical power sources in a 12-Month period do not exceed 60 hours.
- Shall monitor and record the cumulative duration that the standby offsite electrical power source is inoperable (for planned maintenance) does not exceed 3 days in a 12 month period.
- Shall monitor and record the cumulative duration of inoperability of an ASG motor pump for preventive maintenance does not exceed 6 hours over a 6-month window.
- Shall monitor and record the cumulative duration of unavailability of 9LBG and/or 9LCD for planned events do not exceed 8 hours over a 12-month period.
- Shall monitor and record the cumulative duration of inoperability of a RCV train A (HHSI) pump for preventive maintenance does not exceed 6 hours over a period of 1 year.

5.6 Maintenance Group Heads;

- Shall ensure that all work scheduled for execution is prepared (in accordance to KSA-147) before end of T-6.
- Shall ensure that PTW's are applied for (in accordance to KAA-667) and in application status before the end of T- 6
- Shall ensure that line Group Section Heads/Supervisor attend the scope and freeze meetings having reviewed the week plans in advance.
- Are responsible for the execution of work on the schedule, the availability of resources for scheduled activities agreed to at the freeze meeting and the reporting of all statutory and non-statutory activities not executed (in accordance to KSA-126 and KAA-835).
- Shall ensure that SAP reflects the current work order status at all times.
- Shall ensure daily resource utilisation is optimised with job jar work (KAA-765).
- Shall ensure that emergent work handed over from the FIN team co-ordinator is managed and included into the schedule (see Appendix 4).
- Shall ensure that corrective and deficient maintenance is coded "Ready to be Scheduled" once the work is ready for execution, spares are available, support is identified and SAP updated accordingly.

5.7 The FIN Team co-ordinator is responsible for managing priority work to protect the POD. The FIN team co-ordinator is also responsible to provide progress of priority work to the PHO meeting.

5.8 The relevant Safety Engineer is responsible for ensuring that the T-4 schedule is reviewed to assess the risk from a nuclear safety stand point.

5.9 The relevant Shift Manager is responsible for ensuring that the schedule is reviewed at T-10 and T-04 to ensure compliance with OTS, defence in depth, shift work load, allocate starting times for PT's and other Operating activities, perform an integrated risk review for conflicts, identify periods of higher core damage frequency, identify activities that may result in reactivity evolutions, identify activities that can induce plant transients or safety system's actuations. The Shift Manager is also responsible for the evaluation of changes to risk factors due to a change in plant state and infrequently performed activities. The Shift Manager is to inform the relevant Work Controller of any risk activity changes. Alternate chair to the PHO.

5.10 The Chemistry Manager is responsible for ensuring that the schedule is reviewed at T-10 and T-4 to ensure compliance with OTS (chemistry specifications), defence in depth, shift work load, allocate starting times for chemistry activities and to perform and integrated risk review for conflicts. The Chemistry Manager is also responsible for the evaluation of changes to risk factors due to a change in plant state. The Chemistry Manager is to inform the relevant Work Controller of any risk activity changes.

5.11 The Reliability Engineering Manager

- Is responsible for coordinating the T+03 proactive PM review process and initiating action on any improvements emanating from the process (such as ERCRs/SAP Imp/etc.).
- Performs a comprehensive review of T-18 downloaded Preventive Maintenance Tasks (Operation Job Types: PM, ER and KLM-005) to determine opportunities to update SAP PM tasks for alignment with the Approved PM Basis (task title and frequency). Changes are, for example, Extension of PM task frequency, Deactivation of tasks, Changes of task frequency to "On Request" (OR), etc and provide feedback to Work Control at T-16. The feedback is provided via the signed T-16 Milestone form.
- Reviews any matrix changes for potential impact to PM Programme.
- Authorises removal of PM (Preventative Maintenance) scope on critical components from the plan beyond their planned date as requested during planning and preparation phase.

5.12 Material Reliability Group Manager

- Performs a comprehensive review of T-18 download Engineering Programme tasks to determine the scope that is no longer required and provide Work Control with feedback at T-16. The feedback is provided via the signed T-16 Milestone form

5.13 The Nuclear Project Management Manager

- Shall ensure that PTW's are applied for (in accordance to KAA-667) and in application status before the end of T-6.
- Shall ensure that project managers/leaders attend the scope and freeze meetings having reviewed the week plans in advance.
- Are responsible for the execution of work on the schedule, the availability of resources for scheduled activities agreed to at the freeze meeting.
- Shall ensure that project managers/leaders attend the PHO meeting during execution of their scope of work.
- Shall ensure that SAP reflects the current work order status at all times.

5.14 The Operating Work Control Manager is responsible for:

- Determining the impact of isolation on the plant at T-06
- Ensuring that PTW's are prepared before end of T-2 and that day shift PTW's are issued as per the POD.
- Managing priority work to protect the schedule (FIN).
- Assessing the impact of priority carryover work on to the POD at T-01

5.15 Rules on Work Activities Performed under LCO for Corrective Maintenance

5.15.1 The only LCO group events allowed for preventive maintenance are in accordance with OTS/SRSM.

5.15.2 The repair period must not exceed the allowable repair time or fall-back initiation time. Repair period is measured from the time the system is isolated until it is de-isolated and must include post maintenance testing if applicable.
(See Appendix 13 for additional guidelines)

5.15.3 Any LCO group event maintenance that involves multi-disciplines must be planned and run as a project. The plan must ensure:

- A project leader must be appointed by the WC Manager..
- That all required spares are available and verified as correct before implementation of the PTW.
- That all tasks are identified and time duration specified.

- Also include the co-ordination of returning equipment to service and the requalification of the same equipment with required maintenance personnel in attendance.

- For LCO group events for corrective maintenance that's been declared operable but degraded equipment as per the KAA-690 process, the work package and/or work plan must be reviewed and approved by KOSC.

- The KAA-690 number is to be included on the SAP order, and to be quoted in the 'task name' field on the POD.

5.16 High Level Roles and Responsibilities for the Graded Approach to Scheduling

5.16.1 The Work management Manager is responsible for ensuring the implementation of the Graded Approach to scheduling.

5.16.2 The Work management Manager is responsible for ensuring the correct level of oversight for all Level A activities.

5.16.3 The Operating Manager/ Shift Managers are responsible for classifying the priority corrective/deficient work in accordance with priority 1, 2, 3 or 4 criteria, with the assistance of the FIN meeting and with input from the equipment reliability (ER) and SPV classification.

5.16.4 The Work Control Manager is responsible for classifying the level A, B, C, D of preventive maintenance (PM) tasks, with the assistance of OPS Support and the Safety Engineers.

5.16.5 Maintenance Execution Line Managers are responsible for executing priority 1, 2, 3 or 4 and PM tasks and assign a lead person (MWC) for level A and B maintenance that involves multi-disciplines.

5.16.6 Systems Engineering Manager is responsible for ensuring that technical solutions/resolutions for Priority 1 and 2 activities are given at the appropriate time and that technical support is available during execution.

5.16.7 Nuclear Safety Engineers are to ensure that any equipment failures that affect or can potentially affect nuclear safety are graded correctly i.e. Priority 1 and 2 as appropriate.

5.16.8 Programmes Manager ensures appropriate input into the issues or challenges with scheduling of any Engineering Programmes' and PM Programme tasks.

6.0 PROCESS

6.1 Schedule Matrices

6.1.1 All matrices are located on a secure local access folder, accessible via the icon called “KAA-721 Matrix” on the G drive, identified by the matrix name given paragraph 6.1.5.

6.1.2 Changes to matrices shall only be implemented by persons authorised in writing by the Work Control Manager. This authorisation should be reviewed on an annual basis for applicability.

6.1.3 Read only access is granted to all Eskom personnel, while write access is granted to authorised personnel within the Work Control Group.

6.1.4 Updates to these files are only permissible after completion of a matrix change control form is submitted to the WCG (Appendix 11). Reliability Engineering shall be informed prior to any changes to the operating running regime in order to consider the impact on the maintenance basis.

6.1.5 Paragraphs 6.1.1 to 6.1.4 are applicable to:

(1) Operating Running Regime

(2) Ops PT Matrix

(3) Daytime PTs

(4) Chemistry Matrix

(5) Fire Risk Management Matrix

6.1.6 The completed matrix change control form will be retained by the Work Control Group for a minimum period of 1 year.

6.2 Schedules

6.2.1 A 10 yearly Major Component plan will be produced in accordance with Appendix 1.

6.2.2 A 3 yearly PM plan will be produced each year in accordance with Appendix 2.

6.2.3 A weekly schedule for each week will be prepared in accordance with Appendix 3 – work flow responsibility matrix – production of the weekly schedule.

6.2.4 The process to be followed during the execution week is described in Appendix 4.

6.2.5 The process to be followed to change the schedule after T – 6 is described in Appendix 5.

6.2.6 Schedule adherence will be measured in accordance with Appendix 6.

6.2.7 The process to be followed for the Graded Approach to scheduling is described in Appendix 8.

6.3 Online Work Management Milestone sign off

6.3.1 From T-18, the progress of the preparation activities will be monitored continuously. On a weekly basis, a review of the Online key preparation milestones will be performed. The time notation used is: T-X, with “X” being the number of weeks before the execution week. For example “T-18” is 18 weeks before the start of the execution week.

6.3.2 For each week preceding the execution of the week there is an appendix containing all the milestone ‘sign off sheets’ for that week, (Appendix 21). The Owner/s are listed for each Milestone on the “sign off sheet”. The relevant owner must sign to confirm that the milestone completion criterion has been met, or that a recovery plan is in place.

6.3.3 Where a milestone is not met, the relevant group must raise a CR detailing the reasons for not meeting the milestone. The Planning and Preparation Section Head will complete the “sign off sheet” for each milestone due for the current week, and any milestones not met will be documented with their respective recovery plans in the Critique report. New due dates as per the recovery plan will be written into the sign off sheet for the appropriate week.

7.0 RECORDS

7.1 Schedule Change Request Form (KFM-PM-002)

7.2 Matrix Change Control Form (KFM-PM-005)

7.3 T-2 Certification meeting attendance register

7.4 T+1 Scope sign-off sheet

8.0 ATTACHMENTS

Appendix 1 – Work Flow Responsibility Matrix:
Production of the 10Y Major Component plan

Appendix 2 – Work Flow Responsibility Matrix:
Production of the 3Y Plan

Appendix 3 – Work Flow Responsibility Matrix:
Production of the Weekly PM Schedule

Appendix 4 – Work Flow Responsibility Matrix:
Execution of the Weekly Schedule

Appendix 5 – Work Flow Responsibility Matrix:
Schedule Changes after T – 8

Appendix 6 – Work Flow Responsibility Matrix:
Schedule Adherence

Appendix 7 – Production of Board Outage Plan

Appendix 8 – Graded Approach to Scheduling

Appendix 9 – Schedule Change Request Form (KFM-PM-002)

NNR Act 47, Section 51, PAIA 38(b)Redacted as it contains sensitive information

Appendix 11 – Matrix Change Control Form (KFM-PM-005)

Appendix 12 – Online Scope Review Board Agenda & Risk Assessment

Appendix 13 – Guidelines for Scheduling of Cumulative OTS Group 1 & 2
Events and Protocol for OTS Group 1 & 2 Events

Appendix 14 – Management Of Pre-Outage Activities

Appendix 15 – Screening for the Safe Moving of Work from
Outage to On-line

Appendix 16 – Level A,B,C, D Classification Criteria and Oversight

Appendix 17 – Major Equipment Shutdown and System Outages Strategy

Appendix 18 – The Work Management Process
Online Performance Indicators

Appendix 19 – T-2 Certification Meeting Attendance Register

Appendix 20 – T+1 Scope Completion Sign-off Sheet

Appendix 21 -- Online Key Preparation Milestone Checklist

Appendix 22 – 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: Main Flow Secondary Flow	PRODUCTION OF THE 10 YEARLY MAJOR COMPONENT PLAN												NOTES & REFERENCES
	MAJOR COMPONENT PLAN CO-ORDINAOTOR		SPARES SCHEDULER		LINE SECTION HEADS	OCC NETWORK CONTROLLERS	PROGRAMME SECTION						
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
1. Select a list of all Maintenance activities for the next 10 years.	[R]												
2. Create a new project schedule and indicate the outage periods on the 10 year schedule.	[R]					[S]							See the latest revision of the Production Plan.
3. Compile a final plan and indicate the most desirable week for the activity to take place. Prepare SAP scheduled maintenance date changes, if required.	[R]												Ensure that non-outage related work does not coincide with a planned outage and that statutory activities due in that period do not exceed their tolerance periods. Ensure that KSA-126 requirements are not violated when changing start dates.
4. Confirm: • Budget • Tools • Resources are considered.			(S)		[R]								
5. Produce final plan.	[R]												Load on G:\drive and communicate to the station.

WORK FLOW RESPONSIBILITY MATRIX	APPENDIX 2

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:
Main Flow Secondary Flow

ACTIVITIES	1 SCHEDULERS	2 PROCUREMENT	3 SPARES SCHEDULER	4 SPECIFICATIONS ENGINEERING	5 LINE SECTION HEADS	6 OCC NETWORK CONTROLLERS	7 PROGRAMME SECTION	8	9	10	11	12	NOTES & REFERENCES
	PRODUCTION OF THE 3 YEARLY PM PLAN												
1. Select a list of all maintenance activities for the next 3 years.	[R]	[S]		[S]									January of the 1st year.
2. Create a new project schedule and indicate the outage periods on the year schedule.	[R]					[S]							See the latest revision of the Production Plan.
3. Compile a final plan and indicate the most desirable week for the activity to take place. Prepare SAP scheduled maintenance date changes, if required.	[R]												End of February of the 1st year Ensure that non-outage related work does not coincide with a planned outage, and that statutory activities due in that period do not exceed their tolerance periods. Ensure that KSA-126 requirements are not violated when changing start dates.
4. Ensure: • All Resources are considered.			(S)		[R]								Maintenance review from 1st March to end of October of the 1st year
5. Produce final plan.	[R]												November. Load on G:\drive and communicate to the station
6. Order spares in accordance with the 3 yearly plan.			[R]										Use procurement processes.
7. Produce a Demand Plan (12 months before execution).			R										
8. Reviews the Demand plan to confirm the Spares and Bill of materials (9 months before execution).			[R]		R								
9. Resolve all the Spares and Bill of materials issue (6 months before executions).					R								
10. Prepare SAP scheduled maintenance date changes if required, in accordance with the final plan.	[R]						(S)						Ensure that KSA-126 requirements are not violated when changing start dates. KAA-820.
11. Change SAP scheduled maintenance start dates if required.							[R]						

WORK FLOW RESPONSIBILITY MATRIX | **APPENDIX 3**

PRODUCTION OF THE WEEKLY PM SCHEDULE

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:
Main Flow ⟷ Secondary Flow

ACTIVITIES	1 SCHEDULER	2 WC PROGRAMME SECTION HEAD	3 LINE PLANNERS	4 OPERATIONS SUPPORT GROUP	5 WORK CONTROLLER	6 LINE SECTION HEADS	7 OPERATING DEPARTMENT	8 MATERIALS PLANNING / PROCUREMENT	9 RADIATION PROTECTION	10 OH&SA	11 NUCLEAR SAFETY ENGINEER	12 OPERATING WORK CONTROL	13 SYSTEMS ENGINEERING	14 RELIABILITY ENGINEERING \ MATERIALS RELIABILITY GROUP	NOTES & REFERENCES
SCOPING PHASE T-18 TO T-08															
T-18 to T-12 Activities															
1. Verify all scheduled maintenance orders for a week, 18 weeks ahead from SAP is downloaded.		[R]													The download will be done during the weekend by SAP COE and checked by the programme section in Work Control on Monday.
2. Import all workorders and their associated operations for one week, 18 weeks ahead for each unit.	[R]														This report must include all Scheduled Maintenance and should include any Non-PM activities targeted for that week.
3. Review Scope														[R]	Line Groups to resolve all comments from Engineering.
3. Produce a base plan in accordance with: PT matrices, running regimes, PSA risk matrix, allowed cumulative yearly out of service times, OTS rules, Year plans (MESSO, Unit Outage), etc.	[R]														**Fundamental Principles**: • Ensure work is bundled to maximize equipment availability. • Minimize the core damage frequency by not isolating multiple safe guard equipment at the same time or for extended periods. • Scheduler's Checklist must be adhered to. G:\Koeberg\Work Management\Work Preparation & Control\ weekplans.
T-12 to T-10 Activities															
1. Verify that spares are available to meet the proposed scheduled dates.								[R]							Who responsible Proc or MM
2. Prepare all planned Orders , with respect to manning (MESSO, Online, Unit Outage), duration, spares, PTW and RP requirements. 3. Physical verification of all spares						[R]									Work to be prepared in accordance with KSA-147 for Maintenance and KFA-002 for NPM. • Operations for support to the main activity have to be raised under the main order • Initiate service notes updates if required,
4. A list must be run on operations not prepared in order to identify additional work which needs to be prepared prior to scope freeze.						[R]									

WORK FLOW RESPONSIBILITY MATRIX | **APPENDIX 3**

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Flow Path:
Main Flow ⟷ Secondary Flow

PRODUCTION OF THE WEEKLY PM SCHEDULE

ACTIVITIES	1 SCHEDULER	2 WC PROGRAMME SECTION HEAD	3 LINE PLANNERS	4 OPERATIONS SUPPORT GROUP	5 WORK CONTROLLER	6 LINE SECTION HEADS	7 OPERATING DEPARTMENT	8 MATERIALS PLANNING / PROCUREMENT	9 RADIATION PROTECTION	10 OH&SA	11 NUCLEAR SAFETY ENGINEER	12 OPERATING WORK CONTROL	13 SYSTEMS ENGINEERING	14 RELIABILITY ENGINEERING \ MATERIALS RELIABILITY GROUP	**NOTES & REFERENCES**
5. Start with work package preparation.						[R]									Line Groups
6. Plans to be reviewed by Operating in accordance.							[R]								Note: Refer to Section 5.8.
T-09 Activities															
1. Manipulate data in the Project schedule taking cognisance of the Operating review feedback.	[R]														
T-08 Activities															
1. Scope freeze by end of T-08.	[R]														[No additions after Scope freeze, except support operations will be accepted.] For the removal of PM activities, KFM-PM-002 is required and the KAA-835 process is to be followed. Late inclusions received after this day, will be forwarded to the OSRB (see Appendix 12).
2. Discuss all comments, changes, anomalies at scope meeting.	[R]		[S]	[S]		[S]		[S]					[S]		Scope meeting T–7 The Work Control Preparation Section Head is the Chairperson of the meeting.
3. Ensure all PTW's are initiated.			[R]												
PLANNING AND SCHEDULING PHASE T-07 TO T-05															
T-07 Activities															
1. Ensure that work packages are walked down and reviewed.						[R]									
2. Identify LCO conditions and assign UCLF figures and risk classification figures as per KGA-113. Initiate service note updates as required. Perform an integrated risk review on the plan. Identify orange and red activities and follow rules as per KGA-113.	{S}			[R]											Ensure that not more than one task that generate an OTS Group1 event and not more than four tasks that generate an OTS Group2 event is scheduled at any given time.

WORK FLOW RESPONSIBILITY MATRIX		APPENDIX 3

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S – Service
[ ] – Mandatory Requirement
( ) – As Appropriate/Required
Flow Path:
Main Flow Secondary Flow

PRODUCTION OF THE WEEKLY PM SCHEDULE

ACTIVITIES	1 SCHEDULER	2 WC PROGRAMME SECTION HEAD	3 LINE PLANNERS	4 OPERATIONS SUPPORT GROUP	5 WORK CONTROLLER	6 LINE SECTION HEADS	7 OPERATING DEPARTMENT	8 MATERIALS PLANNING / PROCUREMENT	9 RADIATION PROTECTION	10 OH&SA	11 NUCLEAR SAFETY ENGINEER	12 OPERATING WORK CONTROL	13 SYSTEMS ENGINEERING	14 RELIABILITY ENGINEERING \ MATERIALS RELIABILITY GROUP	NOTES & REFERENCES
3. Review the plan to determine the impact of isolations to the plant.												[R]			Operating Work Control
4. Stage and bond all required spares including contingency spares in SAP						[S]		[R]							
5. Ensure that: • Work package preparation is completed and, • PTW's are in application status (RP to review, input a risk assessment number and sign)						[R]									Final check prior to freeze of work scope.
6. Complete PTW attachments				[R]					[R]	[R]					
7. Manipulate data in the Project schedule taking cognisance of the feedback.	[R]														

WORK FLOW RESPONSIBILITY MATRIX		APPENDIX 3

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: Main Flow Secondary Flow	PRODUCTION OF THE WEEKLY PM SCHEDULE														NOTES & REFERENCES
	SCHEDULER	WC PROGRAMME SECTION HEAD	LINE PLANNERS	OPERATIONS SUPPORT GROUP	WORK CONTROLLER	LINE SECTION HEADS	OPERATING DEPARTMENT	MATERIALS PLANNING / PROCUREMENT	RADIATION PROTECTION	OH&SA	NUCLEAR SAFETY ENGINEER	OPERATING WORK CONTROL	SYSTEMS ENGINEERING	RELIABILITY ENGINEERING \ MATERIALS RELIABILITY GROUP	
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
T-06 to T-05 Activities															
1. Schedule Freeze Meeting by end of T-06	[R]		[S]	[S]		[S]		[S]	[S]				[S]		The Work Control Preparation Section Head is the Chairperson of the meeting. The Work Control Preparation Section Head gains acceptance that all Work Packages have been prepared, that the Line Groups have walked down their activities scheduled, and that all spares are available. **NOTE**: Confirmation of minor changes made at Scope meeting. Work Control reserves the right to remove any activity(deficient maintenance) from the plan that is not yet ready for execution. Where a Line group requires removal of PM (preventative maintenance) scope on critical components, the relevant Programme owner shall be consulted for concurrence (as per KFM-PM-002.
2. Effect changes resulting from the Freeze Meeting	[R]														
3. Risk Review of plan					[R]										

WORK FLOW RESPONSIBILITY MATRIX — APPENDIX 3

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S – Service
[ ] – Mandatory Requirement
( ) – As Appropriate/Required
Flow Path:
Main Flow ⟷ Secondary Flow

PRODUCTION OF THE WEEKLY PM SCHEDULE

ACTIVITIES	1 SCHEDULER	2 WC PROGRAMME SECTION HEAD	3 LINE PLANNERS	4 OPERATIONS SUPPORT GROUP	5 WORK CONTROLLER	6 LINE SECTION HEADS	7 OPERATING DEPARTMENT	8 MATERIALS PLANNING / PROCUREMENT	9 RADIATION PROTECTION	10 OH&SA	11 NUCLEAR SAFETY ENGINEER	12 OPERATING WORK CONTROL	13 SYSTEMS ENGINEERING	14 RELIABILITY ENGINEERING \ MATERIALS RELIABILITY GROUP	NOTES & REFERENCES
PREPARATION PHASE T-04 TO T-01															
T-04 Activities															
1. Ensure; • the required PTWs are ready to be work scheduled						[R]			[S]	[S]					
2. Perform Risk Review. Friday of T – 4. The risk review to include: • Multiple safety systems out at any one time • Duration of system out of service • Nuclear safety risk: identify periods of high core damage frequency and recommend mitigating plans • Consider common mode effects • OTS implications in terms of repair time and/or fall back initiation time • Confirm start times of PTs NNR Act 47, Section 51, PAIA 38(b) Redacted as it contains sensitive information use the PSA Risk Assessment Matrix on the NAL				[R]	[R]		[R]				[R]				**NOTE:** Ensure that not more than one task that generates an OTS Group1 event and not more than four tasks that generate an OTS Group2 event is scheduled at any given time. – Plant Configuration (Running Regime) – Production Risk – Reactivity Management Review comments should be sent via email to the Work Controller.
3. Evaluate the impact of emergent work on the POD					[R]		[R]					[R]			As per the OSRB process
T-03 to T-02 Activities															
1. Effect changes resulting from review comments. 2. Work Schedule all PTW's for the execution week by end of T-2	[S]				[R]										Resolve and feedback to T-4 reviewers.
3. Prepare all PTW's for the execution week by end of T-02							[R]								Operating Work Control

WORK FLOW RESPONSIBILITY MATRIX | **APPENDIX 3**

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S – Service
[ ] – Mandatory Requirement
( ) – As Appropriate/Required
Flow Path:
Main Flow Secondary Flow

PRODUCTION OF THE WEEKLY PM SCHEDULE

ACTIVITIES	1 SCHEDULER	2 PROGRAMME SECTION HEAD	3 LINE PLANNERS	4 OPERATIONS SUPPORT GROUP	5 WORK CONTROLLER	6 LINE SECTION HEADS	7 OPERATING DEPARTMENT	8 MATERIALS PLANNING / proc	9 RADIATION PROTECTION	10 OH&SA	11 NUCLEAR SAFETY ENGINEER	12 OPERATING WORK CONTROL	13 SYSTEMS ENGINEERING	14 RELIABILITY ENGINEERING \ MATERIALS RELIABILITY GROUP	NOTES & REFERENCES
4. Perform ALARA dose estimates. Identify high radiological activities (RP – ALARA) for ALARA planning									[R]						Prepare RPC for every work package for control zone activities. Perform pre-job surveys. (To be performed if the area is accessible). Check that the RPC number is on SAP Operation and on the PTW.
5. Conduct T-2 Certification Meeting				R →	R →	R →	R →	R →	R →		R →	R →	R		Appendix 19 – T-2 Certification Meeting expectations and sign-off sheet. Execution certification meeting by HOG on Tuesday.
T-01 Activities															
1. Include the turnover work from the T-0 work scope. These include: • Carry over work • Emergent priority work	[S] —				[R]	[S]						[R]			Line groups must assess how this work is going to impact the already frozen plans.
2. Review POD and determine the impact of this work to the up coming week's schedule					[R] →							[R]			
3. Issue Final Plan to the Station.					[R]										Friday T–1.

WORK FLOW RESPONSIBILITY MATRIX	APPENDIX 4

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:
Main Flow Secondary Flow

ACTIVITIES	EXECUTION OF THE WEEKLY SCHEDULE													NOTES & REFERENCES
	SYSTEMS ENGINEERING	OPERATING WORK CONTROL MANAGER	OPERATING SHIFT MANAGER	JPT	LINE GROUPS	RADIATION PROTECTION	WORK CONTROL MANAGER	FIN TEAM CO-ORDINATOR	NUCLEAR SAFETY ENGINEER	NUCLEAR PROJECT MANAGEMENT	WORK CONTROLLER	SCHEDULER		
	1	2	3	4	5	6	7	8	9	10	11	12	13	
EXECUTION PHASE T-0														
T-0 Activities														
1. Conduct daily PHO meeting to evaluate • Current plant conditions, • Priorities notifications, • Aggregate impact of new and old defects • Daily schedule adherence • Assess and manage risk on the units • Principles Work Control, Operating, Ops support, MMS, EMS, IMS, I&T	[S]	[S]	[S]	[S]	[S]	[S]	[R]	[S]	[S]	[S]				**NOTE:** In case of priority work that invokes OTS group events; The impact of unplanned OTS Group 1&2 events will be discussed and prioritised with the Planned OTS Group 1&2 events at the PHO meeting. The rest of the work is targeted for preparation and execution as per the 18 week process, according to KAA-721 matrices as described in this process.
2. Conduct daily Prioritization meeting @ 8:00am	[S]	[S]	[S]	[S]	[S]	[S]	[S]	[R]	[S]	[S]	[S]			The new work raised over the last 24 hours is reviewed and either accepted or rejected. Immediate priorities (1 or 2) including safety defects are taken away by the FIN team co-ordinator in order to protect the schedule.
3. Update the POD for the following day.											[R]	[S]		
4. Approve the following day's PTW's		[R]									[S]			
CRITIQUE PHASE T+1														
1. Work Control: • Compile critique and KPI report • Conduct critique meeting, document and trend causes of deviations Scope Completion sign-off sheet to be signed by all line-groups. Applicable Groups: • Implement lessons learned	[S]	[S]	[S]	[S]	[S]	[S]	[R]	[S]	[S]	[S]	[S]			Attachment 20 – T+1 Scope Completion sign-off sheet

WORK FLOW RESPONSIBILITY MATRIX												APPENDIX 4
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: Main Flow Secondary Flow	EXECUTION OF THE WEEKLY SCHEDULE												NOTES & REFERENCES
	Work Control Statutory Controller												
AS FOUND CONDITION REVIEW PHASE T+3													
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
1. Produce a list of as found condition (damage codes: 1,2,3,4)	[R]												To KAA-913

WORK FLOW RESPONSIBILITY MATRIX												APPENDIX 5
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: Main Flow Secondary Flow	SCHEDULE CHANGES AFTER T – 8											NOTES & REFERENCES
	SCHEDULER	LINE PLANNER	RADIATION PROTECTION	LINE SECTION HEAD GROUP	LINE GROUP	OPERATING SUPPORT	WORK CONTROLLER	NUCLEAR SAFETY ENGINEERS	ON-LINE SCOPE REVIEW BOARD			
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
1. T – 08 (Monday) to T – 0 Any additions to the schedule must follow the schedule change request process.				[R]									Complete form in accordance with Appendix 9. **NOTE 1:** A Schedule change request' for preventive maintenance is accepted by the relevant Work Controller and does not follow the OSRB process. **NOTE 2:** Carryover of PM's will be at the discretion of the Work Controllers without a SCR form.
2. Any defect additions must be presented to the On-line scope review board (OSRB).		(S)		[R]									All additions to be registered with Work Control latest 16:00 on a Thurs. for the following week's OSRB. Note: A request for an ADHOC OSRB meeting will be at the Work Control Managers discretion.
3. Originator to liase with support work centres as to availability of resources.		[S]		[R]									Line planner's signature validates all relevant operations are updated in SAP.
4. The schedule change request shall be agreed to and signed by the MWC Section Head. The relevant support groups Supervisor's signature must appear on the form.			[C]	[R]									Ensure that all support operations are prepared correctly i.e. manning duration and PTW requirements are completed. The MWC is responsible to ensure that the operations are scheduled in SAP.
5. Originator to present the details of the work at the OSRB.				[R]			[C]						Work Controller to verify whether the motivation is sufficient.
6. Review the Schedule change request with respect to the existing schedule to ensure: – Multiple Safety Systems Out At Any One Time – Duration Of System Out Of Service – Nuclear Safety Risk – OTS implications in terms of repair time and/or fall back initiation time									[R]				Consider common mode effects. OSRB Meeting convenes every Tuesday

WORK FLOW RESPONSIBILITY MATRIX												APPENDIX 5
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: Main Flow Secondary Flow	SCHEDULE CHANGES AFTER T – 8											NOTES & REFERENCES
	SCHEDULER	LINE PLANNER	RADIATION PROTECTION	LINE SECTION HEAD GROUP	LINE GROUP	OPERATING SUPPORT	WORK CONTROLLER	NUCLEAR SAFETY ENGINEERS	ON-LINE SCOPE REVIEW BOARD			
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
7. The OSRB approves/rejects and provide advice as required.									[R]				See Appendix -12 for agenda, protocol and risk assessment. An appeal following a rejection can be made to the Work Control Manager.
8. Ensure any change in accordance with OSRB is affected. Schedule the activities in SAP for the appropriate date.		[R]			[C]								If the work is not in a position to be scheduled, return the schedule change request to the line Section Head for co-ordination of the package correction. ***NOTE:*** *If any support operations are not prepared, the work will not be scheduled.* For removals of non-PM type maintenance, the line planner will re-schedule the activities for the next appropriate window.
9. Include the relevant operations onto the appropriate week schedule or remove the relevant operations from the week schedule.	[R]												NOTE: An electronic SCR form is available on FLIP, however a manual form will be required for OSRB submissions as it is signed by all stakeholders at the OSRB meeting.

WORK FLOW RESPONSIBILITY MATRIX													APPENDIX 6
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: Main Flow Secondary Flow	SCHEDULE ADHERENCE												NOTES & REFERENCES
	SCHEDULER	LINE GROUP MANAGERS	LINE PLANNERS		WORK CONTROL								
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
1. Feedback to be given on a daily basis to the PHO meeting.		[R]											
2. SAP Orders and Operations to be confirmed as the work is completed and will reflect the correct status on a daily basis.			[R]										All feedback from the relevant Line Managers at the PHO meeting on the progress of the day's work will be reflected on SAP status by 16:15 daily.
3. Schedule Adherence Will Be Measured Daily To Ensure Compliance To The Plan Of Day.					[R]								The Execution Week is from a Monday to a Sunday. A daily snapshot of SAP statuses will be taken for schedule adherence.
4. Analyse information for critique meeting.					[R]								Weekly Critique meeting with all Maintenance Group Heads, Plant Manager, Engineering and Operating. (T+1).

WORK FLOW RESPONSIBILITY MATRIX													APPENDIX 7
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: Main Flow Secondary Flow	PRODUCTION OF BOARD OUTAGES PLAN												NOTES & REFERENCES
	SCHEDULER	LINE GROUP SECTION HEAD/ PROJECT LEADER	LINE PLANNERS		WORK CONTROLLER		OPS SUPPORT						
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
T – 08													
1. Board Outage flagged at scope meeting.	[R]	(C)	(C)		(C)		[C]						
2. Arrange meeting to discuss plan and finalise board outage plan before T-06.	[I]	[R]	[I]		[I]		[I]						Line Group Section Head/ Project Leader to involve all affected groups.
T – 06													
1. Confirm Board Outage Plan at freeze meeting.		[R]			[I]		(C)						
2. Finalise Consequence and SI Sheet.		(C)			[I]		[R]						
T – 04													
1. Send Board Consequence Sheet and SI for OPS Review.		[I]			[I]		[R]						

WORK FLOW RESPONSIBILITY MATRIX												APPENDIX 8
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: Main Flow Secondary Flow	GRADED APPROACH TO SCHEDULING											NOTES & REFERENCES
	SHIFT MANAGER/FIN TEAM, KORC, KOSC, POD MEETING	RESPONSIBLE MANAGER	WORK CONTROL MANAGER	WORK CONTROL PREPARATION SECTION HEAD/ WCG MANAGER	WORK CONTROLLER	SCHEDULER	OPS SUPPORT	NUCLEAR SAFETY ENGINERRS	SHIFT MANAGER/FIN TEAM, KORC, KOSC, POD MEETING			
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
A. INITIATION PHASE													
Preventive Maintenance (PM)													
1. Classify Level A, B, C or D, PMs		[I]	[I]	[I]	[I]	[R]							**Note:** Classify work at T-6 and review the duration taking into consideration AOT, see Appendix 15 for guidance
2. Appoint the project leader		[R]	[I]	[I]	[I]	[I]							**Note:** See Appendix 15 for guidance
Major Equipment Maintenance													
1. Classify Level A, B, C or D maintenance				[R]	[I]	[I]	[I]	[I]					
2. Appoint the oversight manager	[R]												
3. Appoint the project leader				[R]	[I]								
B. PLANNING PHASE													
1. Develop a detailed work plan		[RV]		[R]				[RV]					Project plan must be detailed, logical and must reflect start and finish times
2. Spares identification and verification		[R]											**Note:** Verification includes both SAP and physical verification (walking the bins)
3. Resource Identification and planning		[RV]		[R]									
4. Support structures identification (Eng., MWS, MWSC, MW cranes, OPS, etc.)		[R]		[R]									
5. Identify/establish quality hold points		[RV]		[R]									
6. Perform risk assessment and review OE		[RV]		[R]									Identify risks and develop mitigating plans
7. OTS impact analysis				[I]			[R]	[RV]					Identify applicable LCOs and repair times

WORK FLOW RESPONSIBILITY MATRIX													APPENDIX 8
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: Main Flow Secondary Flow	GRADED APPROACH TO SCHEDULING												NOTES & REFERENCES
	SHIFT MANAGER/FIN TEAM, KORC, KOSC, POD MEETING	RESPONSIBLE MANAGER	WORK CONTROL MANAGER	WORK CONTROL PREPARATION SECTION HEAD/ WCG MANAGER	WORK CONTROLLER	SCHEDULER	OPS SUPPORT	NUCLEAR SAFETY ENGINERRS	SHIFT MANAGER/FIN TEAM, KORC, KOSC, POD MEETING				
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	
C. ASSESSMENT AND REVIEW PHASE													
1. Work plan impact assessment					[R]		[S]	[S]					Identify conflict on the plan, and prioritise work
2. Work plan update (when required)						[R]							Updated work plan, to accommodate the emergent/priority work
3. Hold table top meetings (System outages)						[R]							Determine the readiness
D. EXECUTION PHASE													
1. Execute the task in accordance with the plan				[R]									
2. Monitor progress on an hourly basis for Level A and daily for level B					[R]								**Note:** If delay> than 10 min, project leader to inform Work Controller and if delay > 30 min. inform WCG manager and oversight/responsible manager
3. Progress feedback				[R]									**Note:** Hourly feedback for level A and daily for level B activities.
4. Plant unavailability	(S)				[R]		(S)	(S)					Work could not be performed due to plant unavailability, inform All Line groups to update SAP
E. POST EXECUTION REVIEW PHASE													
1. Critique					[R]								Detailed report comparing achieved performance with the desired performance and areas for improvement
2. Presentation to the critique meeting and to KOSC (on request basis)				[R]									

APPENDIX 9

SCHEDULE CHANGE REQUEST FORM (KFM-PM-002)

Eskom	SCHEDULE CHANGE REQUEST	Reference No.: KFM-PM-002	
		Revision: 8	Page: 1 OF 1
		Associated Procedure:	KAA-721

PTW EXTENSION	PTW NUMBER
DATE:	

REMOVAL	LATE INCLUSION	COMPUTERISED PTW SYSTEM	Y	N
DATE:	DATE:			
WEEK No:	WEEK No.:	RPC NUMBER		

FUNCTION LOCATION		ROOM NO.		PRIORITY	1	2	3	4

ACTIVITY DESCRIPTON	

MNWK CENTRE		PERMITRY REQUIRED	ISOL	NO ISOL	ALIVE	LAR	N/A	PIO

ORDER NUMBER		ACTIVITY CLASSIFICATION	CSR	SR	AR	NSA

DURATION		JOB TYPE	

SUPPORT WORK CENTRES NEGOTIATED					
OPERATION NUMBERS					
EXECUTION SUPERVISOR SIGNATURE					

REASON / MOTIVATION:_____

_____

_____

	NAME (PRINT)	SIGNATURE	DATE	TEL
ORIGINATOR				
LINE SECTION HEAD				
OPS SUP/CHEM REVIEW/RADWASTE				
UCLF 1 2 3 4 5				
REACTIVITY YES NO				
OTS EVENT GRP1 GRP2				
RADIATION PROTECTION				
LINE PLANNER				
ENGINEERING PROGRAMS OWNER/IMPLEMENTATION ENGINEER (REMOVAL OF CRITICAL COMPONENTS ONLY)				
WORK CONTROL MANAGER (REMOVAL OF CRITICAL COMPONENTS ONLY)				
OPS WORK CONTROL				
NUCLEAR SAFETY ENGINEER				
SCHEDULER				
WORK CONTROLLER				

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NNR Act 47, Section 51, PAIA 38(b)Redacted as it contains sensitive information

APPENDIX 11

MATRIX CHANGE CONTROL FORM (KFM-PM-005)

Eskom	TITLE: MATRIX CHANGE CONTROL FORM	Reference No.: KFM-PM-005	
		Revision: 2	Page: 1
		Associated Procedure: KAA-721	

COMPILER	REVIEWER	AUTHORISER
		WORK CONTROL MANAGER

Functional Location:	Description:	Effective Date:

Associated Equipment (f/loc)	Dayshift Activity?	Y	N	Running Regime to be updated?	Y	N

Description of change

Review of KAA-721 – PT Matrix, Running Regime, Chemistry Matrix, Fire Risk Matrix, Day Shift PT's

This schedule matrix change has been seen and accepted by:

OPS Support:	.....	.....	.....
	(name)	(signature)	(date)
Matrix Administrator:	.....	.....	.....
	(name)	(signature)	(date)
Reliability Engineering	.....	.....	.....
	(name)	(signature)	(date)
Scheduler	.....	.....	.....
(Matrix & Running Regime updated)	(name)	(signature)	(date)
Statutory Controller	.....	.....	.....
	(name)	(signature)	(date)

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APPENDIX 12

OSRB AGENDA

PRINCIPALS	**7** SYSTEMS ENGINEERING
1 WORK CONTROL MANAGER (CHAIRPERSON)	**8 CHEMISTRY**
2 SAFETY ENGINEER	**ATTENDEES**
3 WORK CONTROLLER	**1** MAINTENANCE LINE GROUP (SECTION HEAD's)
4 OPS SUPPORT UNIT CO-ORDINATORS	**2** INSPECTION & TEST
5 ALARA	**3** RADWASTE
6 HEAD OF OPS WORK CONTROL	**QUORUM** – Chairperson, plus 3 principals.

MEETING PROTOCOL

1. No late inclusions at T-0, except priority 1, 2, PHO meeting concerns, i.e. Nuclear, Production, conventional and radiological safety defects.
2. Late inclusion consideration for T-2 to T-4: Priority 3 defects as per KSA-139, KOSC actions as reviewed by Work Controller and defect inclusion into equipment outage, breakdowns or where plant is isolated for preventive maintenance (CR will be required).
3. Any emergent issues / work that have been downgraded must be presented at the OSRB which will only be reviewed once a week.
4. A request for an ad hoc OSRB will be at the Work Control Managers discretion.
5. Acceptance Criteria (ALARA, Resources, Conflict, Spares, Contingency, OTS Implications, etc.)
6. Preventive maintenance follows the first available opportunity according to KAA-835 process.
7. Copies of the late inclusion forms must be handed to the Work Controller and will be logged into a register signed by both parties (line and work controller). The copy of the LI should reach Work Control by 16:00 every Thursday (The week before the OSRB convenes).
8. A Generated spreadsheet will be sent out to all relevant parties for review purposes.
9. Support groups must agree to late inclusion by acceptance name and signature.

APPENDIX 12 (continued)

OSRB RISK ASSESSMENT

OSRB RISK ASSESSMENT

Functional Location	
Task Description	
Task Duration	
Main Work Centre	

1. Nuclear Safety Assessment

Is there an impact on OTS or SAR? (if yes, provide a short description of the impact and the mitigating plans)	Yes/No	

Guidance:

- Will the activity render the component/s inoperable, if yes what are the applicable LCOs and their respective fall-back and repair times.
- Will the activity involve a test not described in the SAR where a component is utilised/controlled in a manner that is outside the reference bounds of the design for that component or inconsistent with analyses or description in the SAR? (Applicable to TAFs, Mods, TAs etc.).

2. Production Risk Assessment

Is there any risk of Reactor and/or turbine trip associated with the activity? (if yes provide a brief description and the mitigating plan and if no justify why there is no risk of trip)	Yes/No	

Guidance:

- Consider SPV components (single point vulnerabilities in the system).
- Understand relevant trip settings (consult DSE manuals, system manuals etc.).

NNR Act 47, Section 51, PAIA 38(b)Redacted as it contains sensitive information

3. Radiological Assessment

Will the activity be performed in a radiological zone?	Yes/No	

Guidance: This is aimed at assessing if any mitigation is required to perform the activity ALARA

5. Equipment and personnel Risk Assessment

Does the task involve any risk of equipment damage and danger to personnel e.g. explosion, fire, pipe ruptures, etc.	Yes/No	

Guidance: This is aimed at assessing any risk on equipment damage

- Freeze seal: possible pipe rupture
- Working on a gas filled system, etc.

APPENDIX 13

GUIDELINES FOR SCHEDULING OF CUMULATIVE OTS GROUP 1 & 2 EVENTS AND PROTOCOL FOR OTS GROUP 1 & 2 EVENTS

1. Planned OTS Group 1 events shall be limited to 1 at any given time, as per OTS.

2. Planned OTS Group 2 events shall be limited to 5 at any given time; these instructions are in addition to the requirements of OTS.

PROTOCOL FOR GROUP 1 & 2 OTS EVENTS (PLANNED AND UNPLANNED)

1. Group 1 event (Planned):

All OTS Group 1 events (Planned) shall be treated as Priority 1 (Work until completion).

2. Group 1 event (Unplanned):

All OTS Group 1 events shall be treated as Priority 1 (Work until completion). The duty Work Controller and Operating Manager (or his Delegate) shall be immediately informed of the event as appropriate.

For all Group 1 events (Unplanned) a CR shall be raised.

3. Group 2 events (Planned or unplanned):

If there is 5 group 2 events (Planned or unplanned) in force affecting different systems, it is not permitted to invoke another group 2 planned event.

If for whatever reason there are 5 Group 2 events (Planned or unplanned) in force affecting different systems then one or more of the events must be treated as priority 1 (Work until completion) to ensure the number is reduced to 4 in < 24 hours in according with OTS. The duty Work Controller and Operating Manager (or his Delegate) shall be informed of the event as appropriate.

If for whatever reason there are 6 Group 2 events (Planned or unplanned) in force affecting different systems then two or more of the events must be treated as priority 1 (Work until completion) to ensure the number is reduced to 5 in < 1 hour as per OTS. The duty Work Controller and Operating Manager (or his Delegate) shall be informed of the event as appropriate.

All activities that invoke a Group 2 event (Planned or unplanned) with a repair time of 3 days or less shall be treated as Priority 1. (Work until completion).

APPENDIX 13 (continued)

All activities that invoke a Group 2 event (Planned or unplanned) with a repair time greater than
3 days shall be planned and executed such that only 50% of the repair time is utilized.
(For activities conducted within the 50% of the repair time, the activity should commence as soon as practically possible and there shall be a sense of urgency to clear the event but may not necessarily require an immediate call out and (or) require work until completion)

If during a group 2 event it becomes apparent that we potentially could exceed 50% of the repair time, the Duty Work controller and Operating Manager (Or his delegate) shall be informed to ensure appropriate coordination and (or) oversight.

All PTW's that invoke a Group 2 event (repair time) shall be endorsed by Operating reflecting 50% of the OTS repair time. (E.g. OTS Group 2 event repair time 14 days – 7 Days not to be exceeded).

All PTW's that invoke a Group 2 event (no repair time) shall be endorsed by Operating reflecting the following. (E.g. OTS Group 2 event inform SSS and Work controller if the scheduled time exceeded)

Note:

If during the planning phase it is determined that the activity cannot be completed in 50% of the repair time but would be completed in less than the total repair time, then such activities can be done provided that the Operating Manager (Or his delegate) review the work plan and give permission. Such activities shall have an increased level of oversight as determined by the Operating Manager (Or his delegate).

All activities that invoke a Group 2 event (Unplanned) the Duty Work controller shall be informed such that he can determine the impact on other scheduled activities.

All activities that invoke a Group 2 event (Unplanned) shall have daily feedback at the PHO meeting until cleared.

All activities that invoke a Group 2 event that exceed 50% of the repair time a CR shall be raised for trending.

For all Group 2 events (Unplanned) a CR shall be raised.

APPENDIX 14

MANAGEMENT OF PRE-OUTAGE ACTIVITIES

SCHEDULING

Work control scheduling team is responsible of scheduling of all pre-outage activities and rescheduling of all pre-outage activities back to T-08 to T-06 that have fallen from execution plans.

EXECUTION

Work control execution team is responsible for executing all scheduled pre-outage activities.

MONITORING

Work control execution supervisor is responsible for monitoring the execution of all pre-outage activities during the pre-outage window.

Work control outage support supervisor is responsible for monitoring the execution of all outstanding pre-outage activities during the outages.

MESSO

Messo project leader is responsible to work schedule and execute all Messo Pre-outage activities and monitoring of execution thereof.

HANDING OVER OF NON-PERFORMED PRE-OUTAGE ACTIVITIES

Incorrectly identified pre-outage activities shall be returned to the OCC planning supervisor with the reasons why they cannot be performed online and removed from KPI.

Incomplete pre-outage activities are to be handed over to OCC via the Outage Late Inclusion process.

Responsible line groups shall follow the Outage Late Inclusion process to hand back incomplete pre-outage activities.

APPENDIX 15

SCREENING FOR THE SAFE MOVING OF WORK FROM OUTAGE TO ON-LINE

NOTE:

The screening process below shall be followed for all work activities currently linked to the Outage matrix to become On-line work.

- All work proposed to move to On-line must first be screened by the originator to ensure it is technically possible.
- The originator must submit the request to the Work Control Manager.
- Work Control together with OPS Support must review the activity for On-line risk.
- Work Control must submit the proposal to the OSRB for approval.
- The originator must present the OSRB approved proposal to KOSC for final approval.
- The originator must provide Work Control with the SAP Change control form in accordance with KAA-820 for updating of the Master Data Base so that the activity can be scheduled.
- Outage PMs or defects not completed in the outage must follow an online late inclusion process (OSRB) if they are moving to online. These activities should exclude Pre-Outage tasks and online PMs not complete in outage.
- All SRSM tasks with cycle periodicity must be performed within the same cycle before unit synchronization.
- Work Control to identify all SRSM tasks with periodicity of a cycle within the same cycle or before unit synchronisation.

APPENDIX 16

LEVEL A,B,C,D CLASSIFICATION CRITERIA AND OVERSIGHT

LEVEL	TYPE OF ACTIVITIES	OVERSIGHT			
		Snr. management/ Line management	Section heads	Supervisors	Responsible person
A	• Group 1 LCO's • Major LCOs with significant percentage of available technical specification time (re-entry and accumulative LCO group 2, LCO AOT >50%) • Work activities that require power reduction • Risk of trip activities (consider single point vulnerabilities, SPV) • Major equipment outages – critical path activities • Infrequent activities (KAA-647) • High dose activities	x	x	x	x
B	• Work that requires a significant tag-out (isolation) • Multidiscipline work • Potential high dose activities • Work that involves area coordination • Medium risk-significant work • Support work for level A activities • GRP 2 LCO's		x	x	x
C	• Stand-alone surveillance test • Predictive/preventive maintenance • Minor tag out work • Non-intrusive inspection (thermography)			x	x
D	• Facilities work • Housekeeping • Tool pouch maintenance • Prefabrication work • Outage preparation work • Scaffold construction (if no plant impact)				x

APPENDIX 17

MAJOR EQUIPMENT SHUTDOWN AND SYSTEM OUTAGES STRATEGY

1. PURPOSE

To provide guidelines for MESSO and to outline responsibilities during planning and execution phase. Furthermore, this document will outline the MESSO strategy.

2. SCOPE

This document is applicable to all departments and groups providing support during the preparation and execution of major equipment shutdowns and system outages.

3. MESSO STRATEGY

MESSO strategy will be employed on equipment or systems that meet the following criterion:

- Impact nuclear safety and production,
- Result in major isolations,
- Involve multiple main work centres (>2) and
- Duration of more than a week
- NPM projects that meets the MESSO project milestones will be accepted and the NPM activities will be managed by the NPM project leader.

Maintenance activities that meet the above mentioned criteria will be run as project, by the MESSO project leader.

These components and systems are illustrated in the table below:

Components	Systems
APP and APA (pumps, turbine, motor) and their associated auxiliary systems which is AGR, AET, APU and AGM respectively	LHJ (LHQ, LHP, LHS)
6.6 kV pumps and motors: CEX, ACO, ATE, CRF SEC,	XCA, STR
CFI drum screens	
Electrical boards: LGR, LGI, LGE, LGF,	

APPENDIX 17 (continued)

3.1 Planning Process

Planning for MESSO will start 24 months prior to execution. The outage preparation milestones are outlined in Attachment A. Base plans for all the major equipment shutdowns and system outages must be developed by WCG and line groups and must be saved on G-drive and on the MESSO folder on the G-Drive. WANO reviews must be taken into consideration when the 10Y and 1 year plans are developed.

NOTE: *Work added after the scope freeze requires a sponsor to ensure completion. The sponsor shall engage in negotiating the support necessary to execute the work in an organised manner.*

3.2 Oversight

A Sponsoring Manager will be assigned to MESSO projects.

3.3 Reporting Structure

Major equipment shutdowns and system outages project manager must be appointed**.** This individual will reside in Work Control department. His/her responsibility will be:

- To manage and update the 10Y plan,
- Develop the major equipment shutdown year plans,
- Monitor the preparation milestones progress,
- Manage the execution of the plans,
- Give feedback on past performance (achievements and challenges),
- Feedback on readiness for the upcoming shutdowns or outages at the PHO meeting.

Dedicated project leaders reporting to the project manager must be appointed (see figure 1). Management oversight is required from planning to execution phase. Therefore, PHO chairperson must appoint the oversight manager for equipment and system outages. For shutdowns where one main work centre (MWC) has majority of the scope e.g. pump overhaul where MMS is the MWC, the line group manager must provide oversight. For level A outages or shutdowns as per the graded approach to scheduling (Appendix 8), senior management oversight or a sponsoring manager must be nominated.

APPENDIX 17 (continued)

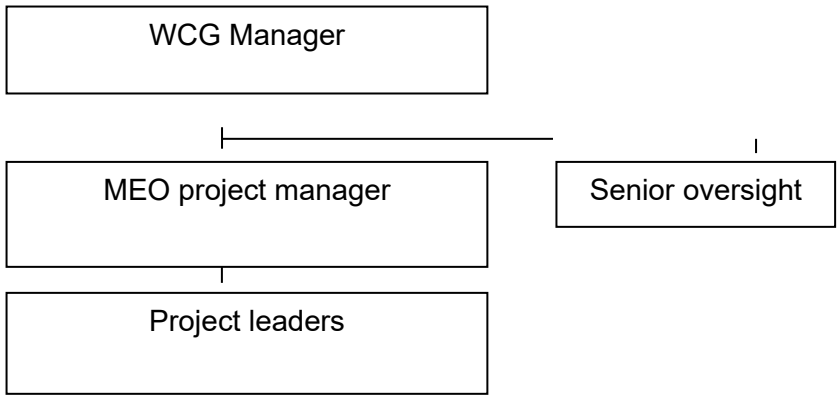

Figure 1: MESSO reporting structure

4. PERFORMANCE INDICATORS

Preparation Milestone indicators will be used to monitor progress of the preparation milestones. The following indicators will be used to measure/monitor progress during this phase; spares identification, spares availability, and permit to work readiness. Execution phase indicators are as follows; scope survival, scope stability, schedule adherence, budget, duration and quality.

4.1 Preparation Phase Performance Indicators

Spares Identification

This is an indication of planning effectiveness i.e. proper identification of pares required for the project. It is expressed as a percentage of spares requested at T-20 to T-19 versus the total number of spares requested by the start of work.

$$Spares\ Identification = \frac{Total\ No.of\ spares\ requested\ @\ T_0}{Total\ No.of\ spares\ requested\ @\ T_{-20}} \times 100$$

Spares Availability

This is the percentage of work activities that have all identified spares available by T_0. It is an indication of material support effectiveness.

$$Spares\ Availability = \frac{Total\ \ No.\ of\ \ available\ spares\ @\ T_0}{Total\ \ No.\ of\ \ ordered\ \ spares\ @\ T_{-20}} \times 100$$

Permit to work (PTW) Readiness

This is the percentage of PTW ready to be implemented by T_0, based on the total number of PTW required for the outage/shutdown.

$$PTW\ \ readiness = \frac{PTW_{(ready\ to\ be\ \ implemented\ @\ T_0)}}{Total\ No.of\ PTW\ required} \times 100$$

APPENDIX 17 (continued)

4.2 Execution Phase Performance Indicators

Scope stability: is an indication of the ratio of work added and removed from the plan

$$Scope\ Stability = \frac{TF - \{Losses + additions\}(from\ T_{-04}\ \ to\ T_{-01}) + Additions(from\ T_{-04}\ \ to\ T_{-01})}{TF}$$

Where:
TF = scope freeze time
T_{01} = end of the month prior to execution

Schedule adherence: Schedule adherence is measured from the beginning of execution (T_0) to the end of the outage/ shutdown.

$$Schedule\ Adherence = \frac{Total\ \ completed\ scheduled\ \ activities(of\ the\ total\ scheduled)}{Total\ scheduled\ activities} \times 100$$

Scope Survival (SS)

This indicator will measure the percentage of critical work orders identified for inclusion in the major equipment shutdown and system outages at the scope freeze (T-04) that are still on the plan at the start of execution. This indicator will also measure the ability of the station to deliver all work preparation milestones and spares availability for critical work compared to what was originally scoped into the plan.

$$Scope\ Survival = \frac{TS - deletions\ by\ T_{-01}}{TS} \times 100$$

Where:
TS = total scope of critical work orders at scope freeze
T_{-01} = end of the month prior to execution
Deletions = scope of critical work orders that are still not in the plan compared to TS population

APPENDIX 17 (continued)

5. MAJOR EQUIPMENT OUTAGE PREPARATION MILESTONE CHECKLIST

5.1 PURPOSE

To outline the preparation milestones for major equipment and system outages

5.2 SCOPE

The list is applicable to all departments and groups that are involved in the preparation milestones for major equipment shutdowns and system outages at Koeberg Nuclear Power Station.

5.3 PROCESS

5.3.1 The progress of the preparation activities will be monitored continuously. However, on a monthly basis a review of the milestones will be performed. The time notation used is: T-X, with “X” being the number of months before the start of the major equipment shut down or system outage, for example “T-24” is 24 months prior to the start of the outage.

5.3.2 For each month preceding the major equipment outage there is a ‘master sign off sheet’ listing all the departments / groups who have actions to be completed for the month. Each group / department, listed on the master sign off sheet must sign to confirm that the milestone completion criterion has been met, or that a recovery plan is in place.

5.3.3 Where a milestone is not met, the responsible department / group must raise a CR. The MEO project manager will complete the master sign off for the current month, and any milestones not met will be documented with their respective recovery plans. New due dates as per the recovery plan will be written into the master sign off sheet for the appropriate month.

5.3.4 The major equipment shutdown and system outage project manager must elevate missed milestones on major equipment shutdowns or system outages that are classified as level A in accordance with the graded approach to scheduling (see Appendix 8) to Senior Management. The responsible department / group must present the recovery plan and the impact to Major Equipment Outage Forum (Alternate PHC-S).

APPENDIX 17 (continued)

6. Performance Indicator

The progress of the major equipment outage preparation milestones will be tracked on a 3 monthly frequency and an indicator sheet will be published at least 3 monthly, or more often if the status changes. Each sign off sheet will have an associated "block" on the station indicator.

Milestone indicator colour:

- White for future milestones,
- Green for milestones that have been met,
- Yellow for milestones that are at risk (Can return to green if rectified in time),
- Red for milestones that have been missed,
- Orange for those milestones that were missed, but have now been satisfied.

When a milestone is not met, the indicator will turn red; after the milestone is reached the indicator will become orange and remain that way (It cannot return to green).

7. Recovery Plans

It is the responsibility of the respective line group manager to compile a recovery plan as soon as it is evident that a milestone will not be met (see form 1). This recovery plan must be submitted to the Major equipment (ME) outage project manager and tabled at the ME outage preparation meeting so that the new due dates can be tracked. The recovery plan must evaluate the impact on subsequent milestones and must document the actions taken to minimise the impact. The status of the recovery plans will be discussed at the ME outage meeting, until the recovery is complete and the activity is back on track.

8. Preparation Milestones (Months)

1st Milestone (T-24 to -21)
a) Major work scope determined, defects and modifications included **(WCG, Line groups)**
b) Review of the major work scope **(Line groups)**
c) Spares verification (SAP and physical) **(materials planning)**
d) Spares to be ordered **(Procurement)**

2nd Milestone (T-20 to -07)
a) All SAP orders and support operations raised **(Line groups)**
b) Base plan developed **(WCG)**
c) Review of the plan **(Line groups)**
d) Spares delivery dates confirmed **(Procurement)**

3rd Milestone (T-06 to T-03)
a) Work packages compiled **(Line groups)**
b) Scope Freeze {late inclusions to follow the MEO SRB process} **(WCG)**
c) Application of all PTW

4th Milestone (T-02 to -01)

Issue the final plan **(WCG)**
Hold table tops **(WCG)**

APPENDIX 17 (continued)

Table A : Milestone Description

Milestone	Month	Completion criteria	Owner
Determination of major work scope (including Mods and defects)	T-24	The MEO project manager approved the major work including defects and modifications where applicable.	MEO project manager, Line groups and Systems Engineering
Review of the major work scope	T-23	Reviewed plan sent to MEO project leader/manager	Line groups Systems Engineering
Spares verification, (SAP and physical): • Stock items • Non stock items • Review BOM	T-22 to T-21	A list of available and unavailable spares	Materials planning Procurement Line groups
Spares to be ordered	T-20 to T-19	SAP orders have been placed with the vendors and delivery dates supplied.	Procurement
Identify work that requires external support e.g. long term contractors, specialists and make necessary arrangements e.g. placing contracts	T-18- to T-15	PR raised on SAP to request the required support	Line groups
All SAP orders and support operations raised	T-12 to T-11	SAP updated	Line groups
All support groups planned for their support operations	T-10 to T-09		Line groups
MESSO plan development (Base plan)	T-09 to T-08	Base plan sent to the line groups for review	WCG MESSO project leader
Review of the major work scope	T-08 to T-06	Reviewed plan with comments submitted to WCG	Line groups and Systems Engineering
Table top the scope plan	T-04 until T-02	Include all PM order numbers and Non-PM orders included in the project.	WCG MESSO project leader

APPENDIX 17 (continued)

Milestone	Month	Completion criteria	Owner
All spares on site	T-03	All spare parts are onsite including contingency spares **Note:** Any spares not on site will be carried on the spares list and tracked at the MESSO meetings, until the issues are resolved. Critical spares will be tracked at the Production meeting and Spares forum	Procurement
Permit to work and Readiness meeting	T-01	All PTW applied for and all outstanding issues are resolved.	Line groups and Operating Support
Issue the final plan	T-01	Final plan issued to the relevant groups	WCG/ME outage co coordinator
Staging the work site, Scaffolding erected	T-01	Scaffolding and staging to be done at W-01 (one week prior execution)	Line groups
Execute project as per the key milestones	T-0	Conduct feedback meetings for project status and milestones. SAP to be updated by 10:00 the following day. Highlight project risks to the sponsoring manager and request a risk mitigation plan from the responsible group. Co-ordinate isolation and requalification plans.	Line groups WCG MESSO project leader
Critique/Wash-up meeting	T+01	Conduct a Critique/Wash-up meeting to capture all the lessons learned on the project. Record all the relevant OE in CR's.	WCG MESSO project leader Line groups

APPENDIX 17 (continued)

Form 1: Recovery Plan template for missed preparation milestones

ME Outage (e.g. 1 LHQ 6Y overhaul)		**Date:**
Description of missed milestone or milestone under threat:		
Reason for missing or challenging the milestone target date:		
Plan of action to recover the milestone:		
Impact on the subsequent milestones:		
Commitment date for recovery		

APPENDIX 18

THE WORK MANAGEMENT PROCESS
ONLINE PERFORMANCE INDICATORS

Purpose:

Measurement of online work management indicators. Performance indicators help the station understand the relative health of station equipment and the relative maturity of the work management process. Furthermore, the indicators provide diagnostics to help identify and address specific detailed performance issues and inputs into the equipment reliability indicators (ERI).

RESPONSIBILITIES

The work control manager is responsible for the compilation and dissemination of the on-line work management performance indicators.

Line group managers are responsible for the resolution of the performance gaps within their area of responsibility.

ON-LINE WORK MANAGEMENT INDICATORS

APPENDIX 18 (continued)

1.1 On-Line Corrective Maintenance (CM) Backlog: Critical Components (CC)

Definition

The "**On-line corrective critical**" indicator (*Indicator Code **CC***) is the average number of on-line corrective critical components that require corrective maintenance in a normal fuel cycle (18 or 24 months).

Guidance/Key Insights to Understand:

 On-line corrective critical components refers to a level of deficiency to a plant component that has failed or is significantly deficient such that failure is imminent (within its operating cycle/preventive maintenance interval) and it no longer conforms to or cannot perform its design function. (See AP-928.) This maintenance will be performed, with the main generator connected to the grid (on line). Critical components are those scoped and identified as critical systems, structures, and components in accordance with AP-913.

NOTE: A work order is considered part of the backlog until the field work and testing are complete.

Data is entered at a unit level. The value for the unit is calculated as follows:

The cycle value for the "**On-line corrective critical**" indicator measures the average number of on-line corrective critical components that require corrective maintenance in a normal fuel cycle (18 or 24 months).

Number of corrective maintenance backlog items, as defined in AP-928, on critical components, as defined in AP-913. This maintenance will be performed, with the main generator connected to the grid (on line).

Target:

This indicator will consist of an agreed upon target

1.2 On-Line Corrective Maintenance (CM) Backlog: Non-Critical Components (CN)

Definition

On-Line Corrective Noncritical refers to a level of deficiency to a plant component that has failed or is significantly deficient such that failure is imminent (within its operating cycle/preventive maintenance interval) and it no longer conforms to or cannot perform its design function. (See AP-928.) This maintenance will be performed on noncritical components as defined by AP-913, with the main generator connected to the grid
(on line).

APPENDIX 18 (continued)

The indicator is defined as the average number of on-line corrective noncritical components that require corrective maintenance in a normal fuel cycle (18 or 24 months). Data is entered for the total value at a station.

NOTE: A work order is considered part of the backlog until the field work and testing are complete.

Target:

This indicator will consist of an agreed upon target

2. On-Line Deficient Maintenance (DM) Backlog: Critical Components (DC)

Definition:

The "**On-Line Deficient Critical Maintenance**" indicator (*Indicator Code **DC***) is defined as the average

number of On-Line Deficient Critical components that require corrective maintenance in a normal fuel cycle (18 or 24 months).

Guidance/Key Insights to Understand:

 On-Line Deficient Critical refers to any work on a plant component that has a potential or actual deficiency that does not threaten the component's design function or performance criteria. (See AP-928) This maintenance will be performed with the main generator connected to the grid (on line).

Critical components are those scoped and identified as critical systems, structures, and components in accordance with AP-913.

NOTE: A work order is considered part of the backlog until the field work and testing is complete.

Target:

This indicator will consist of an agreed upon target

APPENDIX 18 (continued)

3. Scope Stability

Definition:

Workweek scope includes all the scheduled activities in that week. All PMs and Pre-Outage surveillances, CMs, DMs, and other work activities on the schedule along with scheduled activities to hang clearances, build scaffolds, remove insulation, and provide radiological protection support would be included in scope.

Calculation:

(Scope [TF]PM + Pre-outage) - (Losses [TF to T01] PM + Pre-outage)+ (Additions [TF to T01]/Scope [TF] PM + Pre-outage)

Where:
TF = scope freeze time
T01 = the end of the execution week

Reporting:

Percentage scope stability per station

This indicator can be greatly influenced by the selection of the scope freeze week. It is more difficult to maintain scope stability the farther from execution the scope is frozen. Each station should strive to identify the optimum scope freeze time for its staff that balances the ability to make scope freeze meaningful and the desire to forecast predictable work activities.

Target

This indicator will consist of an agreed upon target

4. Number of PMs Deep in Grace: Critical Components

Definition:

In some cases, plant conditions or situations will make it impractical to complete interval-driven PMs in the first half of grace, despite the best intentions of the work management process or the PM programme. The database should have two indicators: one for critical PM tasks on critical components as per the ER classification, KGU-035) and one for total PMs. The first reflects the ability of the organization to maintain its most critical PMs on or near their due dates. The total PM indicator reflects the ability of the organization to handle the overall workload with given resources.

Calculation:

Number of PMs that are beyond 50% of their grace periods two indicators are reported, one for critical interval-driven PMs and one for total interval-driven PMs.

Reporting:

Critical PMs deep in grace

Total PMs deep in grace

Target:
This indicator will consist of an agreed upon target

APPENDIX 18 (continued)

5. Number of PMs Deep in Grace: Non-Critical Components

Definition:

In some cases, plant conditions or situations will make it impractical to complete interval-driven PMs in the first half of grace, despite the best intentions of the work management process or the PM programme. The database should have two indicators: one for critical PM tasks on critical components as per the ER classification, KGU-035) and one for total PMs. The first reflects the ability of the organization to maintain its most critical PMs on or near their due dates. The total PM indicator reflects the ability of the organization to handle the overall workload with given resources.

Calculation:

Number of PMs that are beyond 50% of their grace periods two indicators are reported, one for critical interval-driven PMs and one for total interval-driven PMs.

Reporting:

Critical PMs deep in grace

Total PMs deep in grace

Target:

This indicator will consist of an agreed upon target

6. Daily Schedule Adherence (Level A and B)

Definition:

Schedule adherence/completion is reported from the beginning of week T-0 to the end of the week for all utilities. It is calculated as: total completed schedule activities (of the total scheduled)/total scheduled activities.

NOTE 1: Activities that could not be completed as a result of emergent priority work, is not considered as non-adherence.

NOTE 2: Weekly progress monitoring for Pre-outage activities will be performed by Work Control.

Schedule adherence during an outage;

On-line schedule adherence would not count for the unit that is in a refuelling outage or planned outage (nothing to adhere to; no on-line work was scheduled). However, it would be in effect for a unit that would enter a forced outage (scheduled work for that week was not performed or was not finished). On-line adherence would continue to be in effect for the operating unit in all cases.

Graded Approach (Schedule Adherence)

With the graded approach to scheduling (see Appendix G), schedule adherence is monitored consistent with the expectations for each level. Level A activities are monitored for hourly compliance, Level B for daily or shift compliance, and Level C for weekly compliance. The indicator should be a composite percentage of activities completed as expected.

APPENDIX 18 (continued)

Calculation:

If you completed 1 of 2 level A tasks as scheduled (hourly), 39 of 48 level B tasks as scheduled (daily), and 100 of 150 level C tasks as scheduled (weekly), your adherence would be (1 + 39 + 100) / (2 + 48 + 150) = 140 / 200 or 70% adherence, regardless of whether all level A and level B tasks were eventually completed within the week.

Reporting:

Schedule adherence percentage by station

Target:

This indicator will consist of an agreed upon target

7. Scope Survival

Definition:

From the original scope selection, some work does not survive the process up to execution, for a variety of reasons. This indicator will measure the percentage of critical component work orders identified for inclusion in the workweek at the scope freeze that are still on the schedule at the start of execution. This indicator will also measure the ability of the station to deliver all work preparation milestones and material availability of critical components compared to what was originally scoped into the workweek.

Calculation:

[TS - (Deletions by T01)/ TS] X 100

Where:

TS = total scope of critical component work orders at scope freeze

T01 = the end of the execution week

Deletions = scope of critical component work orders that are still not in the workweek compared to TS population

Example:

Original 1000 at scope freeze - 100 still not in scope at the start of execution/1000 x

100 = 90% scope survival

Reporting:

Schedule stability percentage by station for critical components.

Target:

This indicator will consist of an agreed upon target

APPENDIX 18 (continued)

8. On-Line Total PMs Deferred

Data is entered at a unit level. The value for the unit is calculated as follows:

- Station unit value + (station common value/the number of operating units at the site) The number of online preventive maintenance tasks (critical and noncritical) in each month that have been deferred to exceed their original late dates (additional 25% of the original schedule interval for the task) with an approved engineering evaluation that determines the acceptability for extension to a new due date before the original late date is exceeded. Each additional deferral of a preventive maintenance task, after deferral to exceed the original late date, is counted as a new deferral for this data element. An item is only counted as deferred in the month in which the deferral was approved. See AP-928, Appendix F, for additional details.

9. Unit 1 LCO Execution

Unit 2 LCO Execution The "**LCO Execution**" indicator represents performance of planned LCO safety system outages by comparing scheduled LCO duration versus actual LCO duration.

FIN Effectiveness KPI

The **"FIN Effectiveness"** is a measure of FIN's ability to manage incoming on-line work, protect the on-line schedule and provide timely resolution of high- priority on-line work. This is a measure of the percentage of on-line corrective and deficient maintenance completed by FIN and the percentage of on-line high priority work completed by FIN.

Guidance/Key Insights to Understand:

 New on-line high priority on-line work is work that is deemed of high enough priority that it needs to be worked as soon as possible inside of scope freeze that cannot wait until the next scheduled Functional Equipment Group (FEG) work window.

Weekly Schedule Completion (Level A, B, C, D)

The "***Work Week Scope Completion***" indicator (*Indicator Code* ***WWSCOM*****)** is percentage of Critical

Component work completed as scheduled at the Work Week Scope Freeze through the End of the Work Week.

Guidance/Key Insights to Understand:

 The "***Work Week Scope Completion***" indicator is a Unit Level Indicator. The value for the unit is calculated as follows: Unit value + (station common value/the number of operating units at the site)

APPENDIX 19

T-2 CERTIFICATION MEETING ATTENDANCE REGISTER

TERMS OF REFERENCE:

T-2 Certification Meeting Objective:

- To get final confirmation from all the line groups that they are ready to execute their activities and that they understand the risk associated with their work scope/activities and have developed mitigation plans to ensure safe and reliable operation of the units.

Operational Focus Fundamental:

- Operational Risk (OF.2): The plant operational risk associated with equipment removed from service or degraded, or associated with planned plant activities is maintained low. Inadvertent operational events are prevented through planning, preparation, controls, contingencies and communication.

Measurement of Success:

- More than 96% schedule adherence at T-0 (4% is the allowance for unplanned plant defects)
- No inadvertent operational events such as OTS non-compliances, PSC, rework, FME etc.

Expectations:

- WCG to send the T-2 week plans compiled in accordance with the Work Management fundaments as briefly described in section 1.1
- Line groups are expected to review their scope as detailed in the T-2 certification plans that WCG sends out weekly on Mondays to make sure that the fundamental readiness criterion as detailed in 1.2 are met.
- OPS and Safety Engineers to review the plan to make sure that it is safe to be executed i.e. OTS requirements for domain RP are met (nuclear safety risk). Furthermore OPS to perform and integrated risk review on the plan to make sure that risk to production is well understood and mitigated.

1.1 **WCG to confirm that:**

- Activities are scheduled in accordance with PT matrix, running regime, and FEG principle
- PSA risk matrix and OTS requirements are met, PTW are work scheduled
- Backlog activities are included into the plan
- Deep in grace and Infrequently performed activities are scheduled and graded appropriately
- Activities are graded as per KGA 113

APPENDIX 19 (continued)

1.2 **Line Groups (IMS, EMS, MMS, MSS ,E&S, MMTG, MMLB, MMPS, RP, RADWASTE, HC, I&T, FRM, CEC, RFE, PROC, ENG, SAFETY ENG):**

- Resources for the activities have been confirmed: Authorized manpower, spares onsite and verified, procedures and work packages developed and approved, contracts, special tools, etc.
- All support activities identified and operations raised in SAP, PTW applied for and RP approved, Final plant walk downs performed, Activity durations are accurate
- Risk related to the activities are identified and respective mitigation plans developed

1.3 **OPS (OPS shift and OPS Support):**

- OTS requirements are met
- PTW isolations reviewed and confirmation that the plant can be isolated
- Resources to isolate the plant and perform PTs are allocated.
- UCLF and risk rating of the activities and the integrated risk rating for the unit based on the activities (as per KGA 113 rules) is accurate

1.4 **Safety Engineers:**

- To confirm that OTS requirements for domain RP are met.

APPENDIX 19 (continued)

Attendance Requirements

This meeting must be attended by the Head of Groups (HOGs) (Primary attendee) or senior advisor (Secondary attendee) or a delegated HOG stand-in. Furthermore, the Maintenance Manager, Engineering Manager, Materials Management Manager, Work Management Manager, OPS Manager, ISED Manager, RP Manager and the stations GMR2 must attend this meeting

Group	Initial and Surname	Signature	Group	Initial and Surname	Signature
Plant Manager			RP OPS		
Work Management Manager			MMLB/MMTG		
Operating Manager			MMS		
Radiation Protection Manager			EMS		
Maintenance Execution Manager			IMS		
Systems Engineering Manager			I&T		
Work Control			MSS		
Safety Engineer			E&S		
Chemistry			NPM		
Ops Support			FRM		
Programmes Engineering			MMPS		
Procurement					

APPENDIX 19 (continued)

Activities not ready for execution/ Actions to be resolved before execution week				
ORDER NUMBER	**FUCTIONAL LOCATION**	**DESCRIPTION**	**MWC**	**CR**

APPENDIX 20

T+1 SCOPE COMPLETION SIGN-OFF SHEET

Eskom	**WORK CONTROL GROUP** **T+1 SCOPE COMPLETION SIGN OFF SHEET**

MWC	Scope completion	Scope not completed
CEC		
EM1		
EM2		
EM0/6/9		
ICA		
ICB		
ICD		
TIST		
TIBP		
TISI		
OPS		
MMMS/MMPT/MRM/MMSV		
MMPM		
MMV		
MMVT		
MMFIN		
MMAX		
MMLB		
MMTG		
MMVNP		
MWCR		
MWRG		
MWEL		

APPENDIX 20 (continued)

MWSC/MWLG/MWPT		
MWMM/MWEM/MWHK		
MWCS		
MWCB		
MC4		
MWDR		
MTS		

Expectation:

1. Signing on “scope completion” means all work allocated for the week has been completed and SAP has been updated.
2. Signing on “scope not completed” means the line group has handed over to Work Control Group all the activities that were not completed with reasons for not completing work in the allocated week.

APPENDIX 21

Online Key Preparation Milestones checklist

Key Activities ***prior*** to the T-4 Execution Milestones

T-18 to T-16	Definition	Owner and Teams Involved
Activity #1 (a) ***Scope Definition*** **T-18 to T-16 Preventive Maintenance (PM) Programme Scope Review (Supporting Scope Selection)**	**Description:** Reliability Engineering performs a comprehensive review of T-18 downloaded Preventive Maintenance Tasks (Operation Job Types: PM, ER and KLM-005) to determine opportunities to update SAP PM tasks for alignment with the Approved PM Basis (task title and frequency). Changes are, for example, Extension of PM task frequency, Deactivation of tasks, Changes of task frequency to "On Request" (OR). **Completion Criteria:** From the T-18 downloaded scope of Preventive Maintenance (PM), Reliability Engineering to perform a review for the particular week. .	Reliability Engineering (Owner), Main Work Centres (SAP Change Control Form Compilation) and Work Management (Updating Master Data on SAP)
Activity #1(b) ***Scope Definition*** ***T-18 to T-16 Engineering Programme Scope Review (Supporting Scope Selection)***	**Description:** Material Reliability Group performs a comprehensive review of T-18 downloaded PMs to determine the scope that is no longer required and provide Work Control with feedback at T-16. **Completion Criteria:** From the T-18 download scope of relevant programme maintenance, Material Reliability Group to perform scope selection for the particular week as per their reviews to advise the Main Work centres of the SAP Master data change requests required to avoid future download.	Material Reliability Group (MRG) Engineering Programmes (Owner), Main Work Centres (SAP Change Control Form Compilation) and Work Management (Updating Master Data on SAP)
Activity #2 **Spares verification for proposed SOW**	**Description:** Material Planning Management verifies that spares are available to meet the proposed scheduled dates. **Completion Criteria:** Materials Planning reviews a T-12 plan and confirm if spares are available for the proposed SOW. If spares are not available they need to liaise with the affected Line Group and inform Work Control of scope that should not be finalized due to lack of spares or expected late arrival of spares. A recovery plan should be submitted to WC if the spares are not available for proposed SOW.	Materials Planning Management

Activity #3 **Review the plan to determine the impact of isolations to the plant.**	**Description:** Operations Support reviews the T-7 plan to identify impact of isolations to the plant to ensure that safety and production is not compromised. **Completion Criteria:** Operations Support to inform WCG if additional operations are required to be added on the plan to mitigate or minimize risk on the plant.	Ops Support Group
Activity #4 **All required Spares and Contractors/Contracts are available.**	**Description:** Line Groups have walked down their scheduled activities, and that all spares are available. **Completion Criteria:** SAP is fully updated and the correctness of spares verified.	Electrical Maintenance Instrumentation maintenance Mechanical Maintenance MMTG/MMLB MSS E&S Inspection & Test CEC
Activity #5 **Work package walk down & reviewed, PTW's are in application status (RP to review, input a risk assessment number and sign)**	**Description:** Line Groups to ensure work package preparation is completed and PTW's are in application status (RP to review, input a risk assessment number and sign) **Completion Criteria:** SAP and FLIP to reflect the effected changes from the walk downs. To be completed prior freeze of work scope.	Electrical Maintenance Instrumentation maintenance Mechanical Maintenance MMTG/MMLB MSS E&S Inspection & Test CEC

T-16	ONLINE PREPARATION MILESTONE CHECK LIST Period 16 Weeks Prior Execution	Week: Week:
Online		Date for Final Signature:

Department / Group	Associated Milestones							Name	Signature	Date
Reliability Engineering	# 1a									

#	Description of Milestones for T-16	Department / Group
#1a	**Scope Definition: T-18 to T-16 Preventive Maintenance (PM) Programme Scope Review**	Reliability Engineering

* Milestones Missed and new target date (Recovery Plan)		New Target Date	Manager Name	Dept.
1				

Work Control Manager	Signature	Date

T-16 Online	ONLINE PREPARATION MILESTONE CHECK LIST Period 16 Weeks Prior Execution	Week: Date for Final Signature:

Department / Group	Associated Milestones							Name	Signature	Date
Material Reliability Group	#1b									

#	Description of Milestones for T-16	Department / Group
#1b	**Scope Definition: *T-18 to T-16 Engineering Programme Scope Review***	Material Reliability Group

* Milestones Missed and new target date (Recovery Plan)		New Target Date	Manager Name	Dept.
1				

Work Control Manager	Signature	Date

T-12	ONLINE PREPARATION MILESTONE CHECK LIST Period 12 Weeks before Execution	T-12
Online _____		Date for Final Signature:

Department / Group	Associated Milestones							Name	Signature	Date
Materials Planning Management	#2									

#	Description of Milestones for T-12	Department / Group
#2	**Spares verification for proposed SOW**	Materials Planning Management

* Milestones Missed and new target date (Recovery Plan)		New Target Date	Manager Name	Dept.
2				

Work Control Manager	Signature	Date

T-7	ONLINE PREPARATION MILESTONE CHECK LIST Period 7 Weeks before Execution	T-7
Online		Date for Final Signature:

Department / Group	Associated Milestones							Name	Signature	Date
Ops Work Control	#3									
Electrical Maintenance	#4									
Instrumentation Maintenance	#4									
Mechanical Maintenance	#4									
MMTG/MMLB	#4									
MSS	#4									
E&S	#4									
Inspection & Test	#4									

#	Description of Milestones for T-7	Department / Group
#3 #4	**Review the plan to determine the impact of isolations to the plant** **All required Spares are available**	Ops Work Control Electrical Maintenance Instrumentation Maintenance Mechanical Maintenance MMTG/MMLB MSS E&S Inspection & Test

* Milestones Missed and new target date (Recovery Plan)		New Target Date	Manager Name	Dept.
3				
4				
4				

Work Control Manager	Signature	Date

T-6 Online	ONLINE PREPARATION MILESTONE CHECK LIST Period 6 Weeks before Execution	T-6 Date for Final Signature:

Department / Group	Associated Milestones Circle any milestone number NOT met. *							Name	Signature	Date
Electrical Maintenance	#5									
Instrumentation Maintenance	#5									
Mechanical Maintenance	#5									
MMTG/MMLB	#5									
MSS	#5									
E&S	#5									
Inspection & Test	#5									

#	Description of Milestones for T-6	Department / Group
#6	**Work package walk down & reviewed, PTW's are in application status (RP to review, input a risk assessment number and sign)**	Electrical Maintenance Instrumentation Maintenance Mechanical Maintenance MMTG/MMLB MSS E&S Inspection & Test

* Milestones Missed and new target date (Recovery Plan)		New Target Date	Manager Name	Dept.
5				
5				
5				
5				
5				

Work Control Manager	Signature	Date

APPENDIX 22

JUSTIFICATION

Revision 10

1. Full Review.
2. Update pre-outage requirement.
3. Change from POD meeting to PHO.
4. T-2 Certification Meeting.
5. T+1 Scope Completion Sign-Off.
6. Inclusion of the work order revision field coding “Do Not Reschedule”. See links to CR 108287-019 GA and NSA shortfall NSA SF 38473, “Equipment health priorities [Top ER Issues] do not inform or feed into the work planning, execution and resource priority system”.
7. Inclusion of the T+03 milestone (Proactive PM Review) for alignment with KAA-913 ‘Integrated Equipment Reliability Process’.
8. Inclusion of references to single point vulnerabilities (SPVs) to improve awareness and visibility in station processes for SPV components, see SE 38123-034 GA-004 GA (from WANO 7ER Elevation Plan).
9. Update Plant Engineering to Systems Engineering as per the change in Nuclear Engineering organisational structure.
10. Replaced the word “preventative” with “preventive” throughout the document to be in line with the standard.
11. Inclusion of a reference to the ERI procedure, KAA-852, for improved alignment of KPIs.

Revision 11

1. Definition For Corrective maintenance to align to AP-928.
2. Definition For Deficient maintenance to align to AP-928.
3. Appendix 21 : Online Key Preparation Milestones checklist.
4. To close CR 108286 – 16 CA , CR 108286 – 017 CA, GA 3974.
5. Editorial changes on the T-2 Certification Meeting Agenda.