Public Safety Information Forum (PSIF):

Long Term Operation (LTO) Updates for Koeberg Nuclear Power Station (KNPS)

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Purpose of this presentation

The purpose of the presentation is to share information with the Public Safety Information Forum (PSIF) regarding LTO as required by NIL-01 Variation 21.

- Introduction
- Overview of the NNR LTO directive
- Status of LTO safety case activities
- Status of the Periodic Safety Review (PSR) Integrated Implementation Plan (IPP) activities
- Status of the specific requirements in the NNR LTO directive
- Conclusion

Introduction

Introduction

- All activities required before entry into LTO have been completed.
- Koeberg **Unit 1** was issued with a Long-Term Operation (LTO) licence from the National Nuclear Regulator (NNR) allowing it to operate for an additional 20 years until 21 July 2044. The decision for **Unit 2** LTO licence was deferred to later, prior to 9 November 2025.
- The Koeberg Nuclear Installation Licence, NIL-01 has been amended to Variation 21 to reflect a new licence expiry date for Unit 1 and include Condition 16.4 incorporating the NNR directive, k10001925N.
- The NNR directive contains the following licence conditions:
  - post-LTO safety case commitments,
  - the periodic safety review (PSR) safety improvements, and
  - a list of specific requirements identified by the NNR

NNR LTO directive
Overview

Overview of the NNR LTO Directive

Outcomes of Assessment for LTO

The directive addresses the conditions for post-LTO as covered in the Nuclear Installation Licence No. NIL-01 (Variation 21) - Condition 16.4. This NNR directive stipulates conditions that include the *LTO safety case commitments, 3rd Periodic Safety Review (PSR) safety improvements as well as specific requirements*. The LTO conditions are summarised as follows:

1. Implementation of all commitments in the LTO safety case Integrated Preparation Plan (IPP) and the 3rd PSR Integrated Implementation Plan (IIP)
2. Assessment of the effectiveness of the Koeberg Nuclear Emergency Plan and implementation of improvement actions
3. Development of external events Level 2 PSA and seismic PSA
4. Update Emergency Plan Technical Basis (EPTB)
5. Aseismic bearings ageing and seismic assessment
6. Implementation of the containment recovery plan
7. Re-qualification of qualified cables
8. Re-assessment of qualified life of identified transmitters in mild environments
9. Implementation of RPV Radtrack fluence monitoring system and PTS analysis
10. Assessment of updated DSSR on design basis including flooding
11. Report on progress to the NNR (6-monthly) and to the PSIF and public (periodically)

Status of LTO safety case activities

NNR LTO Directive
Status of LTO safety case activities

The **post-LTO safety improvement activities** according to the NNR LTO directive (i.e., *Activities after LTO implementation*) are **progressing well and are on track** in accordance with their schedules, with the exception of the following items:

- **Item no.3:** Timelines for implementation of the ICCP project are challenged. This is a first-of-a kind project, it requires innovative solutions and rigorous validations (currently ongoing). Changes to the schedule will be communicated to the NNR once verified by Eskom.
- **Item no. 9:** Construction for the hardened water supply project started in December 2024 and will be completed within this year. There was a delay to the project, however the delay does not challenge the safety of the plant.
- **Item no. 10:** The implementation of the hardened water connection points modification is scheduled in the current outage for unit 1 (Outage 127). However, schedule constraints may impact the timely conclusion of the project. The constraint is caused by timely delivery of the ordered components for construction. The current mitigative actions indicate that without further delays the target dates can be achieved.

Safety Case Activities

1) Containment monitoring instrumentation
2) ILRT (Integrated Leak Rate Test)
3) ICCP (Impressed Current Cathodic Protection)
4) RIC thermocouple cables and connectors on Unit 1
5) RCP pressuriser heaters (Unit 1 & Unit 2)
6) I&C containment penetrations (Unit 1 & Unit 2)
7) SG snubber replacement on Unit 2
8) Restoration of Control Room Envelope (CRE)
9) Hardened water supply
10) Hardened water connection points (Unit 1 & Unit 2)
11) Primary pump shutdown seals (Unit 1 & Unit 2)
12) Plant assessments resulting from outcomes of the SHA studies

Status of PSR IIP activities

NNR LTO Directive
Status of the PSR IIP activities

- All safety improvements in the PSR IIP are **progressing well and are on target for completion by their due dates**. The safety improvements are categorised into:
  - Engineering modifications (e.g. External Events Review Initiative (EERI) modifications);
  - Analytical work (such as external events PSA/DSA studies and analysis);
  - Programmatic (programs, processes, procedures);
  - Organisational (skills, capacity, culture); and
  - Configuration management (paper plant).
- There is a total of 108 PSR safety improvements, of which 46 have been completed. All remaining open activities are expected to be completed by their committed due dates, mostly by the latest 2029 – i.e., 10 years and before the next PSR.

Note: The engineering modifications listed in the PSR IIP are aimed at enhancing overall operational safety and implementation thereof reflects a commitment to continuous improvement and adherence to best practices in nuclear safety management.

Status of NNR LTO directive specific requirements

NNR LTO Directive
Specific requirements overview

In addition to the LTO safety case commitments and the PSR III safety improvements, the directive includes specific requirements as follows:

NNR Directive Specific Requirements

1) Assessment of the effectiveness of the Koeberg Nuclear Emergency Plan and implementation of improvement actions (Status: **Schedule Constraints**)
2) Development of external events Level 2 PSA and seismic PSA (Status: **On track**)
3) Update Emergency Plan Technical Basis (EPTB) (Status: **Schedule Constraints**)
4) Aseismic bearings ageing and seismic assessment (Status: **Schedule Constraints**)
5) Implementation of the containment recovery plan (Status: **On track**)
6) Re-qualification of qualified cables (Status: **On track**)
7) Re-assessment of qualified life of identified transmitters in mild environments (Status: **On track**)
8) Implementation of RPV radtrack and PTS analysis (Status: **On track**)
9) Assessment of updated DSSR on design basis including flooding (Status: **On track**)
10) Reporting to the NNR, biannually on the status of implementation of all activities covered in the NNR LTO directive (Status: **On track**)
11) Communicating periodically to the PSIF and the public at large the status of implementation of all activities. (Status: **On track**)

NNR LTO Directive
Specific requirements overview (cont.)

- All activities are **progressing well and are on track** in accordance with their schedules, with the exception of the following items:
  - **Item no. 1:** The *assessment of the effectiveness of the Koeberg Nuclear Emergency Plan* has schedule constraints due to a requirement for appointment of an independent contractor to perform the assessment. A user requirement specification (URS) was updated to reflect the revised scope after input was obtained from the NNR. Contract placement is currently in progress.
  - **Item no.3:** The *update of the emergency plan technical basis (EPTB)* requires input from the seismic probabilistic safety assessment (PSA). The contract for the seismic PSA has been placed and work has commenced (and on track), however, in the unlikely event of delays on the seismic PSA, there is a potential to impact the schedule for update of the EPTB.
  - **Item no.4:** The *accelerated ageing (and testing) of representative samples of the aseismic bearings* has schedule constraints. A new contract is required to do the additional works which was initiated and will be placed by April. It is anticipated that the project will meet its deadline despite the constraints.

Conclusion

Conclusion

- The scope of activities to be completed is defined, closely monitored, and progressing well.
- One activity is delayed (i.e., hardened water supply) and one has schedule challenges (i.e. ICCP).
- There are a few NNR directive-specific requirements that have schedule constraints. These activities have recovery plans and undergo specific focus to ensure mitigation of the identified risks. All activities are expected to be completed by their committed due dates.
- The oversight process established ensures that good progress continues to be made, and challenges are identified early and resolved expeditiously.
- The NNR is kept informed about the LTO-related activities on a formal and informal basis. The NNR scrutinises all Eskom submissions and demands the highest nuclear standards to be kept.
- Koeberg remains safe and is being enhanced with more safety features and processes. This continuous improvement is a hallmark of the nuclear industry.

Questions