



National  
**Nuclear  
Regulator**

# **Welcome Media Briefing**

## **Regulatory update on the Koeberg Long-Term Operation (LTO) Licence Application**

4 December 2023, 10:00-12:00, MS Teams

Host: Gino Moonsamy, Manager Communications and Stakeholder Relations



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## Conduct of briefing

Microphones muted.

Video cameras switched off.

Raise hand using icon if you wish to ask a question during the Q&A.

Post your question in the side bar using the chat icon during the Q&A.

Fact check your article.

Presentation will be accessible from the Newsroom on the website.



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# Briefing outline

- Introduction
- Regulatory Update on Long Term Operation (LTO) of Koeberg Nuclear Power Station
- Public Consultation
- Q&A
- Adjourn

# Introduction

**Orion Phillips**  
**Divisional Executive: Nuclear Power Plants**

# Introduction



National  
**Nuclear  
Regulator**

- The National Nuclear Regulator (NNR) is an independent regulatory authority established as a juristic person in terms of Section 3 of the National Nuclear Regulator Act, (Act No.47 of 1999).
- Ensure the effective oversight of nuclear safety to protect people and the environment from radiation risks associated with nuclear power plants, nuclear technology, radioactive waste and naturally occurring radioactive materials.
- Authority vested in the NNR is enshrined in national legislation, which gives it the ability to permit (or deny) siting, design, construction, operation, manufacture of component parts, and decontamination, decommissioning, and close nuclear installations.



# Regulatory scope & footprint



Nuclear Power Plants



Nuclear Research Reactors



Radioactive Waste Management Facilities



Transport of Nuclear Substances & Nuclear-Powered Vessels



Uranium Mines

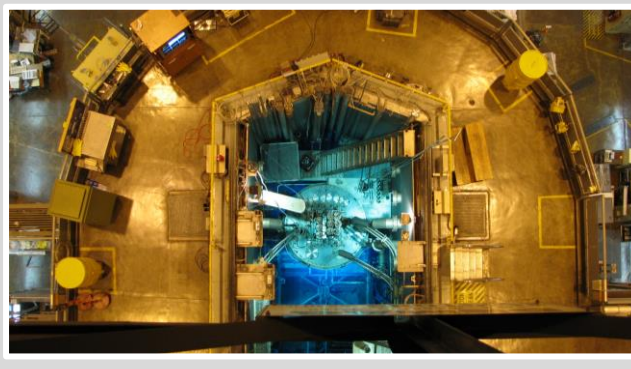
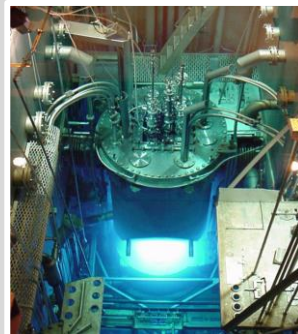
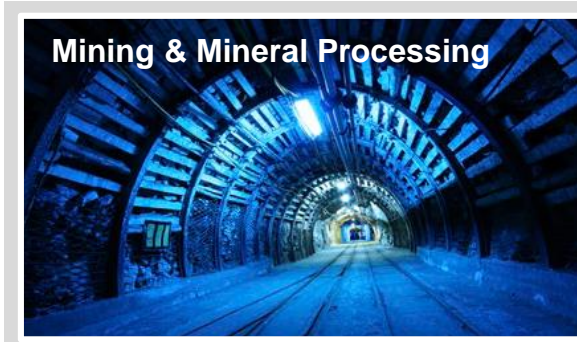


Mineral Processing & Scrap Metal Industry



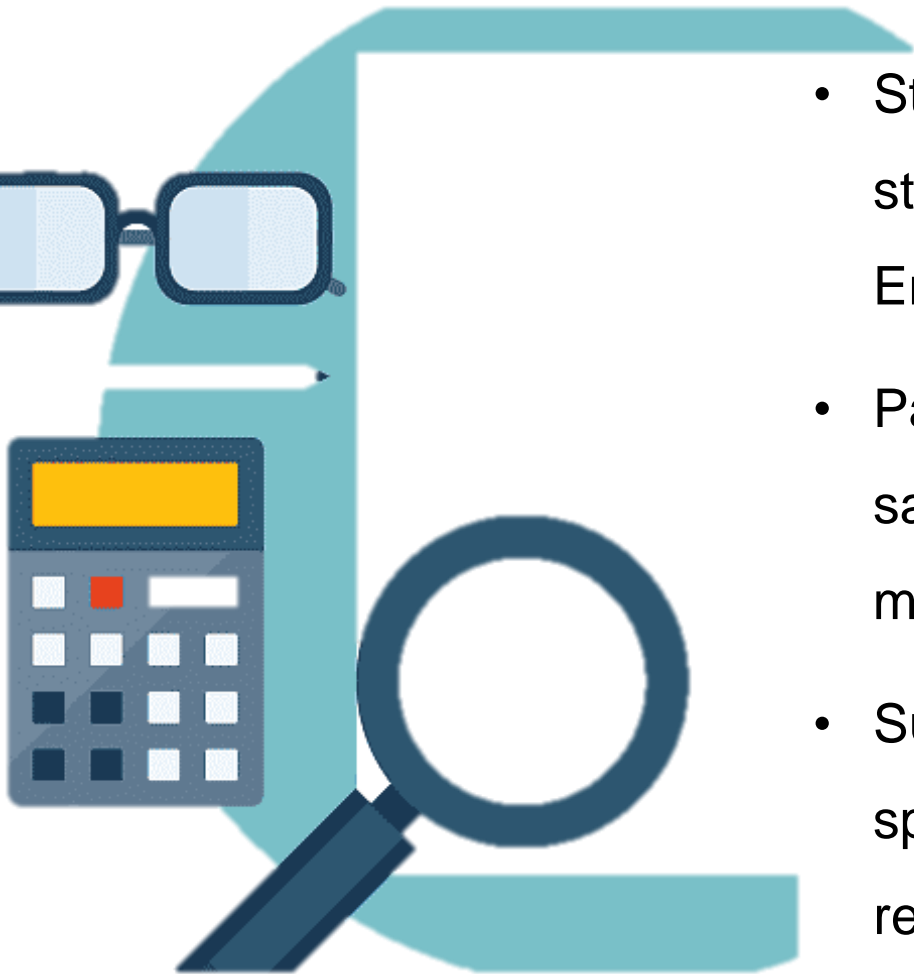


# Regulated facilities & activities





# Regulatory competency and capacity



- Staff responsible for safety reviews of the Koeberg nuclear power station have combined expertise and knowledge of over 400 years. Engineers, scientists and experienced regulatory professionals.
- Participate actively in International Atomic Energy Agency (IAEA) safety standards committees, technical forums and peer review missions.
- Supported by Technical Support Organisation. Access to highly specialised skills such as seismology, and additional resources when required. TSO has access to resource pool that includes retired nuclear regulatory staff both nationally and internationally.



# Snapshot of NNR LTO regulatory team

NNR LTO Resource Matrix		
Role	Function	Nuclear Experience
Orion Phillips, Executive NPP	General project oversight	33 years
Peter Bester, Programme Manager: NPP	Technical oversight and licensing	29 years
Kameshni Naidoo, Manager: Assessments	Review of LTO Safety Case	19 years
Nangamso Silinga, Manager: Inspections	Conduct inspections and monitor activities	10 years
Ubert Coetzee, Project Leader	Coordinate review and assessment activities	31 years
Assessment Team Member – X28 (~ 55% with Masters or PhD's)	Perform reviews in areas of specialisation	Cumulative > 411 yrs Average > 14 yrs
Inspectorate Team Member - X4	Perform Inspections and monitoring	Cumulative > 80 yrs Average > 20 yrs
TSO	Support NNR civil and electrical cabling reviews	Retired Regulatory Staff

# Regulatory update: Koeberg LTO Application

Peter Bester  
Programme Manager: Nuclear Power Plants



# Regulatory update: Koeberg LTO Application

- **Definition:** “Long Term Operation” means the operation of the plant beyond an established time frame set forth by, for example, licence term, design, standards, licence and/or regulations, which has been justified by safety assessment, with consideration given to life limiting processes and features of Structures, Systems and Components (SSCs).
- **Process:** The Plant Life Extension process involves replacement, maintenance, and or modifications to major SSCs to support safe operation. Depending on the national licensing framework, LTO may be approved for a period of 20 years beyond the 40-year lifetime. In the USA many NPPs are nearing the end of 60 years after doing the 20 year LTO programme.



# Regulatory update: Koeberg LTO Application

- Eskom is authorised to operate the KNPS under the Nuclear Installation Licence, NIL-01 Variation 19 (and as amended from time to time in terms of section 23 of the NNR Act) and associated conditions. The KNPS comprises of two pressurised water reactor units which started commercial operation in July 1984 on Unit 1 and in November 1985 on Unit 2.
- Eskom decided in 2010 to pursue LTO. Early engagement between Eskom & NNR. Steam Generator Replacement (SGR) project started in 2014/15.
- On 10 May 2021, the NNR received an application from Eskom for a variation to NIL-01 to operate the KNPS beyond the current license term of 21 July 2024, for an additional 20 years, to 21 July 2044 for Unit 1 and to 9 November 2045 for Unit 2.

# Regulatory approach to LTO

- In response to Eskom's decision to pursue LTO, the NNR benchmarked international approaches and standards and established the regulatory framework for LTO
- The framework considers both technical and administrative provisions as enshrined in the Constitution and associated legislation as well as the NNR Act.
- LTO regulatory framework includes:
  - ✓ Variation to NIL-01 to include operational time frame (2019)
  - ✓ Issue of LTO regulations and associated regulatory guidance (2020 -2021)
- Regulations stipulate process and requirements for LTO which includes submission of an application and safety case.
- An application triggers the formal licensing process in terms the NNR Act and associated provisions

# Regulatory approach to LTO

- The programme for LTO should be implemented by Eskom in a manner consistent with the requirements of the NNR and relevant national regulations (**NIL-01 Variation 19, NNR Act, Regulation on LTO R.266, SSRP, RG-0027: Guidance on Ageing Management and LTO, RG-0028 Guidance on Periodic Safety Review**).
- For LTO, the NNR set standards, perform technical reviews and studies; conduct public hearings; issuance of authorisation; inspection, investigation and enforcement; evaluation of the operating experience.
- The NNR assessment for the Koeberg LTO should demonstrate, in particular, that ageing effects will be adequately managed so that the intended functions of the SSCs can be maintained consistent with the plant's current licensing basis for the planned period of LTO.



# Regulatory Approach to LTO

## Use of License Renewal

- License specify period of operation, i.e. 40 years
- License renewal for 20 years at a time
- US, South Korea

## Use of Periodic Safety Review

- Licenses does not expire
- 10-yearly PSR
- France

## NNR Approach

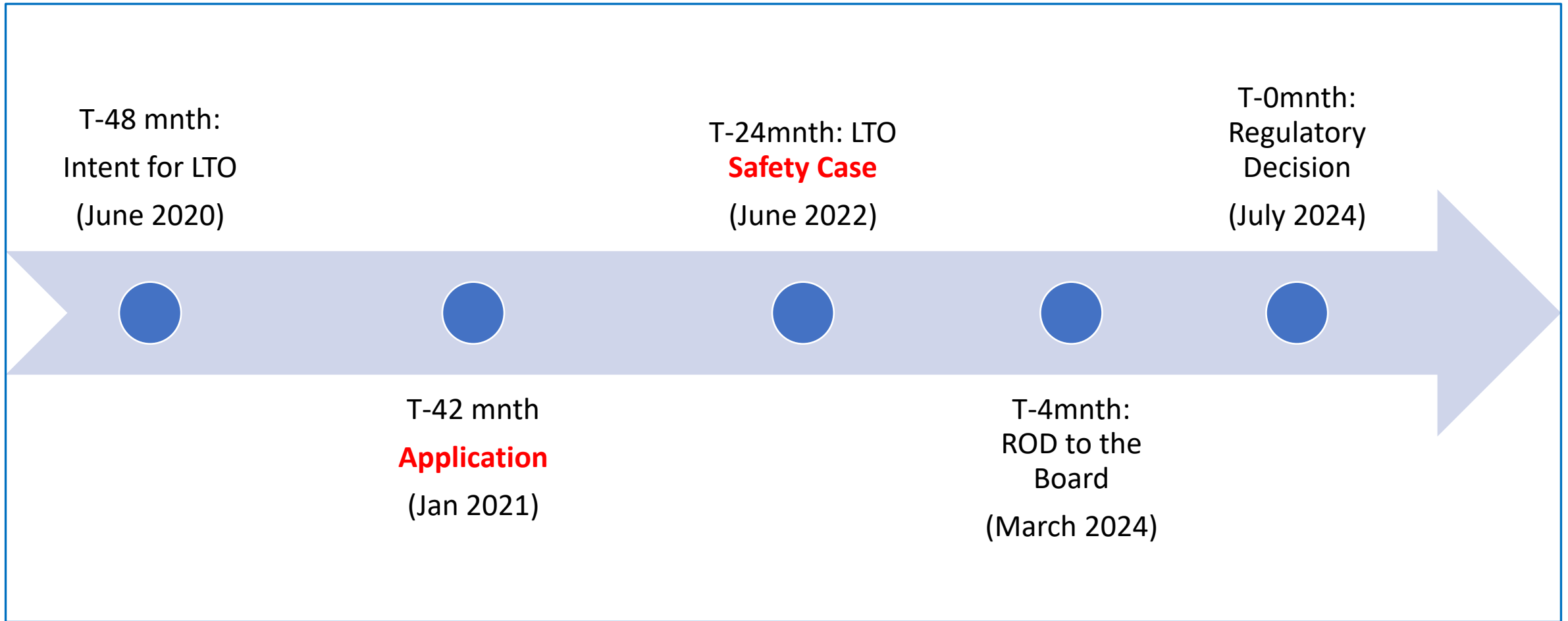
- Operational timeframe limited
- PSR required
- Submit a Safety Case
- South Africa

NNR approach informed by International and national Regulatory experience.

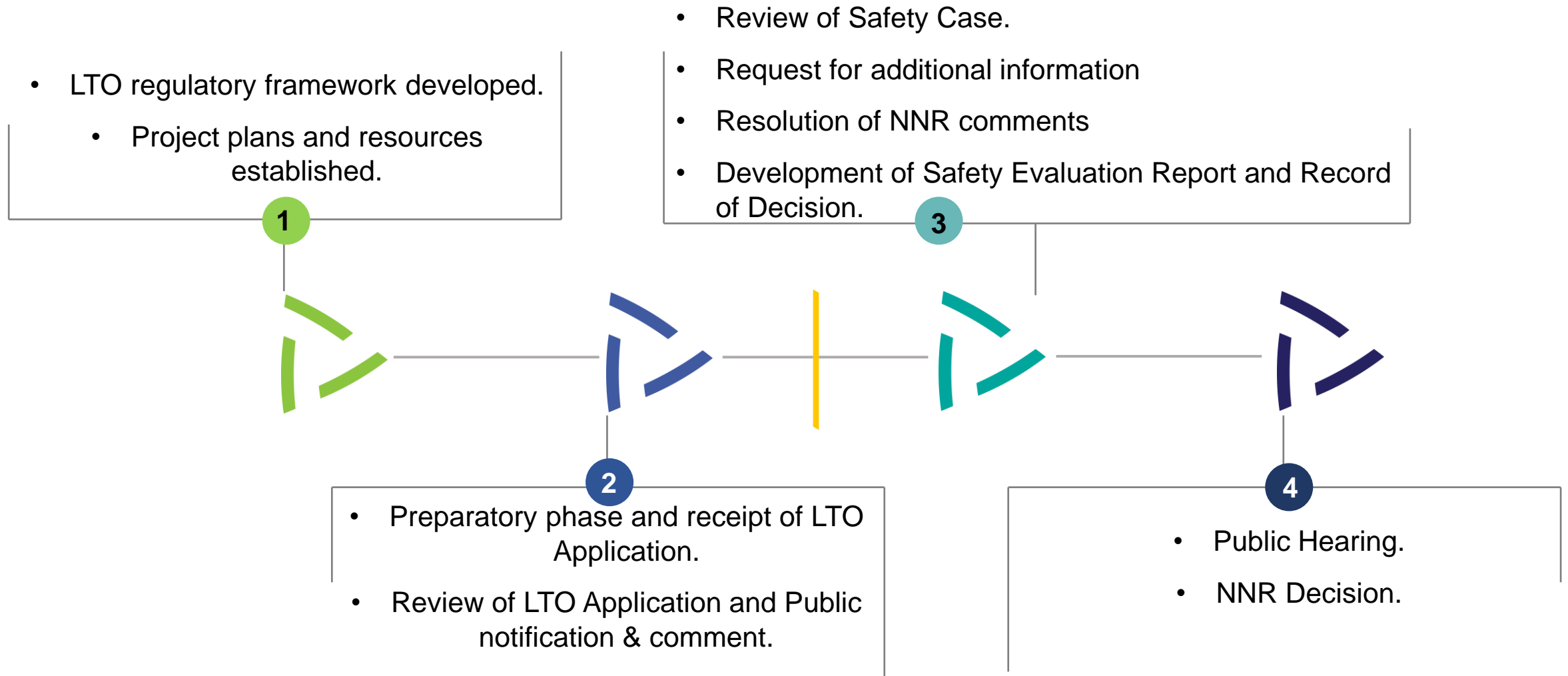
Periodic Safety Review (PSR) - a review that compares the operating plant against modern codes and standards for the purpose of identifying opportunities to enhance nuclear safety.

# Regulatory Approach to LTO

## Key milestones



# LTO approach & project phases





# LTO review preparation activities

- Invited five IAEA expert missions to inform the **development of the NNR regulatory framework for LTO** with experts from **USA, Canada, Sweden, Netherlands, Czech Republic and Finland**.
- Benchmarked our regulatory framework with other countries that use different approaches to LTO.
  - ✓ France, Sweden and Switzerland use the 10 yearly Periodic Safety Review as a regulatory tool to justify continued operation of the plant.
  - ✓ Whilst the USA, Canada, Finland, Hungary, Romania and Spain uses Licence Renewal process to extend the life of the plant beyond the design life.
- Expert missions and benchmarking informed the development of the NNR Regulatory Framework for LTO which is essentially a hybrid of Licence Renewal and Periodic Safety Reviews due to the operating experience of KNPS and the current national legislation and regulations.

# LTO review preparation activities

- Technical workshops and exchanges with ASN (France) on their standards and practices for LTO. ASN Inspectors accompanied NNR Inspectors on various plant surveillance activities over a two-week period exchanging information, best practices and gathering regulatory intelligence.
- Held technical workshops on ageing management and LTO held with USNRC technical experts.
- Senior NNR staff actively participates in IAEA working groups on ageing management (Civil, mechanical, electrical, etc.). Insights from these working group activities based on lessons learned by industry partners informed NNR review and inspection activities on ageing management
- Staff training initiatives implemented for developing the regulatory framework prior to review of the safety case on (a) Licence Renewal, (b) NNR LTO Regulatory Framework, (c) Applicants LTO Programme, (d) NNR LTO Assessment Guidance.

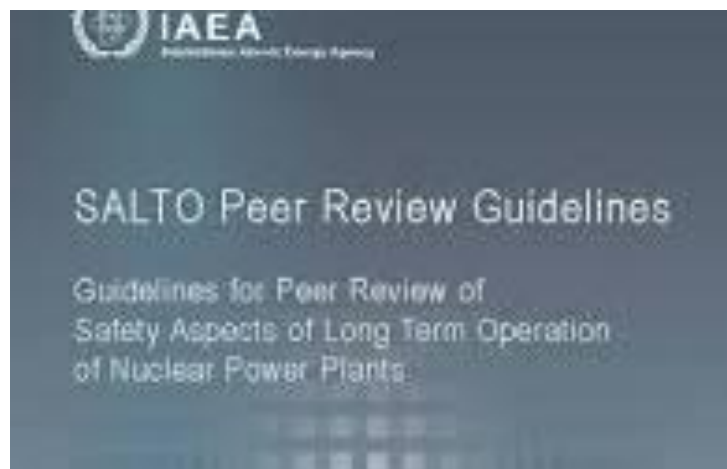
# SALTO & Ageing management



Safety Aspects  
of Long Term  
Operation

SALTO

- Managing ageing for nuclear power plants means ensuring the availability of required safety functions throughout the service life of the plant, considering changes that occur with time and use. This requires addressing both physical ageing of structures, systems and components (SSCs), resulting in degradation of their performance characteristics, and obsolescence of SSCs, i.e. their becoming out of date in comparison with current knowledge, standards and regulations, and technology.





# SALTO & Ageing management

## Typical Systems, Structures, and Components Considered in the Ageing Evaluation

### CIVIL STRUCTURES

- Containment Building
- Raft Foundation
- Aseismic Bearings
- Concrete grounded tendons

### ELECTRICAL

- Electrical Cables
- Control and Instrumentation

### MECHANICAL

- Reactor Pressure Vessel
- Plant Safety Systems (E.g., Control Rods Drive System)

# SALTO & Ageing management

The SALTO peer review is a comprehensive operational safety review service addressing strategy and key elements for safe LTO of NPPs.

- 1<sup>st</sup> Pre-Salto Mission completed in 2015
- 2<sup>nd</sup> Pre-Salto Mission completed in 2019
- Full Salto Mission completed in 2022
- Follow-up Mission scheduled for end of 2024

## Areas reviewed

Area A - Organisation and functions, current licensing basis, configuration/ modification management;

Area B - Scoping and screening and plant programmes relevant to LTO;

Area C - Ageing management review, review of AMPs and related TLAAAs for mechanical components;

Area D - Ageing management review, review of AMPs and related TLAAAs for electrical and I&C components;

Area E - Ageing management review, review of AMPs and related TLAAAs for civil structures;

Area F - Human resources, competence and knowledge management for LTO.

Note: SALTO mission considered supplementary and parallel to NNR review. NNR safety case review is not influenced by IAEA mission recommendations or suggestions.

# LTO Safety case elements

## LTO Safety Case

Modifications

Ageing  
Management

Safety  
Assessments  
(SALTO)

Periodic Safety  
Review

Other Inputs

SGR Project

Scoping

Revalidation of  
time limiting  
components

14 Safety  
Factors  
reviewed,  
including  
external hazards

Safety Related  
programmes  
impacted by LTO

Rx Pressure  
Vessel Heads  
replacements

Ageing  
Management  
Reviews

Re-analyses of  
time limiting  
components

Safety  
Improvement  
Plan

Waste  
Management

Fukushima  
Safety & PSR  
Safety  
Improvements

Ageing  
Management  
Programmes

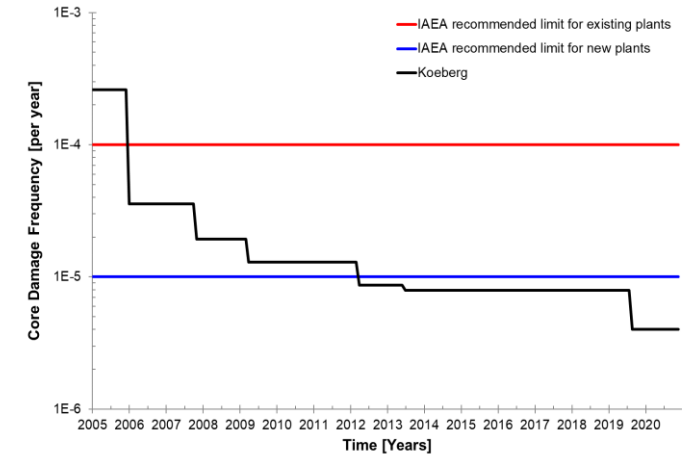
Programme and  
system updates

Emergency  
Planning

Etc.

Physical Security

Modifications: Has been implemented since initial operation in line with principle of optimisation of safety and continuous improvements





# Update on the separation of unit 1 and unit 2 in the application

- NIL-01 (Variation 19) limits the operational life of KNPS (for both Units) to 21 July 2024.
- The LTO application included request to separate the operational design life of the units.
- The NNR review of the request is complete.
- The outcome of the review with a recommendation will be submitted to the NNR board for consideration.

# NNR Review schedule

#	Activity	Due Date (T-Months)	Status
1.	Eskom notification of intention for LTO	T- 48 months (July 2020)	Completed
2.	Application to vary Koeberg licence	T - 42 months (January 2021)	Completed
3.	Safety case submittal	T 24 months (July 2022)	Completed
4.	Preliminary report for Board	T - 12 months (July 2023)	Completed
5.	Public consultation	T- 6 months (January 2024)	In progress
6.	Recommend LTO decision for Board consideration	T -4 months (March 2024)	Not started
7.	Finalise and announce LTO decision	T -0 months (July 2024)	Not started

# Status of NNR review

#	Activity	Status
1.	Initial PSR Review	Completed
2.	Initial LTO SC Review	Completed
3.	RAI PSR	In progress
4.	RAI LTO Safety Case	In progress
6.	Decoupling of operational timeframe	Review completed
7.	PSR – Nuclear Security	Completed
8	Review of outstanding technical deliverables	In progress
9.	Verification of commitments	In progress

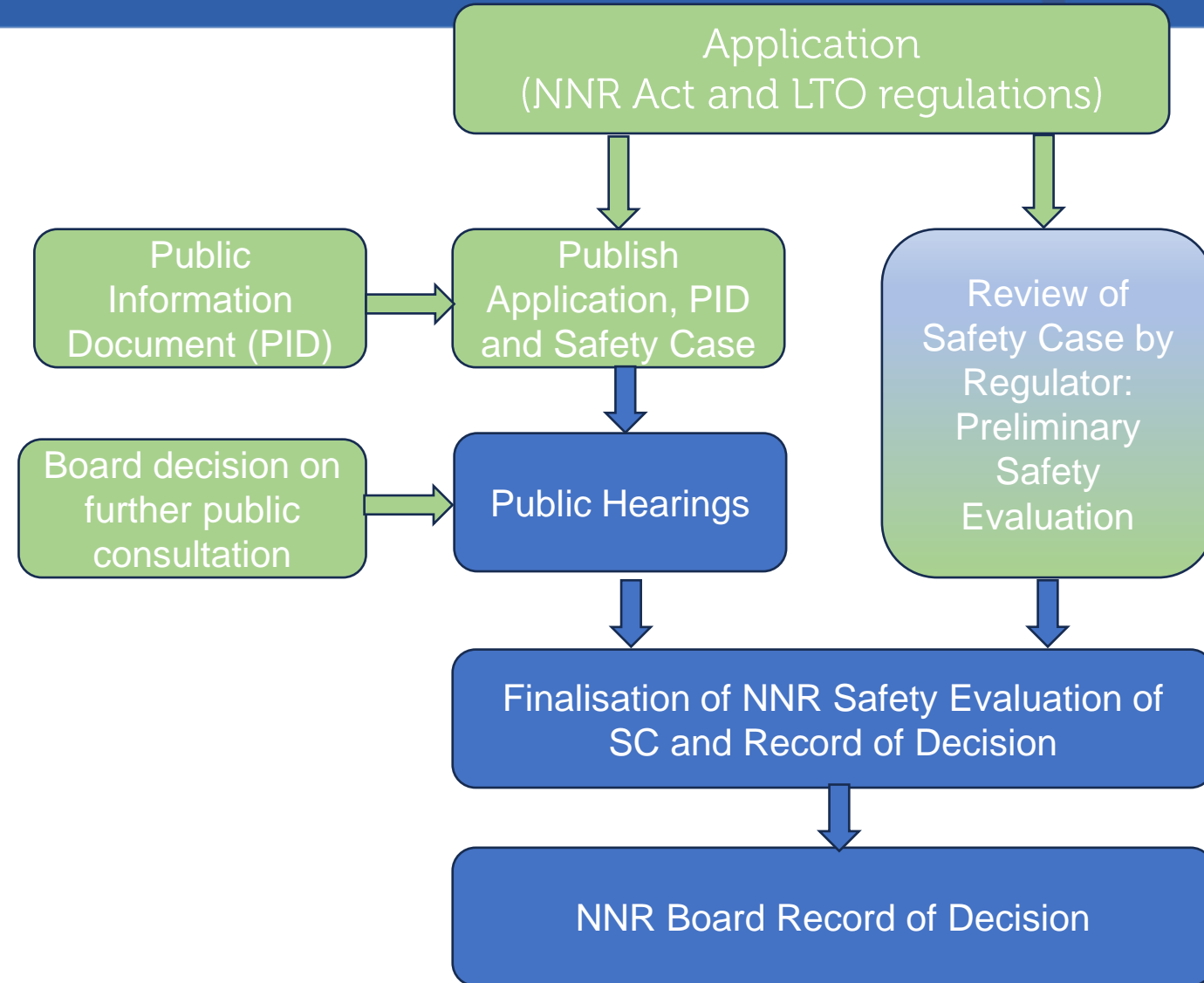




**Ubert Coetzee**  
**Principal Specialist: Nuclear Power Plants**



# Public Consultation process



- The first stage of public consultation implemented is the stakeholder notification and request for comment from members of the public. (Completed)
- NNR Board has resolved that further public debate is required on the application.
- The decision to proceed with the next phase of public hearings is based on the analysis and merits of the public comments received during the first stage.
- Safety case review ongoing

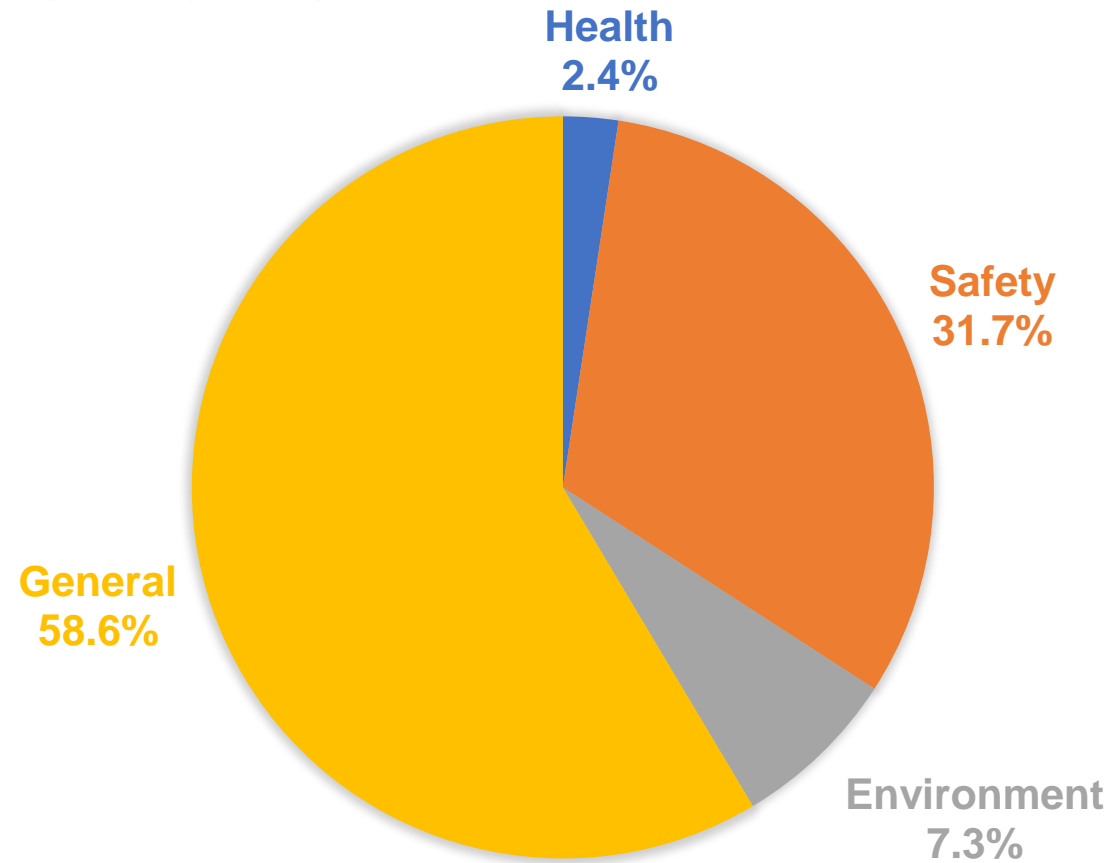
# Overview: Public comments received

Top five themes from public comments received:

Specific	Generic
Radioactive waste, processing, and transport thereof	Inadequate public consultation and process
Emergency planning	Redacted safety case
Loadshedding, power supply, grid issues and blackouts	Inadequate public notification and medium utilised
SALTO findings and TLAAs	Incomplete or missing information for meaningful participation
Decommissioning, ageing infrastructure and corrosion	Economics and costing

# Feedback from initial public comments

## CATEGORISATION



# Way forward

- Finalise review of the Safety Case and identified technical issues to be resolved by Eskom.
- Continue to track and monitor issues on a monthly basis to ensure proactive engagement of emerging issues on the safety case. We have also adopted a risk management approach to mitigate issues which require our intervention.
- The review of deliverables in accordance with the LTO safety case is ongoing.
- Public Hearings are scheduled for 3, 10 & 17 February 2024 in Tableview, Atlantis & Athlone.
- For more information on how to participate, visit: <https://nnr.co.za/public-information/public-hearings/>



# Way forward

- Outcome of public hearings and completion of Technical Review Report will inform the recommendation to the board.
- NNR Board Decision on LTO in July 2024.



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