

# ESKOM PRESENTATION

LTO Public Engagement Sessions

February 2024



## **Purpose:**

Present the Koeberg Nuclear Power Plant Long Term Operation (LTO) license application (in accordance with R.266) that has been lodged with the National Nuclear Regulator. The Eskom application requests for the National Nuclear Regulator to approve a 20-year extended operation license for the nuclear power plant.

## **Overview/Outline:**

- South African Energy Demand Context
- License Application
- Eskom Approach to LTO
- LTO Assessments
- Benefits
- Application Status Quo



- International experience has demonstrated that nuclear plants like Koeberg can safely, economically, and reliably operate beyond the design life assumed in their original analyses.
- Koeberg Power Station is no different, it reaches its 40-year original design life in 2024/2025 and the results of all the required regulatory Eskom believes that the plant can safely be operated for another 20-years,

The Integrated Resource Plan (2019) reflects this position, as reflected by the following extracts.

**5.3.1 Immediate Term Security Supply** In the short-term supply and demand side interventions will have to be deployed to minimise the risk of load shedding and/or extensive usage of diesel peaking plant due to Eskom's plant low EAF. Taking into account supply and demand balance and the impact of load shedding on the economy, **shutting down of MES non-compliant power plants and Koeberg power station in 2024 (at the end of its design life) are not recommended.** **Koeberg is one of the best performing power plants with a low operational cost (it is fully depreciated).**

***Decision 2: Koeberg power plant design life must be extended by another 20 years by undertaking the necessary technical and regulatory work.***

**5.3.6 Nuclear** The extension of design life of the Koeberg Power Station is critical for continued energy security in the period beyond 2024, when it reaches the end of its 40-year life. **This extension, once all the necessary regulatory approvals have been received,** will increase the capacity to its original design capacity of 1926MW.



## Long-term operation Context of Licence application.

- Eskom Operates Koeberg Nuclear Power Station under Nuclear installation license (NIL-001) license issued by the National Nuclear Regulator in terms of the National Nuclear Regulator Act, 1999 (Act 47 of 1999)
- The current licence limits the operation to the original assumed 40 years of operation, unless the licence is:
  - a) amended for subsequent licensing stages including long term operation; or
  - b) varied, suspended or revoked.
- As Eskom would like to continue to operate Koeberg beyond the current dates specified in the current variation of the Operating Licence, a Licence Application in terms of the NNRA (Act 47 of 1999) to operate Koeberg for an additional 20 years was submitted to the National Nuclear Regulator.



## Regulatory Requirements

- In support of the Licence Application Eskom was required to through the submission of a safety case, which includes:
  - *Demonstrate compliance with relevant regulatory safety criteria and requirements.*
  - *Base the application on the results of a safety analysis, with consideration of the ageing of Systems, Structures, and Components.*
  - *Provide an overall assessment of the safety of the nuclear installation and justification for continued safe operation.*
  - *Include the necessary safety improvements in the application, including refurbishment, provision of additional Systems Structures and Components, and additional safety analyses and engineering justifications, to ensure the licensing basis remains valid during the LTO period.*



## Assessments

## Purpose

Periodic Safety Review (PSR) – informs the safety case for LTO

- The objective of a PSR is an **assessment of safety throughout the plant's past and future operating life by evaluating the cumulative effects of plant ageing, modifications, operating experience, technical development and international trends.**
- Provides assurance that the **plant status is acceptable against current safety requirements** (national and international) and that the **plant is safe to continue operating.**
- Determine nuclear safety improvements to be implement in the next 10 years.

Duynefontyn Site Safety Report (DSSR)

- **Review the magnitude & probability of occurrence** of external events,
- **Review the site security, public exposure risks & physical characteristics** that could pose a significant impediment to the development and execution of emergency preparedness and response actions.

Safety Aspects of Long-term Operation (SALTO) – Ageing management assessments

- Comprehensive technical review of the applicability of the current **ageing management of the plant** for the extended period of operation, through a **time limited ageing analyses (TLAAs).**
- The evaluation of programmes and performance is made **based on Regulatory requirements and other international guidance** documents
- The analyses is to identify any needed **updates to the existing maintenance and inspection programs and process improvements required for safe LTO.**



## Some major activities completed or planned for completion

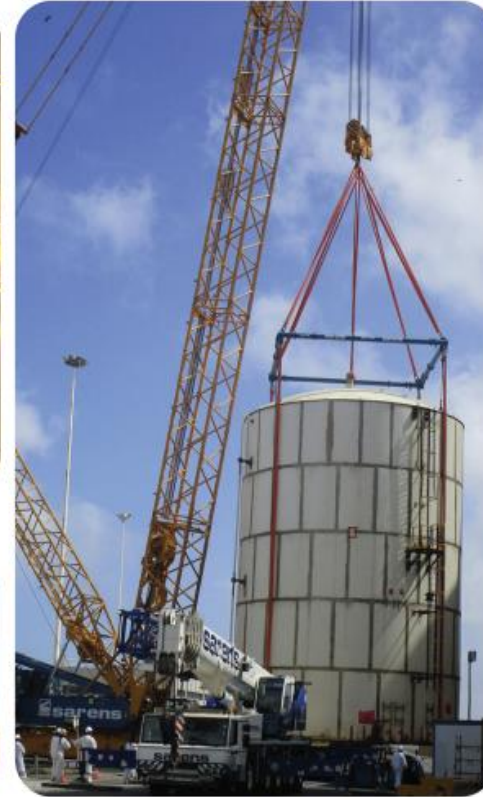
- Steam generator replacements.
- Replacement of refuelling water storage tanks.
- Replacement of the reactor vessel heads.
- Concrete repairs of the reactor building.
- Upgrade of obsolete analogue monitoring and control systems.
- Implementation of additional ageing management programmes.
- Inspection and testing of equipment important to safety (e.g., containment building integrated leak rate test).
- Updated assessment of all aspects of Koeberg site characteristics (seismic, tsunami, tornadoes, etc.).
- Transient interim storage facility for used nuclear fuel.



Loading of spent fuel casks.



The storage facility housing the replacement steam generators.



Reactor Cavity and Spent Fuel Pool Cooling System tank.



Arrival of the Reactor Pressure Vessel Head and Control Rod Drive Mechanisms at Koeberg.



The arrival of one of the six replacement steam generators.

- Security of energy supply since Koeberg is the only base load power station within the Western Cape grid, and therefore Koeberg continuous operation prevents strain on the electricity system.
- The review of the license application submission will ensure that safety, health and environmental aspects related to the operation have been adequately assessed to prevent undue risk to the public and the environment.
- Positive impact on the provincial and local economy.

## Socio-economic benefits

- KNPS is one of the **top three ratepayers** in the Western Cape.
- It **contributes** billions of rands to the **local economy**.
- Local and national companies and communities **benefit directly from the ongoing operation of KNPS through jobs and investment**.



**1500**  
Direct Jobs



**20 000**  
Induced Jobs





- The safety case for LTO demonstrates that there is no undue risk to public and the environment due to long term operation of the plant,
- All preparation activities for LTO have been completed and submitted to the NNR except for the seismic hazard analysis and tsunami studies which are due to be submitted mid March 2024,
- LTO is not only beneficial to ensure security of supply of electricity but has also socio-economic benefits to the region as well.
- Eskom has safely and reliably operated Koeberg for over 39 years, and believes it has demonstrated to the National Nuclear Regulator that it can continue to do so for another 20 years.



**Thank you**