



“NNR KOEBERG LTO PRESENTATION”

Emmanuel Montwedi

Executive Chairperson: SAYNPS

10 FEBREUARY 2024

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WHO IS SAYNPS



- South African Young Nuclear Professionals Society (SAYNPS) is a registered Non-Profit Organization.
- Established in **2002** after the second biannual conference of the International Youth Nuclear Congress (IYNC 2002) in Dae-Jung, South Korea.
- More than **400 members** across South Africa
- **Affiliate** member of the African Young Generation in Nuclear (**AYGN**) and the International Youth in Nuclear Congress (**IYNC**)



SAYNPS Objectives



- Promote the South African nuclear industry both locally and internationally by ensuring effective and adequate participation of South African youth in nuclear related activities.
- Educate youth about careers in the nuclear industry
- Educate and raise awareness in society (esp Youth) on the benefits of peaceful use of Nuclear Technology.
- Advocacy & Advisory Role to Policy Makers and Implementers in determining the future of the youth of South Africa in the Nuclear Sector

Importance of koeberg NPP

- Provide **grid stability** to the South African energy grid
- Contributes to the **local economy**.
- Provides skilled **jobs**
- Produces clean reliable **electricity**.

The stations with an EAF greater than 80% are:

Station	EAF
Peaking	90.43

The units with EAF greater than 80% are:

Unit	EAF	Unit	EAF	
Koeberg 1	96.31	Matla 3	85.61	
Medupi 1	95.78	Matla 6	83.99	
Medupi 6	93.19	Kusile 1	83.8	
Medupi 2	91.99	Lethabo 1	82.37	
Lethabo 4	90.57	Majuba 5	81.97	
Camden 1	89.83	Matla 2	81.87	
Medupi 3	88.43	Lethabo 3	81.55	

Koeberg long-term operation

- Application for variation of NIL-01 to operate koeberg NPP beyond current license term for an additional 20 years.
- Done in compliance with **regulations on LTO** (regulation No. R266)
- Based on **safety case** which demonstrate safe operations for at least 60 years
- inline with industry norms
 - **136** nuclear reactors operating for **40 years or more**
 - **USNRC approved 94 reactors extend 40 to 60 years** and **6 reactors to operate for 80 years**

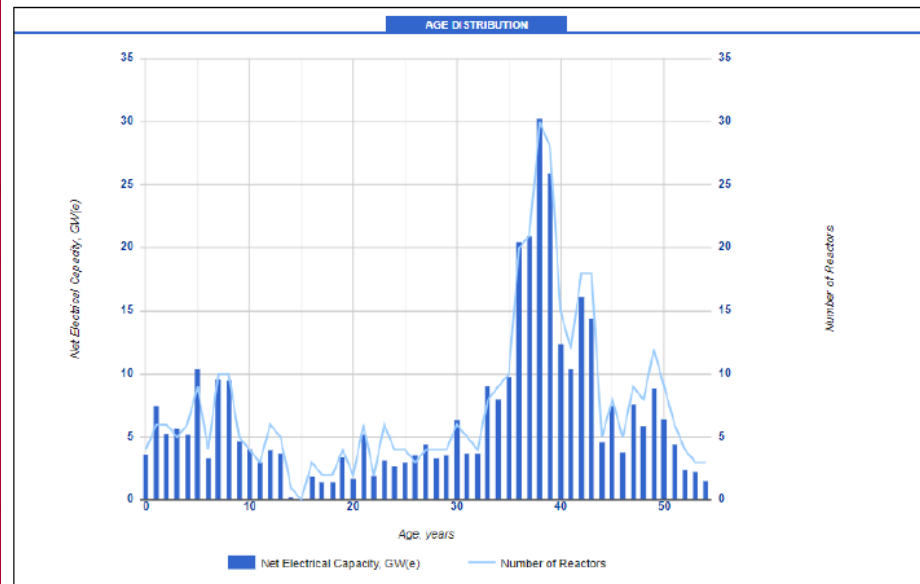


Figure 2: Electrical output and age of nuclear power reactor units in operation [3]

LTO safety case, PSR & LTO

- Supports the LTO application to prove that there is not undue risk to safety, health or the environment for Koeberg to operate for 20 more years.
- This includes **PSR**
 - Outcome confirms that continued safe operation of Koeberg was supported, including LTO

Table 1: List of safety factors reviewed during the Koeberg PSR

Subject area	Number	Safety factor title
Plant	SF-1	Plant design
	SF-2	Actual condition of SSCs
	SF-3	Equipment qualification
	SF-4	Ageing
Safety analysis	SF-5	Deterministic safety analysis
	SF-6	Probabilistic safety assessment
	SF-7	Hazard analysis
Performance and operating experience (OE) feedback	SF-8	Safety performance
	SF-9	Use of experience from other plants and research findings
Management	SF-10	Organisation, the management systems, and safety culture
	SF-11	Procedures
	SF-12	Human factors
	SF-13	Emergency planning
Environment	SF-14	Radiological impact on the environment

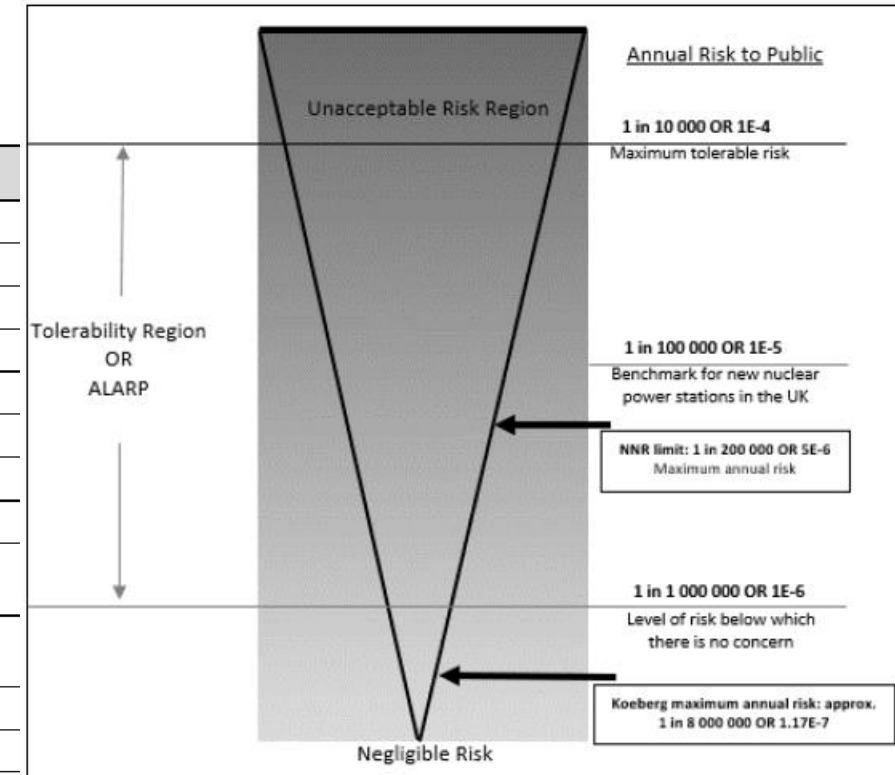


Figure 10: Managing risk as low as reasonably practical (ALARP) adapted from [6]

LTO safety case, PSR & LTO

- SALTO
 - Peer review mechanism focusing on safety aspects of long-term operation
 - Safe and effective approach to LTO with inputs from international experts
 - Evaluation of aging management programmes based on IAEA SS and GD
- Observations
 - 14 issues identified (not safety safety)
 - Inline with results from NPP's that have successfully extended their plant life
 - Only 4 of 14 issues in progress
 - Only 2 of 4 issues require completion prior to LTO and do not pose risk to LTO (on track)

8	Complete the revalidation ³ of environmental qualification for all the SSCs in-scope of the	During LTO	Koeberg has an equipment environmental qualification programme that ensures equipment is (and will remain) qualified for the environmental conditions (such as
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³ Revalidation is the analysis done to confirm that a previously qualified component can safely continue to perform its function for a defined period.

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Public Information Document for the Long-Term Operation of Koeberg Nuclear Power Station

Unique Identifier: 240-165294677
 Revision: 3
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Issue No.	SALTO mission issue raised	Target completion Pre or during LTO	Description and progress of the resolution
	environmental qualification programme. (suggestion)		temperature, humidity, radiation, etc.) in which it is used. This issue relates to installing localised temperature measurement devices to monitor and record the temperature in the vicinity of essential, qualified, plant equipment. The localised temperature measurement devices were fitted inside the containment building and currently gathering more accurate environmental data. The data from these devices will be extracted and used to update the environmental condition monitoring programme (ECMP) on an ongoing basis during LTO. This action is not required to be completed prior to LTO.

Issue No.	SALTO mission issue raised	Target completion Pre or during LTO	Description and progress of the resolution
12	Improve the revalidation of TLAA's for concrete structures. (suggestion)	Complete	This issue relates to the TLAA for the containment building concrete structure. The revalidation of the containment structure is complete, and the results justify an additional 20 years of extended operation for the concrete containment structures of U1 and U2.
13	Ensure full functionality of the containment structure monitoring system. (recommendation)	During LTO	The containment structure is monitored by various instruments to detect deformation and strain in the concrete structure. Some of the measuring instruments are not functional. This issue relates to the repair of the non-functional instruments. (Some instruments are not serviceable because they are embedded in concrete). The repair of the existing instruments has been prioritised and a modification is planned during the period of LTO for additional instruments. The remaining functional instruments continue to monitor the containment building strain and additional measuring equipment will be fitted when conducting the 10-yearly pressure test (ILRT) of the containment building during LTO.

Socioeconomic impact

South Africa's only nuclear power station has an important role to play in the country's economy a study by KPMG has found.

Through investments and operations, economic activity supported or stimulated by Eskom's Koeberg plant is currently worth an estimated ZAR53.3 billion (\$3.9 billion).

The study estimated Koeberg's current combined impact, through investment and operations, to be ZAR53.3 billion over the period 2012-13 to 2015-16 - ZAR30.2 billion in Western Cape and ZAR23.1 billion in the rest of South Africa.

In that period, the plant sustained, on average, 1786 direct jobs and created nearly 35,000 indirect and induced jobs per year, earning a total estimated revenue of ZAR 16.4 billion for the government.

Conclusion

- **SAYNPS support Koeberg NPP LTO**
- **No impediments to safe operation for 20 more years**
- **PSR in the next 10 years will further prove LTO**
- **ESKOM should start looking at the feasibility of another extension to 80 years**
- **Youth unemployment is at a record-time low and koeberg can assist**



Private bag X10 Kernkrag | Cape Town | 7441 | Contact: Sonwabile Baklei

Tel: +27 21 522 3169 | Mobile +27 81 564 2017