

DRAFT MINUTES

OF THE KOEBERG PUBLIC SAFETY INFORMATION FORUM (KPSIF), HELD ON THURSDAY, 14 MARCH 2024 AT KOEBERG NUCLEAR POWER STATION (VISITORS CENTRE)

Chairperson (Acting): Ms Smokie La Grange

Deputy Chairperson: Vacant

Secretariat: Ms Kim Kline

RESIDENTS		
Surname and Name	Organisation	Present
Becker, Peter	Koeberg Alert Alliance	P
Beyl, Trudy	Resident	P
Browne, Peter	Resident	P
La Grange, Duval	Resident	P
Mayhew, Robert	Resident	P
Mayhew, Sylvia	Resident	P
Pannaye, Angelique	Resident	P
Pannaye, Eric	Resident	P
Slabbert, Johan	Resident	P

OFFICIALS		
Surname and Name	Organisation	Present
Anhe, Armand	DMRE	P
Bester, Peter	National Nuclear Regulator	P
Cronje, Nardus	Eskom Koeberg	P
Dubazana, Sibusiso	DMRE	P
Ellis, Frikkie	Eskom Koeberg	P
Featherstone, Keith	Eskom Koeberg	P
Flatela, Mvola	Eskom Koeberg	P
Freeman, Samuel	City of Cape Town - DRM	P
Joshua, Debbie	Eskom Koeberg	Apology
Khumalo, Jotham	City of Cape Town - DRM	Apology
Kline, Kim	Eskom Koeberg	P
La Grange, Smokie	Chairperson (Acting)	P
Mashele, Bravance	Eskom Koeberg	P
Minnie, Johan	City of Cape Town	P
Mollagee, Shafeeq	City of Cape Town	P
Motsumi, Teboho	DMRE	P
Munsami, Nicholas	Eskom Koeberg	P
Ntuli, Velaphi	Eskom Koeberg	P
Oaker, Bradley	Eskom Koeberg	P
Paul, Vernon	Eskom Koeberg	P
Phidza, Lewis	Eskom Koeberg	P
Pienaar, Shaun	Eskom Koeberg	P

Surname and Name	Organisation	Present
Silinga, Nangamso	National Nuclear Regulator	P
Stephanus, Aminah	Eskom Koeberg	P
Thauge, Phina	Eskom Koeberg	P
Thomas, Mandy	City of Cape Town	P
Valaitham, Mahesh	Eskom Koeberg	Apology
Van Schalkwyk, Tobie	Eskom Koeberg	P
Van Wyk, Jurgo	DWS	P
Venter, Emuel	Eskom Koeberg	P
Vrey, Marius	WCG Agriculture	P

DEFINITIONS			
Definition	Description	Definition	Description
Accident	An unintended event, including operating errors, equipment failures or other mishaps.	Disaster Management	A continuous and integrated multi-sectorial, multi-disciplinary process of planning and implementation of measures aimed at: a) Preventing or reducing the risk of disaster; b) Limiting the severity or consequences of disasters; c) Emergency preparedness; d) Responding rapidly and effectively to disaster; and Post-disaster recovery and rehabilitation
Emergency	An event that requires taking prompt action, or the special regulation of persons or property, to limit the risk to people's health, safety or welfare, or to limit damage to property or the environment.	Emergency Plan	A document describing the organisational structures, its roles and responsibilities, concept of operation, means and principles for intervention during an emergency at Koeberg.
Evacuation	The rapid, temporary removal of people from the area to avoid or reduce short-term radiation exposure in the event of an emergency.	Megawatts (MW)	A unit of measure - one megawatt is equal to one million watts.
Millisievert (mSv)	A measure of the absorption of ionising radiation by the human body.	National Electricity Grid	The network of high-voltage power lines fed by the various power stations, which supplies electricity to the country.
Outage	The maintenance period on a power plant when a number of activities are performed on equipment that keeps the plant running.	Public Notification	Notification to the public of an emergency and the appropriate protective actions to be taken by using the installed siren and loudspeaker system, as well as local authorities, local radio and television station.
Radiation	Energy released in the form of particles or electromagnetic waves during the breakdown of radioactive atoms.	Release	The controlled or accidental discharge of radioactive substances into the environment.
Sheltering	A protective action whereby members of the public stay indoors with windows and doors closed, to reduce their exposure to radioactive material in an emergency.		
ABBREVIATIONS			
Abbreviation	Description	Abbreviation	Description
AFI	Area for Improvement	AECC	Alternate Emergency Control Centre
CCGT	Closed Cycle Gas Turbines	CCT	City of Cape Town
CISF	Centralised Interim Storage Facility	CPA	Consumer Protection Act
CSB	Cask Storage Building	DOC	Disaster Operations Centre
ECC	Emergency Control Centre	EIA	Environmental Impact Assessment
EMP	Environmental Management Plan	EP	Emergency Plan

Abbreviation	Description	Abbreviation	Description
EPSOC	Emergency Planning Steering and Oversight Committee	EPZ	Emergency Planning Zone
FC	Functional Coordinator	FME	Foreign Material Exclusion
GCE	Group Chief Executive	IAEA	International Atomic Energy Agency
INPO	Institute of Nuclear Power Operations	IPP	Independent Power Producer
ISO	International Standards Organisation	KCWIB	Koeberg Cooling Water Intake Basin
KEP	Koeberg Emergency Procedure	KNEP	Koeberg Nuclear Emergency Plan
KNPS	Koeberg Nuclear Power Station	KPSIF	Koeberg Public Safety Information Forum
LTI	Lost Time Injury	LTO	Long Term Operation
NECSA	South African Nuclear Energy Corporation SOC Limited	NERSA	National Energy Regulator of South Africa
NNR	National Nuclear Regulator	NOSA	National Occupational Safety Association
NOSCAR	The grading of NOSA for safety performance.	NOU	Nuclear Operating Unit
NRWDI	National Radiation Waste Disposal Institute	NSRB	Nuclear Safety Review Board
OCA	Owner Controlled Area	OEM	Original Equipment Manufacturer
PAZ	Precautionary Action Zone	PSGM	Power Station General Manager
SABC	South African Broadcasting Corporation	SAMG	Severe Accident Management Guideline
SAPS	South African Police Service	SGR	Steam Generator Replacement
SHEQ	Safety Health Environment and Quality	SPF	Spent Fuel Pool
SSA	Sea Shore Act	TEM	Traffic Evacuation Model
TISF	Transient Interim Storage Facility	UPZ	Urgent Protective Action Planning Zone
WANO	World Association of Nuclear Operators		

1. WELCOME AND OPENING

Mr Phidza (Eskom KNPS) welcomed the attendees to the Koeberg Public Safety Information Forum (KPSIF). He informed the members that the KPSIF Chairperson and Deputy Chairperson are yet to be appointed. He therefore asked if there were any objections to Mrs Smokie La Grange chairing the Forum. In the absence of no objections lodged, the acting Chairperson opened the KPSIF. She made emphasis to the fact that 40 yrs. ago (to the day), on 14 March 1984, at 09:43, Unit 1 went critical.

The Chairperson informed the members that the MS Teams platform was not operational due to multiple undersea cable breaks, affecting internet connectivity throughout South Africa.

2. SAFETY BRIEFING

The safety briefing was conducted by Mr Phidza. Emphasis was made to the different types of alarms, the emergency exit points, and the assembly points. He appealed to the members to adhere to instructions in the event of an emergency.

3. ANNOUNCEMENT OF KPSIF CHAIRPERSON AND DEPUTY CHAIRPERSON

Mr Bester, Programme Manager: Nuclear Power Plants, of the National Nuclear Regulator (NNR), informed the members that the KPSIF Chairperson and Deputy Chairperson positions are yet to be finalised/appointed due to the poor nominee's response received. After readvertising the positions through various platforms, i.e., newspapers and emails, two nominations for the position of Chairperson were received, and none for Deputy Chairperson. Furthermore, Mr Bester stated that the two nominees received need to be submitted to the NNR Board in April 2024, for ratification. A status report to be provided at the next forum.

Mr Mayhew expressed his concern regarding the slow progress made by the NNR pertaining to the appointment of the Chairperson and Deputy Chairperson. Mr Bester responded that the NNR needs to follow due process, which unfortunately is a tedious process.

4. APOLOGIES

Apologies were recorded as aforementioned (refer to pages 1–2).

5. APPROVAL OF THE MINUTES (FORUM HELD OF 30 NOVEMBER 2023)

Mr Phidza apologised for the late dissemination of the Minutes for the KPSIF held on 30 November 2023. The Chairperson requested the members to forward their corrections of the Minutes *via* email. The members agreed that the Minutes will be approved at the next forum, scheduled to take place on 27 June 2024.

6. MATTERS ARISING FROM PREVIOUS MINUTES

6.1 Reopening of the Koeberg Nature Reserve

Mr Featherstone informed the members that Eskom is in the process of issuing a communiqué stating that the Koeberg Nature Reserve is open to the public. The public need to register for Owner Controlled Area (OCA) permits at the new Fitness for Duty (FFD) Centre. Mr Featherstone made emphasis to the fact that those who do not adhere to the rules, will be restricted from the reserve. Furthermore, Mr Featherstone stated that there were several reasons why the reserve was closed. Some of the reasons for the closure were communicated to the public, and some were not. He reiterated that, due to Koeberg Nature reserve being private property, Eskom reserves the right to admission to the public.

6.2 Clarification of the formal Emergency Planning Zone

Mr Bester stated that the clarification of the Formal Emergency Planning Zone is under discussion with the NNR Board. A progress report will be provided to the members at the next KPSIF.

7. PRESENTATIONS

7.1 Koeberg Quarterly Feedback

Mr van Schalkwyk conducted a presentation on the Koeberg quarterly feedback. Emphasis was made to the following:

a. Radiological Safety:

- Public dose

b. Analysis of Current Performance:

- Less than 1% of NNR public dose constraint of 0.25 mSv.
- Stable performance well below legal limit.
- Radioactive discharges less than 20% of limits
- No uncontrolled or unplanned radioactive discharges

c. Status Update

Koeberg Unit 1 - Plant Status:

- Synchronisation: 18 November 2023
- Days on-line: 122 Days
- Reactor Power: 100%Pn
- Megawatts: Generated: 973 Mwe; Sent-out: 933 MWe

Koeberg Unit 2 – Plant Status:

- Currently in Outage 226
- Outage Day: Outage Day 94 (13 March 2024)
- Current Plant State: Domain RCD (Reactor Completely Defueled)
- Nuclear Safety: No significant Nuclear Safety related events.
- Industrial Safety: No loss time injuries (LTI).
- Major Scope: Steam Generator Replacement (SGR); Maintenance on plant structures, systems and components (SSCs); Long-Term Operation (LTO) activities

d. Noteworthy events:**Full Volume Siren Test**

- A Full Volume Siren Test was conducted between 5 and 7 March 2024.
- All Public Notification System sirens were tested and individually observed.
- All Control Stations from which the sirens could be sounded were tested.
- Minor defects were detected and corrected (e.g., recordings not playing after the alarm tone).
- One siren (out of 82 sirens tested) did not sound during the test.
- A maintenance work-order have been raised and maintenance teams are currently working to restore the full volume functionality of the siren.
- A Public Notification for the defective siren location (Atlantis Sewerage Works) is currently covered by the City of Cape Town (CCT) manual notification process.

Unusual Event: Security Incident - 6 March 2024

- Koeberg Nuclear Power Station experienced a security incident on 6 March 2024.
- Security response measures were activated while a delivery vehicle was being inspected at Koeberg, prior to entry.
- South African Police Services (SAPS) and City of Cape Town Emergency Response were called to site as per security protocol.
- An Unusual Event, in accordance with the Koeberg Emergency Procedures, was declared.
- The threat was assessed, and the site declared safe.
- The Unusual Event was stood down.

Executive Visits: February – March 2024

- 6 February: Minister of Electricity: Dr Kgosientsho Ramokgopa; Generation Group Executive: Mr Bheki Nxumalo
- 16 February: Acting Group Chief Executive: Mr Calib Cassim; Generation Group Executive: Mr Bheki Nxumalo; Group Executive for Human Resources: Ms Elsie Pule
- 8 March: Eskom Group Chief Executive: Mr Dan Marokane and the National Nuclear Regulatory (NNR) Board

Concluding remarks:

- Koeberg Nuclear Power Station continues to operate safely and reliably
- The recent external reviews indicated that Koeberg's nuclear safety culture is healthy
- Koeberg priority focus areas: Outage 226 execution; The well-being of staff and contractors; Preparation for Long-Term Operation (LTO)

Question raised from the presentation:

Question 1:

Mr Mayhew asked what the time scale for putting Unit 2 back online is.

Response:

Mr Featherstone explained that Eskom has committed to the 30 September 2024.

7.1.1 Long Term Operation (update)

Mr Oaker (Eskom KNPS) conducted a presentation on the Koeberg containment integrity. Emphasis was made to the structural Integrity, i.e.,

a. Delamination

- The main function of the containment building is to contain the release of radioactive material in the unlikely event of a nuclear accident.
- Affected area – approximately 700m² per containment building (approximately 12% of containment building surface area)
- Repaired area – approximately 500m² per containment building (approximately 4% need to be repaired)

- Depth of concrete delamination approximately 80 mm (less than 10% of the 900 mm vertical wall thickness).
- Loss of reinforcement material thickness due to corrosion is rectified by adding additional reinforcement where necessary.
- Tendon ducts are generally in good condition and the tendons are unaffected.
- Delamination and repairs are expected to continue as part of normal business – i.e, ongoing maintenance.
- The repair specification is best in class as reported by international experts.
- Chloride levels in the concrete are monitored and visual inspections and surveys are conducted.

b. Crack in the containment dome

- Evaluated by a team of experts.
- Circumferential crack ~110mm long
- Both containment buildings affected
- Unaffected during pressure test (does not change or increase in size)
- No structural implication
- Koeberg is not unique – similar cracks reported at other plants.

c. The Koeberg Containment Buildings - post-tension structural integrity

- After the concrete is set, the tendons are tensioned to the design value.
- The tension in the tendons is monitored in a sample of tendons during the service life.
- The strain in the concrete is monitored.
- The strain measurements and the tension measurements provide evidence of structural integrity.
- When evaluated, the results indicate that the containment structure meets design requirements.
- When projected/extrapolated – it indicates that the design requirements are also met after 60 years of operation.

d. Concluding remarks

- The containment buildings are well-designed and robust.
- The dome crack has no impact on the structural integrity as determined by the analysis, behaviour under pressure, expert opinion and international operating experience.

- The delamination does not affect the structural integrity because it only affects about 10% of the thickness of the wall and the tension in the tendons is unaffected by the delamination.
- The evaluation of the strain trends and dynamometers (tension in tendons) indicates that the containment building remains within compression even when pressurised to design accident criteria.
- The function of the containment is unaffected because the leak-tightness of the containment building is ensured by the steel liner and not the concrete.
- The containment buildings are safe and structurally sound.
- The delamination of the containment buildings is managed. There are short, medium and long-term plans that are overseen by the NNR which ensure that the containment building remains safe and structurally sound.

Questions raised from the presentation:

Question 1:

Mr Mayhew enquired when looking for cracks and delamination, do you do x-rays to check if it is coming? What is going on the inside?

Response:

Mr Oaker responded that the problem is on the outside because the chlorides from the ocean enter from the outside and only get so far. The problem is not in the inside.

Response:

Mr Venter explained that Eskom does not use x-rays. But we have in the used radar in the past but generally not to detect chlorides. We use other detection methods to look at the cracks and delamination like visual and sound surveys.

Seismic Hazard Analysis Report

Mr Venter (Eskom KNPS) conducted a presentation on the Seismic Hazard Analysis. Emphasis was made to the following:

a. The key components that comprise a Seismic Hazard Analysis (SHA) are:

- Earthquake epicentre

- Path from epicentre to the site, and
- Site response due to the geological conditions directly beneath the site

b. Objective of the Senior Seismic Hazard Analysis Committee (SSHAC) process

- Ensure that the centre, body and range (CBR) of the problem is captured.

c. Koeberg Design and 2023 Senior Seismic Hazard Analysis Committee (SSHAC) Study Outcomes

- The plant design remains robust up to an earthquake of 0.5 PGA, as demonstrated by the Seismic Margin Assessment (SMA).

d. Conclusion

- The SSHAC has been completed and provides an excellent state-of-the-art assessment of the seismic situation at the Koeberg site.
- The LTO Seismic Margin Assessment (SMA) provides assurance that the Koeberg plant is robust against significant seismic events.
- The SSHAC does not invalidate the SMA evaluation performed for LTO, and this remains the seismic justification for the LTO safety case.
- All the known, unknown and postulated faults have been considered in the SSHAC study.

Questions raised from the presentation:

Question 1:

Mr Mayhew enquired who calculates if it does come back (return period), what will happen to Koeberg?

Response:

Mr Venter responded that for seismic return periods it is similar to 1 in 1,000s of years. We have very old rock (SA has some of the oldest bed rock in the world) and the bedrock is not active at Koeberg.

Question 2:

Mr Freeman enquired about earthquake of 0.5pga - compare i.t.o richter scale with magnitudes.

Response:

Mr Venter explained that Richter scale is not used anymore and is an old way of referring to earthquakes. We now use 'Moment magnitudes' and it measures the size of the actual break or slip in the soil. Pga is the vibration / force that you will feel during the shaking. And 0.5 pga is half of the earth's gravity but in a shaking acceleration horizontally. For example, standing straight is 1g of acceleration and a 0.5g pga is the horizontal acceleration. It's the physical acceleration that you will feel. In terms of moment magnitude, a 0.5 pga can be in the order of 6-7M.

Question 3:

Mr Mayhew enquired about what is the difference between the two detection tests (hazard analysis methodologies)?

Response:

Mr Venter explained that deterministic methods are looking at the measurements we have and using it to determine the wind we need to design to. This looks at the events that regularly happen.

Probabilistic methods are measuring the wind speed and calculating the probability of that wind speed being representative off all the other wind speeds which may affect the site. It uses a lot of measurements, data points, mathematics and tries to get the entire range of the uncertainty. This considers all credible accidents.

7.1.2 Development of the new Traffic Evacuation Model (TEM) for KNPS

Mr Mollagee (CCT–Transport Systems and Modelling Unit) conducted a presentation on the new Traffic Evacuation Model (TEM). Emphasis was made to the following:

a. New TEM overview brief

- The conditions outlined by the NNR, the City of Cape Town's objectives through this project are to develop a flexible, scalable, multimodal traffic simulation model that can be used to establish, confirm and refine previous estimates of evacuation times, expand the scope of the evacuation scenarios

and strategies to be considered and establish the current and future development horizons for the UPZ, given the legislated assessment criteria.

- Requirements for the model has been agreed between NNR, Eskom and CCT.

b. New TEM development

- Has been in development since late 2021. Currently a completed BASE model has been handed over and CCT staff have been capacitated. Model is currently in testing and maintenance. In this process, required changes have been identified. The model is currently being refined based on testing in preparation for operationalisation.
- Has not yet been operationalised i.e., currently in a testing and refinement phase.
- Capabilities (and departures from spreadsheet-based model)
- Incorporates over 850 transport analysis zones.
- Is fully parameterised. Any input parameters can be adjusted as necessary.
- Automatically calculates over 800 matrices during a full model run (approximately 35 mins per scenario run).
- Assignment follows a simulation-based procedure i.e., vehicle trajectories are explicitly calculated for the full analysis period.
- Allows for any evacuation sector to be individually evacuated and analysed.
- Consists of over 4000 links and almost 6500 nodes (intersections) of various classes and control schemas.
- Signal timing for all signalised intersections have been incorporated.
- Vehicle routing determined iteratively based on input and calculated volumes, optimised path search, minimum gaps, node impedance and car following model.
- CCT is currently in the process of fully incorporating the future road network in the model.
- Was also calibrated for travel time based on google maps travel times.
- The Google travel time information (on an individual link level) was obtained for weekdays for congested and uncongested conditions for the majority of the higher order routes.

c. The way forward

- Testing of the model via the application of model in parallel with the existing spreadsheet-based model (a number of developments for parallel testing have been identified).
- Further refinement of future transport infrastructure.
- Addition of certain individual developments (with latent rights).
- Aligning internal committees and processes.
- Re-establish consultation with key stakeholders (NNR, Eskom, CCT sister departments).
- Current TEM Development contract closes July 2024.

Questions raised from the presentation:

Question 1:

Mr Mayhew question related to the fact that the model refers to figures and calculations which is not practical in the real world as in the real world we have to deal with people and their different attitudes and whether this has been factored into the TEM.

Response:

Mr Mollagee informed the member that it has not been considered, but such scenarios can easily be incorporated into the new TEM.

It was concluded that a presentation be conducted on the new TEM (incl. people and their different attitudes) once it has been approved.

7.1.3 Potassium Iodate (including pre-distribution strategy)

The presentation pertaining to potassium iodate was not conducted. It was agreed that the City of Cape Town will conduct the presentation at the next Forum.

8. GENERAL

8.1 2024 Koeberg EP Calendar

Mr Mayhew stated that he received four Koeberg EP Calendars in his mailbox. The Chairperson responded that it was the duty of the Contractor to deliver the Calendars.

9. DATE OF THE NEXT KPSIF

The next Public Safety Information Forum is scheduled to take place on *Thursday, 27 June 2024, at Koeberg Nuclear Power Station (Visitors Centre).*

10. AGENDA ITEMS FOR THE NEXT KPSIF

It was concluded that the following items will be discussed at the next KPSIF:

- *Appointment of Chairperson (NNR)*
- *Koeberg Quarterly Feedback (Eskom)*
- *Koeberg Long Term Operation (Eskom)*
- *Potassium Iodate tablets (incl. pre-distribution strategy)*

11. CLOSING

The acting Chairperson thanked the attendees for their contribution and adjourned the meeting at 20:32.

KPSIF Action item list – 30 November 2023

No.	Action	Raised by	Comment	Status
1.	Re-opening of the Koeberg Nature Reserve.	Mr Naylor	Koeberg Nature Reserve is opened to the public.	Closed

KPSIF Action item list – 14 March 2024

No.	Action	Raised by	Comment	Status
1.	Clarify the formal Emergency Planning Zone.	Mr Becker	The Formal Emergency Planning Zone was under discussion with the NNR Board.	To be clarified in the June 2024 KPSIF.
2.	Conduct a presentation on new TEM once it has been approved.	Mr Mayhew	Include people and their different attitudes	Date to be confirmed.

SMOKIE LA GRANGE
Chairperson (Acting)

27 June 2024
Date