

Koeberg Public Safety Information Forum (KPSIF) Minutes of the meeting held on Thursday, 30 March 2023

Venue: Koeberg Visitors Centre (in-person)

Chairperson: Ms Smokie La Grange

Deputy Chairperson: Cyril Mack

Name and Surname	Organisation	Present
Abraham, Tony	Resident	P
Barry, Austin	Resident	P
Becker, Peter	Koeberg Alert Alliance	P
Beyl, Trudy	Resident	Apologies
Booyesen, Jeffry	Resident	P
Browne, Peter	Resident	P
Davidson, Donald	Resident	P
De Roy, John	Resident	Apologies
Du Plessis, Austin	Cycling South Africa	P
Estherhuyse, Freda	Resident	P
Gorgens, Deon	Resident	P
Goss, Clive	Resident	Apologies
Goss, Marga	Resident	Apologies
Harrison, Douglas	Resident	Apologies
Iosiphakis, John	Resident	A
Jones, John and Anneke	Resident	Apologies
Karsten, Timothy	Resident	P
La Grange, Duval	Resident	Apologies
Le Roux, Adrian	Resident	P
Lee, Nick	Resident	P
Lee, Anne	Resident	Apologies
Malgas, Heinrich	Resident	P
Mayhew, Robert	Resident	P
Mayhew, Sylvia	Resident	P
Mayers, Dr Nadine	Resident	P
Mayers, Paul	Resident	P
McDaid, Liz	Resident	A
McKinnel, Jenny	Resident	Apologies
Mutangadura, Tapiwa	Resident	P
Naylor, Paul	Resident	Apologies
Naidoo Andre	Resident	P
Nel, Andrea	Resident	P
Pannaye, Eric	Resident	Apologies
Petersen, Lydia	Resident	P
Dr Reutener, Marcelle	Resident	P
Scott, Peter	Resident	Apologies
Slabbert, Johan	Resident	P
Swart, Francois	Resident	P
Terblanche, Jurgen	Resident	P
Van Tonder, Willem	Resident	P
van Tonder, Ezé	Resident	P
van Rensburg, Ryno	Resident	P
Van Rensburg, Wilhemina, Cornelia	Resident	P
Wotherspoon, Bruce	Resident	P

OFFICIALS		
Bester, Peter	National Nuclear Regulator	P
Bele, Joyce	Eskom Koeberg	P
Bruiners, Rodger	National Nuclear Regulator	A
Coetzee, Ubert	National Nuclear Regulator	A
Cronje, Nardus	Eskom Koeberg	Apologies
Ditlhake, Kentse	Eskom Koeberg	A
Ellis, Frikkie	Eskom Koeberg	Apologies
Featherstone, Keith	Eskom Koeberg	P
Flatela, Mvola	Eskom Koeberg	P
Franco, Johannes	City of Cape Town	P
Jeannes, Deon	Eskom Koeberg	P
Joshua, Debbie	Eskom Koeberg	P
Julius, Graham	Eskom Koeberg	A
Kana, Thando	Eskom Koeberg	P
La Grange, Smokie	Chairperson	P
Lenders, Ricky	City of Cape Town – Disaster Risk Management	A
Le Roux, Jurina	Eskom Koeberg	P
Mack, Cyril	PSIF Deputy Chairperson	Apologies
Mashele, Bravance	Eskom Koeberg	Apologies
Maree, Marc	Eskom Koeberg	Apologies
Maree, Vanessa	National Nuclear Regulator	A
Meyer, Fifi	Eskom Koeberg	P
Minnie, Johan	City of Cape Town	P
Moonsamy, Gino	National Nuclear Regulator	Apologies
Ntutha, Ntsiki	City of Cape Town	A
Ncuru, Anele	Eskom Koeberg	P
Paul, Vernon	Eskom Koeberg	P
Phidza, Lewis	Eskom Koeberg	P
Powell, Charlotte	City of Cape Town	A
Ramerafe, Mothusi	National Nuclear Regulator	Apologies
Silinga, Nangamso	National Nuclear Regulator	P
Stephanus, Aminah	Eskom Koeberg	A
Swart, Paul Cllr	Ward Counsellor (DA)	Apologies
Touffie, Sadika	Eskom Koeberg	A
Thomas, Mandy	City of Cape Town	P
Van Rensburg, Stephen	City of Cape Town	Apologies
Van Schalkwyk, Tobie	Eskom Koeberg	P
Valaitham, Mahesh	Eskom Koeberg	Apologies

Abbreviation/definition list			
Abbreviation	Description	Abbreviation	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: <ul style="list-style-type: none"> 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 e) Post-disaster recovery and rehabilitation
AFI	Area for Improvement – usually the outcome of a benchmarking exercise, which enables the identification of successful practices/strategies implemented by other organisations in the same or similar industry,	GCE	Group Chief Executive
Boron	A very hard, almost colourless crystalline metalloid element that in impure form exists as a brown amorphous powder. It occurs principally in borax and is used in hardening steel. The naturally occurring isotope boron-10 is used in nuclear control rods and neutron detection instruments.	ECC	Emergency Control Centre
CIA	Central Intelligence Agency	KNEP	Koeberg Nuclear Emergency Plan
Donax	A genus of small, edible saltwater clams, marine bivalve molluscs. The genus is sometimes known as bean clams or wedge shells or white mussels; Donax species have numerous different common names in different parts of the world.	CISF	Centralised Interim Storage Facility
CISF	Centralised Interim Storage Facility	SPF	Spent Fuel Pool
CSB	Cask Storage Building	TEM	Traffic Evacuation Model
DOC	Disaster Operations Centre	Evacuation	The rapid, temporary removal of people from the area to avoid or reduce short-term radiation exposure in the event of an emergency.
ECC	Emergency Control Centre	UAE	United Arab Emirates
EIA	Environmental Impact Assessment	INPO	Institute of Nuclear Power Operations
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.	UPZ	Urgent Protective Action Zone
EPZ	Emergency Planning Zone	EPSOC	Emergency Planning Steering and Oversight Committee
FC	Functional Coordinator	CPA	Consumer Protection Act
IPP	Independent Power Producer	KEP	Koeberg Emergency Procedure

		mSv	The millisievert (mSv) is a measure of the absorption of ionising radiation by the human body.
ISO	International Standards Organisation	CCT	City of Cape Town
KNPS	Koeberg Nuclear Power Station	IAEA	International Atomic Energy Agency
NOU	Nuclear Operating Unit	SABC	South African Broadcasting Corporation
SGR	Steam Generator Replacement	TISF	Transient Interim Storage Facility
KPSIF	Koeberg Public Safety Information Forum	WANO	World Association of Nuclear Operators
LTI	Lost Time Injury	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.
MW	Megawatts. A unit of measure - one megawatt is equal to one million watts.	CCGT	Closed Cycle Gas Turbines
NECSA	South African Nuclear Energy Corporation SOC Limited	DOC	Disaster Operations Centre
NNR	National Nuclear Regulator	NOSCAR	The grading of NOSA for safety performance.
NOSA	National Occupational Safety Association	Radiation	Energy released in the form of particles or electromagnetic waves during the breakdown of radioactive atoms.
NSRB	Nuclear Safety Review Board	NRWDI	National Radiation Waste Disposal Institute
OCA	Owner Controlled Area	AECC	Alternate Emergency Control Centre
OEM	Original Equipment Manufacturer	FME	Foreign Material Exclusion
Outage	Refers to the maintenance period on a power plant when a number of activities are performed on equipment that keeps the plant running.	National Electricity Grid	The network of high-voltage power lines fed by the various power stations, which supplies electricity to the country.
PAZ	Precautionary Action Zone	EP	Emergency Plan
PSM	Power Station Manager	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 situation.
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.	EMP	Environmental Management Plan
Release	The controlled or accidental discharge of radioactive substances into the environment.	UPZ	Urgent Protective Action Planning Zone
SAPS	South African Police Service	KCWIB	Koeberg Cooling Water Intake Basin
SHEQ	Safety Health Environment and Quality	WAC	Waste Acceptance Criteria
SSA	Sea Shore Act	SAMG	Severe Accident Management Guideline
TEM	Traffic Evacuation Model	NERSA	National Energy Regulator of South Africa
UAG	Unplanned Automatic Grid Separation	Hazmat	Hazardous material

1. Welcome

The Chairperson, Ms Smokie La Grange, welcomed everyone to the March 2023 Public Safety Information Forum (PSIF) meeting.

2. Safety briefing

Ms Fifi Meyer, Head of the Koeberg Visitors Centre did the safety briefing informing the PSIF members of the safety protocols for the Visitors Centre including the alarms. She indicated where the emergency exit points and assembly points are and cautioned everyone to use the rails when ascending or ascending the stairs.

3. MS Teams meeting protocol and PSIF Code of Conduct

The chairperson took the members through the PSIF protocol and PSIF Code of Conduct. She informed the meetings are recorded for reference and minute-taking purposes. She informed members to raise their hands if they have any questions and state their name for the record. She also asked members to put their cellphones on silent and also reminded attendees that no eating or drinking allowed in the Auditorium.

Ms La Grange clarified a question posed to her earlier about the taking of photographs. She indicated that there is a Koeberg authorised photographer who will be taking photos of the meeting and that no other person of the public are allowed to take photos.

4. Apologies

The following apologies were tendered

- Mr Renier Smith
- Mr Peter Scott
- Mr and Ms Ank and John Jones
- Ms Jenny Mckinnel
- Mr Gino Moonsamy
- Ms Anne Lee
- Ms Bravance Mashele
- Cllr Paul Swart
- Mr Douglas Harrison
- Mr Paul Naylor
- Mr Mahesh Valaitham

5. Acceptance of the Minutes of the previous meeting of 1 December 2022

- Two x Ps on page 8 on the eight paragraph - should be one P
- Comache Peak to be corrected on page 10 – should be Comanche Peak

The Chairperson requested that the abbreviation KPSIF (and not PSIF) be used throughout all future the Minutes to indicate that it is the Koeberg Public Safety Information Forum.

Minutes approved by Mr Mayhew and seconded by Mr Lee.

Comment by Ms Petersen

Ms Petersen questioned the lateness of the Minutes and enquired whether it is a norm for the Minutes to be this late as she only received her Minutes two weeks before the meeting.

Response by the Chairperson

The Chairperson explained that the Minutes has to be checked by various managers before it is released to the members, which takes time. She also confirmed that it is released in line with the expectations of the PSIF Constitution.

Question by the Deputy Chair

The Deputy Chair requested that for the clarity of all in attendance that it be confirmed by when the Minutes are to be released, according to the KPSIF Constitution, in case the question arises again.

Response by Mr Phidza

Mr Phidza confirmed that as per the KPSIF Constitution, the Minutes are to be released before the next meeting as it will be ratified in the meeting.

5.1 Action list review – 30 March 2023 (see updated Action Item list at end of Agenda) - Lewis**Action item 1: Frequency and duration of the PSIF meetings**

Item to be closed – it was dealt with in the December 2022 KPSIF.

Action item 2: Opening of the Nature Reserve (Keith Featherstone)

Mr Featherstone confirmed that all the work done by the City of Cape Town has been concluded and that the roads have been repaired but due to operational challenges and until the issue with the security of the power station has been resolved, the reserve will remain closed.

Action item 3: Hybrid KPSIF

Mr Harrison proposed that a hybrid solution be considered for future KPSIF meetings. Mr Phidza explained that due to that all that is involved in having the KPSIF operate on hybrid model, this will have to be discussed with their IT Department and other relevant roleplayers. Feedback will be provided at the next KPSIF meeting in June 2023.

6. Presentations:**6.1. Koeberg quarterly feedback - Mr Mahesh Valaitham, Koeberg Power Station General Manager (Acting)****Summary of presentation:**

Mr Valaitham's presentation covered the following topics:

- Radiological Safety
- A status update on Koeberg's Performance (Plant Status and Industrial Safety)
- Outage 126 Overview and Steam Generator Replacement Update

- Noteworthy Events
- Minister of Electricity's Visit
- Concluding Remarks

Radiological Safety:

Impact of Koeberg on public and environment for radioactive effluent discharges (Jan to Dec 2022)

- Radiological environmental survey shows only trace levels of radioactivity attributed to KNPS
 - No radioactivity from Koeberg Nuclear Power Station > 1% of reportable levels found in the environment

Analysis of environmental survey programme shows the following:

Confirms that the impact on the environment of the KNPS effluent discharges remains minimal and below limits

A status update on Koeberg's Performance (Plant Status and Industrial Safety)

Plant Status:

Unit 1: On outage (Outage 126)

Unit 2: Online for 38 days

Safety System

performance: **Safety System availability:**

- February 2023: Satisfactory performance for High Head Safety Injection, Auxiliary Feedwater system and Emergency Diesels

Chemistry

performance: **Chemistry Performance Index:**

Target : < 1.01 (for February 2023)

- **Unit 1:** The monthly CPI for unit 1 had been 1.00.
- **Unit 2:** The monthly CPI for Unit 2 remained at 1.00.

Industrial Safety Performance

Current Status

- The current combined Lost Time Injury Rate (LTIR): 0.19 and is below the target of 0.30

Recovery actions:

- Workstops and engagements have been held with the Plant teams to analyze the root causes for the incidents and to address this trend.
- Increased focused observations and walkdowns together with additional oversight have been implemented, especially for "line-of-fire" conditions or acts.
- Pre-job briefs and preparation walkdowns to identify hazards and to ensure staff are fit for duty.

Noteworthy events

Minister of Electricity Visit

- On Friday, 24 March 2023, the Electricity Minister, the Honourable Dr Kgosiensho Ramokgopa, the Eskom Board, the Department of Public Enterprises and Eskom Executive Committee (EXCO) members visited the Koeberg Nuclear Operating unit. He engaged with senior management, labour unions and staff. The Minister of Electricity is leading an eight-day

assessment tour to several power stations across the country and committed to working closely with the Eskom Board members, senior managers, technicians and organised labour formations to end loadshedding.

Concluding Remarks:

- Koeberg continues to operate safely and reliably.
- Koeberg is currently busy with Outage 126 execution and Outage 226 preparation
- As part of Plant Availability, **Outage performance** remains a priority **focus area**. Additional outage oversight meetings have been established to drive the required progress / productivity.
- Specific interventions have been implemented to reduce industrial safety incidents and to prioritise the well-being of staff and contractors.

Question by Mr Mayhew

Mr Mayhew had three questions he posed. The first question was whether the process of replacing the Steam Generators is getting easier after already having replaced the first two steam generators and Koeberg being in the process of replacing the third one. The second question he posed was whether the welding of the water pipes is done by a person or a machine and whether x-rayed. The third question related to the defective electronic card on the turbine protection system that caused the trip, he queried why there wasn't a back-up system that could override it.

Response by Mr Valaitham

Mr Valaitham informed Mr Mayhew that the process of replacing the Steam Generator (SG) them being in the process of replacing the third SG, is getting easier. He confirmed that the welding of the water pipes is done by a machine and all welds will be X-rayed. Mr Mahesh confirmed that it was two cards that failed, the card that was installed to take over the services, appeared to be faulty and the card that they installed also failed which allowed them to trip the turbine.

Question by Mr Gorgens

Mr Gorgens confirmed that as per the presentation five weeks of 35 weeks has been lost in the Outage. He enquired about the plans that have been put in place to recover the time lost.

Response by Mr Valaitham

Mr Valaitham explained that the learnings that they have gained from Steam Generator 1 and 2 they are utilising in the replacement of Steam Generator 3 and that they are also engaging on an executive level to ensure that the learnings are entrenched in the plans going forward and to ensure that it is realised. They are also doing the maintenance work that usually takes place after the Steam Generator replacement, in parallel with the Steam Generator Replacement scope of work to make up for the time lost and limit the maintenance window after the Steam Generator Replacement work has been concluded.

Question by Mr Becker

Mr Becker enquired whether the presentation can be distributed to the members after the meeting.

Response by Mr Phidza

Mr Phidza explained that the organisation has decided to not distribute the presentations as context and content is lost without a proper explanation, which attending the KPSIF affords.

Question by Mr Becker

Mr Becker felt that since the Koeberg Public Safety Information Forum is a public meeting, the information shared should be available to the public. He asked Mr Phidza to clarify which organisation (that decided not to distribute the presentations) he was referring to.

Response by Mr Phidza

Mr Phidza explained that the organisation he referred to is Eskom as per the NNR guidelines.

Question by Mr Mayers

Mr Mayers enquired about the faulty card that was sent away, he asked whether the procedure had to be redone or whether they had a back-up card.

Response by Mr Valaitham

Mr Valaitham explained that the maintenance team continued with the activity, they recognised that the card was faulty, they replaced the card, requalified the system, after which the system was working well. Whilst continuing with the work they were informed by the Operators that the turbine had tripped.

Question by Ms Mayers

Ms Meyer enquired about the nature and severity of the accidents of the five people.

Response by Mr Valaitham

Mr Valaitham explained that none of the incidents were life threatening or entailed the loss of limbs, and that all the individuals are doing well, for which he is grateful. He however explained that even though it wasn't life threatening or despite no limbs being lost, it could have been worse.

6.2 Koeberg Nuclear Power Station Solid Radioactive Waste Management update by Mr Tertius Karsten - Radiation Protection Manager

Summary of presentation:

Presentation covered the following topics:

- Radwaste definition
- Radwaste cycle
- Low and Intermediate Level Waste at Koeberg
- Used fuel
- Radwaste from large component replacement
- Concluding Remarks

Radwaste defined

Radwaste is material that contains or is contaminated with radionuclides at concentrations or activities greater than clearance levels as established by the regulatory body, and for which no use is foreseen.

Classification of Radwaste

High level waste (HLW)

Heat generating radioactive waste with high long and short-lived radionuclide concentrations.

Low or intermediate level waste (LILW-LL)

Low or intermediate short-lived radionuclide and intermediate long-lived radionuclide concentrations (>31 years).

LILW-SL

Low or intermediate short-lived radionuclide and / or low long-lived radionuclide concentrations.

Radwaste cycle

[Radioactive Waste Management Policy and Strategy for the Republic of South Africa 2005 | South African Government \(www.gov.za\)](#)

refer to page 25 for the cycle

Transport:**Requirements:**

International Atomic Energy Agency (IAEA) transport regulations

Method:

- Trailers with hold down system
- Escort
- Trained and qualified driver
- Specific route
- Monitored by Koeberg
- Emergency response
- 5 concrete drums or 88 steel drums per load

Disposal:**Site considerations**

- Population density
- Mineral potential
- Seismic stability
- Agricultural development
- Rainfall and groundwater recharge
- Ecological and environmental considerations
- Industrial growth
- Political stability

Requirements

- Waste Acceptance Criteria based on Vaalputs Safety Analysis and Post Closure Radiological Safety Assessment

Method

- Shallow Land Disposal
- Near Surface Trenches

Used fuel**Classification**

- High Level Waste ONLY once classified as waste (no use is foreseen)

Current strategy

- Stored under water on site until decay heat reduced

Interim storage

- Dry storage on site in casks

Future

- Economic viability of reprocessing
- Research options
- Central Interim Storage Facility (operated by the National Radioactive Waste Disposal Institute, NRWDI, target completion by 2030)
- Deep geological disposal

World practise:

Reprocessing

- France, Russia, India

Disposal at repository

- Belgium, Finland, Germany, UK, USA

Planning phase

- China (own reprocessing)
- Japan (own reprocessing, currently done elsewhere)
- Canada (direct disposal at repository)

From IAEA report NW-T-1.14, 2022

Future

- Partitioning and Transmutation of by-products (USA)

Radwaste from large component replacement

Classification

- Low and Intermediate Level Waste Short-Lived

Current strategy

- Seal Original Steam Generator (OSG) and storage on site (Original Steam Generator Interim Storage Facility - OSGISF)

Medium term

- Finalise waste management plan for National Committee on Radioactive Waste Management (NCRWM) approval by 2027

Future

- Disposal at Vaalputs by 2030

Refueling water storage (PTR) tanks

Classification

- Cleared waste
- Welds: Low and Intermediate Level Waste Short-Lived

Current strategy

- Interim storage outside LLW building

Short term

- Decontaminate
- Clearance of plates (regulatory approval)
- Weld edges enter standard radwaste processing stream (dry miscellaneous non-compactible waste)

Future

- Re-use plates (scrapped) after clearance
- Disposal of radwaste at Vaalputs

Reactor heads

Classification

- Low and Intermediate Level Waste Short-Lived

Current strategy

- Interim storage on site (inside LLW building)

Medium term

- Finalise waste management plan for National Committee on Radioactive Waste Management (NCRWM) approval by 2025

Future

- Disposal at Vaalputs by 2027

Concluding remarks

Radwaste management needs continued attention to ensure sustainable environmental, public and worker safety

Question by Mr Mayhew

Mr Mayhew asked two questions. The first question was what the half-lives are of the steam generators that were removed, and the second question was what the progress is in getting rid of the spent fuel rods, specifically related to time scales.

Response by Mr Karsten

Mr Karsten informed Mr Mayhew that the steam generators will last forever due to the thickness of the steel, but the half-life of the nuclides inside of the steam generators is five years - Cobalt 60 will decay every five years to half its activity. He further explained that after 30 years there will be almost no radioactivity left, although they will still dispose of the steam generators in a safe manner. He explained that pertaining to the storage of the fuel, the Interim storage of the fuel will be on the Koeberg site. He further explained that by 2030 the National Radioactive Waste Disposal Institute (NWRDI) would have finished the construction of the Central Interim Storage Facility (CISF) where the fuel would then be moved to.

Comment by Mr Featherstone

Mr Featherstone reminded those who participated in the Temporary Interim Storage Facility (TISF) Environmental Impact Assessment (EIA) that it was done in a modular fashion demonstrating that there will be sufficient space to store the fuel on the Koeberg site for up to 60 years of operation.

Question by Ms Mayers

Ms Mayers referred to the comment made by Mr Karsten in his presentation, that Koeberg wasn't eligible for the new reprocessed fuel technology and that in the future of refuelling and reprocessing of fuel whether that technology will be able to be used

by Koeberg, or whether there are certain technologies and certain types of plants that do not allow for that type of technology.

Response by Mr Karsten

Mr Karsten explained that Koeberg is a light water pressurised water reactor, so they use a specific type of water (you get different types of water). Koeberg uses a specific neutron-fission process which involves the use of slow neutrons. He explained that you get different types of reactors such as fast neutron reactors, breeder reactors, Magnox reactors and you get Candu type of reactors using different types of fuel. The majority of reactors around the world use the French design like Koeberg. He explained that a significant type of modification is required to burn that type of reprocessed fuel, which goes through a different type of reactor.

Question by Mr Wotherspoon

Mr Wotherspoon enquired about the laundry water that is used to wash the clothing used in the power station.

Response by Mr Karsten

Mr Karsten explained that that they have two types of laundries at Koeberg. The cold laundry is applicable to the clothing used in non-contaminated areas. The clothing is monitored to ensure it is free of contamination and then it is washed in the cold laundry for hygiene purpose. The water is discharged into the sewerage treatment plant and released in Melkbosstrand sewage works, where they are constantly monitored for radioactivity. He explained that to date no increase in radioactivity has been detected, but rather a decrease in radioactivity has been noted. They also monitor the water that is discharged, and it is accounted for in their effluent model. The clothing that is contaminated is also monitored. If it's too high to be washed due to the limits imposed, its disposed of as radioactive waste. The clothing that is low in activity, goes through the hot laundry and the wash water goes into the liquid treatment tanks and the liquid is treated, it either goes through the evaporators or the resin and filters and cleaned and discharged into the ocean after being monitored for radioactivity. The highly radioactive water that is retained, goes into the waste.

Question by Ms Petersen

Ms Petersen enquired about the lifespan of the concrete casks. She also enquired about the research options for spent fuel that Mr Karsten mentioned in his presentation, and if not reprocessing, what are the options he was referring to. She mentioned that they are receiving conflicting reports that the CISF is meant for Vaalputs, she enquired whether this is the case and whether there is a licence for the site/spent fuel.

Response by Mr Karsten

Mr Karsten responded to the first question of the lifespan of the concrete casks, that they do models with the concrete and perform a chloride ingress into the concrete until it reaches the rebar which indicates that the concrete drum is not able to fulfil its containment function, which is typically in the region of 100 years. The second question related to research options which he responded that besides reprocessing there is also deep geological disposal, however there is currently uncertainty as to what these deep geological sites will look like in South Africa. There is some research being done, however not at a large scale. With regards to the CISF, Mr Karsten explained that it is his understanding is that although its not licensed yet, it will be licensed. He also confirmed that in his understanding the CISF will be at a Necsa facility – he confirmed that he can confirm and revert back to the member. Currently the Vaalputs site has been identified for the Interim storage.

Question by Mr Becker

Mr Becker's concern was that in his understanding that with regards to reprocessing internationally his understanding is that there is the threat of weapon proliferation and whether Mr Karsten can confirm this, and he can confirm whether reprocessing is thus not a likely option in the light of this. Mr Becker enquired about the Molton Salt reactors in Europe that will consume/reprocess the waste and how many of these reactors are operational at the moment. He also enquired about the 5mg of Cobalt isotopes in the cooling water and that there's a lot in the spent fuel. Mr Becker enquired how many kilogrammes of spent fuel there was at Koeberg.

Response by Mr Karsten

Mr Karsten explained that the world is looking at implementing Molton Salt reactors and that it's an advance stage. He further explained that there are companies in the Netherlands that are working on the Molton Salt reactor technology. So, it's not operational yet, but they are looking at the next 10 years for it to be operational. He confirmed that there were Molton Salt reactors operating in the 1960s and that they are revisiting the technology at this stage. Mr Karsten explained that according to the IAEA document reprocessing is still taking place and he mentioned that in La Hague in France they are doing reprocessing. He explained that he is not the expert on nuclear fuel, but he confirmed that they produce about 20 tonnes of spent fuel per reactor per year which translates to approximately 50 fuel elements per cycle.

Question by Mr Gorgons

Mr Gorgons enquired and sought confirmation as to whether the radiation levels outside the steam generator 'sheds' are really so low that it is safe to eat sandwiches there – as was mentioned by Mr Karsten. He also enquired whether the subsistence farmers at Vaalputs where the waste is stored, are safe and that there's no harm of contamination to them.

Response by Mr Karsten

Mr Karsten response to the first question and confirmed that the radiation levels are low enough that you can eat your sandwiches next to the building and he also confirmed that there's no harm to the farmers at Vaalputs. He explained that measurements are taken at the top of the soil that covers the drums, dose rate measurements are taken at the top of those trenches and there's no changes whether there's a trench on no trench. He explained that the radioactivity is kept in trenches at about 8 metres and the water table is at 60 metres. He further explained that estimations are that it will take about 10 000 years for the radioactivity to reach the water table, according to the current shallow trenches design and model.

Question by Mr Mack

Mr Mack wanted to know whether the public is really safe with the high-level waste (spent fuel), which is the biggest balance of the waste being stored Koeberg and the Low and intermediate level waste is stored at Vaalputs. He wanted to know how long it will be before Koeberg runs out of space and whether the risk have been calculated and taken into account. He expressed discomfort in that Koeberg is safe and that there is enough space and that the building plans are underway and on target.

Response by Mr Karsten

Mr Karsten explained that they refer to it as a probabilistic risk analysis where they review all the possible events that can happen and do risk analysis and identify the baseline risk and the risk involved in building facilities to host the spent fuel and whether there is an increase in the baseline risk and how it compares to the norms

worldwide. He further explained that the licencing process is well underway for the interim storage facility, and we have storage space for the next two cycles. There is no notable increase in the baseline risk due to the storage of spent fuel on site.

Question by Ms Petersen

Ms Petersen enquired about the amount of waste (spent fuel) that is currently stored at Koeberg by volume.

Response by Mr Featherstone

Mr Featherstone responded that the answer (actual numbers) to Ms Petersen's question will be included in the Minutes.

Answer to Ms Petersen's question

The total volume of radiative waste in storage at Koeberg (as at 30 April 2023):

Low and Intermediate Level Waste:

1089 m3 stored inside concrete and steel drums (3677 m3 volume including packaging).

Used Fuel:

197 m3 (volume of fuel pins) held in 2729 used fuel assemblies.

Three x original (old) steam generators approximately 780 m3 (total)

Two x Reactor Pressure Vessel Head (RPV heads) = approximately 36m3

Please note that the volume of waste stored in concrete and steel drums does vary from time to time, depending on shipments made to Vaalputs.

6.3 National Nuclear Regulator Emergency Exercise feedback by Mr Reuben Makgae - Manager: Emergency Preparedness and Response

Summary of 2022 Regulatory Emergency Exercise at Koeberg Nuclear Power Station

Introduction:

- In terms of section 5 (f) of the NNR Act (Act No. 47 of 1999), the NNR is required to ensure that provisions for nuclear emergency planning are in place.
- Section 38 of the NNR Act makes provision for the NNR to ensure that the relevant holder of a nuclear authorisation has an emergency plan in place that is effective for the protection of people and the environment in the event of a nuclear accident.
- To discharge the mandate, the NNR:
 - conducts large-scale nuclear emergency exercises (18 to 24 months);
 - conducted the 2022 regulatory emergency exercise on 04 November 2022.
- Following the exercise, a report on the outcome was issued to Eskom.

Exercise Specific Objectives

- The overall objective of the exercise was to evaluate the readiness of KNPS together with the local authorities to respond to a nuclear or radiological emergency.
- The specific objectives were set as follows:
 1. Notification and activation of the Emergency Control Centre (ECC).
 2. Communication between the ECC, Disaster Operations Centre (DOC), intervening organisations and communication equipment;
 3. Implementation of both on-site (limited) and off-site protective actions;
 4. Protection of emergency workers, including suitable radiation monitoring equipment, PPE, etc.
 5. Operation and capabilities of the Mass Care Centre (MCC); and
 6. Arrangements (reception and treatment) for injured and contaminated patients at Tygerberg Hospital.

Exercise scenario and response monitoring areas

- The NNR prepared a simulated scenario in line with the overall and specific objectives of the exercise and a full response to the scenario evolution was required from KNPS in accordance with response procedures.
- The exercise evaluated limited on-site response activities with the main focus placed on off-site response activities.
- The exercise scenario consisted of a simulated Large Break Loss of Coolant Accident (LOCA) on Unit 1, and a subsequent failure of the 3rd barrier (containment) resulting in a release to the environment through the containment.
- The release affected the public domain and required the declaration of a General Emergency with the need to evacuate up to 5 km (PAZ) in the downwind sector.
- Tygerberg's response was triggered by a simulation of an injured and contaminated patient on the Koeberg site.
- It was required for the patient to be transferred to the Koeberg Medical Centre and subsequently to the Tygerberg Hospital for further assessment and treatment.

NNR Umpires monitored responses at the following areas:

- Emergency Control Centre (ECC).
- Field Survey Vehicles (Kilo Mobile 1 and 2).
- Koeberg Medical Station and Tygerberg Hospital.
- Disaster Operations Centre (DOC).
- Media Centre in Bellville.
- Roadblock and sub-zone.
- Mass Care Centre.

Exercise Findings

Findings are classified as non-compliances and observations

- Non-compliance means non-adherence to applicable emergency procedures

- Observation means response is not contravening the emergency procedure(s) but addressing the issue is recommended as it may improve the emergency plan and/or procedure(s)
- 14 non-compliances and 22 observations were identified

Summary of the exercise outcome

- Notification and activation of on-site emergency functionalities by the ECC such as ECC responders and radiological monitoring teams, was found to be adequate.
- Communication between the DOC and intervening organisations on the ground was observed to be acceptable, as was communication between the Field Team Leader in the ECC and the field teams
- Overall, the communication equipment was found to be effective, however, areas of improvement were identified regarding general communication between the DOC and holding point, and the use of some communication equipment.
- On-site and off-site protective actions including sheltering, evacuation, food ban and issuing of KIO3 were successfully implemented during the exercise. Overall, implementation of protective actions was considered acceptable.
- Protection of emergency workers was implemented in certain response areas and responders were wearing PPE, and in possession of suitable radiation monitoring equipment. However, the overall protection of emergency workers was not acceptable as it was lacking in crucial response areas, such as, field teams remaining longer in the plume, some nurses not wearing masks, etc. Thus, areas of improvement were identified and need to be addressed.
- The setting up of the Mass Care Centre was delayed but upon completion it was adequate with necessary facilities in place. However, the overall performance of the MCC was not acceptable. Areas of improvement such as delays in setting up, control and coordination of the centre, and containment of wastewater were identified.
- The assessment of injuries and transfer of the patient to Tygerberg Hospital was found to be adequate. However, a decision was initially taken to transfer the patient to an inappropriate off-site medical facility in the absence of the AMP, and this was corrected once the AMP arrived. The overall receipt and treatment of the patient at Tygerberg Hospital was found to be in accordance with procedures. However, there were areas of improvement identified and need to be addressed.

Question by Mr Mack

Mr Mack felt that there were too many red lights (flags) in the presentation and that a station running as long as Koeberg, having so many non-compliances in an exercise, does not inspire confidence in the safety of Koeberg or the safety of the surrounding communities. His concern was if this is what was picked up in an exercise what a real-life scenario will be like.

Response by Mr Makgae

Mr Makgae explained that the non-compliances as indicated in the presentation are followed up by the NNR to check whether Eskom (or the City of Cape Town) has

exercised those areas, corrected them and whether the corrective actions are effective to which they provide a report. He explained that the NNR only close actions once they have been addressed effectively to the satisfaction of the NNR. Further feedback on Eskom's close-out of the NNR actions will be provided in the PSIF.

Question by Mr Mack

Mr Mack expressed dissatisfaction in what was presented and questioned whether the report presented was thoroughly thought through before it was presented.

Response by Mr Makgae

Mr Makgae indicated that their aim is not to hide anything and that they presented the information as is to the public as they will be affected by it. He further explained that the focus of the NNR is to ensure the safety of the safety of the people, the plant and the environment. They conduct the necessary follow-ups to their satisfaction and inspect these areas. He explained that this doesn't mean that the City of Cape Town and Eskom didn't address any of the concerns, as there were a lot of areas where good practises were observed but what they presented are only focused on the outcomes of the findings.

Question by Mr Mayhew

Mr Mayhew indicated that it was difficult to follow the presentation and that in future he wants to see a list of what went wrong, the remedial actions implemented to address the issues as well as the progress and what the City and Eskom has done to address the non-compliances. He says that as per the presentation it seems like most of the non-compliances is within the City of Cape Town's domain not Eskom's.

Response by Mr Makgae

Mr Makgae indicated that they are in the early stages of closing out the actions as they have until the end of April to conclude. He explained that the process involves conducting the exercise and then to generate a report from the exercise containing the findings, which they provide to Eskom and the City of Cape Town whose responsibility it is to address the findings/non-compliances. Eskom (or the City of Cape Town) will then have to inform the NNR on how they have addressed the findings/non-compliances upon which the NNR will then evaluate their responses in terms of correctness and effectiveness. He explained that once Eskom is ready with their responses, they will present it at the KPSIF.

Question by Mr Lee

Mr Lee expressed concerned that only being informed by the NNR now after 40 years of Koeberg's existence and having a Mass Care Centre in Atlantis that it is situated in the wrong location.

Response by Mr Makgae

Mr Makgae explained that for the purpose of the exercise the NNR requested the City of Cape Town to provide them with a list of Mass Care Centres that they have. He further explained that Mass Care Centres can be on open grounds, stadiums or open areas and that in the past they haven't used any Mass Care Centres in Atlantis (this was the first time). He said that the City of Cape Town only provided them with one Mass Care Centre in Atlantis as this was the Mass Care Centre according to

them (City of Cape Town) that they were going to use. The NNR raised this as an area of concern due to its close proximity to Koeberg.

Comment by Mr Becker

Mr Becker clarified that it is important to realise that Mr Makgae is from the NNR, whose responsibility it is to protect the public and that as members they should all be grateful at the honesty in which he presented the findings. He felt that this is the crux of the KPSIF – how communities are kept safe in case of an accident at Koeberg and in his view, the most important part of the entire KPSIF. He explained that the one issue which disturbed him the most was the radioactive water being released into the river system via the stormwater drains which according to him, has been done for the last 34 years and in all these years the equipment is still not in place to address this issue, which is deeply concerning, this along with the other non-compliances that was presented. He explained that as an observer in the NNR Exercise, he sat next to a lady from the United States Regulator and she explained that they deal with a non-compliance in the United States by starting a 90-day clock in which they demand of the organisation to repeat the exercise in full within that 90-day period. If they don't or they fail, their operating licence is withdrawn, and they shut the plant down. In South Africa the NNR provides six months for the actions to be closed out with no threat of the withdrawal of the operating licence which in his opinion there is not much motivation for Eskom to address these issues. He expressed concern at the different systems used in South Africa and the United States. His issue was also in only addressing one issue in isolation does not test whether the whole system works. He felt that the full exercise needs to be repeated to test if the whole "machine" works. He wanted to know if this in an intention from the NNR and if not, why not. He explained that him and the chairperson met with a Fire Marshal during the exercise, and he was keen to address the Forum. He asked the chairperson if this has been arranged and if not, if it can be arranged.

Question by Mr Makgae

Mr Makgae indicated that the comments have been noted. He explained that they do have bilateral agreements with United States hence they have invited the US to form part of the exercise in the role of observer. He also explained that they do benchmarks and in some of these areas that he has noted, they will request for regulatory improvement as part of a continuous improvement process.

Question by Mr Wotherspoon

Mr Wotherspoon had an issue in that the scenario was drawn with the south easter blowing and yet Atlantis was chosen as the Mass Care Centre where people had to be evacuated to, which means everyone was evacuated with the plume. He felt that there should be two different evacuation centres depending on the wind direction, one in Atlantis if the wind is Northwest (towards Atlantis) and if Southerly the Goodwood Mass Care Centre to be used.

Question by Mr Makgae

Mr Makgae explained that there are different Mass Care Centres which they can choose from, based on the wind direction on the day, the only concern was that they were given one that was within the Emergency Planning Zone.

Comment by Ms La Grange

The Chairperson explained that the list of Mass Care Centres (MCCs) are in the Emergency Plan Calendar.

Question by Mr Lee

Mr Lee wanted to know why the Goodwood Mass Care Centre only came up as an observation now, and why hasn't it been addressed in the past.

Response by Mr Makgae

Mr Makgae responded that the observation was for the Atlantis Mass Care Centre (MCC) and not the Goodwood MCC. The Goodwood MCC is far from Atlantis.

Question by Mr Lee

Mr Lee questioned that if the Atlantis Mass Care Centre is in the 16km zone, how long it has this been a Mass Care Centre and how for how long the NNR has been aware of this.

Response by Mr Makgae

Mr Makgae explained that the Mass Care Centres (MCC) are updated frequently and that it is the prerogative of the City of Cape Town to decide which Mass Care Centre are to be used on the day of the exercise. The idea of the exercise is to improve continuously. Following this, it will be a corrective action to be followed up.

Comment by Ms La Grange

Ms La Grange confirmed that the Goodwood MCC is approximately 38km away from Koeberg which means that Atlantis is the closest MCC.

7.General

Comment by Ms La Grange

Ms La Grange commented on the Siren Test of 7 March 2023 which she felt went very well. She felt that the female voice was clearer than the male voice. She also indicated that the male voice needed grammatical correction. She missed the gong sound that always follows on the conclusion of the message (announcement).

Question by Mr Wotherspoon

Mr Wotherspoon enquired about the report that was produced by the International Atomic Energy Agency (IAEA) that was released in March 2022, that identified 15 issues that needed to be addressed in terms of safety. In his understanding some of the issues were more serious than the others. He wanted to know if it was part of the programme in achieving the Long-Term Operation and if these 15 items will be addressed before Koeberg embarks on the long-term operation.

Response by Mr Featherstone

Mr Featherstone explained that all the items in the IAEA report, which is called the SALTO Report, referring to the Safe Aspects of Long-Term Operation. He explained that the report by the IAEA was on Koeberg's request of which the focus was on the review of Koeberg's efforts related to the Safe Aspects of Long-Term Operation. It takes into account all the possible ageing that can take place on equipment and infrastructure through the relevant maintenance and inspection programmes

proposing to do in the 60 years of operation that takes into consideration the degradation that has not been taken into consideration in the original safety case that only assumed 40 years of operation. He explained that in the report there was a total of 14 items, 11 observations and 3 x recommendations contained in the safety case that they have submitted to the NNR. He confirmed that all the items are being addressed. He explained that the Report is available on the IAEA website and normally restricted for 90 days before it becomes public. It is a public document with containing redacted information such as referencing other power stations and other information that they are allowed to redact from.

Comment by Mr Becker

Mr Becker mentioned that he was glad that the Safety Case has been made public due to public pressure because when asked if it could be made public in a previous PSIF the response was that it couldn't. His issue was that it is heavily redacted he felt that it was highly questionable as to whether the redactions were justified, he felt that the redactions were not based on personal information or another plant but rather what Koeberg will do to make the plant safe which is difficult see due to the redactions. He questioned the lack of transparency pertaining to the IAEA issues and what Koeberg is doing to address them. He felt that to make it easier they should release an unredacted report apart from personal information as opposed to a table of actions as to how to make Koeberg safe. He also questioned if the NNR will release the NNR Exercise report to the public or also keep it a secret from the public as it will also address some of the questions that was posed.

Comment by Mr Mayhew

Mr Mayhew indicated that no calendars have been delivered to Parklands.

Response by Mr Phidza

Mr Phidza explained that the Supplier gave them a lot of problems. He explained that they've increased the Calendar numbers by 7000 to a total to 82 000 so they can also distribute to those who request it outside the 16km Zone, and we will keep on increase the numbers to match population growth in the area. He asked Mr Mayhew to arrange for Calendars to be delivered to his area via Stakeholder Management.

Question by Ms Mayers

Ms Mayers as a resident of Melkbosstrand explained that the LTO documents are highly technical and not understandable to members of the public. She enquired what the role and mandate of the KPSIF is in making such types of information clear and understandable to the public and what the process is, after understanding has been created, to be able to object. Her other issue was that the mayor approved a spatial development plan that will intensify and commercialise sections of Melkbosstrand and as was everyone's understanding over the years, Melkbosstrand will not be intensified and densified due to risk it poses to the Koeberg Evacuation Plan which heightens her anxiety. Her concern was that with Melkbosstrand being intensified and densified along its main arteries coupled with Koeberg extending its life and as she understood from tonight's feedback from the NNR, that the Koeberg's Evacuation Plan not doing well, this does not bode well for the Melkbosstrand residents. She also brought up the question she posed in the previous meeting of whether Koeberg has line of sight of the Spatial Development Plan and whether there was insight or comment on that plan. She added that at the last meetings, she was promised feedback in between meetings which never happened.

Response by Mr Phidza

Mr Phidza explained that LTO has been on the KPSIF Agenda on a regular basis during the past two years. He explained that since they have realised that some of the documents that form part of LTO is quite technical they have identified the need to increase their public engagement in terms of creating awareness and . They are currently working on a public engagement plan in which to create awareness about LTO and educating the public on LTO. They are also working on an Open Day whereby they will engage the public as the more Working on Open Days where the communities can engage further on LTO. They will advertise the Open Day in the local newspapers and give updates in the KPSIF.

Response by Mr Featherstone

Mr Featherstone responded to the question on the Spatial Development Plan. He informed Ms Mayers that he has sent a response to her on her (emailed) question that day, which she probably didn't receive. He explained that the responsibility to reject or accept the Spatial Development Plan resides with the City of Cape Town. He explained that Eskom can only object as any resident and in the same capacity as any other interested and affected party if they are unhappy with the development but that they can only formally object when the City of Cape Town contravenes the rules and regulations and don't follow the requirements from a safety point of view and not an emotional level which it has become due to the impact it has on the Melkbosstrand residents. He further explained that if the City of Cape Town follows the rules of terms of Spatial Development as agreed by the NNR and as per the requirements of the Koeberg Emergency Plan, Eskom has no basis to object. He explained that the City of Cape Town base their decision on the Traffic Evacuation Model (TEM) which verifies that the increase in population numbers based on the developments can still be evacuated based on the infrastructure. He further explained that the city always demonstrates to Eskom and the National Nuclear Regulator all the proposed zoning changes in the area as they log them all and they also demonstrate how it has been assessed against the Traffic Evacuation Model to determine the impact.

Question by a member

The lady explained that they have published some of Eskom's previous electronic calendars on their company's website to be made available to their residents for information. She enquired whether this year's calendars will be made available in digital format.

Response by Mr Phidza

Mr Phidza confirmed that it is available in digital format and that the lady should contact Debbie Joshua via email to send her an electronic copy of the Emergency Plan Calendar.

Comment by Mr Lee

He queried what the NNR is expecting to happen in Duynfontein as their building (in Duynfontein) looks like a bomb shelter.

There was no response from the NNR when the question was posed. The answer below was provided by the NNR when enquired afterwards

Response by Mr Bester (NNR)

The building is an office building for NNR staff that are working on Nuclear Power Plants and complies with the City's building regulations.

8. Proposed Agenda items for the next meeting

The follow items were proposed as Agenda items for the June KPSIF meeting and the September KPSIF meeting. The Chairperson requested that the presentations be kept short and summarised to accommodate questions and answers and to respect the time.

June KPSIF proposed Agenda items:

- Koeberg Quarterly feedback
- Koeberg Long-Term Operation Plan update
- Summarised feedback from Eskom and the City of Cape Town on the NNR non-compliances/actions

September KPSIF proposed Agenda items:

- Koeberg Evacuation Plan
- Presentation by the Fire Marshall (as was proposed by Mr Peter Becker)
- Avian research and monitoring in the Koeberg Nature Reserve (Ms Jurina Le Roux)

9. Date of next meeting:

The next Koeberg Public Safety Information Forum (KPSIF) will be held on Thursday, 29 June 2023.

10. Closing.

The Koeberg KPSIF was adjourned at 22:12

PSIF Action item list – after meeting of 30 March 2023

No.	Action	Raised by	Comment
1.	Re-opening of the Koeberg Nature Reserve	Mr Naylor	<p>Due to operational, security and access issues that need to be resolved, the reserve will remain closed.</p> <p><i>Item to remain open for updates.</i></p>
2.	Proposal for run a hybrid PSIF for future meetings especially for people travelling from afar.	Mr Harrison	<p>The proposal will be discussed with the PSIF Chair, Deputy Chair, relevant Eskom management and IT the decision will be shared at the next KPSIF meeting in June 2023.</p>