



National  
**Nuclear**  
Regulator



Protection of the  
environment benefits  
people, nature and all  
who live in it.

**ANNUAL REPORT**

2021-22

## Introduction to our new logo and brand identity



**National  
Nuclear  
Regulator**

The NNR logo has a universal appeal with a unique modern African identity which embodies the traits, culture and the core mandate of the NNR. Each element of the logo has a rich meaning at its core, representing our purpose and what we do to protect the health and safety of people, and the environment from the harmful effects of radiation. We are driven by our purpose. The elements of the new logo instantly identifies the NNR as being a science based risk informed African nuclear safety authority.

Each element of the logo resonates with the NNR brand positioning and promise. It reflects who we are, our personality, our promise and what we stand for. The colour palette is elegant, professional, sophisticated and meaningful to the NNR.

## Logo elements explained



### ATOMIC ENERGY

It is a reference to science and our ongoing commitment to innovation and continuous improvement. The technical drawing and perfect geometry represents momentum, direction and innovation. The subliminal heart shape formed by the ellipses reflects the NNR's passion and commitment to its mandate. The green triangle encases the blue triangle which represents an additional layer of protection from radiation. Additionally the green triangular shape has diamond shape connector points which denotes strength and gives the logo a unique African appeal.



### RADIATION

It provides context to the NNR's reason for existence.



### TRIANGLE

The encasing of the trefoil symbol within the triangle denotes safety, security, stability and dependability.



### DIAMOND

This symbolises a strong commitment to a meaningful bond with stakeholders.



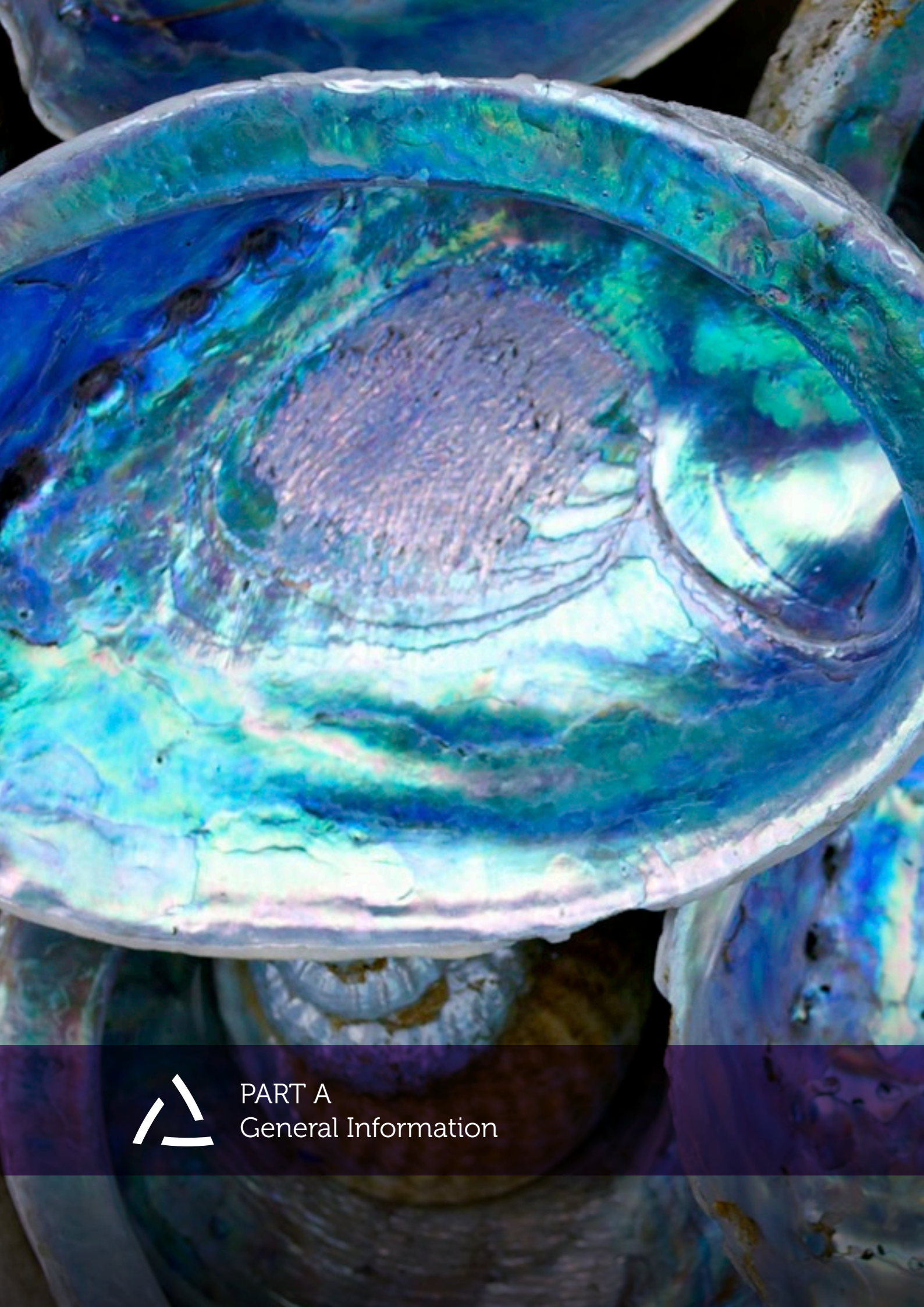
This 2021-22 Annual Report of the National Nuclear Regulator (NNR) is presented to the Minister of Mineral Resources and Energy in accordance with section 7(1)(j) and section 15 (7) of the National Nuclear Regulator Act 1999 (Act No. 47 of 1999).

The report reflects the health and safety related to workers, the public and the environment associated with all sites regulated by the NNR, the activities of the NNR for the 2021/2022 financial year and financial affairs of the NNR in accordance with section 55(1)(d) of the Public Finance Management Act 1999 (Act No. 1 of 1999) and regulation 28 of the Treasury Regulations (as amended).


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PART A  
General Information



South African abalone, mostly known locally as perlemoen (from the Dutch meaning 'mother-of-pearl'), is endemic to the shores of South Africa.

Abalones belong to the class Gastropoda, which comprises 40,000 species of snails and slugs. South African abalone is generally found in shallow coastal waters and seems to prefer rocky surroundings.

Our regulatory framework provides for the prevention of accidents or practices that could result in the contamination of the environment.



## 1. Corporate Information

Registered name:	National Nuclear Regulator
Registration number:	Not Applicable
Registered office:	Eco Glades Office Park Eco Glades 2, Block G Witch Hazel Avenue Highveld Ext 75, Eco Park, Centurion 0046
Business address:	Eco Glades Office Park Eco Glades 2, Block G 420 Witch Hazel Avenue Eco Park, Centurion, Highveld Ext 75 0046
Postal address:	P.O. Box 7106 Centurion, Eco Park Highveld Ext 75 Pretoria 0046
Contact information:	Telephone: 0027 12 674 7100 Facsimile: 0027 12 663 5513 Email: <a href="mailto:enquiry@nnr.co.za">enquiry@nnr.co.za</a> Website: <a href="http://www.nnr.co.za">www.nnr.co.za</a>
Executive Authority:	Minister of Mineral Resources and Energy
Bankers:	ABSA Bank
Auditors:	Auditor-General of South Africa (AGSA)
Secretary:	First Corporate Transfer Secretaries (PTY) Ltd





## 2. Abbreviations/acronyms

<b>AA</b>	Accounting Authority	<b>DoE</b>	Department of Energy
<b>ARCOM</b>	Audit and Risk Management Committee	<b>ENIQ</b>	European Network for Inspection and Qualification
<b>AADQ</b>	Annual Authorised Discharge Quantity	<b>EPSOC</b>	Emergency Planning, Steering and Oversight Committee
<b>AFRA</b>	African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology	<b>FET</b>	Further Education and Training
<b>AFS</b>	Annual Financial Statements	<b>FNRBA</b>	Forum for Nuclear Regulatory Bodies in Africa
<b>ACR</b>	Authorisation Change Request	<b>GRAP</b>	Generally Recognised Accounting Practice
<b>AGSA</b>	Auditor-General of South Africa	<b>HEU</b>	Highly Enriched Uranium
<b>ALARA</b>	As Low As Reasonably Achievable	<b>HR</b>	Human Resources
<b>ARPC</b>	Assistant Radiation Protection Controller	<b>IAEA</b>	International Atomic Energy Agency
<b>ASDPL</b>	Aerodynamic Separation Process	<b>ICRP</b>	International Commission on Radiation Protection
<b>ASME</b>	American Society of Mechanical Engineers	<b>ICT</b>	Information Communication Technology
<b>ASN</b>	French Nuclear Regulatory Authority	<b>ILT</b>	Initial Licence Training
<b>CAA</b>	Civil Aviation Authority	<b>INES</b>	International Nuclear Event Scale
<b>CAE</b>	Compliance Assurance and Enforcement	<b>INPO</b>	Institute of International Nuclear Power Operations
<b>CEO</b>	Chief Executive Officer	<b>INSAG</b>	International Nuclear Safety Advisory Group
<b>CFO</b>	Chief Financial Officer	<b>ISI</b>	In-Service Inspection
<b>CNS</b>	Convention on Nuclear Safety	<b>IT</b>	Information Technology
<b>COE</b>	Certificate of Exemption	<b>JCC</b>	Joint Coordinating Committee
<b>COM</b>	Chamber of Mines	<b>KNPS</b>	Koeberg Nuclear Power Station
<b>COR</b>	Certificate of Registration	<b>KPI</b>	Key Performance Indicator
<b>CPI</b>	Consumer Price Index	<b>LETF</b>	Liquid-Effluent Treatment Facility
<b>CSS</b>	Commission on Safety Standards	<b>LEU</b>	Low Enriched Uranium
<b>DIPR</b>	Dedicated Isotope Production Reactor	<b>LG</b>	Licensing Guide
<b>DSP</b>	Dosimetry Service Providers	<b>LLW</b>	Low-Level Waste
<b>ECC</b>	Emergency Control Centre	<b>LSA</b>	Low Specific Activity
<b>EPD</b>	Electronic Personal Dosimeter		

<b>LTAM</b>	Long-Term Asset Management	<b>RDD</b>	Radiological Dispersive Device
<b>MDEP</b>	Multinational Design Evaluation Programme	<b>RED</b>	Radiation Emission Device
<b>mSv</b>	Millisievert	<b>RPO</b>	Radiation Protection Officer
<b>MW</b>	Megawatt Electrical	<b>RTMC</b>	Road Traffic Management Corporation
<b>NDR</b>	National Dose Register	<b>RSR</b>	Railway Safety Regulator
<b>Necsa</b>	South African Nuclear Energy Corporation	<b>SALTO</b>	Safety Assessment of Long-Term Operation
<b>Nehawu</b>	National Education, Health and Allied Workers' Union	<b>SAMSA</b>	South African Maritime Safety Authority
<b>NEPROC</b>	Nuclear Emergency Preparedness Regulatory Oversight Committee	<b>SAPS</b>	South African Police Service
<b>NERS</b>	Network of Regulators of Countries with Small Nuclear Programmes	<b>SARA</b>	Standards, Authorisations, Reviews and Assessments
<b>NGO</b>	Non-Governmental Organisation	<b>SARS</b>	South African Revenue Service
<b>NIL</b>	Nuclear Installation Licence	<b>SAT</b>	Self-Assessment Tool
<b>NNR</b>	National Nuclear Regulator	<b>SCM</b>	Special Case Mines
<b>NNRA</b>	National Nuclear Regulator Act	<b>SGR</b>	Steam Generator Replacement
<b>NORM</b>	Naturally Occurring Radioactive Material	<b>SHEQ</b>	Safety, Health, Environment and Quality Management
<b>NTWP</b>	Nuclear Technology and Waste Projects	<b>SHEQD</b>	Safety, Health, Environment and Quality Management Department
<b>NUSSC</b>	Nuclear Safety Standards Committee	<b>SSRP</b>	Safety Standards and Regulatory Practices
<b>NVL</b>	Nuclear Vessel Licence	<b>SQEP</b>	Suitably Qualified and Experienced Person
<b>OTS</b>	Operating Technical Specification	<b>TPU</b>	Thermal Power Uprate
<b>PFMA</b>	Public Finance Management Act	<b>TRANSSC</b>	Transport Safety Standards Committee
<b>PLEX</b>	Plant Life Extension	<b>TSO</b>	Technical Support Organisation
<b>PPC</b>	Parliamentary Portfolio Committee	<b>UFCOR</b>	Nuclear Fuels Cooperation of South Africa
<b>PSA</b>	Public Safety Assessor	<b>USNRC</b>	United States Nuclear Regulatory Commission
<b>PSM</b>	Power Station Manager	<b>WAC</b>	Waste Acceptance Criteria
<b>QMS</b>	Quality Management System	<b>WASSC</b>	Waste Safety Standards Committee
<b>RAIS</b>	Regulatory Authority Information System	<b>WiNSA</b>	Women in Nuclear South Africa
<b>RASIMS</b>	Radiation Safety Information Management System	<b>WiN-NNR</b>	Women in Nuclear National Nuclear Regulator
<b>RASSC</b>	Radiation Safety Standards Committee		



### 3. Foreword by Chairperson

Even though the effects were not as dramatic as during the previous financial year, we continued to see the impact of the COVID-19 pandemic during the current reporting period, including the attendant immense stress it has placed on us as a country, and on the world in general. We continue to mourn all who have lost their lives because of the disease, and we are extremely grateful that current variants and strains have proven less debilitating or lethal. In addition, we can only hope that the currently low national vaccination rates will increase steadily in the near future.

The South African business climate remained volatile during the reporting period, due to long-standing and intractable structural factors, and with low economic growth worsened by the ongoing impact of COVID-19 and the unstable power supply. Although these obstacles had, and continue to have, a far-reaching impact on all sectors of society, the NNR's regulatory oversight over nuclear safety was not compromised. This is the case even though some authorisation holders suffered significant financial losses and subsequently surrendered their licences or certificates of registration.

It is therefore gratifying to report that the organisation recorded a performance score

of 98.39% during the reporting period. This reflects the immense commitment and joint efforts of the management team and staff. Regulatory staff carried out 204 nuclear safety inspections and conducted 1 031 nuclear safety assessments. The organisation also held successful public hearings in August and November 2021 for the Thyspunt nuclear installation site licence application submitted by ESKOM.

These public hearings were particularly insightful, and it is worth noting that they were the first to be held in democratic South Africa to discuss the potential construction of a new nuclear power station. We received wide-ranging inputs and submissions from various sectors of society, including from the Links Royal House, Gamaqua Tribal House, political parties, business forums, nuclear science professionals, churches, and many interested parties and organisations.

The Board functioned well during the reporting period and continued to conscientiously discharge its mandate of strengthening governance and providing oversight. We received varied media coverage during the reporting period, especially relating to developments at the Koeberg Nuclear Power

Plant and our corresponding regulatory responsibilities.

We recognise the importance of proactive and meaningful engagement with our key stakeholders. We are committed and endeavour to interact with them consistently and transparently. For example the public, our most important stakeholder, is kept abreast of relevant regulatory activities through public safety information forums, the NNR website, and social media postings, all of which are harmonised by the communication and stakeholder relations department. Authorisation holder engagements are primarily coordinated through the numerous regulatory programmes, while employee relations are managed by the human resources department. We would also like to acknowledge the ongoing engagements we continue to have with our executive authority.

The Board would like to express its immeasurable gratitude to all the NNR employees for their commitment through yet another uncertain and challenging year. In an industry where skills are globally in short supply and consequently in significant demand, thus producing noteworthy high intra-industry and international mobility, we are pleased that so many of our staff have chosen to stay. This is particularly in the context of the freeze on annual salary increases implemented last year.

Lastly, on behalf of the Board, the NNR staff, and the Department of Mineral Resources and Energy (DMRE), I would like to sincerely thank Dr Bismark Tyobeka, who resigned as CEO in March 2022, for his exemplary, ethical, and diligent leadership during the almost nine years he has been at the helm of the organisation. Dr Tyobeka has left an indelible mark on the organisation and an indisputably positive legacy, and we feel proud of this, especially given that we live in a world in which there is a dearth of scrupulous leadership. We wish him all the best in his future endeavours.

We look forward to the following year, during which the Regulator is likely to be kept exceptionally busy by the Long Term Operation activities at the Koeberg Nuclear Power Plant; ongoing Thuyspunt nuclear installation site license application; potential new research reactor at NECSA; and the central interim storage facility.



**Dr Thapelo Motshudi**

Chairperson: Board of Directors



## 4. Chief Executive Officer's Overview

The 2021-22 reporting period proved to be yet another year that tested our true resilience and determination in striving for excellence. Our business continuity plans were put to the test, along with the mettle of our people in facing adversity in a changing environment. I am proud to state that the NNR received a clean audit and the organisation continued to pursue operational excellence as it successfully delivered on annual performance priorities.

The 2021-22 financial year necessitated further transitional operational adjustments as a result of the pandemic. The financial outlook of the NNR has stabilised both from revenue generation and expenditure perspectives. The organisational revenue increased by 3,5% to R291 million of which 99% was spent or committed by the end of the period under review. The financial viability as audited and reported on by the Auditor-General attested that the financial health of the organisation is good with no observed solvency and liquidity challenges. The NNR received an unqualified audit report with no reportable findings (clean audit) for the year under review which is an improvement from the previous financial year where there was one finding reported.

The NNR operations resumed to almost prior pandemic levels except for in-person international activities which were relatively restricted. The organisation spent 94,5% of its total budget which is a significant increase from the 89% reported in the previous financial year. The construction activities for the Cape Town site office gained some momentum during the reporting period. It is envisaged that this will significantly increase capital expenditure in the 2022-23 financial year. Budgeting and expenditure internal controls proved to be robust and resilient and have once again been commended by both internal and external auditors.

The uncertainty in the potential new nuclear build programme and associated research activities poses a challenge to the NNR's financial planning and resource allocation in the short- to medium-term period. The organisation however continues to closely monitor domestic and international industry trends on regulatory preparedness to ensure the NNR can effectively respond to new developments that may arise in this regard. The heightened activities on Koeberg Nuclear Power Station (KNPS) long term operation

licensing and associated site licensing continues to dominate our programme in the short term. Our internal capacity augmented by the contracted technical support organisations as well as established international regulatory bilateral cooperation arrangements serves to assist the NNR in responding to the operators' applications as and when received.

The organisation's request for retention of surplus reported in 2020/21 financial year was approved by National Treasury. These funds are ring fenced to augment funding the construction of the Cape Town site office project which is currently in progress.

The controls within the supply chain management environment were audited by both internal and external auditors and found to be effective. The organisation was found to be compliant with all the rules and regulations applicable in this process by the Auditor-General. The Board of Directors continued to oversee the organisation's activities in this regard through approval of policies necessary in line with applicable laws. The Board reviewed the quarterly risk management and compliance reports pertaining to supply chain management and financial management.

The external auditors reported one finding relating to material adjustments made on the

cash flow statement for 2020-21 financial year. As committed by management, the matter was successfully resolved, and there were no reportable findings for the period under review.

The NNR is a financially viable entity with a healthy balance sheet and liquidity to meet its operational commitments and obligations as a going concern.

I would like to extend my appreciation to our Board for its unwavering commitment and guidance during this challenging year. I commend all staff and management teams for their flexibility, commitment and open-mindedness in plotting a way forward in a transitioning operating environment. Thank you to all our stakeholders for the constructive engagements and confidence bestowed in the nuclear safety regime in South Africa.



**Dr Bismark Tyobeka**  
Chief Executive Officer  
National Nuclear Regulator



## 5. Statement of Responsibility and Confirmation of Accuracy for the Annual Report

To the best of my knowledge and belief, I confirm the following:

All information and amounts disclosed in the annual report is consistent with the annual financial statements audited by the Auditor-General of South Africa.

The annual report is complete, accurate and is free from any omissions.

The annual report has been prepared in accordance with the guidelines on the annual report as issued by National Treasury.

The Annual Financial Statements (Part F) have been prepared in accordance with the standards applicable to the public entity.

The Accounting Authority is responsible for the preparation of the annual financial statements and for the judgements made in this information.

The Accounting Authority is responsible for establishing and implementing a system of internal control has been designed to provide reasonable assurance as to the integrity and reliability of the performance information, the human resources information and the annual financial statements.

The external auditors are engaged to express an independent opinion on the annual financial statements.

In our opinion, the annual report fairly reflects the operations, the performance information, the human resources information and the financial affairs of the public entity for the financial year ended 31 March 2022.

Yours faithfully,

**Dr Bismark Tyobeka**  
Chief Executive Officer

**Dr Thapelo Motshudi**  
Chairperson of the Board



## 6. Strategic Overview

### 6.1. Vision

To be recognised as a caring and trusted nuclear and radiation safety regulator.

### 6.2. Mission

To provide and maintain an effective national regulatory framework through innovation in the protection of persons, property and the environment against radiation damage.

### 6.3. Corporate Values

We are guided by the following set of core values.

**Excellence:** We endeavour to deliver outstanding quality, efficiently, effectively and innovatively.

**Integrity:** We strive for integrity based on non-biased, fair, objective, consistent, honest, reliable, principled attitudes and attributes.

**Openness and Transparency:** We strive for openness and transparency in the regulatory decision-making process and the communication of regulatory decisions.

**Safety and Security:** We endeavour to instil a culture of safety and security within the organisation, with holders of nuclear authorisations and in our interactions with all other stakeholders.

**Teamwork:** We strive to be a cohesive team that works in collaboration to realise common goals in order to deliver exceptional results.

**Valuing People:** We recognise and appreciate our people by valuing their input, showing empathy and creating a conducive and supportive working environment.





## 7. Legislative and Other Mandates

The NNR is listed as a national public entity in Schedule 3 Part A of the Public Finance Management Act (Act 1 of 1999, as amended).

### 7.1. Constitutional and Legislative Framework

The NNR operates within the following constitutional and legislative frameworks:

- Constitution of the Republic of South Africa of 1996 (Act No. 108 of 1996)
- Nuclear Energy Act (Act No. 46 of 1999) (NEA)
- National Nuclear Regulator Act (Act No. 47 of 1999)
- Public Finance Management Act (Act No. 1 of 1999) (PFMA)
- National Treasury Regulations
- National Environmental Management Act (Act No. 107 of 1998) (NEMA)
- Promotion of Administrative Justice Act (Act No. 3 of 2000) (PAJA)
- Promotion of Access to Information Act (Act No. 2 of 2000) (PAIA)

### 7.2. Policy Mandates

#### 7.2.1. Nuclear Energy Policy

The Nuclear Energy Policy of the Republic of South Africa was published in June 2008. It presents a framework within which prospecting, mining, milling and the use of nuclear materials, as well as the development and utilisation of nuclear energy for peaceful purposes by South Africa, shall take place.

The Policy covers:

- The prospecting and mining of uranium ore and any other ores containing nuclear properties and materials.
- The nuclear fuel cycle in its entirety, focussing on all applications of nuclear technology for energy generation. One of the 16 principles of this policy is that nuclear energy shall be used as part of South Africa's diversification of primary energy sources to ensure security of energy supply.

#### 7.2.2. Radioactive Waste Management Policy and Strategy for South Africa

In carrying out its regulatory mandate, the NNR ensures that policy guidelines and principles relating to radioactive waste management are supported for purposes of ensuring safety. The requirements related to the management of radioactive waste are assessed, and compliance of NNR authorisation holders is monitored.

### 7.2.3. International Atomic Energy Agency (IAEA) Member State

The regulation of nuclear safety, security and the transport of radioactive material operates within a global context of international law, obligations, standards and guidance. South Africa has been a member state of the International Atomic Energy Agency (IAEA) since 1957, and has entered into the following multilateral agreements:

- Agreement on the Privileges and Immunities of the IAEA
- Convention on the Physical Protection of Nuclear Material
- Convention on Early Notification of a Nuclear Accident
- Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency
- Convention on Nuclear Safety (CNS)
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (JC)
- Revised Supplementary Agreement concerning the Provision of Technical Assistance by the IAEA
- African Regional Co-operative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA) – Fourth Extension

#### *Legally binding nuclear safety conventions*

South Africa is a signatory to various international conventions which place legally binding obligations on the Republic to demonstrate compliance.

South Africa ratified the Convention on Nuclear Safety (CNS) in 1996, and its obligations commenced on 24 March 1997. In November 2006, South Africa acceded to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (JC). The country's obligations under the JC commenced in February 2007.

As a member state of the IAEA, South Africa is required to fulfil its international obligations and promote international co-operation to enhance global nuclear safety. In terms of section 5(e) of the Act, the NNR is mandated to fulfil national obligations with respect to international instruments concerning nuclear safety, and to act as the national competent authority in connection with the IAEA's Regulations for the Safe Transport of Radioactive Material. The NNR co-ordinates and implements South Africa's Contracting Party (CP) obligations to the IAEA (CNS), and the JC.

## 8. Organisational Structure

### BOARD OF DIRECTORS



**DR BISMARK TYOBEKA**  
Chief Executive Officer

### EXECUTIVE MANAGEMENT REPORTING TO THE CEO



**MR ORION PHILLIPS**  
Divisional Executive:  
Nuclear Power Plant



**MISS DITEBOGO KGOMO**  
Divisional Executive: Nuclear  
Technology and NORM



**MS LOUISA MPETE**  
Divisional Executive:  
Regulatory Improvement  
and Technical Services



**MS ANITA SIMON**  
Divisional Executive:  
Corporate Support Services



**MR DAKALO  
NETSHIVHAZWULU**  
Chief Financial Officer

### MANAGERS IN THE OFFICE OF THE CEO



**MS PHINDILE MASILO**  
Chief Audit Executive




**MR FULUFHELO NDOU**  
Senior Manager: Legal, Risk  
& Compliance



**MS NONTSIKELELO KOTE**  
Manager: Strategy and  
Organisational Performance



PART B  
Performance Information



The angulate tortoise is the only species in the genus *Chersina*, and it is endemic to southern Africa. In South Africa it is classified as a protected species. Their natural habitat is the fynbos, Karoo, albany thickets and coastal scrub (strandveld) vegetation of the south-western part of South Africa.

Protecting the environment is of major importance in the work of the NNR, through its environmental responsibilities under the NNR Act and other relevant legislation.



## 1. Auditor's Report: Pre-determined Objectives

The Auditor-General of South Africa (AGSA) currently performs the necessary audit procedures on the performance information to provide reasonable assurance in the form of an audit conclusion. The audit conclusion on the performance against pre-determined objectives is included in the report to management, with any material findings being reported under the pre-determined objectives heading in the report on other legal and regulatory requirements section of the Auditor's Report. Refer to page 148 of the Report of the Auditors Report, published as Part F: Annual Financial Statements.



## 2. Overview of Performance

### 2.1. Service delivery environment

The NNR is the national competent authority established as a juristic person in terms of the NNR Act which ensures that the regulator remains independent and free from pressures associated with political circumstances, economic conditions, pressures from government departments, authorised persons or other organisations.

Although the COVID-19 pandemic continued to exert pressures on the service delivery environment, the nuclear regulatory aspect remained relatively stable. The increased usage of online platforms to access NNR stakeholders necessitated the organisation to bolster its cyber security measures in order to mitigate information security threats.

The difficult South African economy continued to impact negatively on the regulated facilities in the NORM sector which is sensitive to economic cycles. The organisation discharged its nuclear safety oversight responsibilities. Planned regulatory inspections and visits to authorised sites/facilities were conducted. Safety reviews and assessments of applications as well as change requests from operators were completed according to the annual performance plan.

Public hearings including a series of public information sessions were successfully concluded for the Thyspunt Nuclear Installation Site License (NISL) application. Supplier and vendor invoices were processed within the stipulated 30-day timeline.

The suspension and subsequent dismissal of the NNR Board Member by the Minister of Mineral Resources and Energy (DMRE) attracted media attention for the NNR. Media enquiries received by the NNR pertaining to the Board member issue were referred to the DMRE.

### 2.2. Organisational environment

Being responsive to a dynamic external environment requires an internal environment that is capable to deliver on planned priorities, while improving processes to continue meeting stakeholder needs.

The organisation continued to implement a hybrid workplace arrangement to minimise exposure and reduce the spread of infections in the workplace. This arrangement did not hamper the delivery of the organisation's annual performance targets which is evidenced in the attainment of its highest performance score of 98,39% for the 2021-22 reporting period.

The Chief Executive Officer resigned towards the end of March. Due to the timing of the resignation there was no impact on the annual performance of the organisation. The organisation has established succession plans to enable continuity and the seamless delivery of its obligations.

### 2.3. Key policy developments and legislative changes

- There were no changes or developments to key policies and legislation in the 2021-22 financial year.

### 2.4. Progress towards achievement of institutional impacts and outcomes

- SANAS assessed the NNR's laboratory quality manuals and a report was provided to the NNR with recommendations for implementation in the next financial year (2022-23).
- In 2021, the NNR ensured the effective delivery of regulatory programmes comprising of compliance assurance activities (inspections) and safety reviews and assessments. Overall the NNR exceeded the targets set under this priority. Noteworthy mentions include:
  - 5 additional regulatory inspections conducted
  - An additional 165 reviews and assessments were completed due to improved turnaround times.
- The process for reviewing the conditions of authorisation for three (3) categories of Naturally Occurring Radioactive Materials and the annual compliance assurance programme (CAP) PRO-CAS-002 (Rev 2) were completed.
- The NNR is leading the establishment of an indoor radon regulatory framework for South Africa. The regulatory framework was drafted and is currently under review
- A series of LTO training activities were carried out as planned. The trainings covered the following areas;
  - LTO Regulatory framework (existing and new challenges with requirements, safety case, international approaches and licensing updates).
  - USNRC licence renewal standards and practices.
  - Eskom documentation applicable to LTO.
  - TAG (Technical Assessment Guide) training (TAG development history, structure and expectations, license renewal and safety evaluation report)

- The CNSS sustainability strategy was developed from the Integrated Sustainability plan.
- The framework for establishing principles and procedures for the management of intellectual property associated with CNSS activities was developed.
- The CNSS funding model was developed.
- Implementation of the revised plan for the new Cape Town office was satisfactorily progressed.
- The targets for the nuclear safety awareness programme and stakeholder management plan were met during the reporting period.



## 3. Institutional Programme Performance Information

### Programme 1: The Board of Directors

The Board of Directors are accountable for the governance and performance of the NNR. The Board provides oversight, strategic direction and determines the goals, objectives and approves key organisational policies.

#### Institutional outcomes

As the custodian of corporate governance the Board ensures that the governance framework incorporates the key processes to effectively uphold, sustain and enforce the ethical values of good governance throughout the organisation. The governance framework further provides for prudent risk management and monitoring the effects of the identified risks and the mitigating controls to ensure the organisation functions efficiently.

### Programme 2: Office of the CEO

The Office of the CEO leads with the implementation of the approved organisational strategy as well as ensuring that the organisation's operations and resources are administered effectively and efficiently.

The following sub-programmes form part of the Office of the CEO.

#### Strategy, and Organisational Performance

- Develops the NNR's strategic and annual performance plans for consideration by the Board. Track, monitor and report on the implementation of the annual performance plans and strategic organisational projects.



## Internal Audit

- Provides reasonable assurance to the Board, Audit and Risk Committee and Management, on the adequacy and effectiveness of internal controls, risk management and governance processes.

## Legal, Risk and Compliance:

- Provides legal, governance, compliance and enterprise risk management services to the organisation.

## Programme 3: Financial Management

This programme ensures that the organisation practices good financial governance and maintains financial stability. This programme provides organisational support in the following areas of financial management and administration:

- Financial planning and management;
- Financial reporting;
- Asset and supply chain management (including procurement)
- Accounts payable; and
- Accounts receivable, cash book and payroll management.

### Institutional outcomes:

- Adequate funding for execution of the NNR's mandate.
- Financial sustainability of the CNSS.
- Inclusion of previously disadvantaged individuals in economic activities; and
- Provision of adequate and safe facilities for the site office.

## Programme 4: Regulation of Nuclear Power Plant

This programme conducts regulatory oversight over the Koeberg Nuclear Power Station (KNPS). It is responsible for reviewing applications, granting authorisations and verifying compliance with regulatory requirements for nuclear safety and radiation protection. It also issues authorisations for nuclear vessels which are powered by nuclear or carrying radioactive material onboard.

### Institutional outcomes:

- Provide and implement an effective approach towards compliance assurance.

- Maintain the implementation of regulatory programmes to assure effective nuclear and radiation safety.
- Provide an effective oversight of the LTO.

## Programme 5: Regulation of Nuclear Technology & Naturally Occurring Radiation Material

This programme grants authorisations, conducts oversight of nuclear technology, waste projects and naturally occurring radioactive material. This programme is composed of two business units i.e. Naturally Occurring Radioactive Material (NORM) and Nuclear Technology and Waste Projects (NTWP). The NORM business unit ensures compliance with regulatory requirements and conditions of authorisation through a system of compliance inspections, audits and investigations. This business unit is responsible for regulatory oversight of mining and minerals processing facilities and scrap metal dealers who handle or use material subject to regulatory control. The NTWP business unit ensures compliance with regulatory requirements and conditions of authorisation through a system of compliance inspections, audits and investigations. This business unit is responsible for regulatory oversight of various nuclear facilities on the Pelindaba Site and the Vaalputs National Radioactive Waste Repository. Any other matter that deals with nuclear technology, and which is not associated with NPPs and NORM, primarily falls under the purview of the NTWP unit.

### Institutional outcomes:

- Provide and implement an effective approach towards compliance assurance.
- Maintain the implementation of regulatory programmes to assure effective nuclear and radiation safety.

## Programme 6: Regulatory Improvement and Technical Services (RITS)

The RITS programme supports the NPP, NORM and NTWP programmes through the provision of cross-cutting scientific and technical services. The Center for Nuclear Safety and Security (CNSS) is part of this programme.

### The sub-programmes under the RITS programme are:

**Environment and Radiation Protection (ERP):** ERP conducts in-depth Radiation Protection related reviews and assessments of nuclear authorisation submissions, as well as the provision of independent verification calculations by means of computer codes.

**Engineering Services (ES):** ES undertakes in-depth reviews and assessments of submissions from nuclear authorisation holders and applicants related to Engineering and Probabilistic Safety Assessment in coordination with external technical support when required.

**Emergency Preparedness and Response (EPR):** Through this sub-programme the NNR conducts nuclear safety emergency exercises to test the effectiveness of the authorisation holder's emergency preparedness and response arrangements for protecting people and the

environment. EPR also ensures the readiness and maintenance of the Regulatory Emergency Response Centre arrangements to enable the NNR to respond to notifications of nuclear or radiological emergencies.

**Environmental Surveillance Laboratory:** Through this sub-programme the NNR provide radio-analytical services in support of the compliance assurance programme for environmental monitoring around regulated facilities. It is also manages the accreditation process for Laboratory methods.

**Regulation, Standards and Projects:** This sub-programme develops and reviews regulations, regulatory guides, regulatory position papers and conducts internal technical assessment guidance. In addition, it coordinates internal nuclear projects related to peer reviews, safety culture, nuclear security and the national database of occupational exposures.

#### Institutional outcomes:

- Provide independent radio-analytical verification capability and capacity.
- Ensure the readiness to regulate SMRs.
- Ensure the long-term sustainability of the CNSS
- Provide a framework for securing and managing information and intellectual property emanating from CNSS activities.

## Programme 7: Corporate Support Services

This programme provides a wide range of cross-cutting services to enable the NNR to deliver on its organisational and regulatory objectives. The sub-programme under CSS are:

**Human Capital Management:** This sub-programme is responsible for talent attraction, recruitment, onboarding, performance appraisal and feedback.

**Knowledge and Information Management:** This sub-programme ensures the management of corporate knowledge and the preservation of organisational memory through an effective records management process.

**Education, Training and Development:** This sub-programme develops and implements learning and development programmes in support of organisational priorities. These include but are not limited to; orientation induction, career development as well as management and leadership development.

**Employee Wellness:** This sub-programme's primary role is to ensure workplace health and wellbeing through the provision of work/life initiatives which promote motivation and engagement.

**Integrated Management System:** The sub-programme ensures that the Integrated Management System is established, implemented and continuously improved.

**Facilities Management:** The sub programme ensures the provision of a safe, cost effective, ergonomic, hygienic and conducive work environment for all employees.

**Security and Occupational Health and Safety:** The sub-programme ensures the provision of effective protection of physical assets and personnel. In addition, it strives to prevent and minimise injury and ill-health through the provision of a safe and healthy workplace for employees, contractors and other stakeholders in compliance with applicable OHS legislative requirements.

**Information Communication and Technology:** The sub-programme provides a wide range of Information Technology services to capacitate and enable the organisation to operate effectively. These include IT governance, data security, automation of business processes, technical support and business continuity solutions to mitigate disruptions caused by the external environment.

**Communication and Stakeholder Relations Management:** This sub programme ensures the effective management of internal communications, public engagement, media communications, crisis communications, branding, outreach and corporate social responsibility. In addition, this sub-programme manages bilateral regulatory cooperation with national and international counterparts on behalf of the NNR.

#### Institutional outcomes:

- Develop and implement an ISO:27001 aligned ICT security plan.
- Develop and implement a POPIA compliance plan.
- Promote nuclear safety awareness.
- Develop and implement a stakeholder relationship management plan.

### 3.1. Outcomes, Outputs, Output Indicators, Targets and Actual Achievement

In the 2021/22 FY the NNR APP contained 16 outcomes and 18 output indicators. Based on the PoE provide the organisation registered a performance score of 98,39%. The RAGG indicators summary is reflected as follows:

Red (non-achievement registered below 85% target)
Amber (85-99% achievement to target)
Green (100% achievement of target)
Grey (set aside / not applicable)

**PROGRAMME /SUB-PROGRAMME: REGULATORY IMPROVEMENT & TECHNICAL SERVICES (RITS)**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from Planned Target to Actual Achievement 2021/2022	Reasons for Deviations
Provide an independent radio-analytical verification capability and capacity	SANAS Accreditation Report	RM1: SANAS Accreditation Gamma Spec: (Soil/Sediment ISO/IEC 17025:2017)	SANAS Assessment Report outstanding	SANAS accreditation application form submitted successfully	SANAS Accreditation Report	SANAS accreditation report received	None	Not applicable
Ensure readiness to regulate SMRs	Approved Benchmark Report	RM5: Conduct benchmark study on SMRs regulation	None – new indicator	None – new indicator	Benchmark Report on SMRs regulation	Benchmark Report compiled and approved	None	Not applicable
Ensure the long-term sustainability of the CNSS	Approved sustainability strategy	RM6: Develop CNSS sustainability strategy	Approved CNSS Sustainability Plan	Integrated CNSS Sustainability Plan developed and approved	Approved CNSS sustainability strategy	CNSS sustainability strategy compiled and approved	None	Not applicable
Provide a framework for securing and managing information and intellectual property emanating from regulatory research and CNSS activities	Framework on management of information and intellectual property emanating from regulatory research and development	RM7: Develop framework for CNSS intellectual property	None – new indicator	None – new indicator	Approved framework on management of information and intellectual property for the CNSS	Framework on management of information and intellectual property for the CNSS approved	None	Not applicable

**PROGRAMME: REGULATION OF NUCLEAR TECHNOLOGY NTWP & NORM (NTN) -  
PROGRAMME: REGULATION OF NUCLEAR POWER PLANT (NPP)**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from Planned Target to Actual Achievement 2021/2022	Reasons for Deviations
Provide and implement an effective approach towards compliance assurance	Approved process for the development of the CAP	RM2: Update process for the development of the CAP Compliance Assurance Program (CAP)	None – new indicator	None – new indicator	Approved process for the development of the CAP	Process for the development of the CAP updated and approved.	None	Not applicable
Maintain the implementation of regulatory programmes to assure effective nuclear and radiation safety	Inspection reports Letters to authorisation holder or applicant informing them of inspection outcomes	RM3a: Number of inspections conducted (NORM, NTWP and NPP)	100.30% of the CAP	100.58% (172/171 inspections conducted)	199 inspections conducted	204 inspections conducted	5	5 (+2.51%) additional inspections were conducted – during regulatory oversight it sometimes becomes important to conduct additional unplanned inspections. These are done to provide assurance of compliance in specified areas as per whatever the routine reports or regulatory audits would have identified as requiring further inspection. (102.51%) (NPP 34/29-117.24%, NORM 120/120-100% NTWP 50/50- 100%)
Maintain the implementation of regulatory programmes to assure effective nuclear and radiation safety.	Letter to authorisation holder or applicant informing them of review and assessment outcomes	RM3b: % Implementation of reviews and assessments per plan (NORM, NTWP and NPP)	115.49% reviews and assessments per programme	116.44% (970/833 reviews and assessments undertaken)	100% implementation of reviews and assessments	119.05 % of reviews and assessments implemented (1031/866) (NPP 467/396-117.92% NORM 316/ 235 - 134.47% NTWP 248/235 - 105.53%)	+19.0%	Reasons for over achievement in this instance vary. In some cases it is because the complexity of some of the reviews and assessments did not require as much time to attend to as had been anticipated, and/ or that because of work from home, productivity was increased during the FY, and/ or that staff members have grown in work experience and can move more swiftly through the work, and/or that staff members in a particular area have increased in number during the FY, and/ or that some reviews and assessments were done with the help of the Technical Support Organisation (TSO).

**PROGRAMME: REGULATION OF NUCLEAR TECHNOLOGY & NORM (NTN)**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from planned target to Actual Achievement 2021/2022	Reasons for deviations
Maintain the implementation of regulatory programmes to assure effective nuclear and radiation safety	Approved indoor radon regulatory framework	RM3c: Develop indoor radon regulatory framework	Developed Framework and the funding proposal document	Benchmark conducted, report compiled and approved	Approved indoor radon regulatory framework	Framework under review	-40%	Drafting delays due to engagements with internal experts impacted timelines.

**PROGRAMME: REGULATION OF NUCLEAR POWER PLANT (NPP)**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from planned target to Actual Achievement 2021/2022	Reasons for deviations
Provide an effective oversight of the (LTO	Approved LTO training records (certificates, attendance register, training materials)	RM4: % implementation of the LTO training plan	None – new indicator	Resource plan for LTO developed and approved	100% implementation of the LTO training plan	100% of the LTO training plan implemented	None	Not applicable

**PROGRAMME: CORPORATE SUPPORT SERVICES**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from Planned Target to Actual Achievement 2021/2022	Reasons for Deviations
Promote nuclear safety awareness (role of the NNRR)	Annual plan Quarterly reports	RM8: % implementation of the nuclear safety awareness programme	None – new indicator	None – new indicator	100% implementation of the nuclear safety awareness programme	Nuclear safety awareness programme fully implemented	None	Not applicable
Develop and implement a stakeholder relationship management plan	Stakeholder relationship management plan Quarterly reports	RM9: % implementation of the stakeholder relationship management plan	None – new indicator	None – new indicator	100% implementation of the stakeholder relationship management plan	Stakeholder relationship management plan fully implemented	None	Not applicable
Develop and implement an ISO: 27001 aligned ICT Security Plan	Quarterly reports ISO: 27001 plan	PM1: % implementation of the ISO: 27001 plans	None – new indicator	None – new indicator	100% implementation of the ISO: 27001 plan	ISO: 27001 plan fully implemented	None	Not applicable
Develop and implement a Protection of Personal Information Act (POPIA) compliance plan	POPIA compliance plan Quarterly reports	PM2: % implementation of the POPIA plan	None – new indicator	None – new indicator	100% implementation of the POPIA plan	POPIA plan fully implemented	None	Not applicable

**PROGRAMME: LEGAL, RISK AND COMPLIANCE**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from Planned Target to Actual Achievement 2021/2022	Reasons for Deviations
Ensure proactive management of potential litigation	Legislative Compliance Reports	PM3: Number of Legislative Compliance Reports	None – new indicator	None – new indicator	4 Legislative Compliance Reports	4 Legislative Compliance Reports compiled and submitted to ARMCOM	None	Not applicable



**PROGRAMME: FINANCE**

Outcome	Output	Output Indicator	Audited Actual Performance 2019/2020	Audited Actual Performance 2020/2021	Planned Annual Target 2021/2022	**Actual Achievement 2021/2022	Deviation from Planned Target to Actual Achievement 2021/2022	Reasons for Deviations
Adequate funding for execution of NNR mandate	Approved budget Finance quarterly report	FM1: % Funding of NNR planned activities	None – new indicator	None – new indicator	100% Funding of NNR planned activities	NNR planned activities fully funded	None	Not applicable
Financial sustainability of the CNSS	Approved CNSS funding model	FM2: Develop funding model of the CNSS	90% Report awaiting ministerial approval	The proposed fee structure for the costing of CNSS services was developed and approved	Approved funding model of the CNSS	CNSS funding model approved	None	Not applicable
Inclusion of previously disadvantaged individuals in economic activities	Supply Chain Management (SCM) report on bids awarded to targeted groups	FM3: % procurement spent on designated groups	1164% procurement spend on designated groups	63% of procurement spent on designated groups in terms of the PPPFA	70% of procurement spent on designated groups	68% of procurement spent on designated groups	-2.86%	Shortfall caused by the stay in procurement due to the High Court judgement on PPPFA regulations of 2017.
Provision of adequate and safe facilities for the site office.	Project plan Project report	PM4: % implementation of the Cape Town office construction project plan	None – new indicator	None – new indicator	100% implementation of Cape Town Office construction project plan	9/12 key activities implemented	-25%	Project schedule delays due to change of professional services team. Activities to be carried over to 2022-23 FY.

1 164% achievement of target i.e. the target was 50% and actual achieved was 82%, making performance 164% relative to target\*\*Actual achievement must be reported in relation to the performance information reflected in the originally tabled Annual Performance Plan (In the instance where a public entity did not re-table the Annual Performance Plan in the financial year under review) OR in relation to the performance information reflected in the re-tabled Annual Performance Plan.

## Strategy to overcome areas of under performance

The non-achievement of targets can be attributed largely to external factors. The following areas of under-performance will be addressed:

- Fast track internal expert cooperation and collaboration in the radon project.
- Fast track the implementation of the Cape Town Office construction plan.

## Linking performance with budgets

Table 1: Linking performance with budgets

Programme Output	Code	Description	2021/2022			2020/2021		
			Budget R'000	Actual R'000	Variance Under/ (Over) R'000	Budget R'000	Actual R'000	Variance Under/ (Over) R'000
To process applications for nuclear authorisations in a timely and accurate manner	135, 137, 138, 146, 147, 148 & 149	Personnel	21 244	25 796	(4 552)	29 047	21 445	7 602
		Goods & Services	27 510	19 213	8 296	20 009	18 352	1 657
	<b>TOTAL</b>		<b>48 753</b>	<b>45 009</b>	<b>3 744</b>	<b>49 056</b>	<b>39 797</b>	<b>9 259</b>
To ensure effective implementation of nuclear security measures by authorisation holders	139 & 175	Personnel	4 710	4 144	566	4 164	3 965	199
		Goods & Services	265	106	159	339	171	168
	<b>TOTAL</b>		<b>4 975</b>	<b>4 250</b>	<b>725</b>	<b>4 503</b>	<b>4 136</b>	<b>367</b>
To establish an independent verification capability for the NNR	136 & 140	Personnel	8 095	7 421	674	9 625	7 329	2 296
		Goods & Services	1 134	364	770	451	111	340
	<b>TOTAL</b>		<b>9 229</b>	<b>7 785</b>	<b>1 444</b>	<b>10 075</b>	<b>7 440</b>	<b>2 635</b>
To provide assurance of safety performance of authorisation holders through inspections, audits, investigation and taking enforcement action for identified non-compliance	171-174, 176-179	Personnel	43 781	46 086	(2 305)	43 402	36 928	6 474
		Goods & Services	2 733	1 922	810	3 200	1 046	2 154
	<b>TOTAL</b>		<b>46 513</b>	<b>48 008</b>	<b>(1 495)</b>	<b>46 602</b>	<b>37 974</b>	<b>8 628</b>
Good governance	124 - 128	Personnel	17 728	17 380	348	15 779	14 524	1 255
		Goods & Services	7 075	3 856	3 219	6 452	1 870	4 582
	<b>TOTAL</b>		<b>24 803</b>	<b>21 236</b>	<b>3 567</b>	<b>22 231</b>	<b>16 394</b>	<b>5 837</b>

Financial viability and sustainability	155, 156 & 158	Personnel	15 113	29 028	(13 915)	15 001	28 348	(13 347)
		Goods & Services	23 360	31 837	(8 478)	23 896	31 665	(7 769)
<b>TOTAL</b>			<b>38 473</b>	<b>60 865</b>	<b>(22 393)</b>	<b>38 897</b>	<b>60 013</b>	<b>(21 116)</b>
High performance culture, effective human capital management	142, 144, & 145	Personnel	13 217	9 876	3 340	9 941	9 426	515
		Goods & Services	9 183	6 220	2 964	7 322	5 803	1 519
<b>TOTAL</b>			<b>22 400</b>	<b>16 096</b>	<b>6 304</b>	<b>17 264</b>	<b>15 229</b>	<b>2 035</b>
Sound organisational infrastructure	143	Personnel	5 253	4 644	609	5 266	4 291	975
		Goods & Services	15 190	12 815	2 375	16 577	15 453	1 124
<b>TOTAL</b>			<b>20 443</b>	<b>17 459</b>	<b>2 984</b>	<b>21 843</b>	<b>19 744</b>	<b>2 099</b>
Stakeholder relations and corporate image	141	Personnel	3 242	2 786	456	3 164	2 770	394
		Goods & Services	4 174	3 462	712	4 073	2 107	1 966
<b>TOTAL</b>			<b>7 415</b>	<b>6 248</b>	<b>1 168</b>	<b>7 237</b>	<b>4 877</b>	<b>2 360</b>
To provide an independent analytical verification capability and capacity	160 - 167	Personnel	52 994	54 896	(1 902)	51 119	44 474	6 645
		Goods & Services	17 238	8 722	8 516	16 573	6 370	10 203
<b>TOTAL</b>			<b>70 231</b>	<b>63 618</b>	<b>6 613</b>	<b>67 691</b>	<b>50 844</b>	<b>16 847</b>

## 4. Revenue Collection

Table 2: Revenue

Sources of revenue	2021/2022			2020/2021		
	Budget/ Estimate	Actual Amount Collected	(Over)/ Under Collection	Budget/ Estimate	Actual Amount Collected	(Over)/ Under Collection
	R'000	R'000	R'000	R'000	R'000	R'000
Authorisation fees	210 884	209 886	998	235 745	212 715	23 030
Application fees	41 951	25 402	16 549	17 200	22 435	(5 235)
State grant	46 089	46 089	-	40 467	40 467	-
Other revenue	8 148	10 008	(1 860)	7 941	5 738	2 203
<b>TOTAL</b>	<b>307 072</b>	<b>291 385</b>	<b>15 687</b>	<b>301 353</b>	<b>281 354</b>	<b>19 999</b>

Total revenue realised for the 2021/22 financial year amounted to R291 million, against a budget of R307 million. This is an increase of 3,5 percent in comparison to the previous financial year. Authorisation fees account for 72 percent of total revenue. Application fees remain unpredictable and fluctuates year on year based on applications received and additional work agreed upon with applicants on ongoing projects. State grant increase by 13,9 percent from R40 million to R46 million. Other revenue includes interest income and other recoveries from services rendered by the NNR on behalf of partner institutions, such as the IAEA, ENSTTI, etc. The overcollection in this source of revenue can be attributed to consistent positive cash balances on the investment accounts and the increase in interest rates by the South African Reserve Bank Monetary Policy Committee.

Table 3: Performance with budgets

Programme	Description	2021/2022			2020/2021		
		Budget	Actual	Variance Under/ (Over)	Budget	Actual	Variance Under/ (Over)
		R'000	R'000	R'000	R'000	R'000	R'000
Administration	Personnel	54 552	63 714	(9 162)	49 152	59 358	(10 206)
	Goods & Services	58 982	58 190	792	58 320	58 635	(315)
	<b>TOTAL</b>	<b>113 534</b>	<b>121 904</b>	<b>(8 369)</b>	<b>107 472</b>	<b>117 993</b>	<b>(10 521)</b>
Nuclear Power Plants	Personnel	29 339	33 217	(3 878)	38 672	28 774	9 898
	Goods & Services	28 644	19 578	9 066	20 460	16 798	3 662
	<b>TOTAL</b>	<b>57 983</b>	<b>52 794</b>	<b>5 189</b>	<b>59 132</b>	<b>45 572</b>	<b>13 560</b>
Nuclear Technology & NORM	Personnel	48 491	50 230	(1 739)	47 566	40 893	6 672
	Goods & Services	2 998	2 028	969	3 538	1 217	2 321
	<b>TOTAL</b>	<b>51 488</b>	<b>52 258</b>	<b>(770)</b>	<b>51 104</b>	<b>42 110</b>	<b>8 994</b>
Regulatory Improvements and Technical Services	Personnel	52 994	54 896	(1 902)	51 119	44 474	6 645
	Goods & Services	17 238	8 722	8 516	16 573	6 297	10 276
	<b>TOTAL</b>	<b>70 231</b>	<b>63 618</b>	<b>6 613</b>	<b>67 691</b>	<b>50 770</b>	<b>16 921</b>



## 5. Capital Investment

### Administration (Support services)

Total expenditure on compensation of employees for this programme amounted to R63 million. The difference of R9 million against the budget is mainly attributed to the payment of performance bonuses which are not budgeted for. During the year, management implemented a revised annual cost of living adjustments agreement, as per the Ministerial directive and as approved by the NNR Board.

Expenditure on goods and service was line with the approved budget for the 2021/22 financial year, and this can be attributed to the strict monitoring of spending by management.

### Nuclear Power Plants (NPP)

The programme's expenditure on compensation of employees amounted to R33 million, compared to a budget of R29 million. The overspending of about 13 percent can be attributed to the implementation of the revised annual cost of living adjustments and payment of performance bonus.

A total of R19 million was spent on goods and services, against a budget of R28 million, which is equivalent to savings of about 18 percent. Major savings were realised on training and travelling for both domestic, foreign travel and consultancy.

### Nuclear Technology & NORM (NTN)

The NTN division spent R50 million on compensation of employees compared to a budget of R48 million, in the year under review. The implementation of the revised cost of living adjustment agreement and payment of performance bonus largely contributed to the 4 percent variance.

The division spent 68 percent of its goods and services budget for the period under review. The main areas of underspending include spending on protective clothing, domestic and foreign training, and foreign travelling.

### Regulatory Improvements and Technical Services (RITS)

The RITS division incurred total expenditure of R45 million, on compensation of employees, against a budget of R52 million, for the period under review. This increase is mainly attributed to the implementation of the annual cost of living adjustments and payment of performance bonus.

Expenditure on goods and services, for the period under review amounted to R8 million, compared to a budget of R17 million. The main areas of underspending includes on local and foreign training and travelling.

Table 4: Capital investment, maintenance and asset management plan


Sources of revenue	2021/2022			2020/2021		
	Budget	Actual	(Over)/ Under	Budget	Actual	(Over)/ Under
	R'000	R'000	R'000	R'000	R'000	R'000
Cape Town office accommodation	12 894	-	12 894	12 947	53	12 894
<b>TOTAL</b>	<b>12 894</b>	<b>-</b>	<b>12 894</b>	<b>12 947</b>	<b>53</b>	<b>12 894</b>

The Regulator has one major project for the construction of the Cape Town Site Office. The construction phase was planned to commence in the current financial year (2021/22), however, due to delays in the approvals for the demolition of the old building, the commencement date for construction has been revised, and is expected to commence in the 2022/23 financial year. As a result, there was no significant spending on the project for the 2021/22 financial year.



PART C  
Governance





The African Black Oystercatcher is near-endemic to the coast of southern Africa. This bird species is considered as one of the rarest oystercatchers in the world. Due to the small population size of less than 10 000 individuals, they are regarded as 'Near Threatened'. There are 12 known species of oystercatchers worldwide of which two can be found along the coast of South Africa.

Monitoring the impact of sources and radioactive nuclide concentrations in the environment is an obligatory regulatory requirement for nuclear authorisation holders.



## 1. Introduction

Corporate governance embodies processes and systems by which public entities are directed, controlled and held to account. In addition to legislative requirements based on the Regulator's enabling legislation, and the Companies Act, corporate governance with regard to public entities is applied through the precepts of the Public Finance Management Act (PFMA) and run-in tandem with the principles contained in the King's Report on Corporate Governance.

Parliament, the Executive, and the Accounting Authority of the Regulator are responsible for corporate governance. The Corporation is listed as a Schedule 3A Regulator in terms of the PFMA. The company was reconstituted in terms of the Export Credit and Foreign Investment Insurance Act, (Act No. 78 of 1957, as amended) and incorporated in terms of the Companies Act (Act No. 71 of 2008, as amended).

South Africa's legislative framework for corporate entities also applies to the Regulator, although the PFMA supersedes all other legislation apart from the Constitution.

The Entity subscribes to the King Report on Corporate Governance, 2016 (King IV).

### **Public Finance Management Act (PFMA)**

Compliance with the PFMA drives the transparency, accountability and sound management of revenue, expenditure, assets and liabilities in public entities. The ECIC Board, as the Accounting Authority, takes effective and appropriate steps to prevent irregular, fruitless and wasteful expenditure. The Corporation's Materiality and Significance Framework is reviewed annually.



## 2. Portfolio Committee

The NNR presented its 2021/22 Annual Report to the Portfolio Committee on Energy (PCE) on 1 October 2021. The NNR assured the Committee that all nuclear installations and regulated entities under the purview of the NNR did not expose workers to undue levels of ionising radiation or cause nuclear damage to the environment during the reporting period. The NNR successfully fulfilled its fiduciary duties and continued to discharge its mandate in accordance with best practices in governance whilst complying with regulatory and legislative requirements.



## 3. Executive Authority

The Minister of the Department of Mineral Resources and Energy serves as the Executive Authority of the NNR.



## 4. Accounting Authority/Board of Directors

The Board of Directors is the Accounting Authority in terms of the PFMA and the NNR Act. The Board is appointed for a renewable period of three years by the Minister of Mineral Resources and Energy. In terms of Section 8 (1) and (2) of the NNR Act, the Regulator is governed and controlled, in accordance with the NNR Act, by a Board of Directors to ensure that the objectives of the NNR Act are carried out, and to exercise general control over the performance of the Regulator's functions. The Regulator is governed by a unitary Board of Directors who, collectively, have the required experience and business acumen to guide the company's strategy and governance.

The Board of Directors embraces the principles of good corporate governance and considers these as the underlying philosophy in creating organisational excellence at all levels within the Regulator. The Board sets the precedent in driving the ethics of good governance and the Directors, collectively and individually, acknowledge their responsibilities and duties in terms of the Board Charter and other governance, regulatory and legislative requirements.

### Role of the Board

The Board sets the precedent in driving the ethics of good governance and the Directors, collectively and individually, acknowledge their responsibilities and duties in terms of the Board Charter and other governance, regulatory and legislative requirements. The Board of Directors is ultimately accountable for the governance and performance of the NNR. The Board provides oversight, strategic direction, leadership and approves strategic policies of the NNR.

### Board Charter

The Board Charter is reviewed annually and sets out the responsibilities of the Board, its Directors and NNR management. The charter ensures that the Board exercises full control over significant matters, including the Regulator's vision, mission and values, strategic objectives, strategic plans, annual budget, and performance monitoring against set objectives, as well as its design, integrated report, and annual financial statements. The Board Charter supports independence and objective decision-making with no Director holding unfettered decision-making powers. Director "independence" is aligned with King IV, while non-executive Directors who represent government departments are not considered as independent. None of the Directors have contractual or family relationships with the company, nor do they participate in company incentive schemes or charities that benefit from donations by the Regulator. This ensures fair, unbiased, and unfettered judgements about matters that affect the Regulator.

## 4.1. Composition of the Board

The Board comprises nine non-executive Directors who are independently appointed by the Minister of Mineral Resources and Energy, and an Executive Director (Chief Executive Officer). Board members, including the Chief Executive Officer, hold office for a maximum of three years, but are eligible for re-appointment.

The Board consists of nine Directors, including six independent Non-executive Directors, two non-independent Non-executive Directors (government representatives) and the CEO as an Executive Director.

The Board adopted the principles of openness, integrity and accountability as espoused in the King Code on Corporate Governance (King IV). All directors have a fiduciary duty to exercise due care and skill in carrying out their responsibilities. The Board is accountable to the shareholder for the Corporation's activities and performance. The roles of the Chairperson and CEO are separated. The Chairperson is an independent Non-executive Director who ensures that the Board functions efficiently and operates as a unit. The responsibility for managing the Corporation's business is delegated to the CEO, as the Executive Director accountable to the Board.

## Board Members



**DR T MOTSHUDI**  
Chairperson of the Board  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
MB ChB, FC Rad Diag (SA)	Radiology	Nil	Nil	11



**MS D PETA**  
Deputy Chairperson of the Board  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
LLB (UP),LLM Environmental Law (WITS), Prospecting and Mining Law cer (WITS), Introduction to Mining Engineering att (WITS), International Maritime Law PGD (World Maritime University).	Law	-	NNR Board Technical Committee, NNR Board Human Resources and Remuneration Committee	10



**DR Z QUNTA**  
Board Member  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
PHD - Topic: Effectiveness of Public entities, Public Sector Corporate Governance Certificate, Bachelor of Administration, Master of Commerce, Master of Business Administration	Governance, PFMA and MFMA, Strategic planning, Business planning, Financial accounting, Management accounting, Performance management, Macro-economic planning, Corporate governance, Government budgeting and expenditure management, Government supply chain management, Strategy development, Policy development, Skills audit, Training and development	-	NNR Audit and Risk Management Committee, NNR Board Human Resources and Remuneration Committee, Chairs the Audit and Risk Committee of the National Department of Rural Development and Land Affairs	9



**MS V BENDAMAN**

Board Member

Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
LLB, BA Law, Practical Legal Training, Certificate of Competence in Business Communication Skills, Course in Procurement and Tender Approval, Legal Drafting Certificate, Certificate in Medical- Legal Practice, Executive Coaching	Law	Nil	NNR Board Technical Committee	6



**MR P PHILI**

Board Member

Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Master of Commerce (Taxation), Postgraduate Diploma in Accountancy, BCom (Hons), Advanced Certificate in Auditing Apt, Bachelor of Commerce (Accounting)	Accounting Audit	Rand Water Board, Resilient REIT Limited, JSE Listed Property Group, Financial Intelligence Centre (FIC)	NNR Audit and Risk Management Committee	8



**DR M.B TYOBEKA**

Chief Executive Officer

Date Appointed: 1 September 2020

Date Resigned: 31 May 2022

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Graduate School of Business - University of Cape Town: Executive Development Programme 2015, Penn State University - Doctor of Philosophy (Nuclear Engineering) 2007, Colorado Technical University - Master of Science in Management (Project Management) 2005, Penn State University - Master of Science (Nuclear Engineering) 2004, University of North West - M.Sc. Applied Radiation Science and Technology 2000, University of North West - B.Sc. (Ed) 1998			NNR Board Technical Committee, NNR Board Human Resources and Remuneration Committee, NNR Audit and Risk Management Committee	9



**MR K MAPHOTO**

Board Member  
Date Appointed: 1 February 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Executive Leadership Programme, MSc (Applied Environmental Nuclear Physics), BSc (Hons) Physics, BSc (Physics and Chemistry)	Nuclear Physics	Nil	NNR Board Technical Committee	8



**MR B PETLANE**

Board Member  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Master's in Engineering Management, Postgraduate Diploma in Electrical Engineering, BEng in Electrical, International Baccalaureate Diploma	Electrical Engineering	Nil	NNR Board Technical Committee, NNR Audit and Risk Management Committee, Committee Member (ECSA) Investigations and Compliance – 2012 – 2017. (Current)	8



**MR D MAMPHITHA**

Board Member  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Advanced Directorship Programme, MBA, Postgraduate Diploma in Mining Engineering, BCom, National Higher Diploma - Metallurgy	Project management, Health, safety and environmental management, Contract negotiation and management, Negotiation skills, Business presentation skills, Stakeholder engagement and relationship management, Strategy development, implementation, and monitoring, Conflict and people management and leadership skills, Coaching and mentoring, Report writing skills	Nil	NNR Board Technical Committee, NNR Board Human Resources and Remuneration Committee, NNR Audit and Risk Management Committee	9



**MS L DLAMINI**  
Board Member  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
MSc in Environmental Management, BSc (Hons) in Environmental and Water Science, BSc in Environmental Science	Environmental management, Compliance management, Auditing processes, Report writing, Strategy development & implementation, Policy development & implementation, Organisational sustainability, People management	TCTA, South Africa	NNR Board Human Resources and Remuneration Committee, NNR Audit and Risk Management Committee, TCTA, South Africa – Technical Committee, TCTA, South Africa - HRRC	7



**MS V MIYA**  
Board Member  
Date Appointed: 10 June 2021

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Postgraduate Diploma in Labour Law, School for Legal Practice 2008(2) (Law School, Baccalaureus Legum (LLB))	Labour law	Nil	NNR Board Human Resources and Remuneration Committee	8



**MR M MOSIA**  
Board Member  
Date Appointed: 1 September 2020

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
Higher Certificate in Business, Management, BTech Project Management, National Diploma Mechanical, Qualified Fitter & Turner, Management & Leadership Development Programme, Eskom Supervisory Development Programme	Mechanical, Business management, Project management	Nil	NNR Board Technical Committee, NNR Board Human Resources and Remuneration Committee	3

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
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**MR A TAYLOR**  
Alternate Board Member  
Date Appointed: 10 June 2021

Qualifications	Area of Expertise	Board Directorships	Committees or Task Teams	Meetings Attended
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**MR P BECKER**  
Board Member  
Date Appointed: 10 June 2021  
Served Until: 25 February 2022

			NNR Board Technical Committee, NNR Board Human Resources and Remuneration Committee	7
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## Committees

In terms of the NNR Act, the Board has established committees and delegated responsibilities efficiently and effectively. The committees are governed by Board-approved Terms of Reference (ToR) that define the composition, role, responsibilities, and delegated authority of each committee. The respective ToRs are aligned with regulatory requirements and governance best practice. Board Committee ToRs are reviewed annually, as recommended by King IV.

The Board committees are the Audit and Risk Management Committee, Human Resources and Remuneration Committees and Technical Committee. The Board remains ultimately accountable for the proper fulfilment of committee functions.

Committee chairpersons report to the Board on their deliberations and recommendations.

**Table 5: Board members, committees, and meeting attendance from 1 April 2021 to 31 March 2022**

Committee	No. of meetings held	No. of members	Name of members
Audit & Risk Management Committee (ARMCOM)	6	5	Mr P Phili (Chairperson) Mr B Petlane Dr Z Qunta Mr D Mamphitha Ms L Dlamini
Technical Committee	5	6	Mr B Petlane (Chairperson) Mr K Maphoto Ms V Bendeman Ms D Peta Mr P Becker (Vacant) Mr M Mosia
Transformation & Development Committee	5	6	Dr Z Qunta (Chairperson) Ms V Miya Mr D Mamphitha Ms L Dlamini Ms D Peta Mr P Becker (Vacant)

## Remuneration of Board Members

The remuneration of Board members is determined by the Minister of Mineral Resources and Energy with the concurrence of the Minister of Finance and is reviewed annually. Board and Committee members are remunerated for attending meetings and other Board activities e.g., workshops. The details of the remuneration for the year ended March 2022 are stated in Note 30 to the Annual Financial Statements on page 198.

All Board members who are in the employment of the state are not remunerated for the services they render for the Regulator but do get reimbursed for traveling by the Regulator.

**Table 6: Board remuneration**

Name	Remuneration	Other Allowance	Other Re-mbursements	Total
Dr T Motshudi	R219 660.00	-	R2 462.20	R222 122.20
Ms D Peta	R197 223.00	-	R1 223.00	R198 446.16
Dr Z Qunta	R167 847.00	-	R3 347.00	R171 194.00
Ms V Bendeman	-	-	-	-
Mr P Phili	R191 706.15	-	R4 824.17	R196 530.32
Mr P Becker	R 72 846.00	-	-	R 72 846.00
Mr K Maphoto	-	-	-	-
Mr B Petlane	R161 814.00	-	R4 023.62	R165 838.00
Mr D Mamphitha	R131 490.00	-	R4 154.36	R135 644.00
Ms L Dlamini	R127 602.00	-	R4 404.95	R132 006.95
Ms V Miya	R 74 034.00	-	R1 004.66	R 75 038.66
Mr M Mosia	R 32 454.00	-	R1 643.33	R 34 097.33
Mr A Taylor	-	-	-	-

## 5. Risk Management

Risk management in the NNR is fundamental for the delivery of the organisation’s mandate, and achievement of strategic deliverables. The Board is responsible for the governance and mitigation of risk and holds the Chief Executive Officer and the Management accountable for risk management.

During the year under review the organisation implemented the risk management policy, strategy and action plan. The risk management function conducted periodic risk assessments to assess material risks that may affect the delivery of pre-determined objectives and to identify opportunities which could be channelled back to the organisational strategy.

The Risk Steering Committee held quarterly meetings to discuss the risks affecting the organisation and to review the risk management policy, strategy, and risk management implementation plan. The Risk Champions forum met quarterly to monitor and ensure that actions aimed at addressing the identified risks were implemented during the year under review.

The implementation of the risk management implementation plans was monitored using a risk register and risk monitoring tool. The status of key risks was reported to the Executive Committee, ARMCOM and the Board. Identification of new/emerging risks remained a standing agenda item at the Risk Steering Committee.



## 6. Internal Control

The risk management function successfully conducted operational risk assessments on all internal divisions. This included risk incident reporting and monitoring the implementation of action plans to mitigate identified residual risks.

The effectiveness of risk management within the NNR was assessed using the National Treasury Financial Management Capability Maturity Model (FMCMM). The risk maturity level remains at level five out of six. This indicated that the NNR's approach to risk management added value and it improved the overall performances of the organisation.



## 7. Internal Audit and Audit Committees

The in-house Internal Audit function is governed by an approved Internal Audit Charter and upholds the Institute of Internal Auditors International Standards for the Professional Practice of Internal Auditing (Standards) in executing its deliverables.

Internal Audit provides reasonable assurance to the Board, Audit and Risk Committee and Management, on the adequacy and effectiveness of internal controls, risk management and governance processes.

### 7.1. Objectives and key activities of the Internal Audit

In accordance with the definition of internal auditing and the authority to establish and maintain an internal audit function as contained in the PFMA and its Treasury Regulations, the NNR's Internal Audit department provided independent, objective, assurance and advisory services, designed to add value and improve the NNR's operations. To ensure independence, the Chief Audit Executive reports functionally to ARMCOM and administratively to the CEO.

The responsibilities of the Internal Audit department included the following:

- Monitoring and evaluating the organisation's governance processes including ethics.
- Performing an objective assessment of the effectiveness of risk management and the internal control framework; and
- Systematically analysing and evaluating business processes and associated controls.

### 7.2. Summary of audit assignments completed

The annual allocation of internal audit resources to audit activities was established based on an approved annual internal audit plan. ARMCOM remained responsible for approving the rolling three-year and annual internal audit plans.

For the year under review, 13 internal audits were conducted in the following areas: Finance; Corporate Support Services; Information Technology; Legal, Risk and Compliance; Centre for Nuclear Safety and Security (CNSS); Strategy and Organisational Performance, including deliverables for the technical departments; Nuclear Power Plants (NPP), Nuclear Technology

and Waste Projects (NTWP), and Naturally Occurring Radiation Material (NORM) programmes. The outcomes and recommendations of the audits were discussed with the management team and action plans and implementation dates to address the recommendations were developed.

The internal audit department continued to implement actions to address issues raised in the Quality Assessment Review (QAR) report. Progress updates on the implementation were reported to the ARMCOM.

### 7.3. Objectives and key activities of the Audit Committee

The Audit Committee’s mandate is, amongst others, to review the effectiveness of internal controls, ensure satisfactory standards of governance and compliance, and oversee risk management including risk control systems. The Audit Committee complied with all applicable legal requirements as necessary under the legislation and applied the appropriate corporate governance practices for audit committees as recommended by King IV.

For the period under review the Audit Committee assisted the Board in overseeing financial reporting risks, effectiveness of internal audit and the organisation’s systems for internal control. The Audit Committee comprised of five non-executive directors. Relevant information on the Audit Committee is disclosed in the following table.

**Table 7: Attendance of Audit Committee meetings**

Name	Qualifications	Internal or external	If internal, position in the public entity	Date appointed	Date Resigned	No. of Meetings attended
Mr P Phili	<ul style="list-style-type: none"> <li>• Master of Commerce (Taxation)</li> <li>• Postgraduate Diploma in Accountancy</li> <li>• BCom (Hons)</li> <li>• Advanced Certificate in Auditing Apt</li> <li>• Bachelor of Commerce (Accounting)</li> </ul>	External	N/A	1 September 2020		6
Mr B Petlane	<ul style="list-style-type: none"> <li>• Engineering Management</li> <li>• Postgraduate Diploma in Electrical Engineering</li> <li>• Electrical</li> <li>• International Baccalaureate Diploma</li> </ul>	External	N/A	1 September 2020		6

Mr D Mamphitha	<ul style="list-style-type: none"> <li>Advanced Directorship Programme</li> <li>MBA</li> <li>Postgraduate Diploma in Mining Engineering</li> <li>BCom</li> <li>National Higher Diploma - Metallurgy</li> </ul>	External	N/A	1 September 2020	31 July 2022	6
Dr Z Qunta	<ul style="list-style-type: none"> <li>PHD - Topic: Effectiveness of Public entities</li> <li>Public Sector Corporate Governance Certificate</li> <li>Bachelor of Administration</li> <li>Master of Commerce</li> <li>Master of Business Administration</li> </ul>	External	N/A	1 September 2020		6
Ms L Dlamini	<ul style="list-style-type: none"> <li>MSc in Environmental Management</li> <li>BSc (Hons) in Environmental and Water Science</li> <li>BSc in Environmental Science</li> </ul>	External	N/A	1 September 2020		6



## 8. Compliance with Laws and Regulations

The Regulator operates in a highly regulatory environment. The Board plays an oversight role in ensuring that the Regulator complies with applicable laws and considers adherence to non-binding rules, codes, and standards. A dedicated unit for the compliance function identifies applicable legislation, regulatory requirements, and related amendments, analyses their impact on the Regulator and facilitates compliance monitoring and control using a risk-based approach. The function collaborates with other risk assurance providers and internal functions, including Operations.

Management committees through business processes and in line with the delegation of authority, escalate material regulatory issues to the Board and corrective action is taken to address any identified non-compliance.



## 9. Fraud and Corruption

For the year under review, the Board reviewed and approved the NNR's fraud and corruption prevention policy, the whistle blowing policy, a fraud and corruption prevention plan as well as a fraud and corruption response plan.

Fraud and prevention awareness workshops were conducted for the entire organisation to ensure that all NNR staff are aware of the internal and external impact of fraud and corruption. A fraud risk assessment was conducted internally with senior managers aimed at identifying and reviewing potential fraud and corruption risks. The identified fraud risks were rated according to the risk management matrix of the NNR and the risk owners were requested to provide mitigation plans to address any control deficiencies. A consolidated fraud register was developed and approved by the Board.

Monitoring and tracking of the implementation of action plans were conducted on a regular basis to manage identified fraud and corruption risks to an acceptable level within the organisation. There were no incidents of whistle blowing reported for the year under review.



## 10. Code of Conduct

The NNR's code of conduct and ethics framework is aligned to the public servants code of conduct. The framework sets out the ethical standards and behaviours which must be adhered to. The code of conduct serves to guide employees as to what is expected of them from an ethical point of view, both in their individual conduct in public and private life. In line with our vision to be an independent leading nuclear regulator, the conduct of NNR employees is guided by core organisational values which have been developed for the benefit of the Regulator and its employees. Its prime purpose is to promote a culture of ethical behaviour and to instil public trust and confidence in the regulator's employees who are required to be impartial and to act with integrity.

The framework covers inter alia the relationships between employees and stakeholders, conflicts of interest, and information security. Breaches to the code of conduct are handled in accordance with the applicable organisational processes. Serious offences of misconduct such as the unauthorised disclosure of classified information may result in criminal charges being laid against the offender.



## 11. Health, Safety and Environmental Issues

The NNR strives to ensure that it maintains a safe working environment for employees. The NNR's Health and Safety Committee has been appointed in compliance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) During the review period, the NNR conducted quarterly workplace inspections; and external health, safety and environmental assessments and audits. There were no reports of incidents or injuries on duty.

During the year under review the NNR COVID-19 task team in consultation with internal stakeholders developed and implemented a COVID-19 plan to ensure compliance with the Disaster Management Act, 2002 (Act No. 57 of 2002) and COVID-19 related regulations. The NNR's COVID-19 Compliance Manager and the site compliance officers ensured the effective implementation of the COVID-19 plan. In order to minimise exposure and reduce the spread of infections in the workplace, employees were required to either work completely or partially from home depending on the level of lockdown as specified in the National Disaster Management Regulations. The organisation implemented ongoing employee health and safety awareness communications with a specific focus on preventing the spread of respiratory viruses in the workplace as well as encouraging employees to get vaccinated against COVID-19.



## 12. Company/Board Secretary

The Company Secretary guides and assists the Board of Directors to discharge their legal oversight and regulatory responsibilities and duties in the best interests of the Regulator. The Company Secretary's duties include providing Directors with timely and unrestricted access to corporate information, director training, induction, Board and Board committee performance evaluations, meeting agendas and minutes.



## 13. Social Responsibility

Social interventions for the reporting period included local community stakeholder engagements in the management of the indoor radon exposures project. The engagements were aimed at introducing the NNR project to stakeholders, proactively creating awareness of the significant health risks posed by radon and to request local community co-operation in the mitigation and management measures. The project involved installing radon measuring monitors in people's homes and was implemented in the Ga-Khunwana Village in the North West Province and Kutloanong Township in the Free State.

The social upliftment effort focussed on the water crisis situation in Hammanskraal, Pretoria. The NNR provided a 10 000 litre water storage tank, hygiene supplies, and groceries to the Tshwaraganang Children's home and donated 19 000 litres of clean drinking water, hygiene supplies, and groceries to the Wisane Old Age Home in Hammanskraal.

## 14. Audit Committee Report

### Audit & Risk Management Committee Responsibility

The Audit and Risk Management Committee comprised of five Non-executive Directors and a Non-executive Director, who is not the Chairperson of the Board, chaired the Committee.

The ARMCOM assisted the Board in overseeing:

- The quality and integrity of the financial statements and the disclosure thereof.
- The scope and effectiveness of the internal audit function; and
- The effectiveness of the organisation's system of internal control.

The members of the ARMCOM for the reporting period were:

- Mr P Phili (Chairperson)
- Mr B Petlane
- Dr Z Qunta
- Mr D Mamphitha
- Ms L Dlamini

**Table 8: ARMCOM meetings held (April 2021-March 2022)**

Name	13 April 2021	26 May 2021	13 July 2021	26 July 2021 Special Meeting with AGSA	12 October 2021	20 January 2022
Mr P Phili	P	P	P	P	P	P
Mr D Mamphitha	P	P	P	P	P	P
Ms L Dlamini	P	P	P	P	P	P
Dr Z Qunta	P	P	P	P	P	P
Mr B Petlane	A	P	P	P	P	P

P Member present at the meeting.

A Member not present but tendered an apology.

N/A Not applicable refers to member not yet appointed to the Board/Board Committee or member resigned from the Board/Board Committee

The external and internal auditors attend committee meetings, have unrestricted access to the committee and chairperson and can address the Audit Committee at each meeting without the presence of management. The Audit Committee has not recommended the engagement of an external assurance provider on material sustainability issues to the Board as it regards the internal assurance as adequate, given the maturity of existing processes.

The committee believes that it has complied with its legal and regulatory responsibilities for the year under review (refer to Audit Committee Report on page 150 of this report).





## 15. B-BBEE Compliance Performance Information

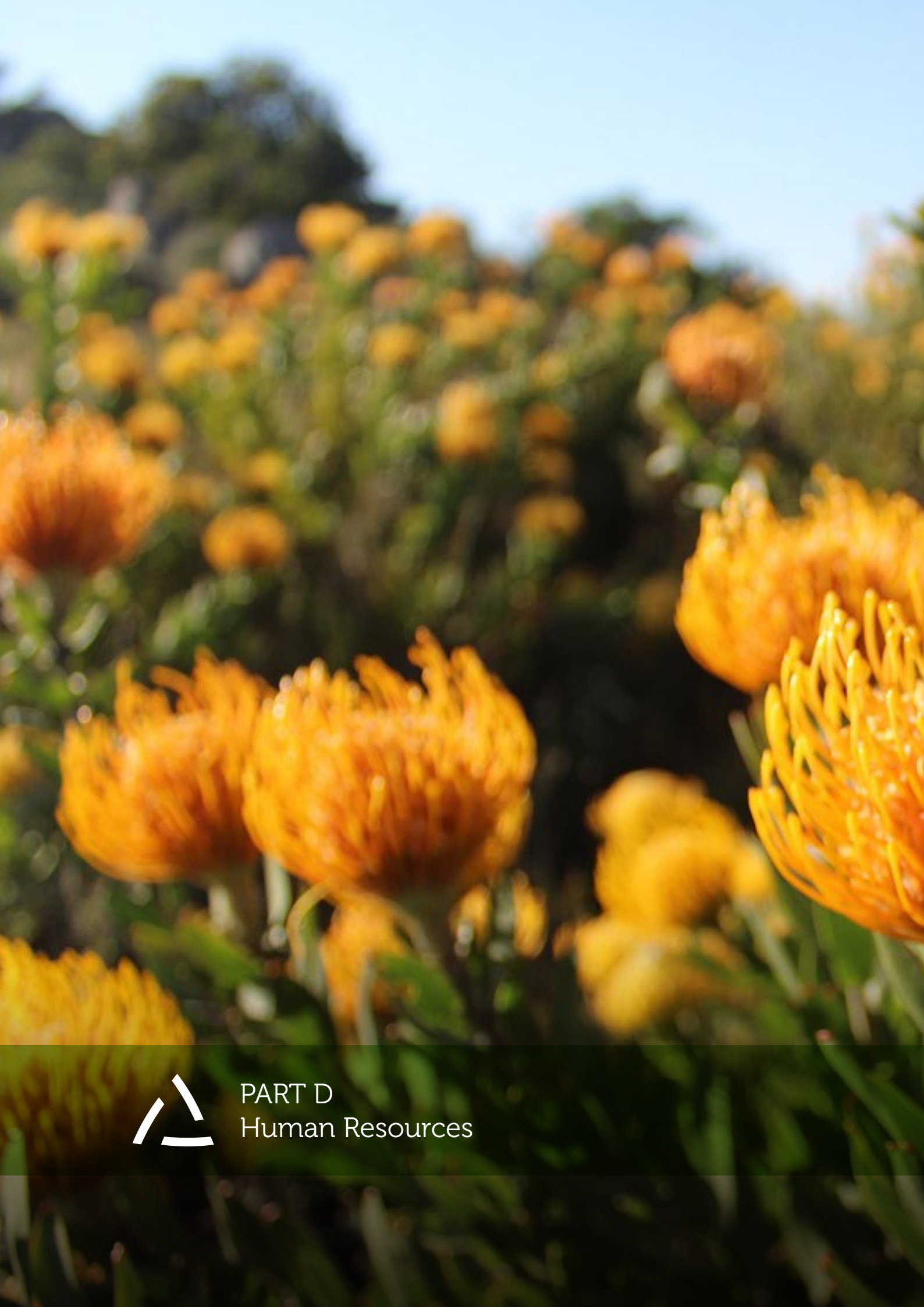
The Broad-Based Black Economic Empowerment Act (Act 53 of 2003), as amended (the B-BBEE Act 46 of 2013), read together with the B-BBEE Regulations, requires that all spheres of government, public entities and organs of state as well as companies listed on the Johannesburg Stock Exchange (JSE) report to the B-BBEE Commission annually on their compliance with broad-based black economic empowerment.

The National Nuclear Regulator (NNR) supports the broad impetus of B-BBEE to structure and transform the economy to enable meaningful participation of the majority of its citizens, and to further create capacity within the broader economic landscape at all levels.


The following table has been completed in accordance with the compliance to the B-BBEE requirements of the B-BBEE Act of 2013 and as determined by the Department of Trade and Industry.

### HAS THE DEPARTMENT/PUBLIC ENTITY APPLIED ANY RELEVANT CODE OF GOOD PRACTICE (B-BBEE CERTIFICATE LEVELS 1-8) WITH REGARDS TO THE FOLLOWING:

Criteria	Response Yes/No	Discussion (include a discussion on your response and indicate what measures have been taken to comply)
Determining qualification criteria for the issuing of licences, concessions or other authorisations in respect of economic activity in terms of any law?	No	As a regulatory body, NNR among other things, issues licences to eligible services providers and regulates the safety and security for nuclear power plants technology. Currently the qualifying criteria applied is that which is determined in terms of the Legislation (National Nuclear Regulator Act No. 47 of 1999).
Developing and implementing a preferential procurement policy?	Yes	NNR has developed supply chain management processes that caters for preferential procurement with corresponding templates, evaluation criteria and frameworks to ensure that the imperatives of B-BBEE are achieved and complied with.
Determining qualification criteria for the sale of state-owned enterprises?	No	NNR is a public entity and recognised as such in terms of Schedule 3A of the Public Finance Management Act. The NNR does not partake in such sales as an entity.
Developing criteria for entering into partnerships with the private sector?	Yes	NNR is guided by Chapter 16 of Treasury Regulations in entering into partnerships with the private sector
Determining criteria for the awarding of incentives, grants and investment schemes in support of Broad-Based Black Economic Empowerment?	No	The award of incentives, grants and investments is not the core activity of NNR. However, the NNR does make investments in the form of bursary awards to staff and corporate social responsibilities that would target previously disadvantaged individuals and institutions such as schools etc.



PART D  
Human Resources



The West Coast is home to thousands of species of plants, including fynbos which is indigenous to the region and found nowhere else in the world. Fynbos vegetation is made up of several plant groups. About 9,000 species, or types, of plants grow in the fynbos region.

The NNR's regulatory framework contributes to preventing and protecting the environment from radiological hazards associated with nuclear energy.



## 1. Introduction

The HRM function includes the following key areas:

- Recruitment and selection;
- Remuneration and rewards;
- Succession planning;
- Performance management;
- Training and development;
- Employee relations; and
- Employee wellness.

The focus for 2021-22 was to ensure that all HR services continued to be delivered in accordance with key processes and despite the restrictions imposed by the pandemic. The HR department achieved all its performance targets despite some delays caused by the lockdown restrictions. The NNR continued to implement its approved resource plan for the year and was able to fill most positions. Sourcing skilled and experienced engineers continued to be a challenge for the NNR. The organisation is focussing on growing its own talent through internships and training programmes. All appointed employees are required to meet the relevant levels of competence.

### Employee performance management framework

The NNR has an integrated performance management system which includes strategic performance, operational performance and individual performance. Final individual performance is a weighted factor of all three components. The performance management cycle consists of contracting, review, assessment, moderation and reward.

### Employee wellness programmes

During the review period, the NNR provided programmes to assist management and employees to manage the return-to-work on a rotational basis. The wellness programme continued to provide support and guidance to employees on how to cope with stress and mental health challenges. The organisation provided on-site health screening biannually for employees to be able to do their regular check-ups. Employees directly affected by COVID-19 were referred to the Employee Assistance programme for further assistance.

The NNR actively participates in the DMRE Gender Committee. The Committee was formed in 2021 and part of its functions is to ensure that gender equality prevails within the sector and that no one is discriminated against based on gender.

## Policy development

All policies were developed and reviewed in accordance with the Integrated Management System. plan. All key performance areas as set out in the approved operational plan were achieved.

Alternate arrangements for provision of online training were implemented and the online library was finalised which allowed employees to continue to access reading and research material despite not having regular access to the office. The organisation implemented a successful work-from-home plan which is evidenced in the outstanding performance achievement amidst the Covid-19 pandemic disruptions experienced.

## Challenges

Recruitment of positions were delayed in the first two quarters of the financial year due to NNR restrictions on in-person meetings, however a catch-up plan allowed the organisation to reach its planned targets in this area. Management of employees working from home presented a few transitional challenges throughout the year. The COVID-19 pandemic also presented a number of other challenges pertaining to staff absences due to illness or isolation/quarantine.

## Future HR plans/goals

The NNR will continue to implement key processes and ensure compliance with all applicable legislation. Employee wellness will continue to be a focus area. Recruitment will continue in accordance with the approved long-term resource plans. Post-pandemic, the NNR plans to adopt a remote work framework which will allow relevant employees to continue working from home where permissible.



## 2. Human Resource Oversight Statistics

### 2.1. Personnel-related expenditure

Table 9: Personnel cost by programme/activity/objective

Programme/activity/objective	Total Expenditure for the Entity (R'000)	Personnel Expenditure (R'000)	Personnel Exp. as a % of Total Exp. (R'000)	No. of Employees	Average Personnel Cost per Employee (R'000)
Administration	144 235	86 045	59,66%	56	1 537
Nuclear Power Plants	46 765	27 187	58,14%	29	937
Nuclear Technology & NORM	45 378	43 349	95,53%	44	985
Regulatory Improvement and Technical Services	54 157	45 475	83,97%	44	1 034
<b>TOTAL</b>	<b>290 535</b>	<b>202 056</b>	<b>69,54%</b>	<b>173</b>	<b>1 168</b>

Table 10: Employee cost by salary band

Level	Personnel Expenditure (R'000)	% of Personnel Exp. to Total Personnel Cost (R'000)	No. of Employees	Average Personnel Cost per Employee (R'000)
Top Management (JE Level 1)	3 538	2%	1	3 538
Senior Management (JE Level 3)	24 154	12%	10	2 415
Professional qualified (JE Level 4, 5, 6, 7)	157 160	78%	124	1 267
Skilled (JE Level 8, 9)	12 743	6%	23	554
Semi-skilled (JE Level 10)	1 092	2%	3	364
Interns and Learners	3 369	1%	12	281
<b>TOTAL</b>	<b>202 056</b>	<b>100%</b>	<b>173</b>	<b>1 168</b>

Table 11: Performance rewards

Programme/activity/objective	Performance Rewards	Personnel Expenditure (R'000)	% of Performance Rewards to Total Personnel Expenditure (R'000)
Top Management (JE Level 1)	550	3 538	16%
Senior Management (JE Level 3)	2 401	24 154	10%
Professional qualified (JE Level 4, 5, 6, 7)	16 414	157 160	10%
Skilled (JE Level 8, 9)	1 843	12 743	14%
Semi-skilled (JE Level 10)	151	1 092	14%
Interns and Learners	0	3 369	0%
<b>TOTAL</b>	<b>21 359</b>	<b>202 056</b>	<b>11%</b>

Table 12: Training costs

Programme/ activity/ objective	Personnel Expenditure (R'000)	Training Expenditure (R'000)	Training Expenditure as a % of Personnel Cost.	No. of Employees Trained	Avg Training Cost per Employee
Training and Development	202 056	1 615	0,80%	173	9
Bursaries	202 056	631	0,31%	20	32
Bursaries (External - CNSS)	202 056	258	0,13%	1	258
<b>TOTAL</b>	<b>202 056</b>	<b>2 504</b>	<b>1,24%</b>	<b>194</b>	<b>13</b>

Table 13: Employment and vacancies

Category	2021/2022 No. of Employees	2021/2022 Approved Posts	2021/2022 Vacancies	% of Vacancies
Permanent Employees	155	167	12	7.19%
Fixed Term Contracts	5	0	0	0.00%
Temporary Employees	1	1	0	0.00%
Interns and Trainees	12	13	1	7.69%
<b>TOTAL</b>	<b>173</b>	<b>181</b>	<b>13</b>	<b>7,8%</b>

Table 14: Employment and vacancies per employment Level

Management Level	2021/2022 No. of Employees	2021/2022 Approved Posts	2021/2022 Vacancies	% of Vacancies
Top Management (JE 1)	1	1	0	0%
Senior Management (JE 3)	10	10	0	0%
Professionally qualified (JE 4,5,6 & 7)	124	130	6	5%
Skilled (JE 8 & 9)	22	23	1	5%
Semi-Skilled (JE 10)	3	3	0	0%
Interns and Learners (Ungraded)	12	13	1	7,69%
<b>TOTAL</b>	<b>172</b>	<b>180</b>	<b>8</b>	<b>12,69%</b>

**Explanation:** All executive and senior management positions were filled, and this level remains very stable at the NNR. Most vacancies were filled within a three-month period. The NNR has approved the conversion of fixed term contract employees into permanent positions and the five (5) remaining fixed term contract positions will be made permanent at the beginning of the next FY. The NNR has also made concerted efforts to employ interns and trainees into entry level positions to contribute towards the employment of youth in South Africa. We continue to experience difficulties in recruiting engineers who have experience in nuclear and will be undertaking initiatives to train graduates to fill these vacancies in the coming years. The NNR Board approved the in-sourcing of the Board Secretary position for which recruitment commenced in the current FY to be finalised in the next FY.

**Table 15: Employment changes**

Salary Band	Employment at Beginning of Period	Appointments	Terminations	Employment at End of the Period
Top Management (JE 1)	1	0	0	1
Senior Management (JE 3)	10	0	0	10
Professionally qualified (JE 4,5,6 & 7)	117	11	4	124
Skilled (JE 8 & 9)	23	0	1	22
Semi-Skilled (JE 10)	3	0	0	3
Unskilled	0	0	0	0
<b>TOTAL</b>	<b>154</b>	<b>11</b>	<b>5</b>	<b>160</b>

**Table 16: Reason for staff leaving**

Reason	Number	% of total no. of staff leaving
Death	1	0.6%
Resignation	2	1.2%
Dismissal	1	0.6%
Retirement	1	0.6%
Ill health	0	0%
Expiry of contract	0	0%
Other	0	0%
<b>TOTAL</b>	<b>5</b>	<b>3%</b>

**Table 17: Labour relations: Misconduct and disciplinary action**

Nature of Disciplinary Action	Number
Verbal Warning	0
Written Warning	0
Final Written warning	0
Dismissal	1



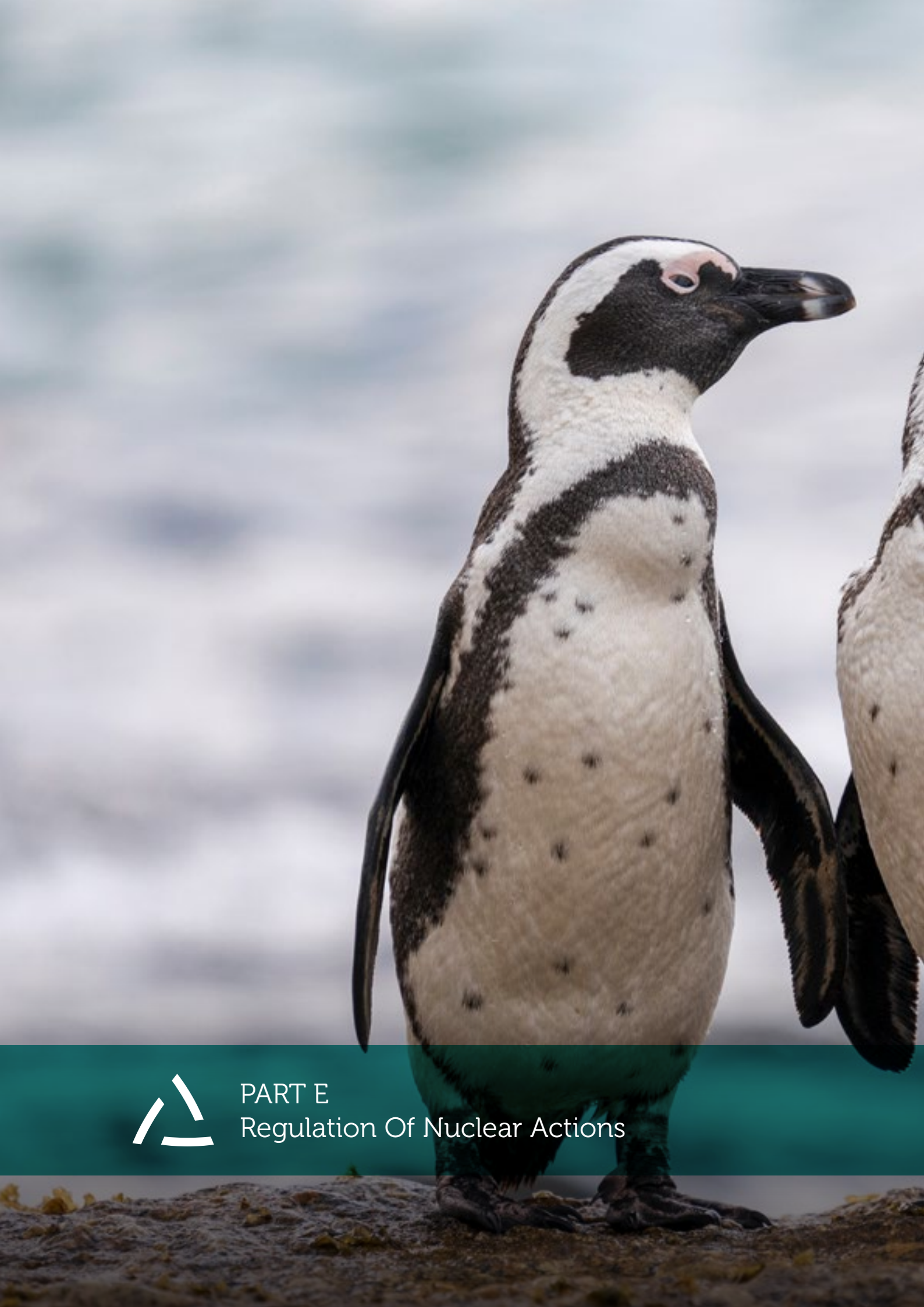
Table 18: Equity targets and employment equity status

Levels	MALE								Foreign Nationals	
	African		Coloured		Indian		White		Current	Targets
	Current	Target	Current	Target	Current	Target	Current	Target		
Top Management	1	0	0	0	0	0	0	0	0	0
Senior Management	3	0	3	0	1	0	0	0	0	0
Professional qualified	46	64	7	8	3	3	6	7	2	0
Skilled	3	8	0	0	0	0	0	0	0	0
Semi-skilled	3	4	0	0	0	0	0	0	0	0
Unskilled	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>56</b>	<b>76</b>	<b>10</b>	<b>8</b>	<b>4</b>	<b>3</b>	<b>6</b>	<b>7</b>	<b>2</b>	<b>0</b>


Levels	FEMALE								Foreign Nationals	
	AFRICAN		COLOURED		INDIAN		WHITE		Current	Target
	Current	Target	Current	Target	Current	Target	Current	Target		
Top Management	0	0	0	0	0	0	0	0	0	0
Senior Management	2	2	0	0	1	1	0	0	0	0
Professional qualified	48	56	0	7	1	1	3	6	2	0
Skilled	15	14	1	1	0	0	3	2	0	0
Semi-skilled	3	4	0	0	0	0	0	0	0	0
Unskilled	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>68</b>	<b>76</b>	<b>1</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>8</b>	<b>2</b>	<b>0</b>

Levels	Disabled Staff			
	Male		Female	
	Current	Target	Current	Target
Top Management	0	0	0	0
Senior Management	0	0	0	0
Professional qualified	2	1	3	1
Skilled	0	0	0	0
Semi-skilled	0	0	0	0
Unskilled	0	0	0	0
<b>TOTAL</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>

**Explanations:** The EE information above was as per the reports submitted to the Department of Labour for the period 1 October 2020 to 30 September 2021. Recruitment was conservative in a constrained financial environment therefore the numerical goals in terms of planned staff were not realised. The NNR did however achieve its transformation goals in terms of race and gender representation.



PART E  
Regulation Of Nuclear Actions

A photograph of an African penguin standing on a rocky shore. The penguin has a white head with a black stripe through its eye and a pinkish-red patch above it. Its body is covered in dark brown and white mottled feathers. In the background, there is a blurred view of the ocean and some rocks. A teal-colored callout box is positioned in the upper right quadrant of the image, containing text about the species. Another teal box is at the bottom left, and a white callout box with a black border is at the bottom right, containing text about environmental monitoring.

The African penguin also known as Cape penguin is a species of penguin confined to southern African waters. They can be found in large colonies along the southwestern rocky coast of Africa.

Monitoring the impact of sources and radioactive nuclide concentrations in the environment is an obligatory regulatory requirement for nuclear authorisation holders.

This section presents an overview report on the health and safety related to workers, the public and the environment associated with all sites regulated by the NNR.

### List of Authorisations

Authorisation No.	Var.	Nuclear facilities	Date issued	B #
NIL-01	19	Koeberg Nuclear Power Station	7 March 2019	NA
NIL-02	3	SAFARI – 1 Research Reactor	21 May 2012	NIL02B0296
NIL-03	1	P2700 Complex	4 May 2012	NIL03B0041
NIL-04	0	Thabana Complex comprising the following facilities: Thabana Pipe Store Thabana Radioactive Waste Storage facility Thabana Containerised Radioactive Waste Storage facility CaF2 Ponds	30 October 2009	NIL04B0001
NIL-05	1	HEU Vault – K0090	4 May 2012	NIL05B0004
NIL-06	0	A-8 Decontamination Facility	11 May 2010	NIL06B0001
NIL-07	0	Building A-West Drum Store	9 February 2009	NIL07B0001
NIL-08	1	ELPROD in Building P-2500	4 May 2012	NIL08B0039
NIL-09	1	UMET in Building P2600	28 October 2011	NIL09B0004
NIL-10	0	Conversion Plant Complex	5 August 2010	NIL10B0001
NIL-11	1	Area 14 Waste Management Complex	18 April 2011	NIL11B0009
NIL-12	0	Quarantine Storage Facility	8 October 2009	NIL12B0001
NIL-13	0	V-YB Pelindaba East Bus Shed Complex	30 October 2009	NIL13B0001
NIL-14	0	Pelindaba East Evaporation Ponds Complex	30 October 2009	NIL14B0001
NIL-15	0	Oil Purification Facility	30 October 2009	NIL15B0001
NIL-16	0	Area 21 Storage Facility	11 May 2010	NIL16B0001
NIL-17	0	BEVA K3 Storage Complex	2 November 2009	NIL17B0001
NIL-18	0	Area 16 Complex	11 May 2010	NIL18B0001
NIL-19	1	Area 40 Complex	1 November 2011	NIL19B0012
NIL-20	0	Area 27 De-Heeling Facility	11 May 2010	NIL20B0001
NIL-21	0	J-Building	24 November 2009	NIL21B0001
NIL-22	0	D-Building	5 August 2010	NIL22B0001
NIL-23	0	C-Building	12 May 2010	NIL23B0001
NIL-24	0	Building P-2900	24 November 2009	NIL24B0001
NIL-25	0	Building XB	11 May 2010	NIL25B0001
NIL-26	0	BEVA Evaporation Ponds	11 January 2010	NIL26B0001
NIL-27	0	Building P-2800	11 May 2010	NIL27B0001
NIL-28	1	Vaalputs National Radioactive Waste Disposal Facility	18 April 2011	NIL28B0010

Authorisation No.	Var.	Nuclear facilities	Date issued	B #
NIL-29	1	Area 26	3 July 2013	NIL29B0027
NIL-30	0	E-Building	5 August 2010	NIL30B0001
NIL-31	0	Dorbyl Camp	25 October 2010	NIL31B0001
NIL-32	0	X-Building	25 October 2010	NIL32B0001
NIL-33	0	Building P-1500	25 October 2010	NIL32B0001
NIL-34	0	YM Vacuum Workshop	5 August 2010	NIL34B0001
NIL-35	0	V-H Building Laboratories	25 October 2010	NIL35B0001
NIL-36	0	P-1900 Laboratories	5 August 2010	NIL36B0001
NIL-37	0	P-1600 Laboratories	16 September 2010	NIL37B0001
NIL-38	0	Fuel Development Laboratories Complex	16 September 2010	NIL38B0001
NIL-39	0	NTP Radiochemicals Complex	06 August 2010	NIL39B0001
NIL-40	0	Pelindaba Analytical Laboratories (PAL) in Building BEVA-E1	05 August 2010	NIL40B0001
NIL-41	1	Liquid Effluent Treatment Facility Complex	24 February 2011	NIL41B0006
NIL-42	0	B-1 Building Basement	20 January 2012	NIL42B0001

COR Number	Name of COR Holder	Category
COR-2	Anglogold Ashanti Limited ( Vaal River Operations)	Category 4
COR-5	ARMgold/Harmony Freegold Joint Venture Company (Pty) Ltd (Tshepong, Matjhabeng & Bambani Operations)	Category 5
COR-6	ARMgold/Harmony Freegold Joint Venture Company (Pty) Ltd (Joel operation)	Category 4
COR-7	African Rainbow Minerals Gold Limited (Welkom Operations)	Category 4
COR-10	Avgold Limited - Target Division	Category 4
COR-11	Gravelotte Mines Limited	Category 4
COR-13	MTC Demolition	Category 2
COR-16	Nuclear Fuels Corporation of South Africa (Pty) Limited	Category 3
COR-18	South Deep Joint Venture	Category 5
COR-20	Foskor Limited (Phalaborwa)	Category 4
COR-23	Steenkampskraal Monazite Mine (Pty) Limited	Category 2
COR-25	Eggerding SA (Pty) Limited	Category 2
COR-26	Richards Bay Iron and Titanium (Pty) Limited	Category 4
COR-27	Foskor Limited (Richards Bay)	Category 3
COR-28	Randfontein Estates Limited-(Kusasaletheu)	Category 4
COR-30	Mine Waste Solutions (Pty) Limited	Category 4
COR-33	Rampete Metal Processors (Pty) Ltd	Category 2
COR-37	Harmony Gold Mining Company Limited (Free State Operations)	Category 5
COR-38	Omnia Phosphates (Pty) Ltd	Category 2
COR-40	ARMgold/Harmony Freegold Joint Venture Company (Pty) Ltd (St Helena Operations)	Category 4
COR-43	Tronox KZN Sands	Category 4
COR-50	Rappa Resources (Pty) Limited	Category 1
COR-53	East Rand Proprietary Mines Limited	Category 4
COR-57	Crown Gold Recoveries (Pty) Limited	Category 4
COR-58	Harmony Gold Mining Company Limited - Randfontein Operations	Category 4
COR-59	Industrial Zone Limited	Category 4
COR-61	Sedex Minerals (Pty) Ltd	Category 1
COR-64	Potchefstroom Plastiek Herwinning BK	Category 1
COR-66	Mintek	Category 1
COR-69	Sibanye Gold Limited (Driefontein Operations)	Category 4

COR-70	Sibanye Gold Limited (Kloof Operation)	Category 5
COR-71	Sibanye Gold Limited (Beatrix Operation)	Category 5
COR-77	Anglo American Research Laboratories (Pty) Limited	Category 1
COR-86	Glenover Phosphate Limited (Mining Site) Operation)	Category 2
COR-87	Rand Refinery Limited	Category 1
COR-92	The Forensic Science Laboratory, SA Police	Category 1
COR-100	South African Airforce (SAAF),Department of Defence (DoD), RSA	Category 3
COR-101	The Reclamation Group (Pty) Ltd (Richards Bay)	Category 2
COR-104	South African Ports Operations-Dry Bulk Terminal Richards Bay A division of Transnet Limited on Sage 300	Category 4
COR-106	Mineral Sands Resources Pty Ltd	Category 4
COR-107	Vesuvius South Africa (Pty) Ltd	Category 2
COR-111	Bosveld Phosphate (Pty) Ltd	Category 2
COR-112	Scaw Metals Group	Category 2
COR-116	Tswelopele Beneficiation Operations	Category 4
COR-118	GoldPlats Recovery Ltd	Category 1
COR-131	East Rand Beneficiation (Pty) Ltd	Category 1
COR-137	Manos Engineering (Pty) Ltd	Category 1
COR-138	Bright Refining (Pty) Ltd	Category 1
COR-140	China African Precious Metals (PTY) Ltd	Category 4
COR-141	Palabora Copper (Pty) Ltd	Category 4
COR-142	Pan African Resources - Evander Gold Mining	Category 4
COR-143	Zirco Roode Heuwel	Category 1
COR-144	Scamont Engineering (Pty) Ltd	Category 1
COR-148	Saldanha Dry Bulk Terminal Cc	Category 2
COR-149	Cronimet RSA (Pty) Ltd	Category 2
COR-150	Minrite (Pty) Ltd	Category 2
COR-151	Covalent Water Company (Pty) Ltd	Category 4
COR-152	SGS South Africa (Pty) Ltd (Cooke operations)	Category 1
COR-153	Resource Reference Materials (Pty) Ltd	Category 1
COR-156	South African Nuclear Energy Corporation (Necsa); calibration pads	Category 1
COR-159	North West Reclaiming	Category 2

COR-160	Shiva Uranium One	Category 2
COR-164	Sulzer Pumps (SA) Limited	Category 1
COR-165	Uramin Mago Lukisa	Category 1
COR-178	Durban Container Terminal - Business Unit of SA Port Operations	Category 1
COR-180	SA Port Operations - Container Terminal Cape Town	Category 1
COR-181	Transnet Limited (SA Port Operations -Multipurpose Terminal,Saldanha bay)	Category 1
COR-182	Buffelsfontein Gold Mine Limited	Category 3
COR-186	AfriSam (Pty) Limited	Category 1
COR-190	Sibanye Gold - Ezulwini	Category 4
COR-195	Houlogon Uranium & Power (Pty) Ltd	Category 1
COR-197	Gold Reef City Theme Park	Category 1
COR-199	Uramin Mago Lukisa	Category 1
COR-201	A&S Mining Supplies	Category 1
COR-203	Cemo Pumps (Pty) Ltd	Category 1
COR-215	Margaret Water Company	Category 4
COR-216	Paddy's Pad 1183 (Pty) Ltd	Category 1
COR-217	Cango Caves Oudtshoorn Municipality	Category 1
COR-218	Grindrod Terminals (Pty) Limited	Category 2
COR-219	Sibanye Gold Eastern Operations (Pty) Ltd.	Category 4
COR-225	New Kleinfontein Goldmine (Pty) Limited	Category 4
COR-226	Rand Uranium (Pty) Limited	Category 5
COR-228	Ergo Mining (Pty) Limited	Category 4
COR-230	ALS Chemex South Africa (Pty) Limited	Category 1
COR-236	Reclaim Invest 101 (Pty) Limited	Category 2
COR-238	Tronox (Namakwa Sands Operations)	Category 4
COR-242	Enviro Mzingazi Gypsum (Pty) Limited	Category 1
COR-246	NTP Logistics (Pty) Limited	Category 2
COR-248	Foskor Zirconia (Pty) Limited	Category 2
COR-252	Harmony Gold Mining Company Limited (South Operations)	Category 4
COR-253	Avgold Limited (North Operations)	Category 4
COR-257	Samco Investments (Pty) Limited	Category 2



COR-258	SA Metal and Machinery Co (Pty) Limited	Category 2
COR-260	African Mineral Standards (a division of Set Point Industrial Technology (Pty) Ltd)	Category 1
COR-261	North West University	Category 1
COR-263	Aklin Carbide (Pty) Ltd	Category 1
COR-264	Umhlathuze Imports and Exports	Category 2
COR-265	Tau Lekoa Gold Mining Company (Pty) Ltd	Category 4
COR-266	Nicolor (Pty) Ltd	Category 1
COR-268	Far East Gold Special Purposes Vehicle (Pty) Ltd	Category 2
COR-269	Newshelf 1186 (Pty) Ltd	Category 2
COR-270	Trans-Med Shipping	Category 2
COR-271	Taurus Africa Scrap Metal	Category 2
COR-272	Sasol Gas Ltd	Category 1
COR-273	E&A Belt Sales CC	Category 2
COR-274	Freight Facilitators (Pty) Ltd	Category 2
COR-275	Vosloo and Lloyd Investments (Pty) Ltd T/A Scrapcore Secunda	Category 2
COR-276	Aquatro Investments CC	Category 2
COR-277	Donnlee Pump Tech (Pty) Ltd	Category 1
COR-279	Harmony Moab Khotsong Operations (Pty) Ltd	Category 5
COR-281	DRD Gold Far West Gold Recoveries (Pty) Ltd	Category 4
COR-282	Kopanang Gold Mining Company(Pty) Ltd	Category 5
COR-283	Access World (South Africa) Pty Ltd	Category 1
COR-284	Ncamiso Trading (Pty) Ltd	Category 1
COR-285	C. Steinweg Bridge (Pty) Ltd	Category 1
COR-286	LightDeepEarth (Pty) Ltd	Category 1
COR-288	Lemowe (Pty) Ltd	Category 1
COR-289	Bomamba Trading (Pty) Ltd	Category 2
COR-291	Nanoretech Processing (Pty) Ltd	Category 3
COR-292	EnviroServ Waste Management (Pty) Ltd	Category 2
COR-294	Golden Core Trade and Invest (Pty) Ltd	Category 5

## 1. Regulation of the Koeberg Nuclear Power Station



The KNPS is located on the West Coast of South Africa, approximately 27 km north of Cape Town and is the only nuclear power station on the African continent. It is owned and operated by the state-owned entity Eskom SOC Ltd and has twin pressurised water reactors with a combined net capacity of 1854 MWe. The KNPS is surrounded by a 3 000 ha nature reserve containing more than 150 different species of birds and half a dozen small mammal species.

**“Operators of nuclear installations have the direct responsibility to protect their workforce and the public from radioactivity-related risks.”**

KNPS is operated under the Nuclear Installation Licence, NIL-01 Variation 19 with 29 attached conditions including specific licensing requirements. These conditions require the operator to implement adequate arrangements to meet requirements and demonstrate compliance with each condition. The NNR reviews the compliance arrangements to ensure they meet the required standard.

**The NPP Division regulates nuclear safety, radiation protection and the transport of radioactive substances associated with the Koeberg nuclear power station.**

The conditions attached to the Nuclear Installation Licence, NIL-01 Variation 19 are:

Conditions of NIL-01 VARIATION 19	
1	General
2	Nuclear Installation Description
3	Demarcation of Site
4	Scope of Actions That May Be Undertaken
5	Radiological Protection
6	Environmental Protection and Effluent Management
7	Radioactive Waste Management
8	Emergency Planning and Preparedness
9	Medical Surveillance and Health Register
10	Transport
11	Safety Assessment
12	Modification to Design of Plant
13	Design and Manufacturing of Components
14	Limits and Conditions on Operations
15	Maintenance and In-Service Inspection
16	Ageing Management and Long-Term Operation
17	Decommissioning
18	Physical Security
19	Dealing with Site
20	Authorised and Qualified Persons
21	Quality and Safety Management
22	Documents and Records
23	Organisational Changes
24	Safety Committees
25	Financial Security
26	Inspection Programme
27	Events on Site
28	Public Safety Information Forum
29	Display of Installation License

**Table 19: Conditions of NIL-01 VARIATION 19**

In terms of section 26(2) of the NNR Act, Eskom as the nuclear authorisation holder implements an inspection programme to ensure compliance with the conditions of the NIL. The NNR implements an independent system of compliance inspections to verify and provide assurance of compliance with the conditions of the NIL in terms of section 5(d) of the NNR Act.

#### MONITORING THE EXPOSURE OF PERSONS WORKING IN NUCLEAR FACILITIES

The NNR regulatory requirements for workplace monitoring are described in the Safety Standards and Regulatory Practices (SSRP). Workplace monitoring is conducted in accordance with the radiation protection programme including provisions for all exposure pathways to be continuously monitored by the licensees. Radiation monitoring is conducted in accordance with an approved radiation protection programme. The system for monitoring worker risk of external exposure to ionising radiation is based primarily on the mandatory wearing of passive dosimeters by individuals to monitor and track external radiation exposures and enables compliance with regulatory limits applicable to workers. The NNR regulations strictly limit the amount of radiation that can be emitted by any regulated nuclear facility.

## 1.1. Occupational exposure to radiation

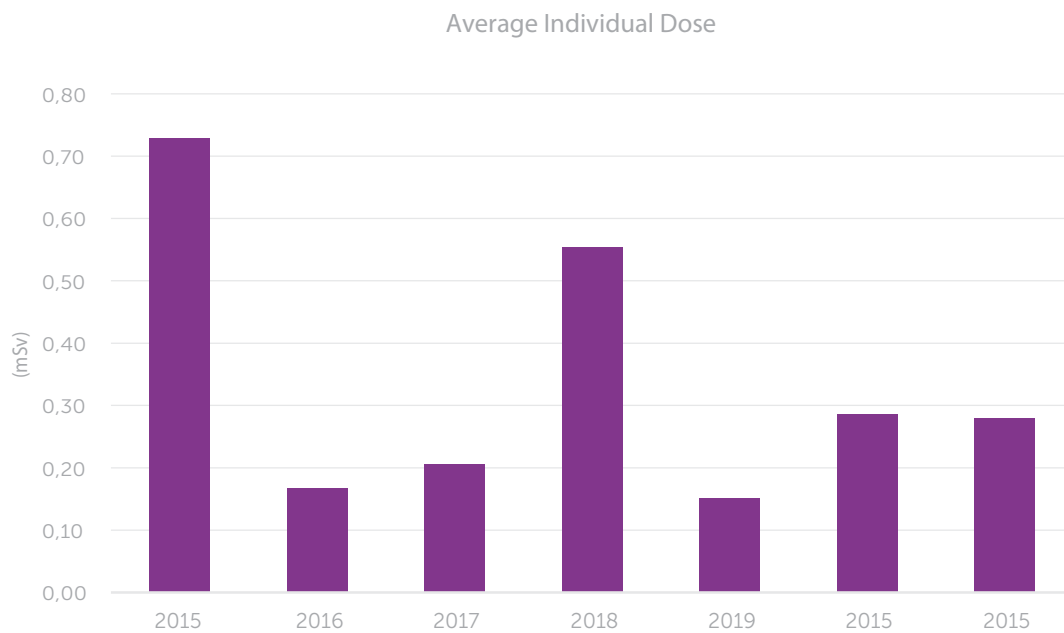
In accordance with RD 0024, the general regulatory dose limit set by the NNR for occupational exposure of any individual worker at the KNPS must be so controlled that the following limits are not exceeded:

- An average effective dose of 20mSv per year averaged over five consecutive years.
- A maximum effective dose of 50Smv in any single year.

Radiation exposure of workers at KNPS remained subject to control by the Operational Radiation Protection Programme. This programme ensured that control within the annual individual dose limit was achieved. In addition, the programme also served to ensure that all doses are kept As Low As Reasonably Achievable (ALARA). The results of worker exposure to ionising radiation at KNPS during the reporting period were within regulatory limits as indicated in figure1 and 2.



Figure 1: Highest individual occupational exposure (2015 – 2021)



**Figure 2: Average individual dose at KNPS (2015 – 2021)**

The average individual dose for 2015 – 2021 was below 20mSv per annum, attesting to the ALARA programme being implemented by the operator. No individual exceeded the average individual dose, averaged over five consecutive years, as prescribed by the SSRP.

#### PUBLIC AND ENVIRONMENTAL RADIOLOGICAL PROTECTION

In accordance with the optimisation principle, the authorisation holder must reduce the radiological impact of its facility to values that are as low as possible under acceptable conditions.

Requirements for control of discharges are included in the SSRP regulations. Operators are required to submit routine reports of discharges to the environment to demonstrate compliance with regulatory requirements. The results of the monitoring programme are reported to the NNR on a routine basis. Thermoluminescence dosimeters (TLDs) are deployed in the environment surrounding nuclear installations and particulate matter is sampled for analysis in an accredited laboratory. In order to monitor the impact of the discharges on the environment, the NNR performs sampling and analysis of environmental media independently from its authorisation holders, through the NNR Environmental Surveillance Laboratory.

### 1.1.2. Projected public exposure to radiation

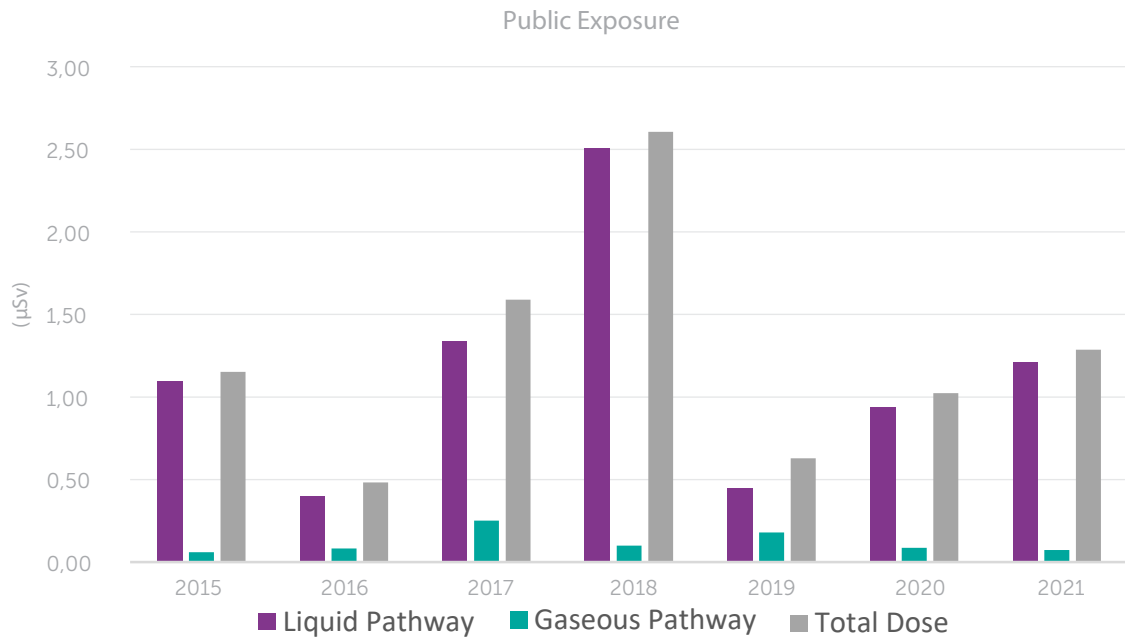


Figure 3: Projected public dose from effluent discharges (2015 – 2021)

In accordance with the conditions of the licence and the SSRP, the public doses resulting from effluent discharges from KNPS must comply with the dose constraint of  $250\mu\text{Sv/a}$  and the system of Annual Authorised Discharge Quantities (AADQs) applicable to the site. Condition 6 of NIL-01, Variation 19 requires amongst others that the Operator must have control over the discharge of liquid and gaseous effluent and implement environmental monitoring programmes to monitor impact on the environment and verify compliance with the licence condition. To this end the Operator reports on a quarterly basis on effluent discharges to the environment. In addition, to performing inspections as may be required on the Operators environmental programme, the NNR also carries out independent environmental sampling and analyses. Considering the above, it can be concluded that KNPS complied with the AADQs and the projected public doses resulting from the effluent releases (both liquid and gaseous) for the 2021 calendar year were well within the dose constraint. There were no unauthorised effluent discharges and therefore no safety concerns to the public living around the KNPS site.

## 1.2. Nuclear safety

### *Ensuring compliance*

The NNR's oversight aims primarily to ensure that the authorisation holder of a nuclear installation licence effectively assumes their obligations and comply with the requirements of the regulations concerning nuclear safety and radiation protection in order to protect persons and the environment from radioactivity-related risks.

**“Inspections are an important element of the NNR’s oversight of its authorisation holders. The NNR conducts inspections to ensure that authorisation holders meet NNR’s regulatory requirements. When authorisation holders meet these requirements, we know that they are most likely conducting safe operations that protect the public and the environment from any undue nuclear risk.”**

The NNR’s inspection programme provides a high level of assurance that authorised activities are conducted in accordance with regulatory requirements and in conformity with general safety objectives. NNR inspections are independent from the required authorisation holders’ inspection programme for ensuring nuclear safety and security.

The authorisation holder’s commitment to safety of the plant and operations are confirmed by inspections carried out during the reporting period. The NPP inspectorate with support from technical analysts in the various assessment functions carried out 34 inspections comprising of planned and reactive inspections. These include inspections during normal operations, outages as well as project related inspections. The inspections were carried out by either an individual inspector or a team of inspectors accompanied by a subject matter expert(s).

The inspectors documented authorisation holder-identified weaknesses which were determined to be of very low safety significance. The authorisation holder implemented appropriate corrective measures to address the weaknesses and no further actions were required.

### *Safety Assessments*

This section presents a summary of the NNRs safety assessment activities carried in relation to the KNPS during the reporting period.

#### **1.2.1. Steam Generator Replacement (SGR)**

Steam generators are nuclear power plant components (NPPs) in which the steam, driving the turbine, is produced. They are heat exchangers between the water circulating in the reactor’s primary coolant circuit - at a temperature of about 350°C and a pressure of 155 bar - and the water in the secondary circuit that supplies steam to the turbines. Their domed lower head is part of the primary circuit and therefore has an important safety role in ensuring cooling water is always available. The twin pressurised water reactors at KNPS were built by Framatome, with unit 1 beginning commercial operation in 1984 and unit 2 the following year. There are three steam generators at KNPS Unit 1 and three steam generators at KNPS Unit 2. The steam generator project is part of the maintenance upgrade to sustain the reliable operation of the KNPS. The first three steam generators for KNPS Unit 1 weigh about 380 tonnes each and are about 20 metres long arrived at the KNPS site in September 2020.

Eskom conceptualised the Steam Generator Replacement (SGR) project in 2010 and commenced with preparations for developing requirements for a commercial contract. The NNR was informed (via letter K-19821-E, dated 8 September 2010) of Eskom's proposed Long Term Asset Management interventions relating to the KNPS which included the replacement of the steam generators, the refuelling water-storage tanks, the Unit 2 reactor pressure vessel head, and the evaluation of the ageing management documents.

In 2014, Eskom appointed the French nuclear manufacturing service provider Framatome for design, manufacture, transportation, installation, and the analyses associated with the RSGs. Individual components of the RSGs were manufactured at various suppliers from different countries with the final manufacturing and assembly performed at Shanghai Electric Nuclear Power Equipment (SENPEC) in China.

Manufacturing was subject to compliance with the NNR quality, safety management and manufacturing requirements contained in RD-0034 and PP-0012. Manufacturing activities at both supplier and sub supplier level were conducted under the oversight of the NNR. The NNR reviewed relevant manufacturing documents, invoked various regulatory intervention points, conducted site visits as well as placed resident inspectors on the SENPEC site.

During the manufacturing of first three RSGs, the NNR identified issues including the requalification of the tube sheet buttering weld which were subsequently resolved. Manufacturing was completed at SENPEC and the three Unit 1 RSGs were delivered to the KNPS in September 2020.

The RSGs are currently stored in an interim storage facility on the KNPS site. In preparation for the outage, the Hot Leg (C-Elbows) were welded onto the three RSGs. Eskom delayed the installation of the RSG's from outage 125 to outage 225 which started in January 2022. This delay was largely due to the construction of the Original Steam Generator Interim Storage Facility (OSGISF). The temporary facilities supporting the SGR installation activities are in the process of completion. Some of the facilities require the approval of a Temporary Licence Change Request (TLCR) by the NNR. The TLCR was reviewed by the NNR and Eskom is in the process of addressing the NNR comments. The TLCR requires NNR approval before the facilities where radiological work will be performed may become operational.

NNR oversight during the planned pre-installation, installation and testing activities is managed through annotated Inspection Plans (IPs) which include relevant NNR intervention points. On 4 March 2022, Eskom informed the NNR of its decision to defer the installation of the KNPS Unit 1 RSGs.

### *Manufacturing of the KNPS Unit 2 RSG's*

Manufacturing of the KNPS Unit 2 RSG's is taking place at SENPEC and is subject to NNR quality, safety management and manufacturing requirements as contained in RD-0034 and PP-0012. The NNR continues to monitor the manufacturing processes as well as the close-out of any non-conformances to specifications in accordance with the agreed requirements.



### 1.2.2. Spent fuel dry storage

Used nuclear fuel must be safely stored on site until the completion of the Centralised Interim Storage Facility. Safe storage of used fuel considers cooling of the used fuel, criticality scenarios and shielding from radiation. The used nuclear fuel is currently stored in the spent fuel pools as well as dry storage casks located in the Cask Storage Building (CSB) at KNPS. Spent Fuel Pool storage capacity must have enough free space for unloading a full reactor core. The storage space in both spent fuel pools at KNPS are almost fully utilised. Eskom adopted an interim strategy to load spent fuel in dry storage casks for storing the CSB and a TISF on the Koeberg site.

Eskom procured fourteen (14) HI-STAR 100 metal casks from the USA based company Holtec. Manufacturing of the casks were completed and delivered to KNPS in accordance with NNR requirements stipulated in RD-0034 and PP-0012.

The NNR approved the safety case for on-site handling and loading of the HI-STAR-100 casks and transfer to storage of casks in the CSB. Four of these casks have previously been loaded with used fuel from Unit 1 and Unit 2 Spent Fuel Pools (SFPs) and are being stored in the CSB. Eskom has loaded a further three casks with used fuel from Unit 2 SFP in preparation for the outage that started in January 2022. Currently there are four CASTOR X 28 and seven HI-STAR-100 casks stored in the CSB.

The NNR has approved construction of phase 2 of the upgraded storage pad in the CSB. The upgraded storage pad will accommodate storage of an additional four (4) casks in the CSB.

### 1.2.3 Application for the Transient Interim Storage Facility (TISF)

The NNR requirements for any nuclear installation are documented in the SSRP regulations as well as associated NNR requirements documents such as RD-0022 (Dose requirements to workers and public), RD-0024 (Principal Safety Criteria that includes risk limits and normal operation dose limits) and RD-0034 (Quality and Safety Management requirements). On 5 May 2020, Eskom applied for the siting, construction, operation and decommissioning of the Transient Interim Storage Facility (TISF) on the Koeberg site. The OSGISF is part of the TISF and is earmarked to temporarily store the used six steam generators as part of the SGR project.

Following an in-depth review of the design and the safety case for the OSGISF, the NNR issued the nuclear installation licence, NIL-44, for construction of one of the OSGISF units with relevant conditions attached. In addition, the authorisation is subject to NNR verification of the items identified during the review process in the construction phase. The NNR subsequently performed site inspections that informed the release of NNR hold points for construction.

### 1.3. Long Term Operation (LTO)

LTO of a nuclear power plant may be defined as operation beyond an established time frame set forth by, for example, licence term, design, standards, licence and/or regulations, which has been justified by safety assessment, with consideration given to life limiting processes and features of systems, structures and components.

The NNR Act empowers the NNR to grant or amend nuclear authorisations and exercise regulatory control over nuclear installations such as the KNPS. Regulation No. R.266 on LTO with associated NNR LTO regulatory guide, RG-0027, establishes the requirements for LTO. In terms of Section 21(1) of the NNR act, Eskom the operator is required to lodge an application for LTO supported by a safety case to demonstrate continued safe operations of KNPS for the period of LTO. The KNPS safety analysis report assumes a design life of 40 years which limits current operations to July 2024. Eskom has established a plant-life extension programme in preparation for the planned LTO. The LTO programme for KNPS includes IAEA technical support and peer review prior to July 2024.

In January 2021, the NNR received Eskom's application to extend the operating life of the plant beyond the period currently justified in the licensing basis. Eskom was required to revise the application in accordance with the regulations on the Long-Term Operation of Nuclear Installations (No. R. 266) promulgated on 26 March 2021. Eskom resubmitted the LTO application in May 2021 addressing NNR comments on the initial application. Following the NNR review of the application in terms of regulation GN1219, the application was accepted for further processing.

The LTO Project Plan received with the LTO application includes the implementation of modifications, safety improvements and the submission of key deliverables. The NNR is monitoring the progress and completion of modifications and deliverables on a monthly basis and escalates as appropriate areas of concern that may impact on Eskom meeting their obligations.

In support of Eskom's preparations to extend the operating life of KNPS, the IAEA conducted a SALTO Mission at KNPS from 22 to 31 March 2022. The IAEA draft report was sent to Eskom and the NNR for comment.

### 1.4. RPVH Replacement Project

The RPVH was manufactured in accordance with NNR requirements stipulated in RD-0034, PP-0012 and ASME III, Version 2007, code. The Unit 2 Reactor Pressure Vessel Head (RPVH) and Control Rod Drive Mechanisms (CRDMs) are being replaced during Outage 225. Following Eskom's decision to defer the installation of the RSGs during outage 225, the RPVH project has progressed in terms of the installation and commissioning schedule. The NNR team, comprising of Analysts and Inspectors, performed ongoing oversight activities during outage 225 on activities related to site work package for decommissioning of original RPVH and commissioning of new RPVH.

## 1.5. Competency and sufficiency of the operator workforce to work safely

Condition 25.2 of NIL-01, Variation 19 requires that the authorisation holder must on an annual basis provide proof to the regulator that the required financial and human resources are available to ensure the safe operation of the plant and maintaining an appropriate safety culture. As such KNPS reports annually to the NNR on the adequacy of human resources and provides quarterly feedback at meetings as required. The NNR Inspectors also monitor activities, including events on the plant that may indicate either lack of resources or skills.

KNPS has demonstrated adequate plans and resources to maintain operational safety and not compromise the operations, including other safety related programmes such as maintenance, in service inspections, testing and radiation protection. To this end, KNPS has developed and implemented a resource strategy and routinely reports on their work force plan

The resources strategy ensures that the organisation is agile enough to respond to external factors as well as natural attrition of staff. The strategy includes recruitment, contracting (Fixed Term Contracts – FTC's), pipelining and associated aggressive training as well as redeployment of staff. Departmental strategies are also developed as the need may arise.

Based on monitoring of events at KNPS, the overall staffing and competency levels required for acceptable performance in work related to nuclear safety were found to be satisfactory during the period under review. However, the NNR remains concerned about Eskom's ability to complete major modification projects as well as maintenance outages according to planned timelines. The KNPS has implemented a short-term and long-term strategy to address resource and competency issues. The strategy includes retention of staff, filling of vacant positions as well as creating resource pipelines for key functions. The NNR is monitoring the implementation of the strategy.

## 1.6. Transport safety

When transporting radioactive substances, the main risks are those of internal and external exposure. Safe transport of radioactive substances relies on an approach called defence in depth. The robustness of the packaging is the first line of defence. The packaging plays a vital role and must withstand the foreseeable transport conditions. The reliability of the transport operations constitutes the second line of defence, and the third line of defence is the means of response implemented in the event of an incident or accident.

As per Condition 10.1 of NIL-01, Variation 19, Transport of radioactive material or any equipment or objects contaminated with radioactive material off site must comply with the relevant provisions of the International Atomic Energy Agency Safety Standard Series, No. SSR-6 "Regulations for the Safe Transport of Radioactive Material".

There were no concerns related to the safe transport of radioactive material during the reporting period. The NNR is currently processing an application for a Nuclear Vessel Licence (NVL) for the transport of fresh nuclear fuel to Koeberg.

## 1.7. Radioactive waste safety

Radioactive waste management refers to the safe treatment, storage and disposal of liquid, solid and gas discharge from nuclear industry operations with the goal of protecting people and the environment.

Within the South African regulatory framework, radioactive waste, for legal and regulatory purposes, is defined as material that contains or is contaminated with radio-nuclides at concentrations or activities greater than clearance levels as established by the regulatory body, and for which no further use is foreseen. It should be recognised that this definition is purely for regulatory purposes, and that material with activity concentrations equal to or less than clearance levels is radioactive from a physical viewpoint, although the associated radiological hazards are considered negligible.

KNPS is required to implement programmes for the minimisation and safe management of radioactive waste on the site.

The radioactive waste management programme must:

- a) ensure the identification, quantification, characterisation and classification of any radioactive waste generated;
- b) provide for the necessary steps leading to safe clearance, authorised discharge, disposal, reuse or recycling; and
- c) provide for the safe storage of radioactive waste between any waste management processes.

All waste package to be stored, transported and disposed shall be approved by the Regulator. The safety report for of each container design intended for storage or transport of radioactive material shall be submitted for regulatory approval. The safety report shall address predisposal, interim storage, transport and disposal requirements and shall demonstrate compliance with respective waste disposal acceptance criteria.

IAEA Safety Standard Series, No. SSR-6 "Regulations for the Safe Transport of Radioactive Material" requires drop tests to be performed for packages being transported in the public domain. Eskom performed drop tests on the 210L metal drums which were observed by the NNR. The outcomes of the drop tests were included in the respective safety report to be accepted by the NNR. The drop tests indicated that 201L drums with trash can be safely transported. The drop test with Steam Generator Blowdown (APG) resins were not conclusive. Eskom was required to demonstrate that the resins will be contained in the drum in case of a transport accident. The drop test results for Non-Compactable Waste (NCW) in 210L drums did not meet the test

criteria. Eskom was required to propose alternative packaging for transport of NCW.

Eskom submitted the Technical Report Demonstrating the Safety and Compliance of C2F Concrete Packages Containing Filters to the NNR for review and approval for shipment and disposal at Vaalputs. The NNR reviewed the submission and provided comments for Eskom to address.

Transportation of 210L metal drums containing trash and concrete drums containing NCW continued during the reporting period with a total of 700 210L drums and 43 concrete drums being delivered to Vaalputs during the 2021 calendar year (See figure 4).

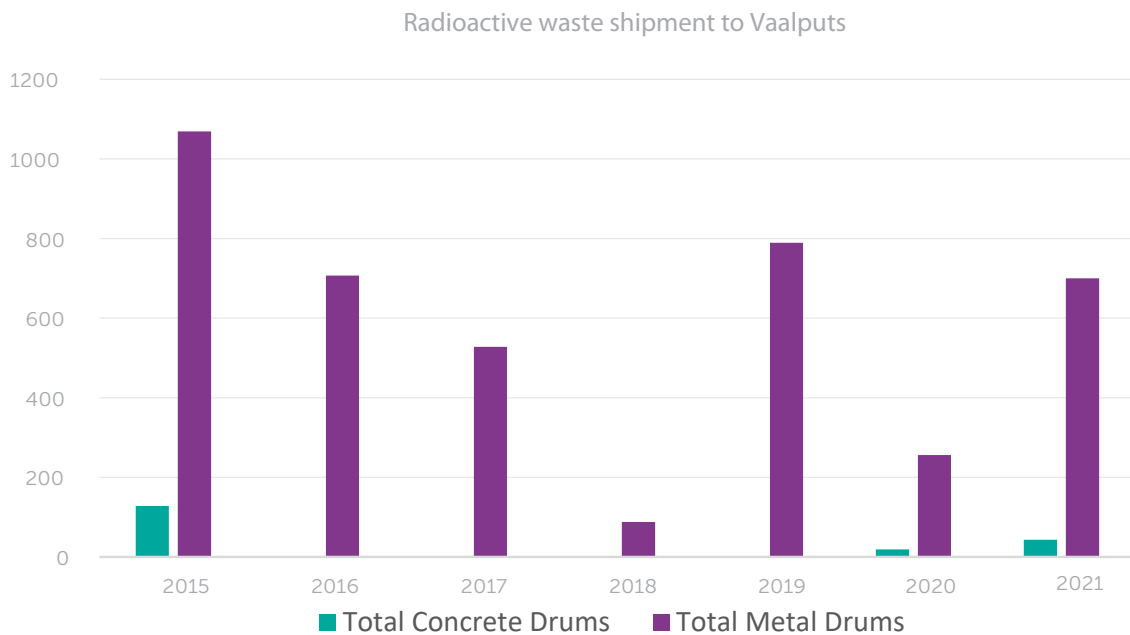


Figure 4: Inventory of solid radioactive waste produced and drummed for calendar years 2015– 2021

## 1.8. Environmental protection

“The authorisation holder is responsible for monitoring the environment around the facility. Environmental monitoring contributes to understanding the radiological state of the facility’s environment through measurements of parameters and substances in the environment. It helps to verify that the impact of the facility on health and environment is in conformity with the impact assessment. Environmental monitoring detects any abnormal increase in radioactivity as early as possible and ensures there are no facility malfunctions, notably by checking authorisation holder’s compliance with regulations.”

Condition 6 of NIL-01, Variation 19 requires amongst others that the Operator must have in place and comply with an environmental monitoring programme accepted by the Regulator. The environmental monitoring programme includes terrestrial monitoring, marine monitoring as well as direct radiation monitoring. Samples were collected from indicator sites located

within 15 km from Unit 1 Reactor, as well as from control sites which are located within 15 to 30 km from Unit 1 Reactor or in areas not influenced by plant discharges. KNPS radiological effluent discharge quantities for 2021 have been lower than the quantitative limits approved by the NNR. There were no safety concerns identified regarding the environment around KNPS during the period under review which have been confirmed by independent NNR monitoring regimes.

## 1.9. Nuclear emergency planning and preparedness

Nuclear activities are carried out within a framework which aims to prevent accidents but also to mitigate their consequences. Despite all the precautions taken, an accident can never be completely ruled out and the necessary provisions for managing a radiological emergency situation must be planned for and regularly tested and revised.

Section 5(f) of the National Nuclear Regulator Act, Act No. 47 of 1999 (NNR Act), mandates the NNR to ensure that provision for nuclear emergency planning are in place. Section 38 prescribes that the NNR must ensure the effectiveness of nuclear authorisation holder's emergency preparedness and response arrangements for protection of persons and the environment.

The effectiveness of the nuclear emergency plan is, amongst others, verified through the conduct of periodic emergency exercises at nuclear and radiological facilities in order to test the established plans, preparedness and response arrangements, relevant procedures, equipment, resources, competency of personnel in performing their assigned tasks, ability of individuals and response organisations to work in a coordinated manner, and identification of areas of improvements.

Due to the COVID-19 pandemic restrictions, the NNR conducted a simulated regulatory nuclear emergency exercise at KNPS in October 2020. The scope of the exercise was limited to the Koeberg Emergency Control Centre and the Alternative Emergency Control. The NNR followed up on the observed non-compliances and continued to monitor the implementation of corrective actions over the reporting period.

NNR inspectors carried out inspections aimed at evaluating the adequacy of the emergency preparedness plan, ensuring that implementation procedures are updated, public education and information sharing is implemented as well as reviewing licensee's compliance with the full volume siren test to inform the public within the 16km radius of KNPS of any emergency.

## 1.10. Physical security

Both the NNR and the National Key Points' Security functionaries have responsibilities regarding physical security at KNPS. As part of its compliance assurance programme, the NNR conducted regular compliance activities at KNPS to verify conformance to licensing requirements on nuclear security. The NNR issued a directive to KNPS in March 2022 to address short comings that have been identified in the Fitness for Duty processes for contractors used on site. The NNR conducted two planned inspections during the reporting period.

## 1.11. Safety of sealed radioactive sources

The safety of sealed radioactive sources on the KNPS site were found to be in compliance with regulatory requirements. There were no concerns regarding the safety of sealed radioactive sources during the reporting period.

## 1.12. Nuclear incidents/accidents reported

Any occurrence or succession of occurrences having the same origin and resulting in an unintended/unauthorised exposure to radiation or release of radioactive material, which is capable of giving rise to an effective dose in excess of 1 mSv to the public off-site in a year, or in excess of 50 mSv to any individual on site received essentially at the time of the event, is regarded as a nuclear accident.

While any unintended event which is reasonably capable of giving rise to an effective dose equal to or in excess of 0,1 mSv to the public received essentially at the time of the event, or the unintended spread of radioactive contamination or exposure to radiation, which could reasonably give rise to an effective dose in excess of 20 mSv to any individual on site received essentially at the time of the event, or significant failure of safety provisions, is regarded as a nuclear incident.

Further, regulation 6.3 of the SSRP and Condition 27.1 of NIL-01, Variation 19, requires that the holder of a nuclear authorisation must immediately inform the Regulator when a nuclear accident occurs or an incident has arisen or is expected to occur or arise, as the case may be, and shall provide such information as may be required. The NNR has the authority to carry out a technical enquiry in the event of an incident or accident in a nuclear activity. This inquiry consists of collecting and analysing all relevant information without prejudice in order to determine the circumstances and the identified or possible causes of the event, and draw up the appropriate recommendations if necessary.

There were no nuclear incidents or accidents, as defined in the NNR Act, reported during the period under review. The NNR was satisfied with the processes implemented at KNPS relating to events/occurrences.

The following operational events at the KNPS raised public interest during the reporting period:

### **Unit 1 reactor trip due to loss of 1RCP002PO**

On 30 August 2021, Koeberg Unit 1 tripped due to a breaker (1 LGD 071 JA) opening as a consequence of its protection relay failing, brought about by the old protection relays not being replaced through preventative measures as a result of inadequate co-ordination between departments for the completion of the equivalency study for the obsolete protection relays.

The evaluation found that the 6.6 kV system, in general, was reliable and that failures that had occurred on the circuit breaker were as a result of age-related component malfunction. The risk assessment in the evaluation has noted that the possibility of failure of the equipment is possible, with action required to be taken to eliminate the consequences of such a failure. It has been noted that design changes and operation mitigations to eliminate the consequence of failure were not feasible. The maintenance mitigation actions were more practical and feasible. Ongoing preventive maintenance and adverse trend monitoring ensured that defective components were removed prior to causing a trip or to reduce the effects of possible multiple failures due to a component reaching its end of life. Prior to the unit trip an adverse trend was not identified on the protection relays. Considering the external OE replacement of the protection relays was considered as a proactive maintenance intervention, however, due to the obsolescence of the protection relays, a preventive and functional testing regime has been employed to prevent in-service failure. An ageing management assessment also noted that the preservation of the protection relays qualifications, currently presents a challenge for onsite refurbishments of components, with a bulk renewal of the protection relays at the earliest opportunity. With the recent failure the evaluation of the protection relays expected life will need to be reconsidered and with actions to drive the resolution of the obsolescence and the implementation of a refurbish and replacement plan.

With the unit trip as a result of the failure of the protection relay, the frequency of the failure of these components has increased and is applicable to Koeberg. This risk has been acknowledged and actions are currently in progress to complete the equivalency study for the obsolete relays and for the refurbishment of existing protection relays.

There were no operational or health and safety consequences due to this event.



## Unit 1 reactor tripped from 100% power

On 24th October 2021, at 03:49, one of the feedwater pumps (1 APP 001 PO) experienced a sudden speed decrease from 3670 rpm to 1622 rpm, which led to a rapid loss of feedwater flow. The Koeberg Unit 1 reactor tripped due to low water level on one of the Steam Generators (SG2 Lo-Lo level).

All plausible failure modes were evaluated and scrutinised to establish whether the results may be refuted, supported or considered inconclusive. All other probable failure modes have been refuted and/or components renewed as per the respective trouble shooting plan. The Woodward governor failure investigation concluded, based on the internal and external visual inspections and the as-received functional tests performed, that the governor operation was deemed acceptable. Therefore, the failure of the Woodward governor as a possible cause is refuted. However, due to the foreign material found inside the control air supply inlet port, the speed reduction due to an interrupted air supply to the Woodward governor is supported as a suspected apparent cause.

There were no operational or health and safety consequences due to this event.

## Unit 2 reactor tripped during shutdown for Outage 225

On 18 January 2022, during shutdown for outage 225, a problem was experienced with Steam Generator (SG) level control. All three SGs were affected, with levels increasing rapidly. A narrow range 1st stage pressure (2GSE044MP) was observed to be reading off scale high in addition to SG # 3 narrow range flow indication (2ARE056MD) reading higher than expected. Feedwater was isolated to avoid overfeeding the SGs and when recovering from high SG level, the reactor tripped on low SG level caused by the shrink effect.

The data provided a clear indication that the trip on the unit was initiated due to the LoLo level on SG1. The decrease in SG levels was due to the closure of the feedwater valves to avoid a SG Hi-Hi level reactor trip as a result of the control circuit not responding as required. The cause for the control circuit not performing as required was linked to a defective component (2GSE 044 MP). The unit was not generating electrical power during the trip and there was no impact on the grid.

There were no operational or health and safety consequences due to this event.

## **Unplanned group1 Limiting Condition of Operation (LCO) declared on 1ASG001BA**

On 24 October 2021, at 03:49, the speed of the main steam feed pump (1 APP 001 PO) spuriously decreased. The pump did not trip automatically and the pump was not tripped manually by the operators, as expected. Unit 1 reactor and turbine tripped automatically at 3:51. During the event, the auxiliary feedwater tank (1 ASG 001 BA) reached a level of 8.59 m (the limit is 8.6 m) and a high temperature of 49°C (the limit is 45°C) resulting in entry into unplanned Group 1, Operating Technical Specification.

The investigation revealed the following apparent causes:

- Inadequate oversight to ensure effective application of the control and teamwork fundamentals: The focus of the Senior Shift Supervisor was control of the SG levels, as the levels decreased significantly after the loss of feedwater flow. It is not expected of the Senior Reactor Operator (SRO) to monitor parameters on the panels but the SRO should have requested feedback of the relevant parameters on the secondary side, if not forthcoming from the panel operator (Shift Supervisor) and clearly stated his expectations in this regard.
- Inadequate application of integrated system understanding: Steam generator (APG) blow down flow was not reduced sufficiently to control feedwater (ASG) tank level. It is expected that the operators must do the math for the integrated systems (SG levels, ASG feedwater flow, VVP steam flow and APG blowdown flow) and get the balance correct

There were no operational or health and safety consequences due to this event.

## **Iodine-131 airborne activity in the Central Alarm Station (CAS) following filter testing**

On Thursday, 28 October 2021 an 18-monthly in-service filter efficiency test on the CAS ventilation system, the charcoal filters (6 SSM 401 PI) were tested with I-131 and the HEPA filters (6 SSM 401 FA) tested with Tc99.

In the event of site contamination, air will be filtered through the iodine train before passing through the normal air conditioning system. The air then passes through an open valve (6 SSM 427 VA), heaters (6 SSM 417 and 6 SSM 418 RS), into a pre-filter (6 SSM 403 FP), absolute filter (6 SSM 401 FA) and charcoal filters (6 SSM 401 and 6 SSM 402 PI). A fan (6 SSM 408 ZV or 6 SSM 409 ZV) discharges through non-return valves (6 SSM 431 VA and 6 SSM 432 VA), respectively.

There are two main aspects to the event:

- The ingress of the I-131 into the CAS; and
- The delay in the identification of the airborne contamination in the CAS.
- Issues identified included:
- Valve or damper configurations should not be stipulated on non-isolation permits, as these are not tagged and cannot be verified by the responsible person (RP).

- Inspection and Test acknowledged that they compiled the permit (PTW) as a straight “cut-and-paste” and did not review or question any of the content.
- Inspection and test could not adequately explain what was intended with the AVAIL status of the main fans; and
- Inspection and test acknowledged that he did not review all the information on the PTW in the Pre-Job Brief for the Workers Register briefing, and did not read the permit instructions for the two main fans 6 SSM 410 and 411 ZV.

These represent Plant Safety Regulation (PSR) non-compliances due to human errors, and were addressed by the PSR Custodian. The corrective action plan included: CAS staff relocation; a Work Stop on filter testing; Whole Body Count monitoring of affected personnel; and revision of Work Instruction. Actions relating to performance management of the relevant individuals were addressed by their relevant Managers.

The grading of this event as significant (graded as S7.6(ii)) was based on the initial conservative estimation of the dose acquired by the CAS individuals. This classification requires that the exposure is in excess of regulatory limits. The subsequent WBC trending and analysis has concluded that none of the CAS individuals acquired above regulatory limits for non-Rad workers / member of the public.

There were no operational or health and safety consequences due to this event.

### **Wrong Unit Operation: Unit 1 valve removed instead of Unit 2.**

On 14 March 2022 at approximately 14H30, the welding team was tasked to perform cut out and replace (COAR) on a valve (2 REN 168 VB) in a sample room that house both units sampling points. At around 15H30 the team contacted the valve team to loosen the union to allow for the safe cutting of the valve. The union was loosened on the request of welding and the valve was handed over to the welding team. The worker cut the valve and left it on the table around 18H40. The nightshift Welding Supervisor received a call from the U1 SSS informing him that the valve that was cut was on the wrong Unit (Unit 1). The nightshift Supervisor went to verify on the plant and confirmed that the valve that was cut was 1 REN 168 VB; and not 2 REN 168 VB

Koeberg implemented a “work stop”, to allow details of the event to be shared with staff, as well as any lessons learnt in order to prevent the same thing from happening again.

There were no operational or health and safety consequences due to this event.

### 1.13. Regulatory compliance inspections and audit

In order to verify the degree of compliance with the conditions of authorisation, the NNR undertakes independent inspections and audits. The NNR conducted 34 inspections at the KNPS as part of its compliance assurance activities in the year under review.

### 1.14. Regulatory warnings and directives to stop work

The NNR issued one directive to KNPS in March 2022 to address short comings identified in the Fitness for Duty processes for contractors on site.

### 1.15. Appeals to the CEO

There were no appeals lodged with the CEO during the reporting period.



## 2. Regulation of Nuclear Facilities and Activities on the South African Nuclear Energy Corporation (Necsa) Pelindaba Site



Necsa, a state-owned company located in the Madibeng District in the North West province of South Africa is responsible for undertaking and promoting research and development in the field of nuclear energy and radiation sciences. Apart from its main activities at Pelindaba, which include operation and utilisation of a pool-type light water-cooled research reactor named SAFARI-1 research reactor, Necsa also manages and operates the Vaalputs National Radioactive Waste Disposal Facility in the Northern Cape on behalf of the National Radioactive Waste Disposal Institute (NRWDI).

In terms of Section 26(2) of the National Nuclear Regulator Act, Act 47 of 1999, Necsa as the nuclear authorisation holder implements an inspection programme to ensure compliance with the conditions of the Nuclear Installation Licences. The NNR implements an independent system of compliance inspections to provide assurance of compliance with the conditions of the nuclear authorisations in terms of section 5(d) of the NNR Act.

The NNR's Nuclear Technology and Waste Projects (NTWP) Programme under the Nuclear Technology and Norm (NTN) division regulates nuclear safety, radiation protection and the transport of radioactive substances associated with various facilities on the Necsa Pelindaba site.

The nuclear facilities on the Necsca Pelindaba site are diverse and include:

- The SAFARI-1 Research Reactor;
- Various fuel cycle facilities involved in the manufacture of nuclear fuel for the SAFARI-1 Research Reactor;
- Analytical Laboratories;
- A Liquid Effluent Treatment Facility;
- A variety of radioactive waste treatment and storage facilities; and,
- An array of facilities in various stages of decommissioning.

These facilities are authorised in terms of Nuclear Installation Licences NIL-02 through NIL-27 and NIL-29 through NIL-42 as well as COR-156. In accordance with the conditions of the authorisation, Necsca is required to ensure that arrangements, acceptable to the NNR, are established and implemented with respect to the following aspects:

Condition of Authorisation			
1	Plant/facility description and configuration	16	Appointment of duly authorised and suitably qualified and experienced persons
2	Scope of activities that may be undertaken	17	Safety committees
3	Demarcation of site boundary, site plans, designs and specifications	18	Safety documentation
4	Physical security	19	Quality and safety management
5	Transport of radioactive material	20	Modification to design of existing plant or facility
6	Restrictions on dealing with the site	21	Construction and commissioning of plant or process
7	Radiological protection	22	Limits and conditions of operation
8	Medical surveillance and health register	23	Examination, inspection, maintenance and testing
9	Radioactive waste management	24	Decommissioning
10	Records management and reporting	25	Management of organisational change
11	Management and reporting of events (including incidents or accidents) on the site	26	Financial security for nuclear liability
12	Emergency planning and preparedness	27	Public safety information forum
13	Environmental protection	28	Self-Inspection Programme to ensure compliance with conditions of authorisation
14	Effluent management	29	Display of the licence
15	Environmental monitoring		

## 2.1. Occupational exposure to radiation

The general regulatory dose limit prescribed by the NNR for occupational exposure of any individual worker at the Pelindaba site must be so controlled that the following limits are not exceeded:

- An average effective dose of 20mSv per year averaged over five consecutive years.
- A maximum effective dose of 50Smv in any single year

Radiation exposure of workers at the Pelindaba site are subject to control through the individual facility specific Operational Radiation Protection Programme and the corporate wide Process Based Licensing (SHEQ-INS) system. In addition, Necsa has committed to implementing an ALARA goal of 4mSv/a. Reporting of worker doses is undertaken on a quarterly basis and includes an evaluation of the doses over a rolling 12-month period. The NNR review of the occupational exposure records for workers on the Pelindaba site over the reporting period confirmed compliance to the regulatory requirements.

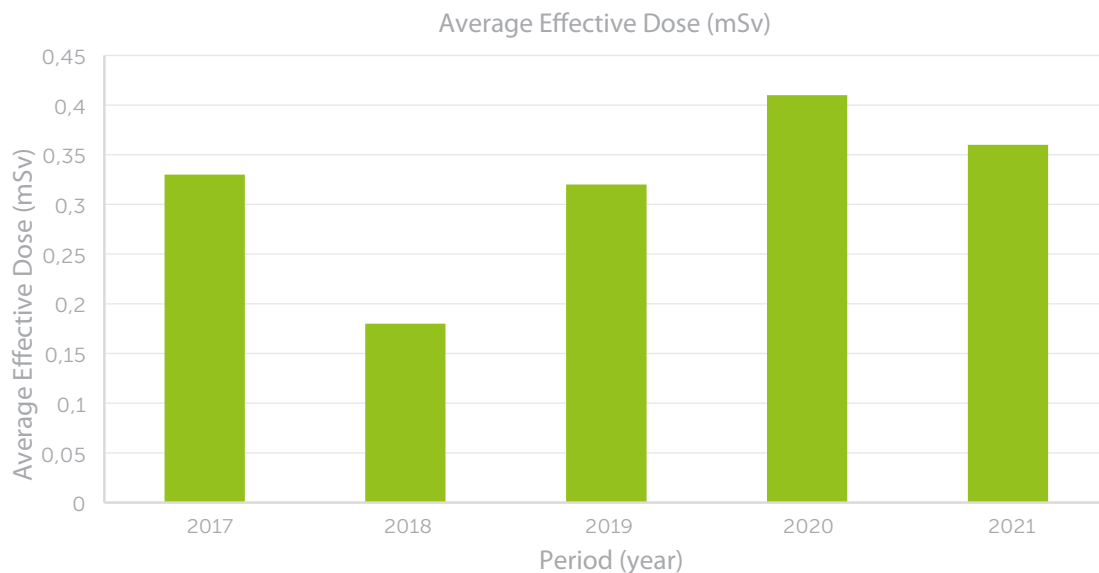
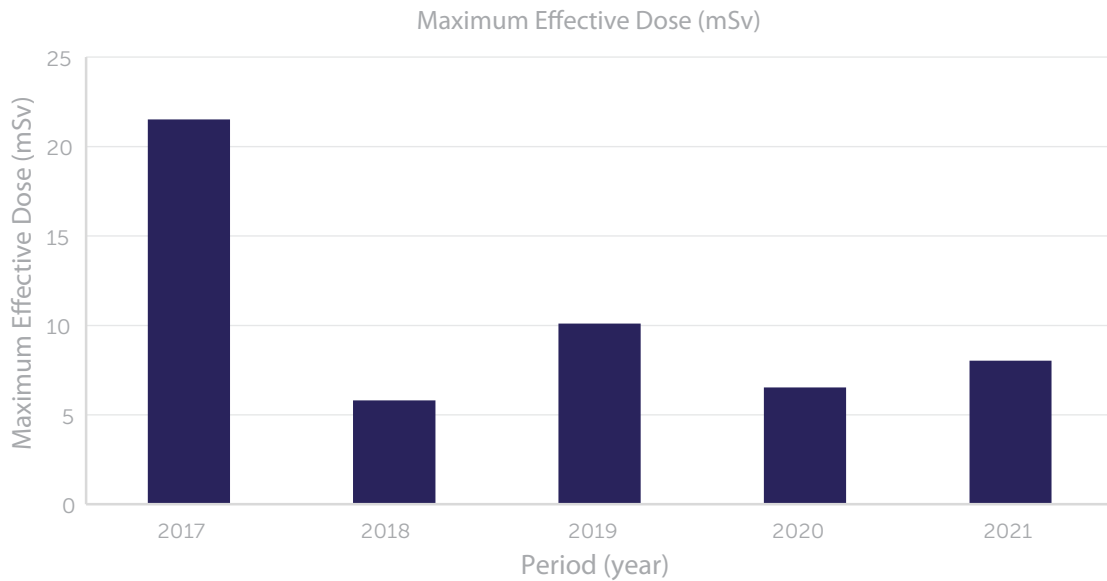


Figure 5: The average effective dose Pelindaba site (2017-2021)



**Figure 6: Maximum individual dose Pelindaba site (2017-2021)**

The average effective dose and the maximum individual doses incurred by Necsa workers during the past five years are shown in Figure 5 and Figure 6 respectively.

## 2.2. Projected public exposure

The conditions of authorisation and the SSRP Regulations require that public doses resulting from effluent discharges from the Necsa Pelindaba site must comply with the dose constraint of 250 $\mu$ Sv per annum and the system of Annual Allowable Discharge Quantities (AADQs) applicable to the site. The system of AADQs limits the total quantity of individual radionuclides that may be released as effluent via the liquid and airborne pathways in a given period. Necsa submits quarterly reports on the effluent releases and projected public doses from said releases to the NNR. The projection of public doses is presented to the public at the quarterly Public Safety Information Forum (PSIF) meetings.

For the reporting period, Necsa demonstrated compliance with the AADQs and prescribed public dose limit. The projected public doses, resulting from the liquid and gaseous effluent releases during the past five years is as shown in Figure 7.



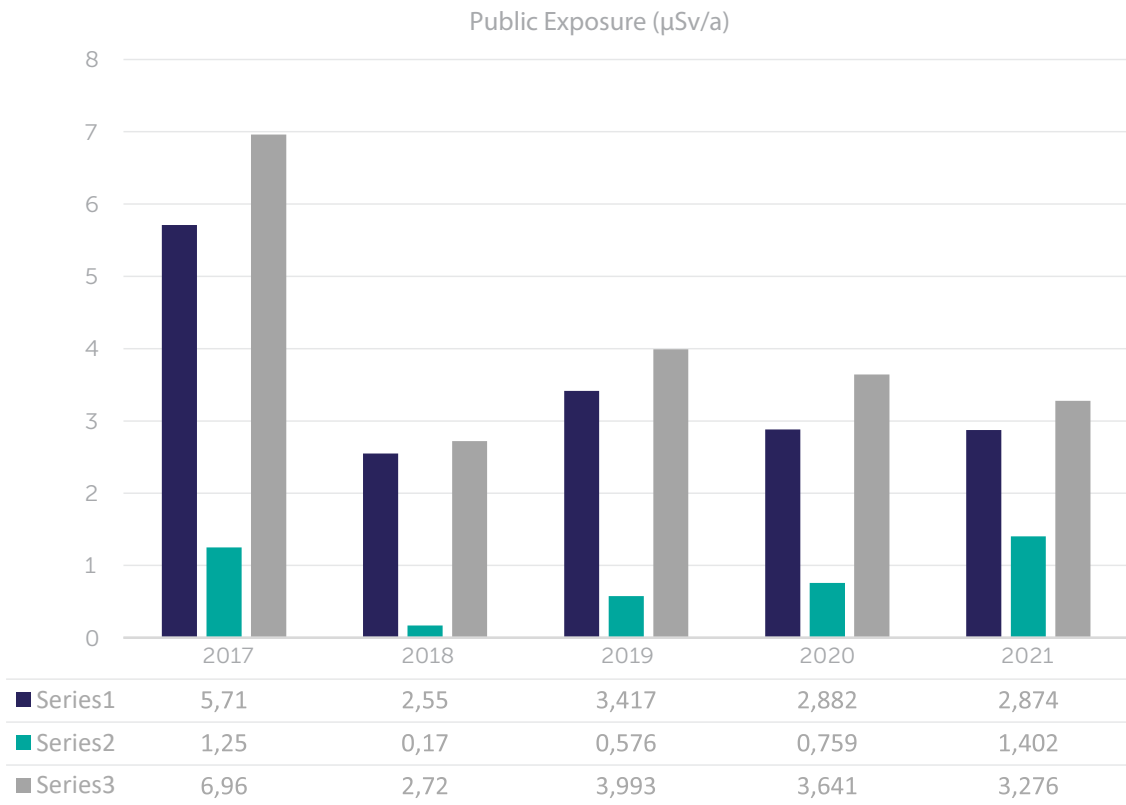


Figure 7: Projected public exposure from liquid and gaseous pathways for Necsas Pelindaba site (2017-2021)

## 2.3. Nuclear safety

### 2.3.1. Necsas response to Covid-19 pandemic

Throughout the reporting period, Necsas provided updates to the NNR on COVID-19 matters via the JPC Forum and the Licensing and Compliance Management Committee. Some Necsas facilities returned to 100% operation, but others were only operated on a as needed basis. Necsas implemented a hybrid working arrangement which allowed some employees to work from home. With the return to service of more facilities aligned with reduction in lockdown levels, worker numbers returning to site increased. Operations at Necsas Pelindaba and Vaalputs continued under strict COVID-19 protocols.

As of 28 February 2022, there were four hundred and twenty-five (425) reported cases of employees having tested positive for COVID-19. According to the Necsas reporting, none of the positive cases were as a result of workplace transmission. Of these 425 cases, 409 employees had fully recovered and unfortunately 11 were deceased.

### 2.3.2. Safety culture

Following on the regulatory concerns at the NTP Radiochemicals Facility, Necsa committed to hosting an independent review of their organisational safety culture. The IAEA was requested by Necsa to conduct an Independent Safety Culture Assessment (ISCA) Review.

The purpose of an IAEA ISCA review is to provide independent advice and assistance to Member States in enhancing the safety culture of a nuclear facility. The aim of this review was to further develop and strengthen the NTP Radiochemicals Facility culture so that nuclear safety remains a priority for all IAEA member states. The reviews provide the requesting organisation the opportunity to better understand and fully address root causes of identified safety culture issues.

The IAEA ISCA review at the Necsa Pelindaba site was conducted from 06 to 17 August 2018. Following the ISCA Review, Necsa was required to develop an action plan to address the recommendations and suggestions in the report. During the reporting period, the NNR continued to monitor Necsas' progress in addressing the ISCA report recommendations. In this regard it must be recognised that culture change is a slow and gradual process that will need evaluation over several years.

### 2.3.3. Review of the current conditions of authorisation

The conditions of authorisation included in Part A of the nuclear installation licences issued for the nuclear facilities on the Necsa Pelindaba site and the Vaalputs National Radioactive Waste Disposal Facility were originally formulated in 2005. A review of the conditions of authorisation was conducted in 2009, as part of the NNR Self-Assessment Project. Resulting from this, updates to the conditions were implemented in the nuclear installation licences issued in the period February 2009 to November 2011.

In the subsequent years, valuable insights were gathered during the self-assessment process in preparation for the 2016 IAEA IRRS mission to South Africa. Further, lessons and insights were learnt from:

1. The findings contained in the 2016 IAEA IRRS mission to South Africa.
2. The reporting requirements under both the Convention for Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (Joint Convention).
3. Participation of NNR staff in various IAEA IRRS missions including the missions to Australia, Belgium, Canada, Finland, Japan and the Netherlands.
4. Participation of NNR staff in the Artemis mission to Poland and the Joint IRRS/Artemis mission to Spain; and
5. The development and updates to various IAEA Safety Standards since 2010, in particular the:

- GSR PART 1, Governmental, Legal and Regulatory Framework for Safety;
- GSR PART 2, Leadership and Management for Safety;
- GSR PART 3, Radiation Protection and Safety of Radiation Sources;
- GSR PART 4, Safety Assessment for Facilities and Activities;
- GSR PART 6, Decommissioning of Facilities;
- SSR-1, Site Evaluation for Nuclear Facilities;
- SSR-3, Safety of Research Reactors; and
- SSR-4, Safety of Nuclear Fuel Cycle Facilities.

Based on the above plus the lessons learnt from regulation of the Necsa facilities and Vaalputs, the current conditions of authorisation were reviewed, and proposed changes were identified. Necsa was consulted on the proposed amendments and an online workshop between the NNR and Necsa was held to provide clarification on the proposed amendments. Necsa was also requested to review the current descriptions under condition 2 and condition 3 of the respective Nuclear Installation Licences and confirm the accuracy of the content.

The amendments to the respective Nuclear Installation Licences will be undertaken in a phased manner. The NNR has issued the following twelve (12) amended Nuclear Installation Licences

- NIL-10 (Conversion Plant Complex)
- NIL-12 (Quarantine Storage Facility)
- NIL-15 (Oil Purification Facility)
- NIL-17 (BEVA K3 Storage Complex)
- NIL-21 (J Building)
- NIL-22 (D Building)
- NIL-23 (C Building)
- NIL-24 (Building P-2900)
- NIL-25 (Building XB)
- NIL-30 (E Building)
- NIL-31 (Dorbyl Camp)
- NIL-34 (YM Vacuum Workshop)
- NIL-42 (B1-Building Basement)

Necsa will be consulted on the amendments of subsequent Nuclear Installation Licences during the Licencing and Compliance Management Meetings held between the NNR and Necsa.

### 2.3.4. Process Based Licence Documents

Process Based Licensing (PBL) is the process where the authorisation holder has the responsibility for technical details relating to nuclear safety and more emphasis is placed on the licence holder to ensure that appropriate processes are in place to comply with the regulatory requirements. Application of PBL at Necsa-run facilities commenced in the 2002/03 financial year and the system comprises of more than 200 Necsa designed documents, dealing with the full spectrum of process areas. These processes include:

1. Identification of applicable fundamental nuclear and radiological safety standards.
2. Identification of the basis for authorisation, change control in respect of modification, processes to update and maintain safety case and relevant operational programmes.
3. Identification of nuclear and radiological safety requirements necessary to underpin the safety case and processes needed to maintain these in line with the safety case.

Monitoring and enforcement of compliance with the requirements identified in (c) above.

During the reporting period, the NNR reviewed the 100 Process Based Licensing submissions and the following are sampled submissions:

1. Necsa Requirements for Access and Egress Control for Radiological Areas
2. Necsa Requirements for Administrative Control Measures for Radiation Workers
3. Necsa Requirements for Document and Record Control
4. Necsa Requirements for Safety, Health and Environmental Policy
5. Necsa Requirements for Quality Policy
6. Necsa Requirements for Safety Culture Enhancement Process
7. Necsa Requirements for Resource Management
8. Necsa Requirements for Radiation Dosimetry Programme
9. Necsa Requirements for System for the Classification and Demarcation of Radiological Areas
10. Necsa Requirements for Building Emergency Plans
11. Necsa Requirements for SHEQ Objectives

### 2.3.5. Safari-1 Research Reactor

SAFARI-1 Research Reactor is owned and operated by the South African Nuclear Energy Corporation (NECSA) at their facility at the Pelindaba site and has been in operation since 1965. It is utilised mainly for the commercial production of medical and industrial isotopes, activation analyses, material modification (such as the neutron transmutation doping of silicon for the semi-conductor industry) and numerous support services such as neutron radiography and neutron diffraction, which are of both industrial and academic interest.

### *2.3.5.1. Ageing management at SAFARI-1*

In the interest of ensuring that SAFARI-1 continues safe operation of the plant going forward an assessment is being performed of all the safety related Systems, Structures and Components (SSCs) to establish the status of health of SAFARI-1 explicitly and objectively as a basis for continuous safe operations, developments, maintenance, and ageing management processes. The facility has developed an ageing management programme for continuation operation beyond 2020. As part of ageing management SAFARI has carried out the upgrade projects and made submissions related to the following projects:

#### **2.3.5.1.1. Area Monitoring System Upgrade Project – Installation and Commissioning Checklist - Installation and Commissioning Report**

During the reporting period, the NNR reviewed the Necsa responses addressing of the previous NNR comments on the commissioning of the upgraded Area Monitoring System. The NNR review concluded that Necsa had satisfactorily addressed the previous NNR comments. Consequently, the NNR granted authorisation for the routine operation of the upgraded area monitoring system.

### *2.3.5.2. Reactor vessel and biological shield assessment*

The NNR received and reviewed the Necsa responses to previous NNR comments linked to the continued assessment of the SAFARI-1 reactor vessel, pool liner, and biological shield. The review outcome concluded that Necsa has satisfactorily addressed the NNR's previous comments. Further, Necsa was required to update and resubmit the SAFARI-1 In-Service Inspection Plan in line with the responses submitted and confirm the action plan to address the recommendations from the independent assessment conducted on the reactor vessel assembly, pool liner and biological shield.

### *2.3.5.3. SAFARI-1 in-service inspection*

#### **2.3.5.3.1. SAFARI-1 In-Service Inspection Plan**

The in-service inspection is performed as part of a maintenance process to provide the necessary information with respect to inspection and tests of all relevant equipment or systems of the plant. The NNR received and reviewed an updated Necsa In-Service Inspection Plan (ISP) that incorporates the changes emanating from the NNR comments on the SAFARI-1 reactor vessel, pool liner, and biological shield inspection report. The NNR review confirmed Necsa had satisfactorily addressed the previous NRR comments and consequently the ISP was accepted by the NNR.

#### **2.3.5.3.2. Summary of SAFARI-1 in-service inspection**

The summary report for SAFARI-1 in-service inspection (ISI) conducted at the facility, as part of a maintenance process to provide the necessary information with respect to inspection and tests of all relevant equipment or systems of the plant, was reviewed during the reporting period.

The outcomes of the review indicated that Necsa did not satisfactorily address all the NNR comments.

#### ***2.3.5.4. SAFARI-1 alternate fuel plate supplier***

SAFARI-1 currently makes use of Low Enriched Uranium (LEU) Fuel Assemblies and Control Rod Assemblies assembled at the ELPROD Facility on the Necsa site, using fuel plates that are procured from France. To enhance security of fuel supply, Necsa has undertaken to qualify an alternate supplier of fuel plates, Novosibirsk Chemical Concentrates Plant, in Russia.

During the reporting period, SAFARI-1 conducted a desktop audit to re-qualify ELPROD within the MTR Fuel Department on selected requirements, which includes general and quality assurance requirements applicable to the supplier as well as confirmation of pre-evaluation requirements and a supplier qualification for the manufacture of the LTA qualification batch. The NNR reviewed and commented on submissions related to:

- Licensing strategy for new supplier
- Supplier Qualification Programme and Plan
- Project Management Plan
- Report on Audit of the proposed alternate supplier

The review outcome revealed outstanding activities that will need to be verified.

#### ***2.3.5.5. SAFARI-1 emergency procedure***

During the reporting period, the NNR received Necsa responses to previous NNR comments on the SAFARI-1 Building Emergency Plan. The outcome of the review confirmed that Necsa did not satisfactorily address the NNR comments. The NNR review outcomes were communicated to Necsa to address the outstanding issues.

#### **2.3.6. Calibration facility for radiometric instruments**

During the reporting period, the NNR reviewed a Safety Assessment Report (SAR) and Radiological Protection Programme for Calibration Pads used to calibrate radiological instruments on the Pelindaba site. The review outcome confirmed that the Radiation Protection Programme was acceptable. However, the SAR did not adequately address the NNR requirements and Necsa was issued with comments to address.

## 2.4. Transport safety

### 2.4.1. Thabana Complex

#### 2.4.1.1. Proposed expansion of the Thabana Pipe Store

The Thabana Pipe Store, within the Thabana Complex, authorised under Nuclear Installation Licence NIL-04, is utilised for the interim storage of used fuel from the SAFARI-1 Research Reactor. This is a dry storage facility comprising of subsurface sealed stainless steel storage pipes, positioned in boreholes, and the pipe openings are shielded with a lead plug and an airtight flange. The pipes are kept under a positive pressure with an inert gas. The operating technical specification limits the acceptance of used fuel to the Thabana Pipe Store to fuel that has undergone a cooling period of at least two years. This subsurface borehole design serves the dual purpose of shielding and heat transfer.

Necsa proposes to increase the current storage capacity for used fuel elements and cater for the long-term storage of uranium residue waste from the NTP Radiochemicals Complex. During the reporting period the NNR responded on:

1. Proposed Licensing Strategy
2. Project Management Plan
3. Project Quality Plan
4. Facility and Process Description
5. SSC Classification
6. Design Report
7. Maintenance and In-Service Inspection Plan
8. Safety Case

Further noting that the proposed expansion will increase the basic footprint of the facility, the NNR has required that Necsa prepare a Public Information Document (PID) for the proposed expansion. The PID will provide the public with information on the project. It is the intent of the NNR to request written public comment on the planned expansion in the next reporting period.

### 2.4.2. Handling instruction for transport packages

Handling instructions prescribe information necessary to safely handle, load, unload, ship and maintain the transport packages during transport activities. Following the outcome of the review, the NNR confirmed that the revised handling instructions for the following transport packages were found acceptable:

Certificate of Package Design Approval	Transport Container	Authorised for	Effective Date	Expiry Date
ZA/NNR 1009/B(U)-96 (Rev 04)	Erica Transport Container	Transport I-131 in solid form within South Africa and internationally including Argentina, Canada, the United Kingdom and the United States of America using all modes of transport.	13 October 2020	12 October 2025
ZA/NNR 1006/B(U)-96 (Rev 05)	1006 Cobalt Flask	Transport 60Co and 137Cs sealed sources in number of countries including Argentina, Canada and the United Kingdom by land, sea or inland waterways.	02 July 2020	01 July 2025

### 2.4.3. Safety assessment of routine transport of fissile material from OR Tambo International Airport

During the reporting period the NNR reviewed and accepted the previous Necsa Safety Assessment Report (SAR) for the Transport of Fissile Material from OR Tambo International Airport to Pelindaba for implementation. The safety assessment quantified the radiological risk associated with the transport of fissile material from OR Tambo International Airport to the Pelindaba site contained in TN-BGC-1 Type B(U) transport containers. The NNR further required Necsa to re-evaluate, update and resubmit the Safety Assessment Report due to the following:

- the release of the new version of NRC-RADTRAN computer code at the end of 2020 which was not available when Necsa submitted the SAR; and
- Changes in the Necsa transport plan, and given that several years had since passed since the initial approval of the safety assessment.

## 2.5. Radioactive waste safety

### 2.5.1. PELSTORE waste projects

PELSTORE is licensed to receive and store radioactive waste drums from various radioactive waste generating facilities on the Pelindaba site. The PELSTORE Waste Acceptance Requirement (WAR) for solid radioactive waste does not allow for drums to contain any free-standing liquid.

#### 2.5.1.1. Volume Reduction Facility

As part of the waste management activities in the PELSTORE, Necsa had initiated a project for volume reduction of compressible radioactive waste packages stored in the PELSTORE. The Volume Reduction Facility (VRF) is currently undergoing hot commissioning and has not been approved for routine operation. The NNR received and reviewed the revised procedure for the verification of drums that will be compressed at the Volume Reduction Facility (VRF). Following the review, the NNR accepted said revised procedure for Necsa to implement for the verification of drums prepared for VRF compaction. Prior to the NNR granting approval for resumption of hot commissioning activities at the VRF, Necsa was required to submit a list of prepared drums



that will be compacted to complete hot commissioning and the schedule thereof. Further, the NNR reviewed the VRF OTS and required Necsa to address NNR comments made.

### ***2.5.1.2. Waste Segregation and Repacking Facility***

The Waste Segregation and Repacking Facility will be constructed with Pel-store and its intention is to enable the removal of liquid or unwanted items from waste containing drums and the segregation and repacking of low-level radioactive waste. During the reporting period the NNR has reviewed Necsa documents for the Waste Segregation and Repacking and X-ray facilities in PELSTORE. Following the review, the NNR issued comments on submitted documents for Necsa to address.

### ***2.5.1.3. X-Ray Facility***

The X-ray Facility will be installed inside PELSTORE since it is used for the verification of drum content compliance with the PELSTORE Waste Acceptance Requirements. The main function is to detect possible presence of liquid inside newly presented to NLM waste drums and old drums inside NLM storage facilities. X-ray scanning is used to identify liquid in waste drums to limit the number of drums that need to be manually inspected and thus limit worker exposure and time. The X-ray Facility will be placed close to the eastern entrance of Pelstore where a receiving area will be located.

During the reporting period, the NNR reviewed the following Necsa submission for the X-ray project:

1. Licensing strategy;
2. Authorisation Change Request for establishing an X-ray Facility; and
3. Project Management Plan.

The NNR has identified comments for Necsa to address.

## **2.5.2. Bus Shed Drum Rehabilitation and Re-Packing Project**

As part of the project to rehabilitate the corroded drums in the Bus Shed started in 2013, after comments received from the NNR on the previous submissions and the requirements of the Vaalputs Waste Acceptance Criteria, a decision was taken to redefine the project. Necsa submitted the following document which the NNR previously reviewed, with comments issued to Necsa to address:

1. Licensing Strategy and Project Management Plan
2. Process Description and Prospective Hazard Assessment
3. Safety Case
4. Qualification Approach for the 85 Gallon Metal Waste Package
5. Testing schedule – for Waste package
6. Sampling Plan

During the reporting period, the NNR has reviewed the Necsa responses to the previous NNR comments. The NNR accepted Necsa responses on the Sampling Plan and further required Necsa to submit supporting documents prior to NNR approval.

### 2.5.3. Uranium Residue Project in the NTP Radiochemical Complex

As part of the radioactive waste management improvements and rationalisation project within the NTP Radiochemical Complex (Hot Cell Complex), Necsa had previously requested approval for modification of the utilisation of Cell 2, Cell 6A and Cell 6B in the facility. Necsa proposed to use Cell 6A and Cell 6B for the conditioning of the uranium residue and Cell 2 as an interim store for the storage of the uranium residue from Mo-99 and I-131 radiopharmaceutical manufacturing processes.

During the reporting period, the NNR reviewed the Necsa submission requesting NNR approval to conduct further uranium residue runs associated with the Uranium Residue Project in Cell 2, Cell 3, Cell 6A and Cell 6B. Following review of the Necsa/NTP request, the NNR granted approval for Necsa/NTP to conduct of a maximum of ten (10) further uranium residue runs. Said runs were conducted in the period 06 January 2022 to 08 February 2022. Further, Necsa/NTP were required to provide a timeframe for the determination and verification of the calibration curves for the Active-Well Coincidence Counter (AWCC). Subsequently, Necsa/NTP made a submission regarding the calibration of the AWCC and revised and submitted the updated hot commissioning report. Said submission will be reviewed in the next reporting period.

## 2.6. Decommissioning

### 2.6.1. Decommissioning in XB Building

Building XB is situated on the east side of the Pelindaba site and was built in the early 1980s to test the efficiency of newly built and decontaminated Separating Element Assemblies (SEAs) using UF<sub>6</sub>(nat) as a process gas. The plant was shut down in the late 90's and Phase 2 decommissioning was carried out and completed in 2001. Building XB is currently under Care and Maintenance. The NNR had approved Phase 2 decommissioning and the facility was stripped of all process equipment and surface cleaned. A portion of the resulting waste was sold off as scrap and the rest placed in drums and sent to D-Building for storage.

During the reporting period, the NNR has reviewed the following documents in support of application for NNR approval of Phase 3 decommissioning of XB building:

1. Authorisation change request
2. Decommissioning Strategy and Plan
3. Prospective Hazard Assessment

The NNR has completed the reviews and communicated the identified comments to Necsa to address.

## 2.6.2. Decommissioning strategies

Section 5.1.1 of the Regulation on Safety Standards and Regulatory requires the authorised facilities to compile and submit the conceptual decommissioning strategy to the competent authority for approval. The conceptual decommissioning strategy includes a description of the decommissioning options, overall timescales for the decommissioning of the facility and the end-state after completion of all decommissioning activities. During this reporting period, the NNR reviewed the decommissioning strategy for SAFARI-1 Research Reactor and NTP Radiochemicals Complex facilities on the Necsa Pelindaba site and provided comments to Necsa.

## 2.7. Regulatory Nuclear Emergency Exercise

### CLASSIFICATION OF NUCLEAR EMERGENCIES

There are progressive stages of response to a nuclear emergency plan, depending on the seriousness of the potential consequences of an accident. These are;

#### UNUSUAL EVENT

An abnormal occurrence that indicates an unplanned deviation from normal operations, the actual or potential consequences of which require notification of the Emergency Controller and activation of the appropriate components of the Emergency Plan.

#### ALERT

A situation exists that could develop into a site or general emergency and therefore requires notification of all emergency personnel in order to obtain a state of readiness to respond.

#### SITE EMERGENCY

An emergency condition exists that poses a serious radiological hazard on site but poses no serious radiological hazard beyond the public exclusion boundary.

#### GENERAL EMERGENCY

An emergency condition exists that poses, or potentially poses, a serious radiological hazard beyond the public exclusion boundary.

A Regulatory Nuclear Emergency Exercise (RNEE) was conducted at Necsa on 26 January 2022. The NNR evaluated the implementation of both Necsa and Madibeng Local Municipality emergency plans together with their respective emergency procedures for on-site and off-site response. The specific objectives of the RNEE were to evaluate:

1. Activation of emergency functionaries (on-site) by the Emergency Control Centre (ECC)
2. Notification of Madibeng Disaster Management Centre (MDMC)
3. Declaration of the general emergency
4. Protection of the emergency workers
5. Availability of emergency and protective equipment
6. Implementation of the Operational Intervention Levels (OILs)
7. Notification of the public
8. Radiological monitoring and assessment of the environment
9. Implementation of the protective actions on-site
10. Communication between response organisations (on-site and off-site)

Prior to the exercise the NNR prepared a scenario in accordance with the specific objectives and prescribed ground rules which were discussed and accepted by Necsa and the intervening organisations. The scenario required the implementation of on-site and off-site protective actions. The implementation of protective actions was monitored and evaluated by a team of NNR umpires, mainly on-site.

In general, considering specific objectives evaluated during the exercise, Necsa demonstrated satisfactory application of emergency preparedness and response actions. Nevertheless, several findings in the form of non-compliances (deficiencies) and observation (areas of improvements) were identified, which need to be addressed for further improvement of emergency plans and procedures. It was concluded that the Necsa Emergency Plan and Madibeng Disaster Management Plan remain viable for the protection of persons, property, and the environment. However, there was a need for urgent action to address the identified deficiencies and areas for improvement.

## 2.8. Environmental protection

As part of their environmental management programme, Necsa collects samples from various media in the environment around the Pelindaba site. The sampling locations were based on the surrounding land use. The sample media include:

1. Air filter monitoring on the Pelindaba site;
2. Water and fish samples from the Crocodile River and Hartbeespoort Dam;
3. Plant material in the surrounding area; and,
4. Milk from surrounding farms.

Samples are analysed and results are submitted to the NNR on a quarterly and annual basis. The analyses showed that there were no nuclear safety or radiological concerns regarding the environment around the Pelindaba site in the review period.

## 2.9. Regulatory independent verification of radiological environmental analysis

The NNR conducted an independent verification of radiological environmental analysis by collecting samples in and around the Necsa Pelindaba site. Analysis of the samples revealed no safety concerns about the environment around the Necsa Pelindaba site.

## 2.10. Competency and sufficiency of Necsa's Pelindaba workforce to work safely

In addition to the requirements in the SSRP Regulations, the conditions of licence require that Necsa must establish and implement arrangements to ensure that suitably qualified and experienced persons perform any duties that may affect the safety of operations on the site, or any duties assigned by or under the conditions of the licence. Such arrangements must make provision for the appointment, as appropriate, of authorised persons to control and supervise operations that may affect plant or facility safety.

During the reporting period, the NNR continued to monitor Necsa to ensure that it meets its obligation:

To service the conditions of authorisation in particular the management of safety and fostering of a strong nuclear safety and nuclear security culture including –

- Maintaining sufficient numbers of suitably qualified and experienced staff to maintain the facility's specific safety case and safe operations.
  - Ability to service creditors, in particular suppliers of Structures, Systems and Components (SSCs) and services important to nuclear and radiological safety and nuclear security.
  - The ability to undertake all required plant modification, maintenance, aging management and refurbishments required in the interest of conventional safety as well as nuclear and radiation safety and nuclear security; and
  - Effective review of events at authorised facilities and undertaking prompt and appropriate corrective and preventative measures.
- Effectively maintain all provisions required for conventional, chemical, nuclear and radiological emergency preparedness and response as well as nuclear security; and
  - Satisfy requirements related to funding and safe management of decommissioning, decontamination, radioactive waste management and used (spent) fuel management.

There were no safety impact issues identified. The NNR continues to monitor Necsa's actions in this regard.

## 2.11. Physical security

The NNR inspects Necsa's security measures as part of the compliance assurance programme and tracks the improvements required as part of said programme. During the reporting period, the NNR conducted three (3) security inspections at the Necsa Pelindaba site. Necsa was required to register separate nuclear occurrences for each of the findings from the NNR inspections. The NNR continues to monitor the corrective actions against these findings.

## 2.12. Safety of sealed radioactive sources

The NNR conducts inspections on radioactive sources at the Necsa Pelindaba site and receives six-monthly reports on radioactive sources that are used, stored on site or transported to and from the site. There were no safety concerns regarding sealed radioactive sources at Pelindaba site during the reporting period.

## 2.13. Nuclear incidents/accidents reported

There were no nuclear incidents or accidents reported during the reporting period.

## 2.14. Regulatory compliance inspections

NNR conducted 41 planned compliance inspections at Necsa's Pelindaba site during the reporting period. Overall, the inspections confirmed satisfactory compliance with NNR requirements and regulations. Nevertheless, non-compliances and/or areas for improvement were identified. Necsa was required to register separate nuclear occurrences for each of the findings from the NNR inspections. The NNR continues to monitor progress against these as part of the annual compliance assurance programme and event reporting system.

## 2.15. Regulatory investigations

There were no investigations conducted during the reporting period.

## 2.16. Regulatory warnings or directives to stop work

There were no directives issued to Necsa facilities during the reporting period. However, operations at the NTP Radiochemicals Complex were intermittently stopped. Details are presented in the following section.

## 2.17. NTP Radiochemicals Complex

### 2.17.1. Operational safe mode: Molybdenum and iodine lines operational readiness run

During the reporting period, the NNR received a Necsa/NTP request to resume operations within Cell 20 production line. Following the review of Necsa's request, the NNR granted the approval. The NNR received and reviewed Necsa/NTP reports on operation readiness run for Cell 19 and

Cell 20. Operations for the quarter showed compliance with the NNR conditions of approval.

On the 18 February 2022, following the dissolution process the cell pressure in Cell 19 increased above the OTS limit due to the Proportional Integral and Differential control (PID) as settings for the cell pressure control valve were incorrect. The Nuclear Facility Manager (NFM) halted further production activities in Cell 19 and a preliminary investigation was conducted. Upon determining the direct cause of the event and the correction of the PID settings for the control valve the NFM approved the resumption of activities in Cell 19. The NNR received notification of the decision by the NFM and the preliminary investigation report. The review outcomes will be communicated to Necsa/NTP in the next reporting period.

### **2.17.2. Monthly report regarding solidification of dissolution cell effluent**

During the reporting period, the NNR received and reviewed the Necsa/NTP solidification reports for the period December 2021 to February 2022. The review outcomes confirmed that the workers' doses were found to be within acceptable limits.

### **2.17.3. Request to recommence operations in Cell 25**

Following the OTS cell pressure violation in Cell 25, operations within that cell were suspended in April 2021. During this reporting period, the NNR reviewed the Necsa/NTP submission and granted approval to recommence operations in Cell 25.

Following the NNR granting Necsa/ NTP approval to recommence operations in Cell 25 in November 2021, Necsa was required to submit operational reports and evidence of the training of personnel. During the reporting period, the NNR received and reviewed the Necsa/NTP submissions and identified the comments for Necsa/NTP to address.

### **2.17.4. Long Term Storage (LTS) Container Transfer Flask Project**

During the reporting period, the NNR reviewed the Necsa/NTP response to previous NNR comment on the following LTS submissions:

1. Waste Management Plan
2. Project Quality Plan
3. Project Management Plan
4. Procurement Management Plan
5. User Requirement Specification

The outcomes of the review confirmed that Necsa/NTP did not satisfactorily address the NNR comments. Further, Necsa/NTP was required to submit all the outstanding safety case documentation for the said project for the NNR to complete the review prior to granting approval.

### 2.17.5. Installation of a cell door mechanical interlock system

Following numerous nuclear occurrences regarding erroneous or unintended opening of the Cell doors during operation, Necsa/NTP launched a project for the installation of a cell door mechanical interlock system to prevent unintended opening of cell doors and the NNR granted approval for the installation of said doors on identified hot cells.

Necsa/NTP reported challenges experienced during the operation of a cell door mechanical interlock system on Cell 12 following installation. Subsequently, the NNR suspended the approval previously granted for further installation activities on other cells. Necsa was required to submit a new request.

## 2.18. Appeals to the CEO or the Board

There were no appeals concerning the Pelindaba site during the period under review

## 2.19. Environmental protection

As part of their environmental management programme, Necsa collects samples from various media in the environment around the Pelindaba site. The sampling locations were based on the surrounding land use. The sample media include:

1. Air filter monitoring on the Pelindaba site;
2. Water and fish samples from the Crocodile River and Hartbeespoort Dam;
3. Plant material in the surrounding area; and,
4. Milk from surrounding farms.

Samples are analysed and results are submitted to the NNR on a quarterly and annual basis. The analyses showed that there were no nuclear safety or radiological concerns regarding the environment around the Pelindaba site in the review period.

## 2.20. Regulatory independent verification of radiological environmental analysis

The NNR conducted an independent verification of radiological environmental analysis by collecting samples in and around the Necsa Pelindaba site. Analysis of the samples revealed no safety concerns with regard to the environment around the Necsa Pelindaba site.





### 3. Regulation of the Vaalputs National Radioactive Waste Disposal Facility



Vaalputs is located in the District of Namaqualand, 110 km south east of Springbok in the Northern Cape Province and is 450 km from the KNPS, about 1400 km from Pelindaba. The site is about 10 000 hectares in extent, of which the area currently set aside for waste disposal occupies approximately 350 hectares surrounded by a 200 m exclusion zone. The Vaalputs property straddles the transition between summer and winter rainfall areas in South Africa which results in semi-arid to arid climate in which evaporation far exceeds precipitation.

Vaalputs currently only receives solid or solidified Low-level Waste (LLW) from Koeberg Nuclear Power Station (KNPS) and the South African Nuclear Energy Corporation (Necsa). The KNPS waste consists essentially of compactable and non-compactable waste like redundant equipment, filters, ion-exchange resins, evaporator concentrate waste and contaminated paper gloves, plastic and coveralls in concrete and steel drums. The Necsa waste currently disposed of at Vaalputs consists of solidified Medium Active Concentrates (MAC) in steel drums and solidified NTP liquid waste in concrete drums.

“Most industries produce waste, some of which is radioactive. Radioactive waste is produced during the operational and decommissioning phases of facilities associated with the operation of nuclear reactors, production and use of radioactive materials in the fields of research, medicine, industry, agriculture, commerce, education and the extraction, processing and combustion of raw materials containing naturally occurring radioactive materials. More than 90% of the radioactive waste generated during these activities is classified as Low-level Waste (LLW), while the rest is made up of Intermediate-level Waste (ILW) and High-level Waste (HLW). Due to the hazardous nature of radioactive waste, these wastes are disposed of in disposal facilities specifically designed to ensure that the waste is isolated from people and the environment until such time that the radioactivity has decayed to the extent that it poses no further hazard to people and the environment.”

The NNR’s Nuclear Technology and Waste Projects (NTWP) Programme under the Nuclear Technology and Norm (NTN) division regulates nuclear safety, radiation protection and the transport of radioactive substances associated with the Vaalputs site.

### 3.1. Occupational exposure to radiation

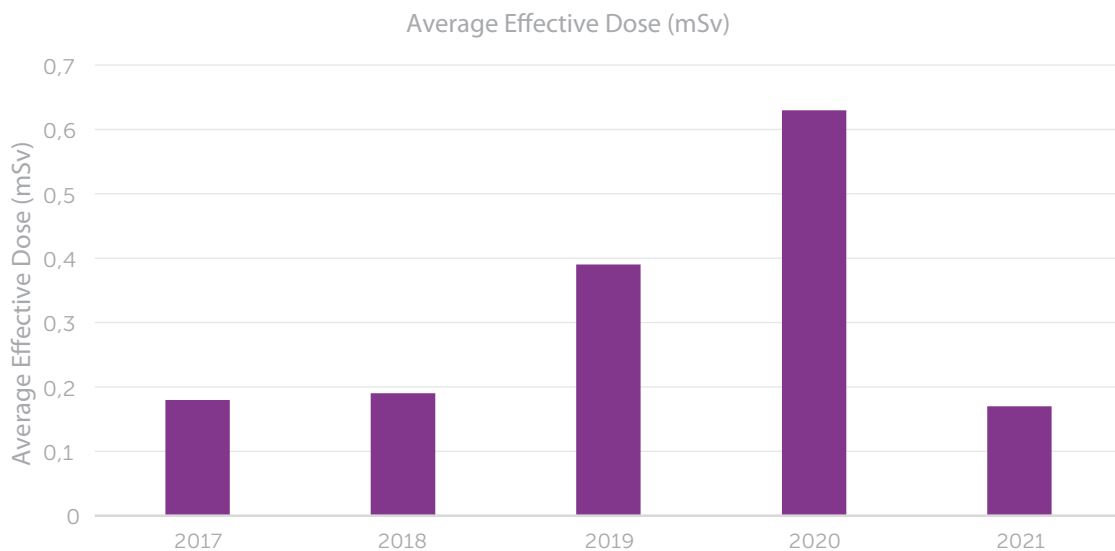


Figure 8: Average Effective Dose at Vaalputs site (2016-2021)

The nuclear authorisation for Vaalputs requires that all Vaalputs workers be subjected to a comprehensive medical surveillance program to ensure that they are, amongst other, fit to work in a radiation environment. Workers are continuously monitored for radiation dose through the use of Electronic Pocket Dosimetry (EPD) and thermoluminescent dosimeters (TLDs).

Vaalputs workers are exposed to external radiation when carrying out the following activities:

- Conducting receiving inspections, quality checks, measuring dose rates, and taking smear samples to determine whether the containers conform to the Vaalputs Waste Acceptance Criteria ;
- Off-loading waste packages by crane at the trench; and
- When backfilling and capping trenches filled with waste packages.

The general regulatory dose limit prescribed by the NNR for occupational exposure of any individual worker at the Vaalputs site must be so controlled that the following limits are not exceeded:

- An average effective dose of 20mSv per year averaged over five consecutive years.
- A maximum effective dose of 50Smv in any single year

The worker doses at Vaalputs over the past five years were within regulatory limits (see Figure 10). Radiation exposure of workers at Vaalputs remained subject to control through the Operational Radiation Protection Programme. This programme is applied to ensure that control within the annual individual dose limit is achieved. In addition, the programme also served to ensure that all doses are kept ALARA. The maximum effective doses accrued for individual workers during the past five years were below 1mSv (see Figure 11).

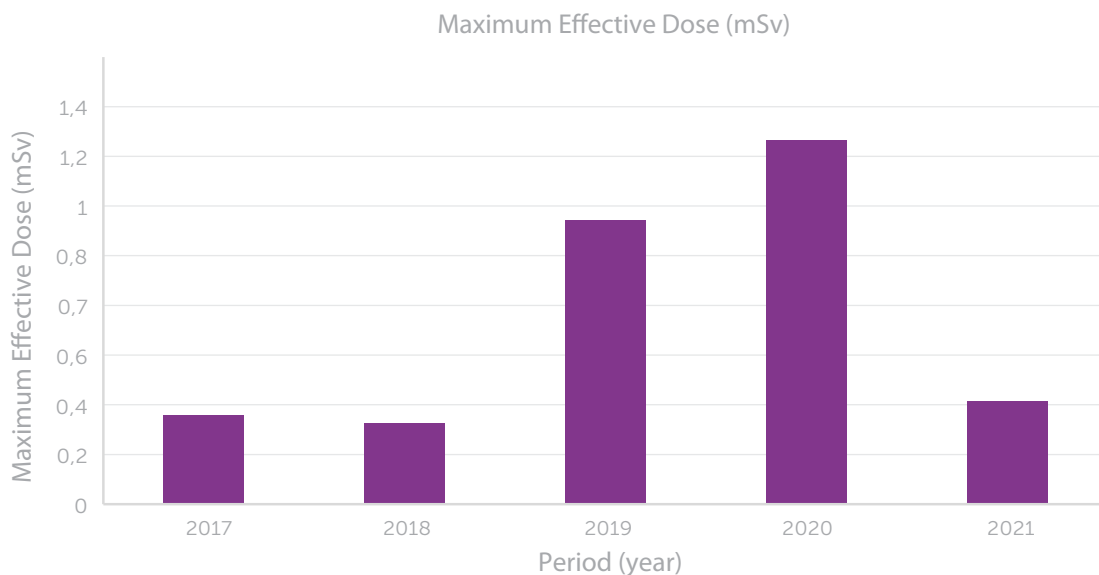


Figure 9: Maximum Effective Dose at the Vaalputs site (2017-2021)

## 3.2. Projected public exposure to radiation

There were no safety concerns regarding public exposure to radiation. In accordance with the conditions of authorisation and the SSRP Regulations, the public doses resulting from effluent discharges from Vaalputs must comply with the dose constraint of 0.25mSv. The Vaalputs environmental surveillance programme has shown no measurable radiological impact on the community living around site.

## 3.3. Nuclear safety

### 3.3.1. Vaalputs post-closure Radiological Safety Assessment

During the reporting period the NNR reviewed the Vaalputs post-closure Radiological Safety Assessment. The following documents were submitted:

1. Vaalputs post-closure Radiological Safety Assessment.
2. Vaalputs Post-closure Radiological Safety Assessment: Confidence in the Long-term Safety of Vaalputs; and
3. Vaalputs Post-closure Radiological Safety Assessment: Evaluation of Waste Concentration Limits and Site Activity Levels.

Following the review, the NNR identified comments on the submitted documents for Necsa to address in the next reporting period.

#### 3.3.1.1. *In-service inspection (ISI) and maintenance programme*

In-service inspection (ISI) and maintenance programmes provide the systematic framework for these examinations. An effective ISI and maintenance programme ensures both that the safety of the plant is not adversely affected after the commencement of operation and that the levels of reliability and availability of all plant SSCs remain in accordance with the assumptions and intent of the design.

During the reporting period, the NNR reviewed Necsa's response to the NNR's previous comment. Necsa satisfactorily address the NNR's comments, thus, the NNR granted approval to Vaalputs to implement the latest revision of the ISI and maintenance programme.

## 3.5. Transport safety

There were no concerns related to the safety of transport of radioactive material during the reporting period.

## 3.6. Radioactive waste safety

The receiving and disposal of radioactive waste at Vaalputs was in conformance with the conditions of authorisation and the Vaalputs Waste Acceptance Criteria . During the reporting period Vaalputs received a total of seven (7) radioactive waste shipments from KNPS comprising:

- Three (3) shipments consisting of 256 metal drum waste packages, and
- Four (4) shipments consisting of 19 concrete waste packages.
- There were no shipments from Necsa.

### 3.7. Environmental protection

There were no concerns regarding the safety of the environment at Vaalputs during the reporting period.

### 3.8. Nuclear emergency planning and preparedness

There were no safety concerns regarding the emergency planning and preparedness at Vaalputs during the reporting period.

### 3.9. Competency and sufficiency of Necsa's Vaalputs workforce to work safely

In addition to the requirements in the SSRP Regulations, the conditions of authorisation require that Necsa establish and implement arrangements to ensure that suitably qualified and experienced persons perform any duties which may affect the safety of operations on the site, or any duties assigned by or under the conditions of authorisation. Such arrangements must make provision for the appointment, as appropriate, of authorised persons to control and supervise operations, which may affect plant or facility safety.

During the reporting period, the NNR reviewed the Necsa submission relating to the appointment of Nuclear Facility Manager and Radiation Protection Supervisor. In addition, Necsa provided status updates on filling of other vacancies which were open due to staff movements. The NNR was satisfied with authorisation holder's compliance with the above requirement, in respect to Vaalputs.

### 3.10. Physical security

During the review period, the NNR conducted one (1) security inspection at Vaalputs. There were no safety concerns regarding the physical security at Vaalputs during the reporting period.

### 3.11. Safety of sealed radioactive sources

The NNR conducts inspections on radioactive sources at the Vaalputs site and receives six-monthly reports on radioactive sources that are used, stored on site or transported to and from the site. There were no safety concerns regarding sealed radioactive sources at Vaalputs during the reporting period.

### 3.12. Nuclear incident/accidents reported

There were no nuclear incidents or accidents reported during the period under review.

### 3.13. Regulatory compliance inspections

During the review period, the NNR conducted two (2) routine inspections at Vaalputs. These inspections provided assurance that there was generally satisfactory compliance with regulations and conditions of authorisation. Nevertheless, some non-compliance issues were raised during these inspections, and the NNR continues to monitor the corrective actions against these.

### 3.14. Regulatory warnings or directives to stop work

There were no directives issued to stop work at Vaalputs during the period under review.

### 3.15. Appeals to the CEO or the Board

There were no appeals concerning Vaalputs during the review period.

### 3.16. Application for the existing Vaalputs Nuclear Installation Licence (NIL-28) to be issued in the name of the National Radioactive Waste Disposal Institute (NRWDI)

The NRWDI application for the issue of Vaalputs Nuclear Installation Licence in the name of NRWDI was received in February 2019. The application was supported by a licensing strategy and a schedule of submissions were made to the NNR to review.

#### 3.16.1. Safety case documentation

During the reporting period the NNR completed the review of the outstanding NRWDI safety case documentation submitted in support of their licence application, i.e., Operating Technical Specifications and Safety Assessment Report. The review outcome concluded that Necsa has satisfactorily addressed the NNR's previous comments. The NNR approved the said documentation for implementation.

#### 3.16.2. NRWDI public participation process

The NNR directed NRWDI in 2020 to publish a Public Information Document (PID) which was used for public consultation, commenced on 01 March and ended on 30 March 2021. The period of public consultation, during which the public were requested to provide written comments related to health, safety and the environment connected with the NRWDI application. Following the closure of the public comment period, a total of 11 sets of comments were received.

During the reporting period, NRWDI was required to update the PID to address the comments received and translate the PID into Afrikaans. Following NRWDI addressing the public comment and submission of revised PID and Afrikaans version, the NNR reviewed and accepted the updated PID and the Afrikaans translation thereof. Further the NNR directed NRWDI to by no later than 30 November 2021:

1. Serve notice of the updated PID and its Afrikaans translation to all persons, institutions, or organisations upon whom notice of the NRWDI application was served, pursuant to NNR directive DIR-NTWP-0003.
2. Publish the notice of the availability of the updated PID and its Afrikaans translation, in the Government Gazette and the following four newspapers, in which the notice of the NRWDI application was initially advertised –
  - Die Gemsbok
  - Die Platterlander
  - Die Namakwalander
  - The Diamond Field Advertiser

### **3.16.3. Proof of Vaalputs ownership in the name of NRWDI**

During the reporting period, the NNR received and reviewed the NRWDI submission that serves as a proof that ownership of Vaalputs is now transferred and registered in the name of NRWDI in terms of section 30(9) of National Radioactive Waste Disposal Institute Act (Act 53 of 20028). The NNR will communicate the outcome of the review to NRWDI.

### **3.16.4. Appointment the NRWDI Chief Executive Officer**

The NNR received a notification of the appointment of the NRWDI Chief Executive Officer as from 01 November 2021. Following the review, the NNR identified erratic statements in the notification and sent NRWDI comments to correct the said errors. Subsequently, NRWDI made corrections and the NNR accepted the notification.



## 4. Regulation of Naturally Occurring Radioactive Material (NORM)



Radionuclides are present in all minerals and raw materials of natural origin, the most important of which, for the purposes of radiation protection, are those in the U238 and Th232 decay series and K40. These materials are commonly referred to as Naturally Occurring Radiation Material (NORM). In some materials, the levels of NORM are significantly higher, to the extent that regulatory control may be required for radiation protection purposes.

In terms of the NNR Act, the NNR is responsible for exercising regulatory control over facilities and activities handling NORM. Facilities and activities which handle NORM require authorisation in terms of the Act. In terms of section 22 (1) of the Act, such facilities and activities are authorised by means of a nuclear authorisation in a form of a certificate of registration (COR) or certificate of exemption (COE).

The nuclear authorisation (i.e. COR or COE) is issued with certain conditions of authorisation with which all holders are required to comply. A system of compliance assurance exercises (inspections, audits and investigation actions) is conducted upon these various holders to assure compliance with the conditions of authorisation and the SSRP Regulations.

The NNR currently grants nuclear authorisations for the following categories of NORM:

- Mining and mineral processing facilities
- Scrap smelters
- Fertiliser manufacturers



- Scrap processors
- Small users
- Service providers

The activities at these facilities include actions such as:

- Mining and processing of gold, copper, uranium, heavy minerals and phosphate rock.
- Recycling of scrap material (i.e. ferrous and non-ferrous metal, plastic, stainless steel, etc.) that is contaminated by NORM.
- Small users (i.e. laboratories) conducting tests of small quantities of NORM samples for verification of proposed and existing actions, including samples from prospecting activities; and
- Service providers (i.e. storage warehouse), supplying clean-up services of radiologically contaminated sites.

## Processing of new applications received

Facilities and activities where NORM form part of the production operations require authorisation in terms of section 22 (1) of the NNR Act. These facilities and activities are authorised by means of a nuclear authorisation in a form of a certificate of registration (COR) or certificate of exemption (COE) depending on various factors such as the radiological risk and complexities of the operation in compliance with the SSRP Regulations.

During the reporting period the NNR issued the following five CORs:

1. Lemowe (Pty) Ltd, COR-288
2. Bomamba Trading (Pty) Ltd, COR-289
3. Nanoretech Processing (Pty) Ltd, COR-291
4. EnviroServ Waste Management (Pty) Ltd, COR-292
5. GoldenCore Trade and Invest Proprietary Limited, COR-294

During the reporting period two applications for land clearance were granted for:

1. Johannesburg Development Agency to construct a new central fire station
2. Ekurhuleni Metropolitan Municipality to develop the remaining extent of the Farm Leeuwpoort and Portion 51 of the Farm Leeuwpoort 113 IR for residential housing units.

## Review of the current conditions of authorisation

The conditions of authorisation included in Part A of the certificates of registration (CORs) issued for different categories of CORs were reviewed and update during the reporting period. The review and update was triggered by various factors such as operational feedback in regulating these facilities and activities, the lessons learned by the Regulator on engagements with other regulatory counterparts globally, and participation of the Regulator in technical meeting expert missions by the IAEA. Consultation with authorisation holders was ongoing during the reporting period.

## 4.1. Occupational exposure to radiation

The primary radiation exposure pathway to workers in the underground mining environment is via the inhalation of radon progeny. The general regulatory dose limit prescribed by the NNR for workers classified as occupational exposed to radiation must be so controlled that the following limits are not exceeded:

- An average effective dose of 20mSv per year averaged over five consecutive years.
- A maximum effective dose of 50Smv in any single year

Based on these limits, the NNR requires the authorisation holders to demonstrate that the average effective dose of 20 mSv per year, averaged over five consecutive years, is not exceeded. This requires the authorisation holders to have proper dose records of all occupational exposed workers for a rolling five years as determined by the SSRP Regulations.

The NNR continued to focus much of its regulatory efforts on those mines where the potential exists for workers to be exposed to radiation levels in excess of the annual dose limit. During the reporting period, no workers exceeded the annual dose limit (see figure 12). The other areas with no potential of exceeding the regulatory annual dose limit (i.e. the so-called Non-Special Case Mines) remain well below the annual dose limit of 50 mSv/a (see figure 14).

## 4.2. Special Case Mines (SCM)

For a mine to be classified as a special case by the NNR, the potential monthly dose rate should be 1.7 mSv and above, or the projected annual dose of 20 mSv is exceeded. During the period under review, the radiological exposures remained below the annual dose limit of 50 mSv/a and 20 mSv/a average, over five consecutive years (2017 to 2021) as illustrated in Figures 12 and 13.

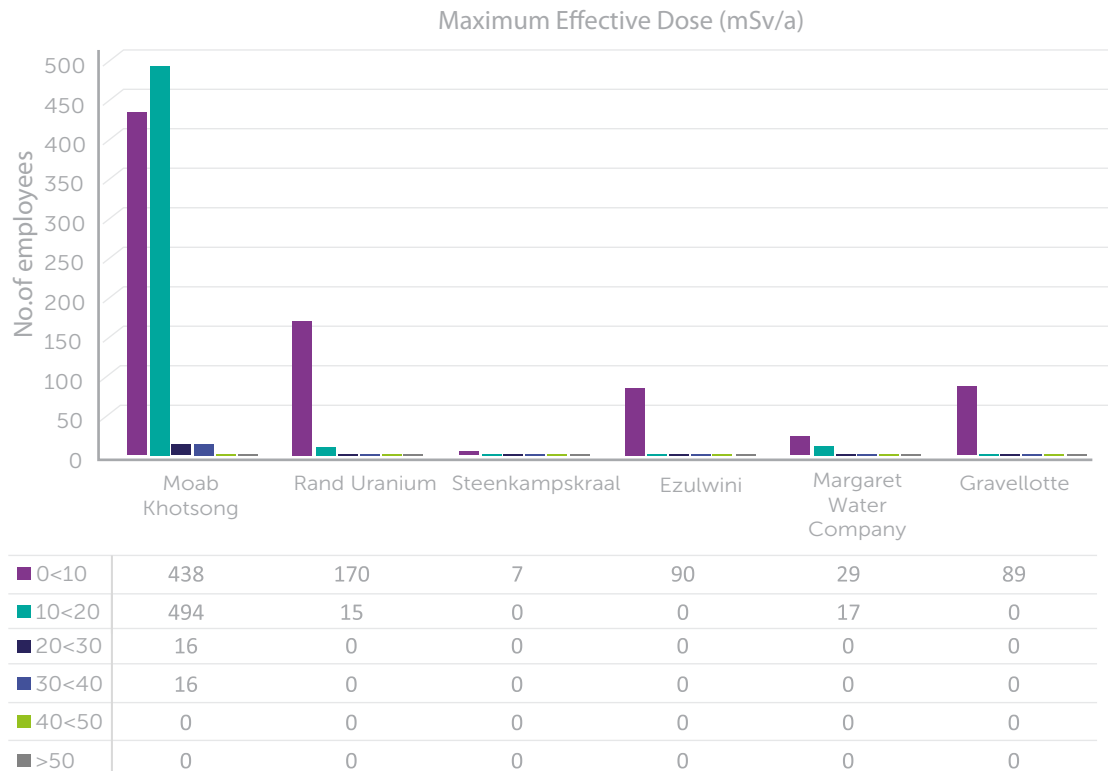


Figure 10: Maximum effective dose for SCMs (2021)

NB: Gravelotte has reported up to end of June before being reclassified as Non-SCM

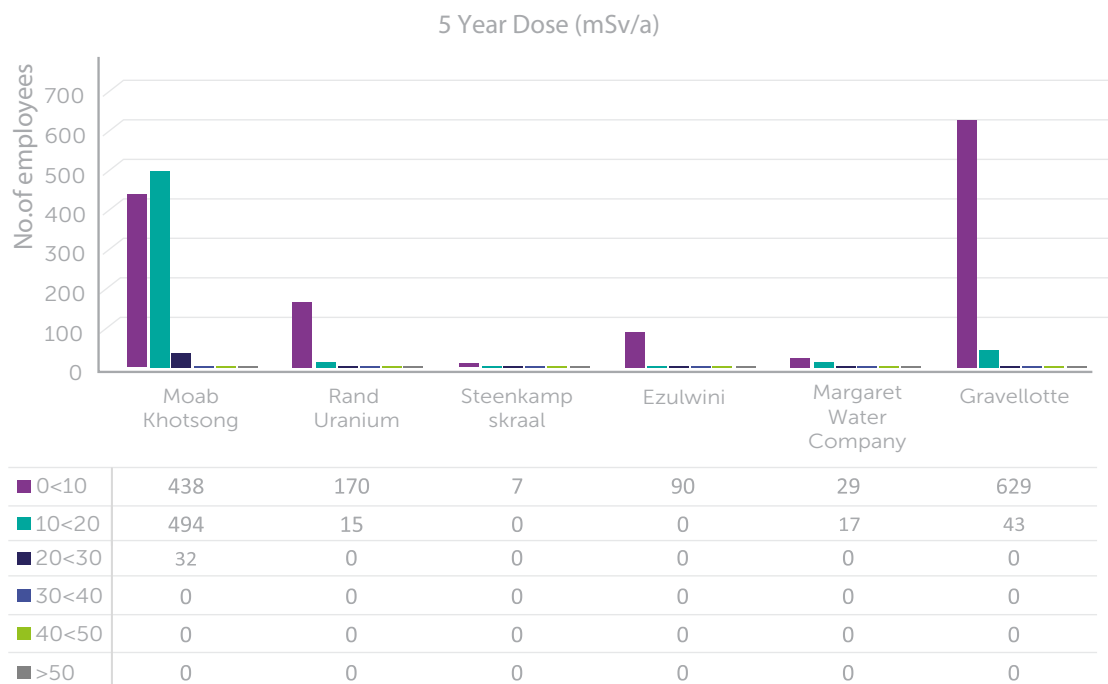


Figure 11: Five consecutive years (2017 – 2021) cumulative dose for SCMs

NB: Gravelotte has reported up to end of June before being reclassified as Non-SCM

### 4.3. Non-Special Case Mines (Non-SCMs)

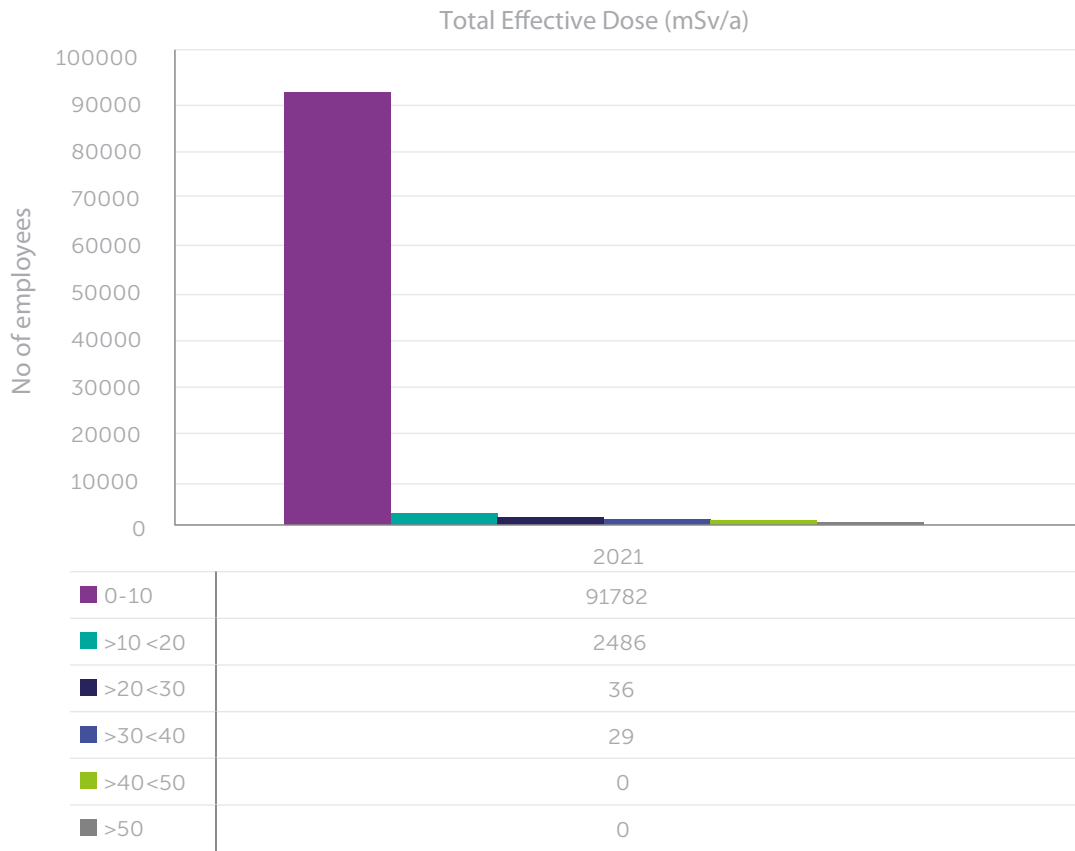


Figure 12: Maximum effective dose for Non-SCMs (2021)

### 4.4. Public exposure to radiation

In accordance with the SSRP, the doses for members of the public must comply with the action specific dose constraint of 0.25 mSv per annum and a dose limit of 1 mSv per annum from all authorised actions. The NNR further requires the holders, on a five-year frequency, to submit the Public Radiological Safety Assessments to ensure that the authorised actions did not pose any undue health risks to members of the public and the environment. These reports were reviewed by the NNR and the projected public exposures from these authorised actions were all within the public dose limit of 1 mSv.

### 4.5. Transport safety

There were no major events of safety concerns regarding transport of NORM during the period under review. The transportation of NORM and NORM contaminated scrap was carried out in accordance with the requirements of the NNR. Routine transport of surface contaminated objects (SCO-1) scrap material takes place on a daily basis between authorised facilities. The NNR continued to receive notifications of consignments triggering alarms at gamma drive-through monitors of facilities that are not authorised to handle radioactive materials. For notification received, the NNR responds accordingly and/or provides guidance to the facilities.

## 4.6. Radioactive waste safety

There were no major safety concerns related to radioactive waste during the period under review. Authorisation holders were required to manage their radioactive waste and associated waste products. Accordingly, condition 1.5 of the COR requires the authorisation holder to implement a waste management programme to demonstrate compliance with NNR requirements.

The quarterly and annual waste management reports submitted to the NNR demonstrated compliance with the NNR requirements. The summary of waste is presented below.

**Table 20: Total waste reported from all authorisation holders**

Type of Waste	Quantities	Unit (tons/m3/L)	No. of consignments
Unrestricted Scrap (tons)	3,492105E+09	tons	80328
Restricted Scrap(tons)	1,819472E+05	tons	5426
Gaseous Releases	3,099460E+11	m3	n/a
Liquid waste (m3/year)	3,340023E+11	L	n/a
Semi solid (tons)	9,934511E+07	tons	n/a
Solids (tons)	3,805990E+08	tons	161392
Other waste (tons)	9,320067E+07	tons	9840

## 4.7. Safety of sealed radioactive sources

The safety and regulation of radioactive sealed sources at NORM facilities falls outside the scope of the NNR Act. However, any sealed source discovered by the NNR during inspections at the NORM regulated facilities or out of regulatory control is handled safely and reported to the Department of Health through the Directorate: Radiation Control of the South African Health Products Regulatory Authority (SAHPRA).

## 4.8. Nuclear incidents/accidents/occurrences reported

There were eleven (11) registered occurrences during the reporting period. The occurrences included pipeline failure incidents resulting in the spillage of slurry into the environment, non-compliance to approved procedures and physical security system related events. Corrective and preventive measures are being implemented to ensure that the incidents do not recur and/or rate thereof is significantly reduced.

Three (3) occurrences were closed and eight (8) are in the process of being closed. The NNR will continue to follow up on these incidents during compliance assurance inspections to ensure that they are closed and to evaluate the effectiveness of corrective and preventive actions that aimed at ensuring that there are no recurrences or they are significantly reduced.

## 4.9. Regulatory compliance

In order to verify the degree of compliance with the conditions of nuclear authorisation, the NNR undertakes independent inspections (announced and unannounced), investigations, environmental verification and review of compliance reports submitted by authorisation holders.

### 4.9.1. Inspections

A total of 120 inspections were conducted during the reporting period. These inspections were conducted to verify compliance of the authorised holders with provisions of the NNR Act, regulations articulated in Safety Standards and Regulatory Practices (R388), NNR requirements, various NNR approved programmes and procedures implemented by the holders.

Authorisation holders were required to investigate the root causes of the non-compliances and implementation of corrective and preventive actions. The corrective and preventive actions implemented by the authorisation holders are confirmed during the NNR compliance inspections.

### 4.9.2. Investigations

The NNR conducted two (2) regulatory investigation during the reporting period.

- An investigation into potential handling of radioactive scrap material by unauthorised scrap in Klerksdorp was conducted on 26 May 2021. The owner of the facility was instructed to remove the contaminated pipes and conduct a clean-up of the site. A follow-up NNR visit was conducted in August 2021. It was confirmed that no there was no handling of contaminated pipes at the site. The investigation is ongoing and not closed until the post-clean up survey is submitted to the NNR for review and approval.
- An investigation was conducted at unauthorised facility in East Rand on 03 August 2021 following a complaint raised by a whistleblower about potential handling of radioactive material. The company has since submitted a corrective action plan which includes conducting Radiological Safety Assessment which will confirm whether the action at the site requires nuclear authorisation. The investigation is ongoing and not closed until the radiological safety assessment is submitted to the NNR for review and approval.

### 4.9.3. Environmental verification samples

There were 334 environmental samples taken up and down stream of the authorised facilities and activities for independent verification purposes. Based on the radio analysis results, the NNR enforces compliance in the interest of protection of persons, properties and the environment, and to inform future environmental sampling programmes.

## 4.10. Regulatory enforcements issued

A graded approach is followed when applying enforcement actions on the identified non-compliances. During the reporting period two (2) enforcement actions in a form of directives were issued as follows:

- A directive was issued to Evander Gold Mine (Pty) Ltd (COR-142) for non-reporting of an occurrence (spillage of mine tailings into the public domain). The authorisation holder has since implemented corrective action measures i.e. cleaning-up of the affected areas and has submitted the required documents to the NNR for review and acceptance. A follow-up NNR inspection was conducted to perform a confirmatory survey on the affected areas. The survey measurements confirmed that the remediated areas do not require further action as the activity concentrations of the naturally occurring radioactive nuclides of uranium and thorium were below the regulatory limits for clearance of the contaminated sites, thus the directive was considered closed.
- A directive was issued to Gravelotte Mine Limited (COR-11) for non-monitoring of underground workers at #4 shaft and for not reporting occupational doses to the NNR as required. The authorisation holder has since corrected the non-compliance by submitting the dose reports and a proof of deployment of radon gas monitors to occupationally exposed workers. The directive was lifted after a follow-up NNR inspection was conducted which verified corrective actions taken.

## 4.11. Appeals to the CEO

No Appeals were received by the office of the Chief Executive Officer during the Reporting period.

## 4.12. Developmental work on regulation of existing exposures

In South Africa, the members of the public may be exposed to radiation because the land they live on may be contaminated with radioactive mine residues or exposed due to natural occurrence of elevated levels of natural radionuclides. Furthermore, those who live on contaminated land are at risk of exposure to elevated levels of radon, especially indoors.

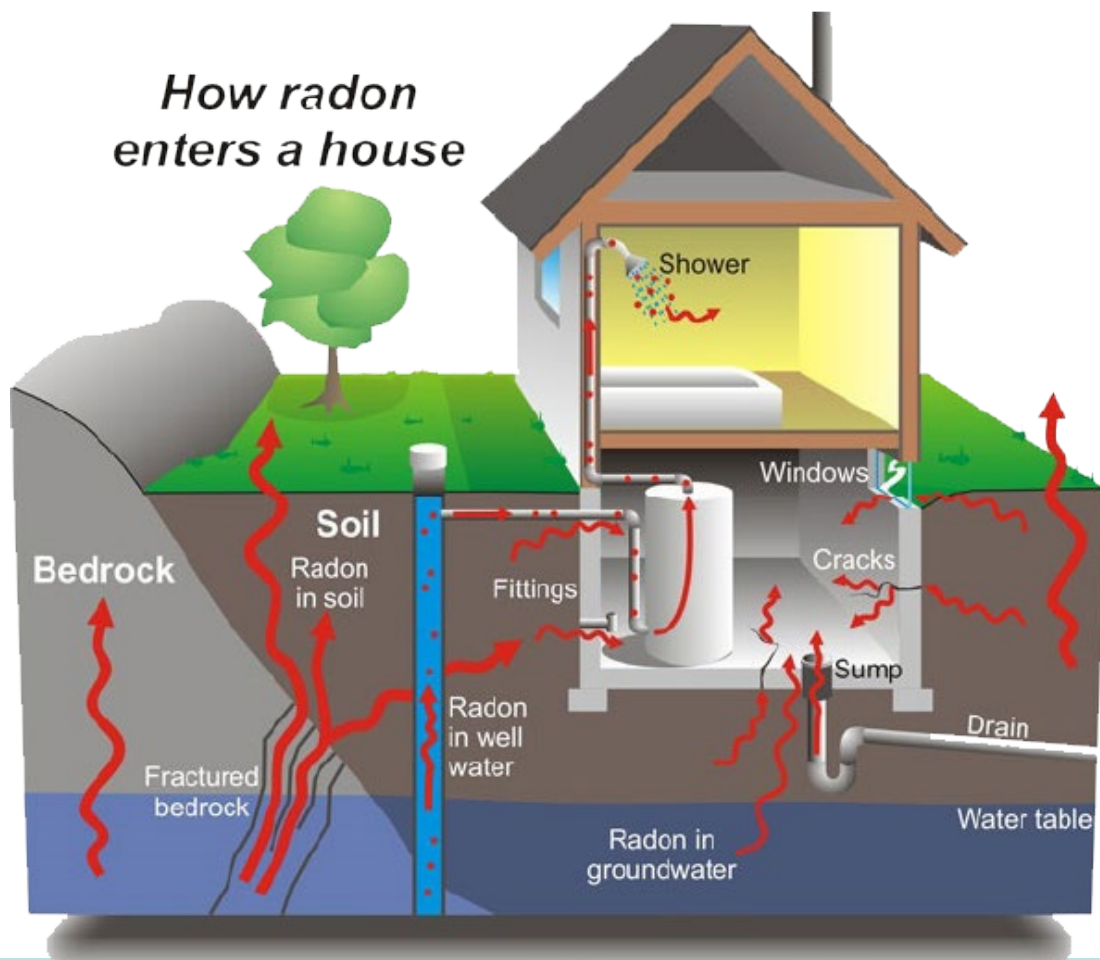
The NNR is expanding its scope of regulatory control to include existing exposure conditions such as living on contaminated land and exposure to radon indoors. In pursuance of this objective, the NNR is developing a suitable regulatory framework for radon inside dwellings and buildings. During the reporting period the NNR conducted indoor radon measurements in homes and some buildings across the country, and the radon surveys are ongoing. The acquired radon data will inform the approach to regulation of indoor radon in South Africa. Furthermore, a proposed regulatory framework for indoor radon was developed and the framework will be subject to consultations of relevant stakeholders in due course.

## Radon Gas

In the nuclear industry, the release of radon in underground uranium mines makes a substantial contribution to occupational exposure. The extraction and processing of radioactive ores that may contain high levels of radionuclides is a widespread activity. The average annual effective dose per worker in the nuclear industry has gradually declined since the 1970s, from 4.4 mSv to 1mSv at present. This is mainly because of significant reduction in uranium mining coupled with more advanced mining techniques and ventilation.

Radon-222 is a radionuclide in the form of a gas that normally emanates from the soil. It is produced from the decay series of uranium-238 present in the rocks and soil of the Earth. When inhaled, some of the radon's short-lived decay products-mainly polonium-218 and-214-are retained in the lungs and irradiate cells in the respiratory tract with alpha particles. Radon is, hence, a primary cause of lung cancer in both smokers and non-smokers; however, smokers are far more vulnerable because of a strong interaction between smoking and radon exposure.

Radon is present in the atmosphere everywhere, and can seep directly into buildings through cellars and floors, where its concentration-the amount of activity in terms of decays per time in a volume of air-can build up. Mainly when homes are heated, warm air rises and escapes at the top of the house through windows or leakages, which creates low pressure in the ground floor and basement. This, in turn, causes active suction of radon from the subsoil through cracks and leakages (e.g. around service pipe entries) at the bottom of the house.







## 5. Regulatory Improvement and Technical Services (RITS)

The RITS programme supports the NPP, NORM and NTWP programmes through the provision of cross-cutting scientific and technical services. The Center for Nuclear Safety and Security (CNSS) is part of this programme. Some of the highlights of the RITS programme activities are summarised in the following section.

### Emergency Planning and Preparedness

The NNR conducted a regulatory nuclear emergency exercise at Necsa on 26 January 2022. The aim of the emergency exercise was to test the response of Necsa and the intervening organisations (i.e. Madibeng Disaster Management Centre) against a simulated scenario. The exercise scenario simulated a release of radioactive material through the SAFARI-1 Research Reactor stack due to a failed experiment container. It was envisaged that the release would impact members of the public and necessitate implementation of on-site and off-site protective actions. The exercise mainly focussed on the responses of the onsite organisations, while the offsite response was only monitored by NNR umpires at Madibeng Disaster Management Centre. The outcome of the exercise is that, although in general Necsa had demonstrated satisfactory implementation of the emergency plan and procedures, areas of improvements were identified for correction. Necsa and Madibeng were required to submit a corrective action plan for NNR review and monitoring.

### Nuclear Safety Standards and Guides

The NNR identified enhancements to its standards to regulate nuclear installations and actions. During the reporting period, the NNR expanded its suite of regulatory standards through the review of regulations, development of regulatory guides, as well as technical assessment guides. The NNR proactively performed a review of the proposed draft general nuclear safety regulations against international standards and regulatory experience. A regulatory guide on transport of radioactive material for Naturally Occurring Radioactive Material was completed. An internal guide on Design of Nuclear Facilities was approved for use during the regulatory review and assessment process.

### National Dose Register

The NNR and other associated South African authorities continue to coordinate and implement an internationally acceptable National Dose Register (NDR) to improve the management and reporting of occupational doses accrued at authorised facilities nationwide. The NDR is administrated by the NNR with oversight from the NDR National Steering Committee. The NNR encourages Data Providers to upload exposure records and verify such uploads. Training and troubleshooting support are being provided to data providers on a frequent basis.

## IAEA Integrated Regulatory Review Service (IRRS)

The NNR continued to implement actions to close out the remaining recommendations and suggestions contained in the IAEA IRRS Mission Report following the international expert mission in December 2016. Major milestones achieved during the reporting period relating to the Action Plan include, amongst others, the strengthening and expansion of the Integrated Management System (IMS), development of several internal guidance documents and inspection guides, as well as the development and implementation of a national radon mapping programme.

## NNR Environmental Surveillance Laboratory

As part of the NNR compliance assurance and independent verification processes, the NNR Environmental Surveillance Laboratory analysed all environmental samples collected from regulated facilities and activities during the reporting period. As part of its quality assurance programme, the NNR Laboratory continued to participate in the IAEA worldwide Proficiency Testing Scheme (PTS) organised by the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA). The NNR test results submitted for various radionuclides by different radio-analytical techniques were found to be acceptable to International Norms and Standards. The Laboratory Quality Management System documents for Gamma Spectrometry in determination of artificial radionuclides and NORM radionuclides were reviewed by SANAS and a plan was approved to address non-conformances and observations received from SANAS.

## Centre for Nuclear Safety and Security (CNSS)

During the 2021-22 financial year CNSS issued a request for proposals (RFP) to initiate collaboration and solicit key information from its partner institutions as well as other interested parties in all pillars of CNSS operations. This replaced the previously call for proposals (CFP) that had been applied since inception but limited to the Regulatory Research and Development (RRD) pillar.

- The RFP covered all areas of collaborations within the three CNSS technical programmes: Education and Training (E&T), Regulatory Research and Development (RRD) and Technical and Scientific Services (TSS).
- CNSS received a total number of 14 RRD, 19 E&T and 6 TSS project proposals.

The proposals will serve as pilot projects for the approved CNSS Integrated Sustainability Plan.

The CNSS, with support from the Office of the CEO and NNR Technical Divisions, also submitted a technical co-operation project proposal to the European Commission (EC) under the new European Instrument for International Nuclear Safety Co-operation (EI-INSC).

The proposal has been accepted and approved by the EC for implementation during the period 2023-2025 by a service provider that will be contracted by the EC.

The specific objectives of this technical cooperation project are as follows:

- To build technical expertise capabilities of the nuclear regulatory body in South Africa (the NNR) and of its technical support organisation (CNSS) in the field of "ageing management", "fire hazards" and "risk-informed approach" for nuclear installations.

- To build technical expertise capabilities of the nuclear regulatory body in South Africa (NNR) and of its technical support organisation (CNSS) in the field of licensing of nuclear installations through specific training and development of regulatory documents.

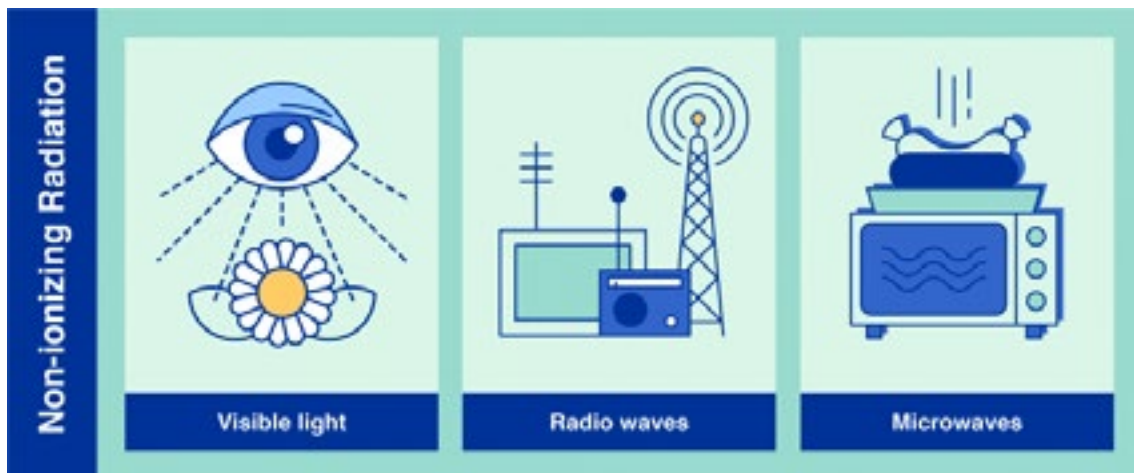
### UNDERSTANDING RADIATION

Radiation and radioactive sources have many beneficial applications, ranging from power generation to uses in medicine, industry and agriculture. These uses require regulation to ensure prevention of potential radiation risks to workers, patients, the public and the environment. The prime responsibility for safety rests with the person or organization responsible for activities involving nuclear technology. Regulating safety is a national responsibility.

### If radiation is beneficial, why should we protect ourselves from it?

Radiation has many beneficial applications but, as in every activity, when there are risks associated with its use specific actions need to be put in place to protect the people and the environment. Different types of radiation require different protective measures: a low energy form, called “non-ionizing radiation”, may require fewer protective measures than the higher energy “ionizing radiation”. The IAEA establishes standards for protection of the people and the environment in relation to the peaceful use of ionizing radiation – in line with its mandate.

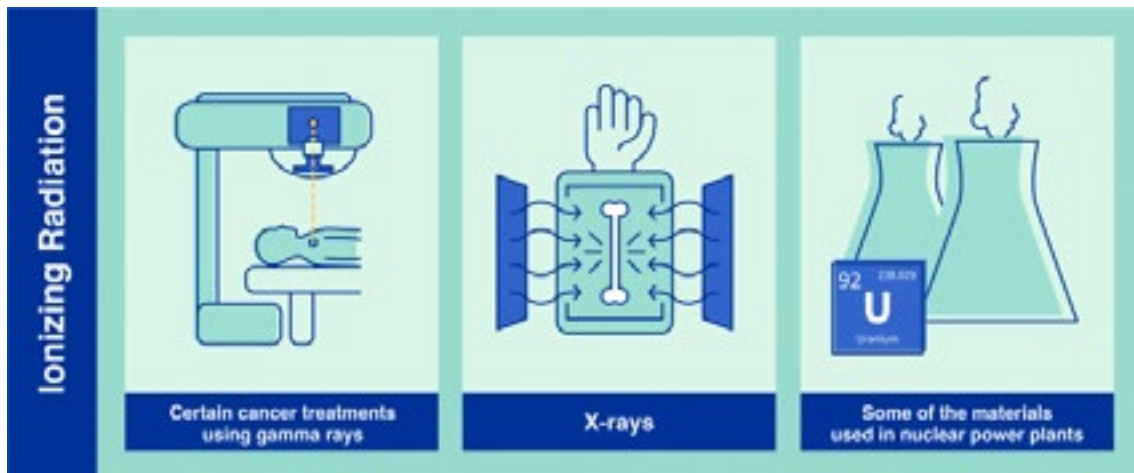
#### Non-ionizing radiation



(Infographic: Adriana Vargas/IAEA)

Non-ionizing radiation is lower energy radiation that is not energetic enough to detach electrons from atoms or molecules, whether in matter or living organisms. However, its energy can make those molecules vibrate and so produce heat. This is, for instance, how microwave ovens work. For most people, non-ionising radiation does not pose a risk to their health. However, workers that are in regular contact with some sources of non-ionising radiation may need special measures to protect themselves from, for example, the heat produced.

## Ionising radiation



*Some examples of ionizing radiation include some types of cancer treatments using gamma rays, the X-rays, and the radiation emitted from radioactive materials used in nuclear power plants (Infographic: Adriana Vargas/IAEA)*

In high doses, ionizing radiation can damage cells or organs in our bodies or even cause death. In the correct uses and doses and with the necessary protective measures, this kind of radiation has many beneficial uses, such as in energy production, in industry, in research and in medical diagnostics and treatment of various diseases, such as cancer.



## 6. Public Communications and Engagement

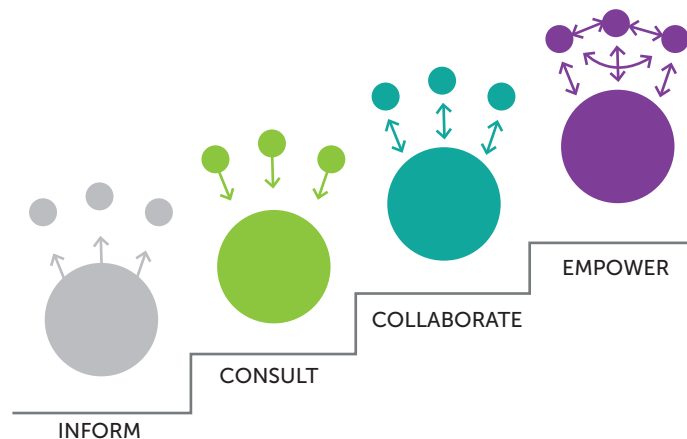
The NNR operates in an ecosystem of public groups with varying interests in our activities and those who are directly affected by the performance of the NNR. The NNR recognises that public awareness, understanding and involvement in its activities are essential for building trust and maintaining nuclear safety. The Fukushima Daiichi nuclear accident showed that nuclear regulators around the world need to enhance their communications with the public. While the NNR continually strives to improve public communication on nuclear safety, it is also the responsibility of all industry role-players including government to build trust.

In 2021, despite the disruptions imposed by the COVID-19 pandemic, the NNR continued to implement public hearings, local community information sharing sessions, public awareness programmes and engagements with interested and affected parties. The NNR increased its usage of digital technology and online platforms to connect with key stakeholders and share information with the general public. This section provides an overview of the NNR’s public engagement activities and achievements during the reporting period.

### Public participation in the regulatory decision-making process

**“NNR’s assessment of a nuclear installation licence application considers an appropriate balance of public consultation, regulatory effectiveness and risk-informed decision making.”**

The NNR’s framework for public participation encompasses informing, involving, consulting, collaborating and empowering. The level of public involvement is determined by the nature of the project, health and environmental safety impacts and relevant legislative requirements.



## Public Hearings for the Thyspunt Nuclear Installation Site Licence Application



Thyspunt is a Greenfield site located in the Kouga Local Municipality in the Eastern Cape of South Africa. The Kouga Local Municipality consists of nine towns, namely, Jeffreys Bay, Humansdorp, St Francis Bay, Cape St Francis, Oyster Bay, Patensie, Hankey, Loerie and Thornhill, as well as various smaller settlements and agricultural nodes.

The NNR held hybrid public hearings in Cape St Francis Bay and Jeffreys Bay on 25 and 26 August 2021 respectively. Additional in person public hearings were held on 23 November 2021 at the Kwanomzamo Hall in Humansdorp and on 24 November 2021 at Vusumzi Landu Hall, Hankey.

In support of the public hearings, the NNR held local community information sessions at the Umzamowethu Civic Hall in Oysterbay, Kwanomzamo Civic Hall in Humansdorp, Western Civic Hall in Hankey Centerton and Ramaphosa Civic Hall in Patensie. During the information sessions, NNR staff listened to concerns, special needs and discussed issues of health and environmental safety related to the Thyspunt NISL application.

The NNR published notices of the public hearings in three official languages in the local newspapers, local libraries and on the NNR website. Local community radio stations and social media platforms were also used to announce the public hearings. The NNR developed and launched an interactive online public hearings section on the NNR website. In response to special needs, the NNR provided transport for members of the public to attend the in-person hearings on 23 and 24 November 2021.

## Civil Society protest outside NNR offices in Cape Town

On 17 February 2022, members from Environmental and Climate Justice Groups gathered outside the NNR's offices in Cape Town to protest against the suspension of the NNR Board member by the Minister DMRE. A memorandum of demands for the reinstatement of the suspended Board member and for the NNR to be more transparent was submitted by Ms Francesca de Gasparis, Executive Director of the Southern African Faith Communities' Environment Institute (SAFCEI) to the NNR. NNR Programme Manager Mr Peter Bester was onsite to receive the memorandum.



## Nuclear Safety Awareness – Radon gas in homes



Radon is a colourless, odourless, tasteless, radioactive gas. It escapes from the ground, and can accumulate in buildings. According to the World Health Organisation, exposure to indoor radon is believed to be a significant cause of lung cancer worldwide.

During the reporting period, the NNR conducted five public information sessions to create awareness of the risks of radon gas and the protective actions to be implemented. The local communities who participated in the information sessions were from the Kraaipan and Ga-Khunwana villages in the North West province as well from Virginia and Thabong in the Free State province.

## Communicating during nuclear or radiological emergencies

**“Procedures for collaborative implementation of communications is vital for convincing people to behave in a specific way to achieve an effective response to a public emergency situation.”**

The responsibility for emergency communications lies with the relevant operating organisation, local and national authorities as well as collaboration from other role players. As the national competent authority for nuclear safety, the notification of a nuclear or radiological emergency may result in the decision by the NNR to activate its Regulatory Emergency Response Centre (RERC). For this reason, the NNR utilises the media as its primary communication channel with the public during a nuclear or radiological emergency.

In September 2021, the NNR finalised its Procedure (PRC-CSR-001) for communicating with the media during nuclear or radiological emergencies. The PRC-CSR-001 describes the steps and actions to be taken by the NNR for communicating with the media during a nuclear or radiological emergency.

### Public Safety Information Forums

The NNR requires nuclear installation licence holders to establish a public safety information forum (PSIF) for sharing information on nuclear and radiation safety as well as emergency planning with members of the public. The nuclear installation licence holder also invites the NNR, relevant local, provincial and national governmental entities to share information as appropriate at the PSIF meetings.

A further provision in accordance with Regulation R968 of 12 September 2008, is for the NNR Board of Directors to appoint the Chairperson and Deputy Chairperson of the PSIF from nominations received from members of the public residing in the relevant municipal area.

During the reporting period, virtual PSIF meetings were held by Eskom for the Koeberg Nuclear Power Station and by Necsa for the Pelindaba site.

**Koeberg:** The NNR published advertisements in two local community newspapers inviting members of the public to submit nominations for the chairperson of the Koeberg PSIF. The appointment of Koeberg PSIF chairperson was finalised during the reporting period.

**Pelindaba:** The NNR published advertisements in two local community newspapers inviting members of the public to submit nominations for a new chairperson and deputy chairperson of the Pelindaba PSIF. The nomination process was concluded towards the latter part of Quarter 4 of the reporting period. The new chairperson and deputy chairperson of the Pelindaba PSIF will be announced in the new reporting period.

**Vaalputs:** Due to COVID-19 safety measures and the lack of internet access in the relevant areas, there were no forum meetings held during the reporting period.



## Learner outreach and public awareness

Forging links with schools and establishing channels to educate and inspire young persons is considered a key pathway for engaging with the public on topics related to radiation and its safe use. In this way the NNR aims to contribute to a future generation of the 'public' who are well-informed in an unbiased way and thus enabled to make better informed decisions on topics such as nuclear safety and radiation protection.

The NNR's Learner Outreach Programme contributes to the development of appropriate skills and capabilities in support of governments' long-term vision of basic education. Our main focus is to help learners, especially in the rural parts of South Africa with course selection in Science, Technology, Engineering, and Mathematics (STEM) fields and with post-matric career guidance in the nuclear energy field. The NNR utilises various engagement conduits including partnering with other entities to conduct learner awareness sessions in the local communities.



The NNR's learner outreach programme is designed to encourage school children to consider STEM subjects as a career choice through presenting radiation and nuclear related topics in an exciting and interactive way. During the reporting period, the NNR conducted 12 learner outreach events at various schools located in the rural areas of Klerksdorp, Welkom, Ga-Khnuwana, Mafikeng and Zeerust. The NNR held four nuclear safety awareness exhibitions at shopping malls targeting the general public.

### General

During the reporting period, the topics which generated the most media attention for the NNR were the Thyspunt NISL public hearings and the extension of the operational lifespan of the Koeberg Nuclear Power Station. The NNR issued three media releases and responded to 21 public enquiries on various topics. The NNR received seven PAIA requests during the reporting period.



## 7. Intergovernmental Cooperation

**“Intergovernmental cooperation facilitates the effective attainment of nuclear safety and radiation protection objectives through close cooperation and collaboration amongst relevant parties.”**

In this regard, the NNR cooperates with relevant organs of state for monitoring and control of radioactive material or exposure to ionising radiation. The NNR has entered into cooperative agreements with the following organs of state:

- Department of Environmental Affairs and Tourism (Currently the Department of Forestry, Fisheries, and the Environment)
- Department of Health (Directorate Radiation Control) (Currently under South African Health Products Regulatory Authority)
- Department of Labour (Currently the Department of Employment and Labour)
- Department of Minerals and Energy Electricity and Nuclear (Currently the Department of Mineral Resources and Energy)
- The Department of Water Affairs and Forestry (Currently the Department of Water and Sanitation)
- Department of Transport : Road Traffic Management Corporation
- Department of Transport : South African Civil Aviation Authority
- Department of Transport : South African Maritime Safety Authority
- Department of Transport : Railway Safety Regulator

The agreements provide for a working relationship between parties with regard to:

- ensuring the effective monitoring and control of a nuclear hazard;
- co-ordinating the exercise of such functions;
- minimising the duplication of such functions and procedures regarding the exercise of such functions; and
- promote consistency in the exercise of such functions.

During the reporting period, the NNR maintained communications and held virtual meetings with the South African Health Products Regulatory Authority, Department of Forestry, Fisheries and Environment as well as the South African Maritime Safety Authority. The NNR published the revised cooperation agreement between the NNR and the Civil Aviation Authority in the National Government Gazette, General Notice 436 of 2021 on 30 July 2021.

## IAEA ConvEx-3 – A major international nuclear emergency exercise

The NNR participated in South Africa's national response to the IAEA ConvEx-3 exercise held on 26 to 27 October 2021. The Convex-3 exercises are aimed at assessing the emergency intervention provisions and the resources in place to deal with a severe emergency for several days. The 36-hour international emergency exercise was based on a hypothetical accident at the Barakah Nuclear Power Plant in Abu Dhabi, United Arab Emirates. The NNR simulated a notification process for informing intergovernmental partners Civil Aviation Authority (CAA) and South African Maritime Safety Authority (SAMSA) of the emergency and technical staff simulated the screening and clearance of potentially contaminated goods at various ports.



## 8. International Regulatory Cooperation

The NNR's international cooperation footprint is broad in scope and ranges from fulfilling legally binding national obligations, contributing to the enhancement of global safety standards, participating in IAEA expert peer review missions, technical counterparts on cooperation initiatives, facilitating bilateral cooperation on regulatory matters and participating in various multilateral fora.

In 2021, the implementation of in-person international cooperation engagements continued to be affected by the COVID-19 pandemic restrictions. The NNR adapted to these challenges and continued to participate in several virtual and hybrid held events. NNR staff were actively involved in various international cooperation activities during the reporting period. This section provides a summary of the high-level outputs for international cooperation.

### African Regional Co-operative Agreement (AFRA)

**"AFRA is an intergovernmental Agreement established by African Member States to strengthen and enlarge the contribution of nuclear science and technology to socioeconomic development on the African continent."**

NNR subject matter counterparts participated in the following technical cooperation projects:

- RAF9063 - Strengthening Competent Authorities for the Safe Transport of radioactive material in AFRA States,
- RAF9061 - Enhancing the Capacities of National Regulatory Bodies for Safety in AFRA Member States
- RAF9066 - Strengthening Regional Infrastructures for Effective Preparedness and Response to Radiological Emergencies.

## Forum for Nuclear Regulatory Bodies in Africa (FNRBA)

The FNRBA is a regional network which was established to improve the nuclear safety and security infrastructures in Africa. The FNRBA serves as a platform for the effective exchange of regulatory experiences and practices among the nuclear regulatory bodies. The forum has established six project-based thematic working groups (TWG) to deliver on its identified priorities. Subject matter experts from the NNR and SAPHRA were nominated to participate in six TWGs in 2022. NNR subject matter experts also coordinate two TWGs. The TWG's contribute to FNRBA efforts aimed at assisting African Member States in strengthening and sustaining their national capacity building in nuclear safety and security.

### NNR representatives participated in the following activities:

- Joint AFCONE-FNRBA meeting held virtually on 26 May 2021 where the TWGs presented their annual work plans.
- The 13th Plenary Meeting of the FNRBA held virtually on 23 September 2021 where participants discussed the annual report including resolutions of the last Plenary, the TWGs workplan, overview of radiation safety infrastructure in Africa unveiled by Radiation Safety Information Management Systems (RASIMS) and the IAEA support on Integrated Management System for Regulatory Bodies in Africa.
- Virtual training course on the Safe Transport of Radioactive Material was held from 6 to 16 September 2021. Representatives from 15 Member States registered for the training course.
- Virtual training course on the Application of the IAEA Transport Regulations to NORM Transports was held from 4 to 14 October 2021. Representatives from 17 Member States registered for the training course.
- FNRBA Steering Committee on 15 December 2021 where TWG coordinators presented the TWG work plans.
- FNRBA-USNRC meeting on 17 February 2022 where TWG coordinators discussed the USNRC support for some of the identified workplan activities.
- Development of model emergency plans and procedures for regulatory bodies in Africa.
- Development of a database of emergency preparedness and response experts in Africa.

## Radiation Safety Information Management System (RASIMS)

The IAEA's RASIMS enables Member States to assess how closely their infrastructures for radiation safety are aligned with IAEA Safety Standards' recommendations and requirements.

RASIMS is a web-based platform that gives Member States the framework for collecting, analysing and viewing information that reflects the status of their national infrastructure for radiation, transport and waste safety. The system is used by IAEA when assessing provision of technical assistance to IAEA Member States. The IAEA developed RASIMS 2 (second iteration after design and update of requirements), which is a web-based system and started training users on the use of the new system. Designated NNR and SAPHRA staff have successfully completed training to use the system. Mr Wilcot Speelman, NNR Principal Specialist ERP is South Africa's National Coordinator for RASIMS.



## United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)

UNSCEAR was established by the United Nations General Assembly to assess and report levels and effects of all sources of ionising radiation. The UNSCEAR online platform supports governments and international organizations to provide national and regional data on radiation exposure of the public, workers and patients. UNSCEAR conducts regular surveys of radiation exposure worldwide and invites national contact persons to submit official data using a prescribed questionnaire via the online platform. All contributions are acknowledged by UNSCEAR in the relevant report to the UN General Assembly.

During the reporting period, the NNR made steady progress in collecting, compiling and reviewing the public exposure data for the five UNSCEAR questionnaires.

Public exposure data for NNR regulated facilities were uploaded to the UNSCEAR Portal on 29 September 2021. UNSCEAR will utilise the data to identify areas where further research is needed to enrich the understanding of sources and levels of exposure to the public. UNSCEAR will verify the data captured and analysed prior to inclusion in its final report.

## The Regulatory Cooperation Forum (RCF)

The NNR is an active member of the RCF which promotes the sharing of regulatory knowledge and experience through international cooperation and collaboration. The RCF currently comprises of members from Bangladesh, Belarus, Canada, Chile, China, Egypt, the European Commission, Finland, France, Germany, Ghana, the IAEA, the Islamic Republic of Iran, Japan, Jordan, Kenya, Morocco, Nigeria, the NEA, Pakistan, Poland, Republic of Korea, the Russian Federation, South Africa, Sudan, United Arab Emirates, United Kingdom, United States of America and Vietnam.



The NNR CEO, Dr Bismark Tyobeka and Chairperson of the RCF participated in two meetings which discussed the experience of countries introducing nuclear power for the first time and reviewed the implementation steps and progress of the Strategic Plan.

## Global Nuclear Safety and Security Communications Network (GNSSCOM)

GNSSCOM was established to support IAEA Member States in developing and sustaining their capabilities for effective communication during non-emergency situations. GNSSCOM serves as a global resource for national regulatory authorities, their technical support organisations and other relevant governmental organisations to collaborate across geographical boundaries in order to continuously improve nuclear communications and build public trust.



The NNR Manager CSR, Mr. Gino Moonsamy and Chairperson of the GNSSCOM Steering committee participated in two steering committee meetings where experts from various member states shared their current experiences, good practices and challenges in nuclear communications. The meetings also discussed the participant feedback from the GNSSCOM six-part webinar series conducted in 2021 and insights were used to inform the workplan for 2022.

## Technical and Scientific Bilateral Cooperation

In support of its core mandate, the NNR enters into formal regulatory bilateral cooperation agreements with international authorities to facilitate technical information sharing in areas of mutual interest concerning nuclear safety.

The NNR has formal bilateral cooperation agreements with ASN (France), ARPANSA (Australia), CNSC (Canada), KINS (South Korea), NNSA (Peoples Republic of China), PAA (Poland), Rostechnadzor (Russian Federation), STUK (Finland), UKONR (United Kingdom) and the USNRC (United States of America).

In 2021, the NNR held three successful technical information sharing workshops with regulatory counterparts ASN and USNRC respectively. During the workshops technical experts shared their experiences, lessons learned and good practices relating to the LTO regulatory processes in France and the United States of America.

## International Conventions

South Africa is a signatory to various international treaties and conventions, which places legally binding obligations on the national government to demonstrate compliance. As the national competent authority, the NNR coordinates and implements South Africa's contracting party obligations under two conventions; namely, the Convention on Nuclear Safety (CNS) and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention). The NNR participates in the peer review process of other contracting parties' submissions which entails both a self-appraisal in compiling the report and an independent international peer review.



In consultation with national role players the NNR made good progress with preparatory work for the 7<sup>th</sup> Review Meeting of the Joint Convention which is scheduled to take place from 27 June to 8 July 2022. The NNR's Programme Manager NTWP, Mr Thiagan is the vice-chair of the 7<sup>th</sup> Review meeting.

Further in consultation with national role players the NNR made good progress in compiling South Africa's 9<sup>th</sup> National Report to the CNS. The draft report was completed and a final report will be issued to the IAEA in 2022.

## IAEA Safety Standards Committees

The IAEA Safety Standards reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from harmful effects of ionising radiation. They serve as a global reference for protecting people and the environment and contribute to a harmonised high level of safety worldwide. The Safety Standards, describe the fundamental safety principles and practical recommendations for members states to use as the basis for their national regulations.



The IAEA's Commission on Safety Standards (CSS) comprises of senior officials from national regulatory organisations.

The NNR representative to the CSS is Mr Orion Phillips. The CSS has an overview role which entails providing guidance, advice and ensuring the effective coordination of the following safety standards committees:

## NNR Technical Staff serving on IAEA Safety Standards Committees



**PAUL HINRICHSEN**  
Transport Safety Standards  
Committee



**PATLE MOHAJANE**  
Transport Safety  
Standards Committee  
(alternate)



**POKE MASHITA**  
Nuclear Safety Standards  
Committee



**NONTUTUZELO MMUTLE**  
Waste Safety Standards  
Committee



**LOUISA MPETE**  
Radiation Safety Standards  
Committee



**MALEBO MAKGALE**  
Radiation Safety Standards  
Committee (alternate)



**MOTHUSI RAMERAPE**  
Emergency Preparedness  
and Response Standards  
Committees



**THEMBINKOSI  
NDOMONDO**  
Emergency Preparedness  
and Response Standards  
Committee (alternate)

- Nuclear Safety Standards Committee (NUSSC) – NNR representative/s: Mr Poke Mashita
- Radiation Safety Standards Committee (RASSC) – NNR representative/s: Ms Louisa Mpete, Ms. Malebo Makgale (alternate)
- Emergency Preparedness and Response Standards Committee (EPRaSC) – NNR representative/s – Mr Mothusi Ramerafe, Ms. Thembinkosi Ndomondo (alternate)
- Transport Safety Standards Committee (TRANSSC) – NNR representative/s: Mr Paul Hinrichsen, Mr Patle Mohajane (alternate)
- Waste Safety Standards Committee (WASSC) – NNR representative/s: Ms Nontutuzelo Mmutle

The committees meet twice every year and NNR representatives participated actively in the meetings. Representatives from South African national organisations also participate in the meetings.



## IAEA General Conference

The NNR's input to South Africa's representation at the IAEA General Conference contributes to fostering international policy cooperation. On a technical level, the NNR comments on draft nuclear safety resolutions and is actively involved in working with national stakeholders towards increasing IAEA technical cooperation initiatives for South Africa and the region. The NNR is part of the South African delegation which participates annually at the General Conference. In 2021, the NNR participated virtually at the IAEA General Conference.



PART F  
Financial Information



Cape fur seals are endemic to Southern Africa. According to the most recent estimations, roughly 2 million Cape fur seals reside in this range. Living in large colonies, the vast majority have settled along the pristine and wild beaches of southern Namibia as well as on islands just off the West Coast of South Africa.

The NNR integrates oversight, authorisations and compliance to protect workers the general public and the environment, from the harmful effects of ionising radiation. Implicit in all aspects of radiation safety is security. Safety and security are accomplished through authorisations, inspections, and controlled access to certain materials.

# Report of the auditor-general to Parliament on National Nuclear Regulator

## Report on the audit of the financial statements

### Opinion

1. I have audited the financial statements of the National Nuclear Regulator (NNR) set out on pages 160 to 204, which comprise the statement of financial position as at 31 March 2022, the statement of financial performance, statement of changes in net assets, cash flow statement and statement of comparison of budget and actual amounts for the year then ended, as well as the notes to the financial statements, including a summary of significant accounting policies.
2. In my opinion, the financial statements present fairly, in all material respects, the financial position of the National Nuclear Regulator as at 31 March 2022, and its financial performance and cash flows for the year then ended in accordance with the Standards of Generally Recognised Accounting Practice (Standards of GRAP) and the requirements of the Public Finance Management Act 1 of 1999 (PFMA).

### Basis for opinion

3. I conducted my audit in accordance with the International Standards on Auditing (ISAs). My responsibilities under those standards are further described in the auditor-general's responsibilities for the audit of the financial statements section of my report.
4. I am independent of the public entity in accordance with the International Ethics Standards Board for Accountants' International code of ethics for professional accountants (including International Independence Standards) (IESBA code) as well as other ethical requirements that are relevant to my audit in South Africa. I have fulfilled my other ethical responsibilities in accordance with these requirements and the IESBA code.
5. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

### Emphasis of matter

6. I draw attention to the matter below. My opinion is not modified in respect of this matter.

#### *Impairment – trade debtors*

7. As disclosed in note 8 to the financial statements, material losses of R8 407 086 were incurred as a result of impairment of irrecoverable trade debtors.

## Responsibilities of the accounting authority for the financial statements

8. The board of directors, which constitutes the accounting authority is responsible for the preparation and fair presentation of the financial statements in accordance with the Standards of GRAP and the requirements of the PFMA and for such internal control as the accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.
9. In preparing the financial statements, the accounting authority is responsible for assessing the public entity's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless the appropriate governance structure either intends to liquidate the public entity or to cease operations, or has no realistic alternative but to do so.

## Auditor-general's responsibilities for the audit of the financial statements

10. My objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with the ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.
11. A further description of my responsibilities for the audit of the financial statements is included in the annexure to this auditor's report.

## Report on the audit of the annual performance report

### Introduction and scope

12. In accordance with the Public Audit Act 25 of 2004 (PAA) and the general notice issued in terms thereof, I have a responsibility to report on the usefulness and reliability of the reported performance information against predetermined objectives for selected programmes presented in the annual performance report. I performed procedures to identify material findings but not to gather evidence to express assurance.
13. My procedures address the usefulness and reliability of the reported performance information, which must be based on the public entity's approved performance planning documents. I have not evaluated the completeness and appropriateness of the performance indicators included in the planning documents. My procedures do not examine whether the actions taken by the public entity enabled service delivery. My procedures do not extend to any disclosures or assertions relating to the extent of achievements in the current year or planned performance strategies and information in respect of future periods that may be included as part of the reported performance information. Accordingly, my findings do not extend to these matters.

14. I evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected programmes presented in the public entity's annual performance report for the year ended 31 March 2022:

Programmes	Pages in the annual performance report
Programme 4 – Regulation of Nuclear Power Plant (NPP)	30 - 31
Programme 5 – Regulation of Nuclear Technology and NORM (NTN)	30 - 31

15. I performed procedures to determine whether the reported performance information was properly presented and whether performance was consistent with the approved performance planning documents. I performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.

16. I did not identify any material findings on the usefulness and reliability of the reported performance information for these programmes:

- Regulation of Nuclear Power Plant (NPP)
- Regulation of Nuclear Technology and NORM (NTN)

## Other matters

17. I draw attention to the matters below.

### *Achievement of planned targets*

18. Refer to the annual performance report on pages 29 to 39 for information on the achievement of planned targets for the year and management's explanations provided for the under/over achievement of targets.

## Adjustment of material misstatements

19. I identified material misstatements in the annual performance report submitted for auditing. These material misstatements were in the reported performance information of Regulation of Nuclear Power Plant (NPP) and Regulation of Nuclear Technology and NORM (NTN). As management subsequently corrected the misstatements, I did not raise any material findings on the usefulness and reliability of the reported performance information.

## Report on the audit of compliance with legislation

### Introduction and scope

20. In accordance with the PAA and the general notice issued in terms thereof, I have a responsibility to report material findings on the public entity's compliance with specific matters in key legislation. I performed procedures to identify findings but not to gather evidence to express assurance.

21. I did not identify any material findings on compliance with the specific matters in key legislation set out in the general notice issued in terms of the PAA.

## Other information

22. The accounting authority is responsible for the other information. The other information comprises the information included in the annual report. The other information does not include the financial statements, the auditor's report and those selected programmes presented in the annual performance report that have been specifically reported in this auditor's report.

23. My opinion on the financial statements and findings on the reported performance information and compliance with legislation do not cover the other information and I do not express an audit opinion or any form of assurance conclusion on it.

24. In connection with my audit, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and the selected programmes presented in the annual performance report, or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

25. I did not receive the other information prior to the date of this auditor's report. When I do receive and read this information, if I conclude that there is a material misstatement therein, I am required to communicate the matter to those charged with governance and request that the other information be corrected. If the other information is not corrected, I may have to retract this auditor's report and re-issue an amended report as appropriate. However, if it is corrected this will not be necessary.

## Internal control deficiencies

26. I considered internal control relevant to my audit of the financial statements, reported performance information and compliance with applicable legislation; however, my objective was not to express any form of assurance on it. I did not identify any significant deficiencies in internal control.

Auditor - General

Pretoria

29 July 2022



## Annexure – Auditor-general’s responsibility for the audit

1. As part of an audit in accordance with the ISAs, I exercise professional judgement and maintain professional scepticism throughout my audit of the financial statements and the procedures performed on reported performance information for selected programmes and on the public entity’s compliance with respect to the selected subject matters.

### Financial statements

2. In addition to my responsibility for the audit of the financial statements as described in this auditor’s report, I also:
  - identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error; design and perform audit procedures responsive to those risks; and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control
  - obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the public entity’s internal control
  - evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the board of directors, which constitutes the accounting authority
  - conclude on the appropriateness of the accounting authority’s use of the going concern basis of accounting in the preparation of the financial statements. I also conclude, based on the audit evidence obtained, whether a material uncertainty exists relating to events or conditions that may cast significant doubt on the ability of the National Nuclear Regulator to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor’s report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify my opinion on the financial statements. My conclusions are based on the information available to me at the date of this auditor’s report. However, future events or conditions may cause a public entity to cease operating as a going concern
  - evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and determine whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation

### Communication with those charged with governance

3. I communicate with the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.
4. I also provide the accounting authority with a statement that I have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on my independence and, where applicable, actions taken to eliminate threats or safeguards applied.



## General Information

Country of incorporation and domicile	South Africa
Nature of business and principal activities	To provide protection for persons, property and the environment against nuclear damage, through the establishment of safety standards and regulatory practices.
Directors	Dr T. Motshudi (Chairperson) Ms P.D. Peta (Deputy Chairperson) Dr B. Tyobeka (CEO) Mr P. Phili Ms L.N. Dlamini Mr D.M. Mamphitha Mr B.P. Petlane Dr N.Z. Qunta Mrs D. Bendeman Ms V. Miya Mr M.A. Mosia Mr A. Taylor (alternate member to Ms V. Miya) Mr V. Maphoto
Registered office	Eco Glades Office Park Eco Glades 2, Block 6 Witch Hazel Avenue Highveld Ext 75, Eco Park, Centurion 0046
Business address	Eco Glades Office Park Eco Glades 2, Block G 420 Witch Hazel Avenue Eco Park, Centurion, Highveld Ext 75 0046
Postal address	P.O. Box 7106 Centurion, Eco Park Highveld Ext 75 Pretoria 0046
Executive Authority	Minister of Mineral Resources and Energy
Bankers	ABSA Bank
Auditors	Auditor-General South Africa (AGSA)  Registered Auditors
Secretary	First Corporate Transfer Secretaries (PTY) Ltd

## Statement of Directors' Responsibilities and Approval

The Directors are required by the Public Finance Management Act (Act No. 1 of 1999), to maintain adequate accounting records and are responsible for the content and integrity of the annual financial statements and related financial information included in this report. It is the responsibility of the Directors to ensure that the annual financial statements fairly present the state of affairs of the entity as at the end of the financial year and the results of its operations and cash flows for the period then ended. The external auditors are engaged to express an independent opinion on the annual financial statements and were given unrestricted access to all financial records and related data.

The annual financial statements have been prepared in accordance with Standards of Generally Recognised Accounting Practice (GRAP) including any interpretations, guidelines and directives issued by the Accounting Standards Board.

The annual financial statements are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgements and estimates.

The Directors acknowledge that they are ultimately responsible for the system of internal financial control established by the entity and place considerable importance on maintaining a strong control environment. To enable the Directors to meet these responsibilities, the Accounting Authority sets standards for internal control aimed at reducing the risk of error or deficit in a cost-effective manner. The standards include the proper delegation of responsibilities within a clearly defined framework, effective accounting procedures and adequate segregation of duties to ensure an acceptable level of risk. These controls are monitored throughout the entity and all employees are required to maintain the highest ethical standards in ensuring the entity's business is conducted in a manner that in all reasonable circumstances is above reproach. The focus of risk management in the entity is on identifying, assessing, managing and monitoring all known forms of risk across the entity. While operating risk cannot be fully eliminated, the entity endeavours to minimise it by ensuring that appropriate infrastructure, controls, systems and ethical behaviour are applied and managed within pre-determined procedures and constraints.

The Directors are of the opinion, based on the information and explanations given by management, that the system of internal control provides reasonable assurance that the financial records may be relied on for the preparation of the annual financial statements. However, any system of internal financial control can provide only reasonable, and not absolute, assurance against material misstatement or deficit.

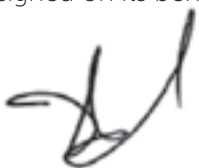
The Directors have reviewed the entity's cash flow forecast for the year to 31 March 2023 and, in the light of this review and the current financial position, they are satisfied that the entity has access to adequate resources to continue in operational existence for the foreseeable future.

The entity is mainly dependent on the authorisation fees and government grant for continued funding of operations. The annual financial statements are prepared on the basis that the entity is a going concern and that the Parliament has neither the intention nor the need to liquidate or curtail materially the scale of the entity or to invoke section 19 of the NNR Act.

Although the Accounting Authority is primarily responsible for the financial affairs of the entity, they are supported by the entity's internal auditors.

The external auditors are responsible for independently reviewing and reporting on the entity's annual financial statements. The annual financial statements have been examined by the entity's external auditors and their report is presented on page 148.

The annual financial statements set out on pages 160 - 204 which have been prepared on the going concern basis, were approved by the Accounting Authority on 31 July 2022 and were signed on its behalf by:



Dr MT Motshudi  
Chairperson of Board



Dr B Tyobeka  
Chief Executive Officer

# Audit and Risk Management Committee Report

The Audit and Risk Management Committee is pleased to present its report for the financial year ended 31 March 2022.

## Membership and Attendance

The membership and attendance of the Audit and Risk Management Committee are as reflected in the Corporate Governance section of the annual report. The committee is required to meet at least four times per annum as per its approved terms of reference.

## Audit and Risk Management Committee Responsibility

The Audit and Risk Management Committee reports that it has adopted appropriate formal terms of reference as its charter in line with the requirements of sections 51(1)(a)(ii) of the Public Finance Management Act (PFMA) and Treasury Regulations 27.1. The Audit and Risk Management Committee further reports that it has conducted its affairs in compliance with its charter.

### The Quality of In-Year Quarterly Reports Submitted in Terms of the PFMA

The Audit and Risk Management Committee reviewed the in-year quarterly reports submitted by management during the period under review and it is satisfied with the quality of these reports.

## The Effectiveness of Internal Control

In line with the PFMA requirements, Internal Audit provides the Audit and Risk Management Committee and management with assurance whether or not the system of internal controls is adequate and effective. This is achieved by means of adopting transparent risk management processes and risk-based internal audit plans that are reviewed regularly.

From the various reports of the Internal Audit, the audit report on the annual financial statements and the management letter of the Auditor-General South Africa (AGSA), refer to paragraph 26 of the Audit Report. Management is continuously putting in place corrective action plans to address weaknesses identified and reported by the Internal Audit. The Audit and Risk Management Committee regularly reviews action plans implemented by management to address the reported weaknesses.

Accordingly, the Audit and Risk Management Committee is satisfied that the system of internal controls over the financial reporting for the period under review was transparent, adequate and effective.

## The Review of Risk Management Processes

The Audit and Risk Management Committee is responsible for the oversight of the risk management function. Management reports to the Audit and Risk Management Committee on the organisation's risk management processes. The Audit and Risk Management Committee reviewed the risk management policy, risk management strategy and enterprise risk management plan. The Audit and Risk Management Committee has monitored the implementation of the risk management plan and is generally satisfied with how the risk management processes are being managed.

## Internal Audit

The Audit and Risk Management Committee is satisfied that the internal audit function is operating effectively and that it has addressed the risks pertinent to the entity in its audits.

The Audit and Risk Management Committee has met separately with the Internal Audit to ensure that the function is executed effectively and objectively.

## Evaluation of Annual Financial Statements

**The Audit and Risk Management Committee has:**

- Reviewed and discussed the audited annual financial statements to be included in the annual report with the Auditor-General South Africa and management.
- Reviewed the management letter issued by Auditor-General South Africa and management's response thereto.
- Reviewed changes in accounting policies and practices, where applicable.
- Reviewed the entity's compliance with legal and regulatory provisions; and
- Reviewed significant adjustments resulting from the audit.

## Auditor-General South Africa

The Audit and Risk Management Committee has met with the Auditor-General South Africa to ensure that there are no unresolved issues of concern.

The Audit and Risk Management Committee recommended the approval of the audited annual financial statements by the Board.



**Protas Phili CA(SA)**

Chairperson of the Audit and Risk Management Committee

31 July 2022

# Directors' Report

The Directors have pleasure in submitting their report and the annual financial statements of the NNR for the year ended 31 March 2022.

## 1. Incorporation

The National Nuclear Regulator is listed as a national public entity in Schedule 3 Part A of the Public Finance Management Act (Act No. 1 of 1999, as amended). It was established in terms of Section 3 of the National Nuclear Regulator Act, (Act No. 47 of 1999). It is engaged in activities at the highest professional level to provide for the protection of persons, property and the environment against nuclear damage, through the establishment of safety standards and regulatory practices.

## 2. Review of Activities

### Main business and operations

The NNR is engaged in activities aimed at protecting persons, property and the environment against nuclear damage in South Africa.

## 3. Going Concern

The annual financial statements have been prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business.

## 4. Subsequent Events

The Directors are not aware of any significant matter or circumstances affecting financial statements arising since the end of the financial year.

## 5. Directors' Interest in Contracts

All Directors have given general declarations of interest in terms of the NNR's Code of Conduct. These declarations indicate the nature of interest a Director, spouse, partner or close family member holds in a company, including any directorship in a company classified as a related party to the NNR. No material contracts in which the Directors have an interest were entered into in the current financial year.

## 6. Accounting Policies

The annual financial statements are prepared in accordance with the prescribed Standards of Generally Recognised Accounting Practices (GRAP) issued by the Accounting Standards Board as the prescribed framework by National Treasury.

## 7. Accounting Authority

The Directors of the entity during the year and to the date of this report are as follows:

Name	Nationality	Changes
Dr T. Motshudi (Chairperson)	South African	
Ms P.D. Peta (Deputy Chairperson)	South African	
Dr B. Tyobeka (CEO)	South African	
Mr P Phili	South African	
Ms L.N. Dlamini	South African	
Mr D.M. Mamphitha	South African	
Mr B.P. Petlane	South African	
Dr N.Z. Qunta	South African	
Mrs D. Bendeman	South African	
Ms V. Miya	South African	Appointment effective - 10 June 2021
Mr M.A. Mosia	South African	Appointment effective - 15 November 2021
Mr A. Taylor (alternate member to Ms V. Miya)	South African	Appointment effective - 10 June 2021
Mr P. Becker	South African	Appointment effective - 10 June 2021, Terminated - 25 February 2022
Mr V. Maphoto	South African	

## 8. Secretary

The secretary of the entity is First Corporate Transfer Secretaries (PTY) Ltd of:

**Business address** 1 Canterbury Crescent  
Gallo Manor  
2052

**Postal address** P.O. Box 216  
Gallo Manor  
2052

## 9. Corporate Governance and Board of Directors Meetings

The Accounting Authority has met as scheduled during the financial year, see page 45 of the annual report for details of the schedule of meetings. Directors have access to all organisational information and to the executive management necessary to discharge its roles and responsibilities as mandated.

## 10. Controlling Authority

The entity's controlling authority is the Minister of Mineral Resources and Energy.

## 11. Bankers

ABSA Bank.

## 12. Auditors

The Auditor-General South Africa (AGSA) is the permanent auditors of the National Nuclear Regulator.



Dr MT Motshudi  
Chairperson of Board



Dr B Tyobeka  
Chief Executive Officer

## Statement of Financial Position as at 31 March 2022

Figures in Rand	Note(s)	2022	2021
<b>Assets</b>			
<b>Current assets</b>			
Receivables from exchange transactions	8	943 098	32 559 575
Receivables from non-exchange transactions	9	632 593	97 832
Operating lease asset	6 -		2 440
Cash and cash equivalents	10	141 914 815	104 257 590
		<b>143 490 506</b>	<b>136 917 437</b>
<b>Non-current assets</b>			
Property, plant and equipment	4	90 750 770	96 984 644
Intangible assets	5	959 453	1 122 286
		<b>91 710 223</b>	<b>98 106 930</b>
<b>Total Assets</b>		<b>235 200 729</b>	<b>235 024 367</b>
<b>Liabilities</b>			
<b>Current liabilities</b>			
Other financial liabilities	12	2 613 674	11 045 763
Operating lease liability	6	662 416	-
Payables from exchange transactions	14	9 048 844	11 247 969
Other payables from non-exchange transactions		345	169 284
Provisions	13	32 823 176	20 044 024
		<b>45 148 455</b>	<b>42 507 040</b>
<b>Non-current liabilities</b>			
Other financial liabilities	12 -		2 734 876
Employee benefit obligation	7	9 253 344	8 978 041
Unspent conditional grants and receipts	11	12 893 618	13 710 309
		<b>22 146 962</b>	<b>25 423 226</b>
<b>Total liabilities</b>		<b>67 295 417</b>	<b>67 930 266</b>
<b>Net assets</b>		<b>167 905 312</b>	<b>167 094 101</b>
Accumulated surplus		167 905 316	167 094 102



# Statement of Financial Performance

Figures in Rand	Note(s)	2022	2021
<b>Revenue</b>			
<b>Revenue from exchange transactions</b>			
Authorisation fees		209 886 130	212 714 671
Application fees		25 402 111	22 434 524
Interest on overdue debtors		104 949	53 898
Actuarial gain		-	414 397
Other income	17	882 921	941 397
Interest received	22	8 223 436	3 953 869
<b>Total revenue from exchange transactions</b>		<b>244 499 547</b>	<b>240 512 756</b>
Revenue from non-exchange transactions			
Transfer revenue			
Government grants	16	46 089 000	40 467 000
Deferred income		796 411	374 021
<b>Total revenue from non-exchange transactions</b>		<b>46 885 411</b>	<b>40 841 021</b>
<b>Total revenue</b>	15	<b>291 384 958</b>	<b>281 353 777</b>
Expenditure			
Compensation of employees	20	(202 056 065)	(173 499 018)
Depreciation and amortisation		(11 780 123)	(12 010 336)
Finance costs	23	(652 568)	(1 465 449)
Lease rentals on operating lease		(4 716 816)	(3 412 704)
Debt impairment	21	(8 805 882)	(10 462 318)
Actuarial losses		(275 303)	-
Goods and services	18	(62 286 986)	(55 596 241)
<b>Total expenditure</b>		<b>(290 573 743)</b>	<b>(256 446 066)</b>
<b>Surplus for the year</b>		<b>811 215</b>	<b>24 907 711</b>

## Statement of Changes in Net Assets

Figures in Rand	Accumulated surplus	Total net assets
<b>Balance at 01 April 2020</b>	<b>142 186 391</b>	<b>142 186 391</b>
Changes in net assets		
Surplus/(Deficit) for the year	24 907 711	24 907 711
<b>Total changes</b>	<b>24 907 711</b>	<b>24 907 711</b>
<b>Balance at 01 April 2021</b>	<b>167 094 102</b>	<b>167 094 102</b>
Changes in net assets		
Surplus/(Deficit) for the year	811 215	811 215
<b>Total changes</b>	<b>811 215</b>	<b>811 215</b>
<b>Balance at 31 March 2022</b>	<b>167 905 317</b>	<b>167 905 317</b>

## Cash Flow Statement

Figures in Rand	Note(s)	2022	2021
<b>Cash flows from operating activities</b>			
<b>Receipts</b>			
Authorisation fees		232 739 763	213 328 156
Application fees		25 402 111	17 470 354
Interest on overdue debtors		104 949	292
Other income		293 519	927 940
Interest income		8 223 436	4 005 200
Government grants		46 089 000	40 467 000
		<u>312 852 778</u>	<u>276 198 942</u>
<b>Payments</b>			
Compensation of employees		(189 188 323)	(171 301 492)
Goods & services		(69 594 710)	(55 087 390)
Finance costs		(652 568)	(1 384 509)
		<u>(259 435 601)</u>	<u>(227 773 391)</u>
<b>Net cash flows from operating activities</b>	26	<b>53 417 177</b>	<b>48 425 551</b>
<b>Cash flows from investing activities</b>			
Purchase of property, plant and equipment	4	(4 315 225)	(6 744 503)
Proceeds from sale of property, plant and equipment	4	84 463	19 633
Purchase of other intangible assets	5	(362 225)	(394 557)
<b>Net cash flows from investing activities</b>		<b>(4 592 987)</b>	<b>(7 119 427)</b>
<b>Cash flows from financing activities</b>			
(Decrease)/Increase on other financial liabilities		(11 166 965)	(8 257 168)
<b>Net cash flows from financing activities</b>		<b>(11 166 965)</b>	<b>(8 257 168)</b>
<b>Net increase/(decrease) in cash and cash equivalents</b>		<b>37 657 225</b>	<b>33 048 956</b>
Cash and cash equivalents at the beginning of the year		104 257 590	71 208 634
<b>Cash and cash equivalents at the end of the year</b>	10	<b>141 914 815</b>	<b>104 257 590</b>

## Statement of Comparison of Budget and Actual Amounts

### Budget on Accrual Basis

Figures in Rand	Approved Budget	Adjustments	Final Budget	Actual Amounts on Comparable Basis	Difference between Final Budget and Actual	Reference
<b>Statement of financial performance</b>						
<b>Revenue</b>						
<b>Revenue from exchange transactions</b>						
Authorisation fees	210 884 333	-	<b>210 884 333</b>	209 886 130	<b>(998 203)</b>	36.1
Application fees	41 951 176	-	<b>41 951 176</b>	25 402 111	<b>(16 549 065)</b>	36.2
Interest on overdue debtors	-	-	-	104 949	<b>104 949</b>	36.10
Other income	762 390	-	<b>762 390</b>	882 921	<b>120 531</b>	36.4
Interest received	7 385 766	-	<b>7 385 766</b>	8 223 436	<b>837 670</b>	36.5
<b>Total revenue from exchange transactions</b>	<b>260 983 665</b>	-	<b>260 983 665</b>	<b>244 499 547</b>	<b>(16 484 118)</b>	
<b>Revenue from non-exchange transactions</b>						
<b>Transfer revenue</b>						
Government grants	46 089 000	-	<b>46 089 000</b>	46 089 000	-	
Deferred income	-	-	-	796 411	<b>796 411</b>	36.14
<b>Total revenue from non-exchange transactions</b>	<b>46 089 000</b>	-	<b>46 089 000</b>	<b>46 885 411</b>	<b>796 411</b>	
<b>Total revenue</b>	<b>307 072 665</b>	-	<b>307 072 665</b>	<b>291 384 958</b>	<b>(15 687 707)</b>	
<b>Expenditure</b>						
Compensation of employees	(185 354 906)	-	<b>(185 354 906)</b>	(202 056 065)	<b>(16 701 159)</b>	36.6
Depreciation and amortisation	(10 641 749)	-	<b>(10 641 749)</b>	(11 780 123)	<b>(1 138 374)</b>	36.11
Finance costs	(1 290 000)	-	<b>(1 290 000)</b>	(652 568)	<b>637 432</b>	36.3
Lease rentals on operating lease	(6 409 476)	-	<b>(6 409 476)</b>	(4 716 816)	<b>1 692 660</b>	36.12
Debt impairment	-	-	-	(8 805 882)	<b>(8 805 882)</b>	36.9
Goods & services	(88 618 412)	-	<b>(88 618 412)</b>	(62 286 987)	<b>26 331 425</b>	36.7

Capital expenditure	(14 758 122)	-	(14 758 122)	-	14 758 122	36.8
<b>Total expenditure</b>	<b>(307 072 665)</b>	<b>-</b>	<b>(307 072 665)</b>	<b>(290 298 441)</b>	<b>16 774 224</b>	
<b>Operating surplus</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1 086 517</b>	<b>1 086 517</b>	
Actuarial gains/ losses	-	-	-	(275 303)	(275 303)	36.13
<b>Surplus/(Deficit) for the year</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>811 214</b>	<b>811 214</b>	
Actual amount on comparable basis as presented in the budget and actual comparative statement	-	-	-	811 214	811 214	

# Accounting Policies

## 1. Presentation of Annual Financial Statements

The following are the principal accounting policies of the entity which are, in all material respects, consistent with those of the previous year.

The annual financial statements are prepared under the historical cost basis, except where otherwise specified. The annual financial statements are prepared in accordance with the South African Standards of Generally Recognised Accounting Practice (SA Standards of GRAP) issued by the Accounting Standard Board, and in the manner required by the Public Finance Management Act, Act No.1 of 1999. These annual financial statements are presented in South African Rand. Assets and liabilities or income and expenditure will not be offset, unless it is required or permitted by a standard.

### 1.1. Significant judgements and sources of estimation uncertainty

In preparing the annual financial statements, management is required to make estimates and assumptions that affect the amounts represented in the annual financial statements and related disclosures. Use of available information and the application of judgement is inherent in the formation of estimates. Actual results in the future could differ from these estimates which may be material to the annual financial statements. Significant judgements include:

#### **Post-employment medical benefits**

The costs and liabilities of the post-employment medical care benefits are determined using methods relying on actuarial estimates and assumptions. Advice is taken from the independent actuaries relating to the appropriateness of the assumptions. Changes in the assumptions used may have a significant effect on the statement of financial performance and statement of financial position.

#### **Provision for impairment of receivables**

A provision for impairment of trade receivables is established when there is objective evidence that the NNR will not be able to collect all amounts due according to the original terms of receivables. The calculation of the amount to be provided for impairment of receivables requires the use of estimates and judgments, refer to note 21.

#### **Annual evaluation of property, plant and equipment, and intangibles**

In order to review property, plant and equipment, and intangibles for possible impairment, changes in useful life and changes in residual values at the end of each financial year in accordance with notes 4 and 5, reference is made to historical information and intended use of assets.

The preparation of financial statements requires the use of estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting periods. Although these estimates are based on management's best knowledge of current events and actions that the entity may undertake in the future, actual results may ultimately differ from those estimates.

# Accounting Policies

## *1.1. Significant judgements and sources of estimation uncertainty (continued)*

The presentation of the results of operations, financial position and cash flows in the financial statements of the entity is dependent upon and is sensitive to the accounting policies, assumptions and estimates that are used as a basis for the preparation of these financial statements. Management has made certain judgments in the process of applying the entity's accounting policies.

## *1.2. Revenue recognition*

Revenue comprises authorisation fees and revenue from special projects, including application fees. Revenue arising from authorisation fees which are published in the Gazette by the Minister on an annual basis is recognised on an accrual basis in accordance with the substance of the relevant arrangement with the holders of authorisation. Revenue from special projects is recognised on an accrual basis in accordance with the terms and conditions agreed upon with the other party.

## *1.3. Government grants*

Government grants are recognised in profit and loss when there is reasonable assurance that they will be received and that the entity will comply with the conditions associated with the grants.

## *1.4. Property, plant and equipment*

Property, plant and equipment is initially measured at cost.

The cost of an item of property, plant and equipment is the purchase price and other costs attributable to bring the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Trade discounts and rebates are deducted in arriving at the cost.

Where an asset is acquired through a non-exchange transaction, its cost is its fair value as at date of acquisition.

Where an item of property, plant and equipment is acquired in exchange for a non-monetary asset or monetary assets, or a combination of monetary and non-monetary assets, the asset acquired is initially measured at fair value (the cost). If the acquired item's fair value was not determinable, it's deemed cost is the carrying amount of the asset(s) given up.

When significant components of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised.

## Accounting Policies

### 1.4. Property, plant and equipment (continued)

The initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located is also included in the cost of property, plant and equipment, where the entity is obligated to incur such expenditure, and where the obligation arises as a result of acquiring the asset or using it for purposes other than the production of inventories.

Recognition of costs in the carrying amount of an item of property, plant and equipment ceases when the item is in the location and condition necessary for it to be capable of operating in the manner intended by management.

Items such as spare parts, standby equipment and servicing equipment are recognised when they meet the definition of property, plant and equipment.

Major inspection costs which are a condition of continuing use of an item of property, plant and equipment and which meet the recognition criteria above are included as a replacement in the cost of the item of property, plant and equipment. Any remaining inspection costs from the previous inspection are derecognised.

Property, plant and equipment is carried at cost less accumulated depreciation and any impairment losses.

Property, plant and equipment are depreciated on the straight line basis over their expected useful lives to their estimated residual value.

The useful life of items of property, plant and equipment have been assessed as follows:

Item	Depreciation method	Average useful life
Land	Straight line	Not depreciated
Buildings	Straight line	20-25 years
Furniture and fixtures	Straight line	10-25 years
Motor vehicles	Straight line	8 years
Office equipment	Straight line	5-25 years
IT equipment	Straight line	3-10 years
Leasehold improvements	Straight line	Over the lease period
Scientific equipment	Straight line	5-20 years

Each part of an item of property, plant and equipment with a cost that is significant in relation to the total cost of the item is depreciated separately.

The depreciation charge for each period is recognised in surplus or deficit unless it is included in the carrying amount of another asset.

Items of property, plant and equipment are derecognised when the asset is disposed of or when there are no further economic benefits or service potential expected from the use of the asset.

The gain or loss arising from the derecognition of an item of property, plant and equipment is included in surplus or deficit when the item is derecognised. The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.



## Accounting Policies

### 1.5. Intangible assets

An asset is identifiable if it either:

- is separable, i.e. is capable of being separated or divided from an entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, identifiable assets or liability, regardless of whether the entity intends to do so; or
- arises from binding arrangements (including rights from contracts), regardless of whether those rights are transferable or separable from the entity or from other rights and obligations.

An intangible asset is recognised when:

- it is probable that the expected future economic benefits or service potential that are attributable to the asset will flow to the entity; and
- the cost or fair value of the asset can be measured reliably.

The entity assesses the probability of expected future economic benefits or service potential using reasonable and supportable assumptions that represent management's best estimate of the set of economic conditions that will exist over the useful life of the asset.

Where an intangible asset is acquired through a non-exchange transaction, its initial cost at the date of acquisition is measured at its fair value as at that date.

Expenditure on research (or on the research phase of an internal project) is recognised as an expense when it is incurred.

An intangible asset is regarded as having an indefinite useful life when, based on all relevant factors, there is no foreseeable limit to the period over which the asset is expected to generate net cash inflows or service potential. Amortisation is not provided for these intangible assets, but they are tested for impairment annually and whenever there is an indication that the asset may be impaired. For all other intangible assets amortisation is provided on a straight line basis over their useful life.

The amortisation period and the amortisation method for intangible assets are reviewed at each reporting date.

Reassessing the useful life of an intangible asset with a finite useful life after it was classified as indefinite is an indicator that the asset may be impaired. As a result, the asset is tested for impairment and the remaining carrying amount is amortised over its useful life.

Internally generated brands, mastheads, publishing titles, customer lists and items similar in substance are not recognised as intangible assets.

Internally generated goodwill is not recognised as an intangible asset.

Amortisation is provided to write down the intangible assets, on a straight line basis, to their residual values as follows:

Item	Useful life
Computer software, other	1 - 10 years

## Accounting Policies

### *1.6. Subsequent expenditure*

Subsequent expenditure on item of property plant and equipment and intangible assets is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure is recognised in the statement of financial performance as an expense when incurred.

### *1.7. Impairment of non-financial assets*

Assets are assessed at the end of each reporting period for any indication that they may be impaired. If indication exist, the recoverable amount of the assets is estimated. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. The NNR assess at each reporting date whether there is any indication that an impairment loss recognised in prior periods for assets may no longer exist or may have decreased. If any such indication exists, the recoverable amounts of those assets are estimated. The increase in carrying amount of assets attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the assets in prior years. A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation is recognised immediately in the statement of financial performance.

### *1.8. Financial instruments recognition and initial measurement*

All financial instruments are initially recognised at fair value, plus, in the case of financial assets and liabilities not at fair value through surplus or deficit, transaction costs that are directly attributable to the acquisition or issue. Financial instruments are recognised when the entity becomes a party to their contractual arrangements. All regular way transactions are accounted for on settlement date. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the period generally established by regulation or convention in the market place.

#### **Derecognition**

Financial assets are derecognised when the contractual rights to receive cash flows have been transferred or have expired or when substantially all the risks and rewards of ownership have passed. All other assets are derecognised on disposal or when no future economic benefits are expected from their use.

Financial liabilities are derecognised when the relevant obligation has either been discharged or cancelled or has expired.

#### **Subsequent measurement**

Subsequent to initial recognition, the entity classifies financial assets as 'at fair value through surplus or deficit', 'held-to-maturity investments', 'loans and receivables', or 'available-for-sale'.

# Accounting Policies

## 1.8. Financial instruments recognition and initial measurement (continued)

### Gains and losses

Gains or losses arising from changes in financial assets or financial liabilities carried at amortised cost are recognised in the statement of financial performance when the financial asset or financial liability is derecognised or impaired, and through the amortisation process.

### Financial assets

The NNR classifies its financial assets into one of the categories discussed below, depending on the purpose for which the asset was acquired. The NNR has not classified any of its financial assets as held to maturity, fair value through profit and loss or available for sale. The accounting policy for each category is as follows:

### Loans and receivables

These assets are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. They arise principally through the provision of services to licensed holders. They are initially recognised at fair value plus transaction costs that are directly attributable to their acquisition or issue, and are subsequently carried at amortised cost less provision for impairment.

Impairment provisions are recognised when there is objective evidence (such as significant financial difficulties on the part of the counterpart or default or significant delay in payment) that the NNR will be unable to collect all of the amounts due under the terms receivable. Trade receivables, which are reported net of such provisions, are recorded in a separate allowance account with the loss being recognised within operational expenditure in the statement of financial performance. On confirmation that the trade receivable will not be collectable, the gross carrying value of the asset is written off against the associated provision. The loans and receivables comprise trade and other receivables at reporting date.

### Cash and cash equivalents

Cash and cash equivalents comprise cash on hand and other short term highly liquid investments that are readily convertible to a known amount of cash and are subject to an insignificant risk of changes in value. Cash and cash equivalents include cash on hand and deposits held at call.

### Financial liabilities

Bank borrowings are initially recognised at fair value net of any transaction costs directly attributable to the issue of the instrument. Such interest-bearing liabilities are subsequently measured at amortised cost using the effective interest rate method, which ensures that any interest expense over the period to repayment is at a constant rate on the balance of the liability carried in the statement of financial position. Trade payables are initially recognised at fair value and subsequently carried at amortised cost using the effective interest method.

## Accounting Policies

### *1.9. Accounting for leases*

A lease is classified as a finance lease if it transfers substantially all the risks and rewards incidental to ownership to the lessee. A lease is classified as an operating lease if it does not transfer substantially all the risks and rewards incidental to ownership to the lessee.

#### **Finance leases - lessee**

Finance leases are recognised as assets and liabilities in the statement of financial position at amounts equal to the fair value of the leased property or, if lower, the present value of the minimum lease payments. The corresponding liability to the lessor is included in the statement of financial position as a finance lease obligation.

The discount rate used in calculating the present value of the minimum lease payments is the interest rate implicit in the lease. The lease payments are apportioned between the finance charge and reduction of the outstanding liability. The finance charge is allocated to each period during the lease term so as to produce a constant periodic rate on the remaining balance of the liability.

#### **Operating leases - lessee**

Operating lease payments are recognised as an expense on a straight-line basis over the lease term. The difference between the amounts recognised as an expense and the contractual payments are recognised as an operating lease liability. This liability is not discounted. Any contingent rents are expensed in the period in which they are incurred.

### *1.10. Employee benefits*

#### **Post-employment benefits**

The NNR provides a defined pension benefit and medical plan to certain qualifying employees. The entity's net obligation in respect of defined benefits is calculated by estimating the amount of future benefits earned in return for services rendered. The obligation and assets related to each of the post-retirement benefits are determined through an actuarial valuation. The assumptions determined by management make use of information obtained from the entity's employment agreements with staff and pensioners, market-related returns on similar investments, and market-related discount rates and other available information. The assumptions concerning the expected return on asset and expected change in liabilities are determined on a uniform basis, considering long-term historical returns and future estimates of returns and medical inflation expectations. In the event that further changes in assumptions are required, the future amounts of post-retirement benefits may be affected materially. The post-retirement medical liability is unfunded.

The overall expected rate of return on an asset is determined based on the market prices prevailing at that date, applicable to the period over which the obligation is to be settled.

The NNR provides a defined contribution plan for all other employees. The post-retirement medical liability is unfunded.

# Accounting Policies

## 1.10. Employee benefits (continued)

### Defined contribution plans

The entity's funding of the defined contribution plans is charged to employee expenses in the same year as the related service is provided.

### Defined benefit plans

The entity provides defined benefit plans for retirement and post-retirement medical aid benefits to qualifying employees. The entity's net obligation in respect of defined benefits is calculated separately for each plan by estimating the amount of future benefits earned in return for services rendered.

The amount recognised in the statement of financial position represents the present value of the defined benefit obligations, calculated by using the projected unit credit method, as adjusted for unrecognised actuarial gains and losses, unrecognised past service costs, if any, and reduced by the fair value of the related plan assets.

The amount of any gain or loss recognised and reflected as expenses is limited to actuarial losses or gains and past service costs plus the present value of available refunds and reductions in future contributions to the plan. To the extent that there is uncertainty as to the entitlement to the surplus, no asset is recognised. No gain is recognised solely as a result of an actuarial loss or past service cost in the current period and no loss is recognised solely as a result of an actuarial gain or past service cost in the current period. The entity recognises actuarial gains and losses for all its defined plans in the period in which they occur.

Past service costs are recognised immediately to the extent that the benefits are vested, otherwise they are recognised on a straight line basis over the average period the benefits become vested.

### Short-term employee benefits

The cost of all short-term employee benefits is recognised during the period in which the employee renders the related service. Provision for employee's entitlement to annual leave represents a present obligation which NNR has to pay as a result of employee's services provided to the reporting date. Annual leave is provided for over the period that the leave accrues.

## 1.11. Provisions and contingencies

Management judgment is required when recognising and measuring provisions and when measuring contingent liabilities as set out in Note 28. The probability that an outflow of economic resources will be required to settle the obligation must be assessed and a reliable estimate must be made of the amount of the obligation.

The entity is required to recognise provisions for claims arising from litigation when the occurrence of the claim is probable and the amount of the loss can be reasonably estimated. Liabilities provided for legal matters require judgments regarding projected outcomes and ranges of losses based on historical experience and recommendations of legal counsel.

Litigation is however unpredictable and actual costs incurred could differ materially from those estimated at the reporting date.

## Accounting Policies

### *1.12. Commitments*

Items are classified as commitments when an entity has committed itself to future transactions that will normally result in the outflow of cash. Disclosure are required in respect of unrecognised contractual commitments. Commitments for which disclosures is necessary to achieve a fair presentation should be disclosed in a note to the financial statements.

### *1.13. Going concern assumption*

The financial statements have been prepared on a going concern assumption that the entity will continue in operation for the foreseeable future.

### *1.14 Related parties*

Parties are considered to be related if one party has the ability to control the other party or to exercise significant influence or joint control over the other party in making financial and operating decisions.

# Accounting Policies

## *1.15. Comparative figures*

Comparative figures are restated in the event of a change in accounting policy or prior period error.

## *1.16. Irregular, fruitless and wasteful expenditure*

Irregular expenditure means expenditure incurred in contravention of, or not in accordance with, a requirement of any applicable legislation, including the PFMA. Fruitless and wasteful expenditure means expenditure that was made in vain and would have been avoided had reasonable care been exercised. All irregular, and fruitless and wasteful expenditure is charged against income in the period in which it is incurred.

## *1.17. Foreign currencies*

Transactions in foreign currencies are accounted for at the rates of exchange ruling on the date of the transactions. Gains and losses arising from the settlement of such transactions are recognised in the income statement.

## *1.18. Interest received*

Interest is recognised on a time-proportionate basis taking into account the principal amount outstanding and the effective interest rate.

## *1.19. Budget information*

GRAP 1, Presentation of Financial Statements, requires entities to provide information on their actual performance against the entity's approved budget. A reconciliation to ensure full compliance with GRAP 1 is included as a disclosure note to the financial statements.

# Notes to the Annual Financial Statements

## 2. Basis of Preparation

The annual financial statements have been prepared in accordance with Standards of Generally Recognised Accounting Practice on a basis consistent with the prior year.

## 3. New Standards and Interpretations

### *3.1. Standards and interpretations issued, but not yet effective*

The entity has not applied the following standards and interpretations, which have been published and are mandatory for the entity's accounting periods beginning on or after 01 April 2022 or later periods:

Standard/ Interpretation	Effective date: Years beginning on or after	Expected impact:
GRAP 1 (amended): Presentation of Financial Statements	01 April 2020	The adoption of this standard will not have material impact on the results of the entity.



## Notes to the Annual Financial Statements

### 4. Property, plant and equipment

	2022			2021		
	Cost / Valuation	Accumulated Depreciation and Accumulated Impairment	Carrying Value	Cost / Valuation	Accumulated Depreciation and Accumulated Impairment	Carrying Value
Land	213 750	-	213 750	213 750	-	213 750
Buildings	122 692 058	(58 498 091)	64 193 967	122 381 558	(52 417 017)	69 964 541
Buildings - improvements (WIP)	2 682 421	-	2 682 421	2 682 421	-	2 682 421
Furniture and fixtures	5 725 664	(2 869 593)	2 856 071	5 738 709	(2 536 843)	3 201 866
Motor vehicles	906 438	(753 645)	152 793	906 438	(636 230)	270 208
Office equipment	6 478 387	(5 253 053)	1 225 334	6 233 569	(4 951 102)	1 282 467
IT equipment	23 856 757	(13 646 451)	10 210 306	21 540 171	(11 406 419)	10 133 752
Leasehold improvements	5 343 134	(5 284 490)	58 644	5 343 134	(5 343 134)	-
Laboratory equipment	20 838 272	(11 680 788)	9 157 484	20 289 304	(11 053 665)	9 235 639
<b>Total</b>	<b>188 736 881</b>	<b>(97 986 111)</b>	<b>90 750 770</b>	<b>185 329 054</b>	<b>(88 344 410)</b>	<b>96 984 644</b>

#### Reconciliation of property, plant and equipment - 2022

	Opening balance	Additions	Disposals	Other movements	Depreciation	Total
Land	213 750	-	-	-	-	213 750
Buildings	69 964 541	310 500	-	141	(6 081 215)	64 193 967
Buildings - improvements (WIP)	2 682 421	-	-	-	-	2 682 421
Furniture and fixtures	3 201 866	26 807	(20 174)	235	(352 663)	2 856 071
Motor vehicles	270 208	-	-	-	(117 415)	152 793
Office equipment	1 282 467	257 297	(112)	163 632	(477 950)	1 225 334
IT equipment	10 133 752	3 832 028	(70 038)	189 425	(3 874 861)	10 210 306
Leasehold improvements	-	-	-	170 594	(111 950)	58 644
Laboratory equipment	9 235 639	685 003	(120)	84 548	(847 586)	9 157 484
	<b>96 984 644</b>	<b>5 111 635</b>	<b>(90 444)</b>	<b>608 575</b>	<b>(11 863 640)</b>	<b>90 750 770</b>

## Notes to the Annual Financial Statements

### 4. Property, plant and equipment (continued)

#### Reconciliation of property, plant and equipment - 2021

	Opening balance	Additions	Disposals	Other movements	Depreciation	Total
Land	213 750	-	-	-	-	213 750
Buildings	75 999 241	-	-	-	(6 034 700)	69 964 541
Buildings - improvements (WIP)	2 628 923	53 498	-	-	-	2 682 421
Furniture and fixtures	3 126 942	482 800	(73 178)	-	(334 698)	3 201 866
Motor vehicles	383 512	-	-	-	(113 304)	270 208
Office equipment	1 539 832	312 290	-	-	(569 655)	1 282 467
IT equipment	8 284 716	4 088 331	(42 994)	1 151 185	(3 347 486)	10 133 752
IT equipment - improvements (WIP)	3 065 359	-	-	(3 065 359)	-	-
Leasehold improvements	379 833	-	-	-	(379 833)	-
Laboratory equipment	7 641 829	2 269 875	-	-	(676 065)	9 235 639
	<b>103 263 937</b>	<b>7 206 794</b>	<b>(116 172)</b>	<b>(1 914 174)</b>	<b>(11 455 741)</b>	<b>96 984 644</b>

The cumulative expenditure recognised in the carrying value of property, plant and equipment as works in progress (WIP) is disclosed per class of asset, in aggregate, as follows:

Buildings - improvements (WIP)	2 682 421	2 682 421
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Included in the value of property, plant and equipment are the following properties:

The NNR owns an office building located at Erf 3078 in Highveld, Centurion, Gauteng (pledged as a security for ABSA mortgage bond) and land and building located at Erf 3187 in Melkbosstrand in Blaauwburg, City of Cape Town Municipality, Western Cape.

## Notes to the Annual Financial Statements

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### 4. Property, plant and equipment (continued)

#### *Other information*

#### Property, plant and equipment fully depreciated and still in use (carrying amount at the beginning of the year)

Office equipment	-	226 917
IT equipment	-	30 016
Laboratory equipment	-	12 464
Leasehold improvement	-	379 833
	-	<u>649 230</u>

#### *Change in accounting estimate: Useful life of assets review*

A review of the useful economic life of property, plant and equipment, and intangible assets was performed during the year. These changes (refer to accounting policies 1.4 and 1.5) resulted in a change in accumulated depreciation for the year. The NNR disclosed the nature and the amount resulting from the change in accounting estimates that has an impact in the current period and is expected to have an effect in the future. This change in estimates is applied prospectively.

#### *Effect of change in accounting estimate on current and future periods:*

##### Statement of financial performance

Decrease in depreciation and amortisation expense	(682 107)	-
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##### Statement of financial position

Decrease in accumulated depreciation	682 107	-
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##### Repairs and maintenance

Total expenditure incurred on repairs and maintenance for property, plant and equipment	2 376 119	2 029 136
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## Notes to the Annual Financial Statements

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### 5. Intangible Assets

	2022		2021			
	Cost / Valuation	Accumulated Amortisation and accumulated impairment	Carrying Value	Cost / Valuation	Accumulated Amortisation and accumulated impairment	Carrying Value
Computer software, other	4 632 528	(3 673 075)	959 453	4 465 124	(3 342 838)	1 122 286

#### Reconciliation of intangible assets - 2022

	Opening balance	Additions	Other movements	Amortisation	Total
Computer software, other	1 122 286	362 225	73 533	(598 591)	959 453

#### Reconciliation of intangible assets - 2021

	Opening balance	Transfers	Amortisation	Total
Computer software, other	674 080	1 002 798	(554 592)	1 122 286

### 6. Operating Leases

Current assets	-	442 865
Current liabilities	(662 416)	(440 425)
	<b>(662 416)</b>	<b>2 440</b>

# Notes to the Annual Financial Statements

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## 7. Employee benefit obligations

The National Nuclear Regulator has retirement employee benefit obligations which consists of:

- Post-retirement pension benefit plan
- Post-retirement medical benefit plan
- Defined pension contribution

The amounts recognised in the statement of financial position are as follows:

### Carrying value

Present value of the defined benefit obligation-wholly unfunded	(9 253 344)	(8 978 041)
Present value of the defined benefit obligation-partly or wholly funded	(58 567 000)	(57 223 000)
Fair value of plan assets	70 386 000	64 703 000
Asset not recognised	(11 819 000)	(7 480 000)
	<b>(9 253 344)</b>	<b>(8 978 041)</b>

The major categories of plan assets as a percentage of total plan assets are as follows:

South African equities	70,00%	70,00%
Bonds	30,00%	30,00%

Net expense (gain) recognised in the statement of financial performance

Current service cost	21 690	43 650
Interest cost	1 085 585	956 842
Actuarial (gains) losses	53 249	(667 632)
Expected return on plan assets	(885 221)	(747 257)
	<b>275 303</b>	<b>(414 397)</b>

Actual return on plan assets

Expected return on plan assets	5 119 000	5 081 000
Actuarial (gains) losses - Plan assets	5 212 000	11 301 000
	<b>10 331 000</b>	<b>16 382 000</b>

Calculation of actuarial gains and losses

Actuarial (gains) losses – obligation	1 459 000	(5 272 000)
Actuarial (gains) losses – plan assets	5 212 000	(11 301 000)
	<b>6 671 000</b>	<b>(16 573 000)</b>

## Notes to the Annual Financial Statements

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### 7. Employee benefit obligations (continued)

#### 7.1. Post-retirement Pension Benefit Plan

The NNR makes contributions towards post-retirement pension benefits for certain eligible employees.

**Changes in present value of the defined benefit obligations are as follows:**

Opening balance	57 222 000	51 221 000
Interest cost	4 506 000	5 550 000
Current service cost	301 000	261 000
Benefits paid	(4 921 000)	(5 082 000)
Actuarial (gain) losses	1 459 000	5 272 000
<b>Closing balance</b>	<b>58 567 000</b>	<b>57 222 000</b>

**Changes in fair value of plan assets are as follows:**

Opening balance fair value of plan assets	64 703 000	53 175 000
Expected return on plan assets	5 119 000	5 081 000
Contribution by employer	273 000	156 000
Contribution by participants	67 000	72 000
Benefits paid	(4 921 000)	(5 082 000)
Actuarial gain/(losses)	5 145 000	11 301 000
	<b>70 386 000</b>	<b>64 703 000</b>

**Key assumptions used**

**Assumptions used at the reporting date:**

Discount rates used	10,00%	8,20%
Expected rate of return on assets	10,00%	8,90%
Expected rate of return on reimbursement rights	6,25%	4,90%
Actual return on reimbursement rights	7,25%	5,90%
Funding level	100,0	113,1

#### *Discount rate assumption*

The discount rate required by GRAP 25 is set with reference to the market yield on government bond. An average nominal yield cap for SA government bond with a duration of between 5 and 10 years as at 31 March 2022 was used. The recommended discount rate is 10%. The source of the yield curve is the Johannesburg Stock Exchange through IRESS data service. No adjustments were made for inflation risk premium that may be present in the pricing of nominal bond.

# Notes to the Annual Financial Statements

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## 7. Employee benefit obligations (continued)

### *Expected return on plan assets assumption*

The assumption used for expected return on plan assets is the same as the one used for the discount rate. It is set with reference to the market yield on government bond. An average nominal yield cap for SA government bond with a duration of between 5 and 10 years as at 31 March 2022 was used. The recommended expected return on plan assets is 10%. The source of the yield curve is the Johannesburg Stock Exchange through IRESS date service. No adjustments were made for inflation risk premium that may be present in the pricing of nominal bond.

#### Sensitivity analysis

##### One percentage point increase

Effect on defined benefit obligation-discount rate	(4 103 000)	(3 984 000)
Percentage change effect on defined benefit obligation-discount rate	(7)	(1)
Effect on defined benefit obligation-salary inflation	(63 000)	48 000
		PA (90)
Effect on defined benefit obligation-post-retirement mortality	(2 048 000)	(1 983 000)
Percentage change effect on defined benefit obligation-post-retirement mortality	(3)	(4)

### *7.2 Post- retirement medical aid benefit obligation*

The NNR has made provision for post-employment medical benefit covering two (2) employees in active employment and six (6) pensioners. The actuarial valuation was determined by One Pangaea Expertise & Solutions, an independent actuary registered with the Actuary Society of South Africa. Valuation has been performed in accordance with GRAP 25.

The NNR makes certain contributions to medical funds in respect of current and retired employees. The NNR has terminated future post-retirement medical aid benefits in respect of employees joining after 31 December 1995. The NNR has an obligation to pay 100% of the membership subscriptions for staff members who had retired from the services of the NNR or then known as The Council for Nuclear Safety on or before 30 July 1990 and also for those staff members retiring from the services of the NNR on or after 01 July 1990, who were in the continuous employment of the NNR before 01 July 1990 to the date of retirement.

The NNR introduced a sliding scale for membership subscriptions for staff joining after 01 July 1990. Subsidy reduced step wise from 100% to a minimum of 60% for employees that joined the NNR after 01 July 1990 and 31 December 1995. Eligible employees must be employed by the NNR until retirement age to qualify for the post-retirement medical aid benefit. The most recent actuarial valuation of the benefit was performed as at 31 March 2022.

## Notes to the Annual Financial Statements

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### 7. Employee benefit obligations (continued)

**Changes in present value of the defined benefits are as follows:**

Opening defined benefit obligation	8 978 041	9 392 438
Current service cost	21 690	43 650
Interest cost	1 085 585	956 842
Benefits paid	(885 221)	(747 257)
Actuarial (gain) losses	53 249	(667 632)
	<b>9 253 344</b>	<b>8 978 041</b>

**Actuarial principal assumption used at the reporting date**

Discount rate used	10%	13%
Medical inflation rate	8%	10%
General inflation rate	6%	8%
Post-retirement interest rate	2%	3%
Proportion of continuing membership at retirement	100%	100%
Proportion of retiring members who are married	90%	30%

**In-service members**

Age of spouse (Husbands: three years older than wives)	65	65
Mortality of in-service members	SA SA85-90 (L)-3	SA SA85-90 (L)
Mortality of continuation members post-retirement	PA (90)-2 years	PA (90)-2 years
Annual rate of withdrawal - from age 55+	0%	4,00%



# Notes to the Annual Financial Statements

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## 7. Employee benefit obligations (continued)

### Number of members

Number of members in active employment	2	2
Number of pensioners	6	7
	<b>8</b>	<b>9</b>
Average retirement age	60	60

The most significant assumptions are those relating to the discount rate and medical inflation. It is the relationship between these assumptions that is important for the purpose of the calculations rather than their absolute values. Assumed healthcare cost trends rates have a significant effect on the amounts recognised in surplus or deficit. A one percentage point change in assumed healthcare cost trends rates would have the following effects:

### Sensitivity analysis

One percentage point increase		
Effect on the aggregate of the service cost and interest cost	373 533	349 679
Effect on defined benefit obligation	9 626 877	9 327 721
Effect on the aggregate of the service cost and interest cost discount rate	(668 212)	(619 913)
Defined benefit obligation discount rate	8 585 132	8 358 128
Percentage change effect on defined benefit obligation discount rate	1	1

Amounts for the current and previous four years are as follows:

	2022	2021	2020	2019	2018
Defined benefit obligation	9 253 344	8 978 041	9 392 438	8 708 245	10 529 198
Experience adjustments on plan liabilities	519 234	253 234	(905 463)	298 570	699 802

### 7.3. Defined contribution plan

It is the policy of the entity to provide retirement benefits to all its employees. A defined contribution pension fund, which is subject to the rules of the fund and to the Pensions Fund Act exists for this purpose.

The entity is under no obligation to cover any unfunded benefits.

The amount recognised as an expense for defined contribution plans is:	20 025 633	19 531 834
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## Notes to the Annual Financial Statements

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### 8. Receivables from exchange transactions

Trade receivables	36 558	31 696 073
Staff advance	23 217	8 064
Deposits and prepayments	709 196	494 203
Other receivables	174 127	361 235
	<b>943 098</b>	<b>32 559 575</b>

#### Trade receivables past due but not impaired

Trade receivables which are less than a year past due are not considered to be impaired. At 31 March 2022, R36 558 (2021: R31 696 073) were past due but not impaired.

The ageing of amounts past due but not impaired is as follows:

Current	12 312	-
1 month past due	16 215	16 302 872
2 months past due	8 030	6 043 166
3 months past due	-	62 493
6 months past due	-	9 425 218

#### Trade receivables impaired

As of 31 March 2022, trade receivables of R27 917 191 (2021: R19 510 105) were impaired and provided for.

The ageing of these debtors are as follows:

Over 120 days	27 917 191	19 510 105
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#### Reconciliation of provision for impairment of trade receivables

Opening balance	19 510 105	10 794 701
Provision for impairment	8 407 086	8 715 404
	<b>27 917 191</b>	<b>19 510 105</b>

#### Reconciliation of trade receivables

Trade receivables before impairment	27 953 749	51 206 178
Provision for impairment	(27 917 191)	(19 510 105)
	<b>36 558</b>	<b>31 696 073</b>

## Notes to the Annual Financial Statements

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### 8. Receivables from exchange transactions (continued)

The creation and release of provision for impaired receivables have been included in operating expenses in surplus or deficit (refer to Note 21). Amounts charged to the allowance account are generally written off when there is no expectation of recovering the amount. The NNR's policy is to provide for impairment on receivables which are more than 120 days outstanding. Interest on outstanding debt, over 30 days after the issuance of invoice, is calculated on the day balance owing and compounded monthly. The interest rate is determined by the Minister of Finance in terms of section 80 of the PFMA, (Act No. 1 of 1999).

### 9. Receivables from non-exchange transactions

Other receivables from non-exchange revenue	632 593	97 832
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### 10. Cash and cash equivalents

Cash and cash equivalents consist of:

Cash on hand	759	15 012
Bank balances	2 210 335	1 215 139
Short-term deposits	139 703 721	103 027 439
	<b>141 914 815</b>	<b>104 257 590</b>

Included in the cash balance above is R 12,8 million unspent conditional grant relating to the construction of the Cape Town office, refer to Note 11 for more details.

### 11. Unspent conditional grants and receipts

*Unspent conditional grants and receipts comprises of:*

#### Unspent conditional grants and receipts

Government grant	12 893 618	13 710 309
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#### Movement during the year

Balance at the beginning of the year	13 710 309	12 947 116
IAEA sponsorship funds	-	1 137 213
IAEA sponsorship funds - refund (unutilised funds)	(20 280)	-
Conditions met- amount realised	(796 411)	(374 020)
	<b>12 893 618</b>	<b>13 710 309</b>

The design of the Cape Town office building is complete, and there was a delay in the finalisation of the handing over site to the contractor to start demolition of the old building and resume with the construction. The construction site has since been handed over to the contractor, and the demolition and construction is expected to resume in the 2022/23 financial year.

## Notes to the Annual Financial Statements

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### 12. Other financial liabilities

**At amortised cost**

Mortgage bond	2 613 674	13 780 639
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**Non-current liabilities**

At amortised cost	-	2 734 876
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**Current liabilities**

At amortised cost	2 613 674	11 045 763
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### 13. Provisions

**Reconciliation of provisions - 2022**

	Opening Balance	Additions	Utilised during the year	Reversed during the year	Total
Annual leave	8 906 801	6 252 555	(6 050 475)	-	9 108 881
Annual performance bonus	11 137 223	23 714 295	(21 359 442)	10 222 219	23 714 295
	<b>20 044 024</b>	<b>29 966 850</b>	<b>(27 409 917)</b>	<b>10 222 219</b>	<b>32 823 176</b>

**Reconciliation of provisions - 2021**

	Opening Balance	Additions	Utilised during the year	Reversed during the year	Total
Annual Leave	7 209 018	6 703 138	(5 005 355)	-	8 906 801
Performance Bonus	10 646 420	11 137 223	(9 439 700)	(1 206 720)	11 137 223
	<b>17 855 438</b>	<b>17 840 361</b>	<b>(14 445 055)</b>	<b>(1 206 720)</b>	<b>20 044 024</b>

#### *Provision for annual leave*

The leave provision represents management's best estimate of the NNR's liability for leave based on the NNR's approved leave policy. Leave provision represents the amount due to employees for unutilised leave days accrued for services rendered to the NNR as of 31 March 2022.

#### *Performance bonus*

Performance bonus represents management's best estimate of bonus potentially payable to qualifying NNR employees who signed the performance agreement with the NNR for financial year ending 31 March 2022. Performance target is set by the Board at the beginning of each financial year, and employees' performance scores are linked to the overall performance of the NNR. Management has reasonably provided for a bonus in accordance with bonus payment of the 2020/21 financial year at an average individual pay-out rate of 15% of total cost to company. The payment of bonus is discretionary in terms of the NNR policy and is only due and payable after declaration and approval by the Board.

## Notes to the Annual Financial Statements

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### 14. Payables from exchange transactions

Trade payables	5 134 206	8 977 759
Accruals - trade creditors	1 223 620	556 650
Accruals - staff accounts	972 885	84 018
13th cheque accrual	1 718 133	1 629 542
	<b>9 048 844</b>	<b>11 247 969</b>

### 15. Revenue

Authorisation fees	209 886 130	212 714 671
Application fees	25 402 111	22 434 524
Interest on overdue debtors	104 949	53 898
Actuarial gain	-	414 397
Other income	882 921	941 397
Interest received	8 223 436	3 953 869
Government grants	46 089 000	40 467 000
Deferred income	796 411	374 021
	<b>291 384 958</b>	<b>281 353 777</b>

The amount included in revenue arising from exchanges of goods or services are as follows:

Authorisation fees	209 886 130	212 714 671
Application fees	25 402 111	22 434 524
Interest on overdue debtors	104 949	53 898
Actuarial gain	-	414 397
Other income	882 921	941 397
Interest received	8 223 436	3 953 869
	<b>244 499 547</b>	<b>240 512 756</b>

The amount included in revenue arising from non-exchange transactions is as follows:

#### Transfer revenue

Government grants	46 089 000	40 467 000
Deferred income	796 411	374 021
	<b>46 885 411</b>	<b>40 841 021</b>

## Notes to the Annual Financial Statements

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### 16. Government Grants

#### Operating grants

Government grant	46 089 000	40 467 000
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#### Unconditional

Unconditional grants received	46 089 000	40 467 000
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#### Conditional grant

Balance unspent at beginning of year	13 710 309	12 947 116
IAEA sponsorship funds	-	1 137 213
Conditions met - transferred to revenue	(796 411)	(374 020)
IAEA sponsorship funds - refund	(20 280)	-
	<b>12 893 618</b>	<b>13 710 309</b>

### 17. Other Income

Other sundry income	843 991	941 397
Bad debts recovered	38 929	-
	<b>882 920</b>	<b>941 397</b>

# Notes to the Annual Financial Statements

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## 18. Goods and services

Advertising	838 402	842 594
Property rates and municipal charges	2 034 053	2 050 310
Auditor's fees	2 591 634	2 193 923
Cleaning	861 457	811 740
Consulting and professional fees	20 614 740	18 786 209
Consumables	551 124	468 793
Insurance	597 463	614 737
Community development and training	313 561	456 513
Conferences and seminars	118 460	60 796
IT expenses	5 007 243	7 317 428
Marketing	124 600	-
Magazines, books and periodicals	1 133	27 964
Medical expenses	24 696	16 900
Postage and courier	138 255	40 469
Printing and stationery	1 384 548	1 081 480
Security	2 021 192	1 881 110
Software expenses	4 866 476	4 612 469
Subscriptions and membership fees	2 136 518	891 868
Telephone and fax	1 701 530	1 869 085
Training	1 615 352	1 590 169
Travel - local	3 445 598	1 254 773
Travel - overseas	401 428	(14 861)
Electricity	1 561 206	1 380 559
Repairs and maintenance	2 376 119	2 029 136
Board fees	1 406 357	912 481
Bursaries	889 070	357 494
Other expenses	4 664 771	4 062 103
	<b>62 286 986</b>	<b>55 596 242</b>

## Notes to the Annual Financial Statements

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### 19. Operating (deficit)/surplus

Operating (deficit)/surplus for the year is stated after accounting for the following:

#### Operating lease charges

Premises

• Contractual amounts	4 247 982	2 814 478
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Equipment

• Contractual amounts	468 834	598 226
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<b>4 716 816</b>	<b>3 412 704</b>
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Depreciation on property, plant and equipment	11 780 123	12 010 336
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Employee costs	202 056 065	173 499 018
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Defined contribution funds	20 025 633	19 531 834
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Defined benefit funds	229 813	215 767
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### 20. Employee-related costs

Basic	102 078 405	92 559 618
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Performance Bonus	21 359 442	9 439 700
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Medical aid	5 823 423	5 783 805
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UIF	695 032	620 239
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Workmen's compensation fund	180 544	189 944
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SDL	1 653 545	1 056 969
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PAYE	50 010 228	44 138 438
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Pension fund-defined benefit plan	229 813	215 767
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Pension fund-defined contribution plan	20 025 633	19 494 538
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<b>202 056 065</b>	<b>173 499 018</b>
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### 21. Debt Impairment

Contributions to debt impairment provision	8 407 086	8 715 404
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Bad debts written off	398 796	1 746 914
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<b>8 805 882</b>	<b>10 462 318</b>
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### 22. Interest Received

#### Interest revenue

Short-term deposits	8 223 436	3 953 869
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## Notes to the Annual Financial Statements

Figures in Rand	2022	2021
<b>23. Finance Costs</b>		
Non-current borrowings	652 568	1 465 449
<b>24. Auditors' Fees</b>		
Fees	2 591 634	2 193 923
<b>25. Lease Rentals on Operating Leases</b>		
<b>Operating lease charges</b>		
Premises		
• Contractual amounts	4 247 982	2 814 478
Equipment		
• Contractual amounts	468 834	598 226
	<b>4 716 816</b>	<b>3 412 704</b>
<b>26. Cash Generated from Operations</b>		
Surplus	811 215	24 907 711
<b>Adjustments for:</b>		
Depreciation and amortisation	11 780 123	12 010 336
Movements in operating lease assets and accruals	664 856	(327 056)
Movements in post-retirement obligation	275 303	(414 397)
Movements in provisions	12 779 152	2 188 586
Profit/(Loss) on assets written off	20 023	73 178
Profit on disposal of assets	(14 043)	(13 457)
Deferred income	(796 411)	-
<b>Changes in working capital:</b>		
Receivables from exchange transactions	31 616 475	7 282 193
Other receivables from non-exchange transactions	(534 761)	(55 493)
Payables from exchange transactions	(2 199 125)	3 147 970
Other payable from non-exchange transaction	(168 939)	-
Unspent conditional grants and receipts	(816 691)	(374 020)
	<b>53 417 177</b>	<b>48 425 551</b>

## Notes to the Annual Financial Statements

Figures in Rand	2022	2021
<b>27. Commitments</b>		
<b>Capital Commitments</b>		
<b>Already contracted for but not provided for</b>		
• Property, plant and equipment	42 294 487	821 826
<b>Total capital commitments</b>		
Already contracted for but not provided for	42 294 487	821 826
<b>Operational commitments</b>		
<b>Already contracted for but not provided for</b>		
• Leases	20 336 525	3 887 147
• Other	18 758 016	17 422 313
	<b>39 094 541</b>	<b>21 309 460</b>
<b>Total operational commitments</b>		
Already contracted for but not provided for	39 094 541	21 309 460
<b>Total commitments</b>		
Capital commitments	42 294 487	821 826
Operational commitments	39 094 541	21 309 460
	<b>81 389 028</b>	<b>22 131 286</b>

This committed expenditure relates to plant and equipment, mainly for the construction of the Cape Town office, and operational expenditure commitments, mainly for technical support and organisational support that will be financed by available retained cash surpluses and existing cash resources.

### *Operating leases - as lessee (expense)*

<b>Minimum lease payments due</b>		
- within one year	4 263 619	1 963 518
- in second to fifth year inclusive	8 749 015	1 923 628
- later than five years	7 323 891	-
	<b>20 336 525</b>	<b>3 887 146</b>

## 28. Contingencies

28.1. The NNR has an outstanding matter at the CCMA pertaining to an employee who was dismissed and is challenging the dismissal as being unfair. The entity is defending a demand of R850 000 requested for settlement.

28.2. The National Nuclear Regulator expects to retain surplus funds realised in the 2021/2022 financial year, upon approval by National Treasury, in accordance with National Treasury Instruction No. 12 of 2020/2021. This amount is estimated at R4 594 069.

# Notes to the Annual Financial Statements

Figures in Rand

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## 29. Related Parties

Directors	Refer to Directors' report note
Ultimate controlling entity	Department of Mineral Resources and Energy
Executive Authority	Minister of Mineral Resources and Energy
Entities ultimately under common control	National Nuclear Corporation of South Africa (Necsa)
	National Energy Regulator of south Africa (NERSA)
	South Africa National Energy Development Institute (SANEDI)
	National Radioactive Waste Disposal Institute (NRWDI)
	The Petroleum, Oil, Gas Corporation of South Africa (PetroSA)
	Central Energy Group Fund (CEF)(Pty)Ltd
	Council for Mineral Technology (Mintek)
	Council for Geoscience (Geoscience)
	Mine Health and Safety Council (MHSC)
	Petroleum Agency South Africa (PASA)
	African Exploration Mining and Finance Corporation (AEMFC)
	South Africa Diamond & Precious Metals Regulator (SADPMR)
	State Diamond Trader
Post-retirement pension for employees	NNR Pension Fund
Members of key management	Dr M. Tyobeka (CEO)
	Mr D. Netshivhazwaulu (CFO)
	Ms A. Simon (Executive: CSS)
	Ms D. Kgomo (Executive: NTN)
	Mr O. Phillips (Executive: NPP)
	Ms L. Mpete (Executive: RITS)

## Notes to the Annual Financial Statements

Figures in Rand

2022

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### 29. Related Parties (continued)

**Related party transactions**

**Amount included in trade receivable/(trade payable) regarding related parties**

Necsa	-	(166 706)
Necsa	-	73 246
MINTEK	1 697	2 827

**Services rendered to related party**

Necsa	57 198 471	54 947 872
NRWDI	970 200	2 692 400
MINTEK	69 387	65 132

**Government transfer**

Department of Mineral Resources and Energy	46 089 000	40 467 000
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**Services from related party**

Necsa	(868 916)	(221 516)
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**Other**

NNR Pension Fund	20 255 446	19 710 305
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## Notes to the Annual Financial Statements

Figures in Rand

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### 30. Executive and Directors' Emoluments

#### *Executive*

2022

	Basic Salary	Performance Bonus	Total	Leave Provision
Dr B. Tyobeka (CEO)	2 751 139	550 228	3 301 367	227 457
Mr D. Netshivhazwaulu (CFO)	1 951 441	282 672	2 234 114	143 119
Ms A. Simon (Executive: CSS)	1 871 168	348 348	2 219 516	117 838
Ms D. Kgomo (Executive: NTN)	1 868 274	186 827	2 055 101	41 925
Mr O. Phillips (Executive: NPP)	2 065 116	413 023	2 478 140	218 392
Ms L. Mpete (Acting Executive: RITS)	1 868 273	280 241	2 148 514	111 361
	<b>12 375 411</b>	<b>2 061 339</b>	<b>14 436 752</b>	<b>860 092</b>

2021

	Basic Salary	Performance Bonus	Contributions	Total	Leave Provision
Dr B. Tyobeka (CEO)	2 751 139	137 557	-	2 888 696	140 819
Mr D. Netshivhazwaulu (CFO)	1 884 481	141 336	56 948	2 082 765	114 113
Ms A. Simon (Executive: CSS)	1 741 740	130 631	-	1 872 371	136 164
Ms D. Kgomo (Executive: NTN)	1 868 274	93 414	50 512	2 012 200	23 966
Mr O. Phillips (Executive: NPP)	1 984 806	154 884	93 384	2 233 074	127 065
Ms L. Mpete (Acting Executive: RITS)	1 774 859	140 120	62 892	1 977 871	104 176
	<b>12 005 299</b>	<b>797 942</b>	<b>263 736</b>	<b>13 066 977</b>	<b>646 303</b>

## Notes to the Annual Financial Statements

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### 30. Executive and Directors' Emoluments (continued)

#### Directors

2022

	Directors' Fees	Total
Dr T. Motshudi (Chairperson)	219 660	219 660
Ms P.D. Peta (Deputy Chairperson)	197 223	197 223
Mr P. Phili	191 706	191 706
Ms L.N. Dlamini	127 602	127 602
Mr D.M. Mamphita	131 490	131 490
Mr B.P. Petlane	161 814	161 814
Dr N.Z. Qunta	167 847	167 847
Ms V. Miya	74 034	74 034
Mr M.A. Mosia	32 454	32 454
Mr P. Becker **	72 846	72 846
	<b>1 376 676</b>	<b>1 376 676</b>
<b>CNSS Panel Members</b>	<b>Members' Fees</b>	<b>Total</b>
Mr J.C. Repussard	10 476	10 476
Dr H.M. Sithole	10 476	10 476
Dr A. Pautz	10 476	10 476
	<b>31 428</b>	<b>31 428</b>

\*\* Contract terminated - 25 February 2022

2021

	Directors' Fees	Total
Dr T. Motshudi (Chairperson)	162 130	162 130
Dr P. Dube (Deputy Chairperson)	30 745	30 745
Ms B. Mokoetle	36 504	36 504
Mr P. Phili	145 021	145 021
Mr A. Le Roux	39 287	39 287
Dr B. Sehlapelo	18 252	18 252
Mr K.S. Kakoma	44 525	44 525
Ms L.N. Dlamini	61 182	61 182
Mr D.M. Mamphita	81 972	81 972
Ms P.D. Peta (Deputy Chairperson)	102 548	102 548
Mr B.P. Petlane	96 906	96 906
Dr N.Z. Qunta	80 496	80 496
	<b>899 568</b>	<b>899 568</b>

# Notes to the Annual Financial Statements

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## 30. Executive and Directors' Emoluments (continued)

Independent Technical Committee Advisor	Advisors' Fees	Total
Mr P. Fitzsimons	5 238	5 238
Dr M.E. Makgae	5 238	5 238
	<b>10 476</b>	<b>10 476</b>
CNSS Panel Members	Members' Fees	Total
Ms K.E. Chiloane	16 381	16 381
Mr J.C. Repussard	19 638	19 638
Dr H.M. Sithole	13 095	13 095
Mr F. van Niekerk	2 409	2 409
	<b>51 523</b>	<b>51 523</b>

## 31. Risk Management

### *Financial risk management*

The entity's activities expose it to a variety of financial risks: fair value interest rate risk, cash flow interest rate risk, price risk and credit risk.

The entity's overall risk management programme focusses on the unpredictability of liquid cash and seeks to minimise potential adverse effects on the entity's financial performance. Risk management is carried out by the Executive Committee of the NNR under policies approved by the Accounting Authority. Entity finance division identifies, evaluates and hedges financial risks in close co-operation with the entity's Audit and Risk Management Committee. The Accounting Authority provides written principles for overall risk management, as well as written policies covering specific areas, such as, interest rate risk and credit risk.

### *Liquidity risk*

Prudent liquidity risk management implies maintaining sufficient cash. The NNR's primary source of funding is authorisation fees which are gazetted in terms of section 28 of the National Nuclear Act 1999, (Act No. 47 of 1999). The NNR maintains liquidity by collecting and paying within 30 days and by limiting capital and operational expenditure within the pre-approved budget. Impairment rate for the year as reported on Note 8 was 13,30% (9,17% - 2020/21) against the total authorisation fees recognised on the statement of financial performance. Payables for the year was 3,11% (4,39% - 2020/21) against the total expenditure. The NNR maintained a positive cash balance of R141 914 815 compared to R104 257 590 of the previous financial year.

# Notes to the Annual Financial Statements

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## 31. Risk Management (continued)

### *Credit risk*

Credit risk consists mainly of cash deposits, cash equivalents, and trade debtors.

Trade receivables comprises of licence and certificate holders by major reputable mining and scrap metal companies. Management evaluates credit risk relating to each license or certificate holder on an ongoing basis and continuously implements strict collection terms. There are no independent crediting ratings, risk control assesses the credit quality of customers, taking into account financial position, past experience and other factors before a licence or certificate can be granted. The impairment rate for the year as reported on Note 8 was 13,30% (9,17% - 2020/21) against the total authorisation fees recognised on the statement of financial performance.

### **Trade receivables past due but not impaired**

Trade receivables which are less than a year past due are not considered to be impaired. At 31 March 2022 - R36 558 (2021: R31 696 073) were past due date but not impaired.

The ageing of amounts past due date but not impaired is as follows:

Current	12 312	-
1 months past due	16 215	16 302 872
2 months past due	8 030	6 043 166
3 months past due	-	62 493
4 months past due	-	-
6 months past due	-	9 287 541

### **Trade receivables impaired**

As of March 31, 2022, trade receivables of R27 917 191 (2021: R19 510 105) were impaired and provided for.

The ageing of these receivables is as follows:

Over 120 days	27 917 191	19 510 105
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Provision for impairment of trade receivables is established when there is objective evidence that the NNR will not be able to collect all amounts due according to the original terms of receivables. The calculation of the amount to be provided for impairment of receivables requires the use of estimates and judgements.

In terms of section 29(2) of the NNR Act, the Minister (DMRE) must, on recommendation of the Board and in consultation with the Minister of Finance and by notice in the Gazette, determine the level of financial security to be provided by holders of nuclear installation licences in respect of each of the various nuclear installation licence categories. There was no requirement for licence holder to provide any financial securities in the period under review.



# Notes to the Annual Financial Statements

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## 31. Risk Management (continued)

### *Interest rate risk*

The entity's interest rate risk arises from long-term borrowings. Borrowings issued at variable rates expose the NNR to cash flow interest rate risk.

The entity analyses its interest rate exposure on a dynamic basis. Various scenarios are simulated taking into consideration refinancing, renewal of existing positions, and alternative financing. Based on these scenarios, the entity calculates the impact on surplus or deficit of a defined interest rate shift.

### *Cash flow interest rate risk*

Financial instrument	Current interest rate	Due in less than a year	Due in one to two years	Due in two to three years	Due in three to four years	Due after five years
Bond over property - floating rate	7,75%	2 651 671	-	-	-	-

The NNR owns an office building located at Erf 3078 in Highveld, Centurion in Gauteng. This building is pledged as security for a mortgage bond held with ABSA. The balance on the mortgage bond at the end of March 2022 was R2,6 million and is due to be settled at the end of June 2022.

### *Price risk*

The NNR's exposure to price risk is minimal as the NNR determines authorisation fees based on cost recovery principle, time spent and effort required for each of the authorisations holders which are gazetted in terms of section 28 of the NNR Act.

## 32. Going Concern

The annual financial statements have been prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business.

## 33. Fruitless and Wasteful Expenditure

Opening balance	21 331	21 331
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No fruitless and wasteful expenditure was incurred during the 2021/2022 financial year. The balance of R21 331 is still under investigation.

## Notes to the Annual Financial Statements

Figures in Rand	2022	2021
<b>34. Irregular Expenditure</b>		
Opening balance	245 112	169 989
Add: irregular expenditure - current year	22 264	75 123
	<b>267 376</b>	<b>245 112</b>

### *Details of irregular expenditure – current year*

The balance of R245 112 relates to irregular expenditure incurred or reported in the 2020/2021 financial year. Irregular expenditure incurred in the current financial year is as follows:

34.1. Irregular expenditure to the value of R22 264 was incurred as a result of non-compliance with the SCM process during the hiring of equipment from University of Cape Town.

### **35. Reconciliation between Budget and Statement of Financial Performance**

Reconciliation of budget surplus/(deficit) with the surplus/(deficit) in the statement of financial performance:

Net surplus per the statement of financial performance	811 215	24 907 711
<b>Adjusted for:</b>		
Provision for doubtful debts	8 805 881	10 462 318
Actuarial gain/loss	275 303	(414 397)
Variance on authorisation fees	998 203	23 030 329
Variance on other income	15 527 175	(4 443 840)
Variance in compensation	16 701 159	(13 009 413)
Variance on goods and services	(28 024 085)	(26 857 527)
Variance on depreciation	1 138 373	1 473 952
Variance on finance cost	(637 432)	(1 114 551)
Variance on capital expenditure	(14 758 122)	(15 861 713)
Variance on investment income	(837 670)	1 827 131
<b>Net surplus per approved budget</b>	<b>-</b>	<b>-</b>

### **36. Budget Differences**

#### *Material differences between budget and actual amounts*

##### **36.1. Authorisation fees**

Revenue from authorisation fees, for the period under review, amounted to R209,8 million against a budget of R210,9 million. The variance of 0,5% can be attributed to the decline in the number of regulated licences, caused by the number of licence surrenders and reclassification of licences from higher to lower categories.

## Notes to the Annual Financial Statements

### 36. Budget Differences (continued)

#### 36.2. Application fees

Application fees for the New Installation Site Licence (NISL) accounts for a larger portion of this revenue stream. A total of R25,4 million was realised, compared to a budget of R41,9 million, for the period under review. The 39% variance between projected and actual revenue is attributed to the unpredictable number of applications and associated quantum at the planning period.

#### 36.3. Finance cost

The variance of 49% on finance cost can be attributed to projection of a higher interest rate increase at the beginning of the year. Total finance cost for the year amounted to R652 000 compared to a budget of R1,2 million. The borrowing rate, at the time of reporting was 7,75 percent.

#### 36.4. Other income

This revenue stream is comprised mainly of recoveries from services rendered by the NNR on behalf of partner institutions (IAEA, ENSTTI, etc.). The variance of about 16%, realised in the period under review is attributed to lower projections of the revenue during budget adjustment. Total revenue for the year amounted to R883 000, compared to a budget of R762 000.

#### 36.5. Interest received

Interest received amounted to R8,2 million at the end of March 2022. This increase is attributed to the consistent positive cash balance on the investment accounts and the increase in interest rates by the South Africa Reserve bank monetary committee. The interest received is 11,3% over the annual target.

#### 36.6. Compensation of employees

Expenditure on compensation of employees for the period under review exceeded the budget by 9%. Total expenditure amounted to R202 million against a budget of R185 million. The variance is attributed to payment of a performance bonus that was not budgeted for in the current financial year but provided for in the previous financial year and paid from the balance sheet.

#### 36.7. Goods and services

The total expenditure on goods and services for the year under review amounted to R62,2 million compared to the annual budget of R88,6 million which results in 30% underspending. This can partly be attributed to the low spending in consultation, seminars and traveling expenses for both local and foreign activities due to COVID-19 restrictions. The suspension of procurement transactions above R30 000 by National Treasury, following the Constitutional Court ruling in February 2022, has also affected spending during the period under review.

## Notes to the Annual Financial Statements

### 36.8. Capital expenditure

Total budget for capital expenditure for the period under review amounted to R14,7 million. The bulk of the budget was earmarked for the construction of the Cape Town office building. There was a delay in the finalisation of the handing over the site to the contractor to start the demolition of the old building and resume with the construction. The construction site has since been handed over to the constructor, and demolition and construction is expected to resume in the 2022/23 financial year.

### 36.9. Debt impairment

The NNR provides for impairment of trade receivables when there is objective evidence that the NNR will not be able to collect all amounts due according to the original terms of receivables. The total debt impairment for the period under review amounts to R8,8 million. The NNR does not budget for debt impairments, and calculates this amount using estimates and judgments.

### 36.10. Interest on overdue debtors

The NNR charges interest on debtors that fail to settle the account within 30 days after the issuing of invoices. Interest on overdue debtors amounted to R104 000 at the end of March 2022. The NNR does not budget for the line item.

### 36.11. Depreciation and amortisation

The NNR budgeted an amount of R10 million for depreciation and amortisation for the period under review. The variance of R1,1 million can be attributed to the addition of PPE and adjustment in depreciation resulting from changes in accounting estimates.

### 36.12. Lease rentals on operating lease

Total expenditure on lease rentals on operating lease for the year under review amounted to R4,7 million compared to the budget of R6,4 million. This resulted in a variance of 26% underspending. This can be attributed to higher projections due to uncertainties on the value of the contracts that were due for renewal.

### 36.13. Actuarial gains/losses

Actuarial gains and losses arise from increases or decreases in the value of the NNR's definite benefits obligations. This amount is not budgeted for, and is derived from the actuarial valuations performed by an independent actuary.

### 36.14. Deferred income

Deferred income is not budgeted for hence the 100% variance. This amount of revenue is recognised as and when services are rendered or funds spent from unspent conditional grant.

## 37. B-BBEE Performance

Information on compliance with the B-BBEE Act is included in the annual report under the section titled B-BBEE Compliance Performance Information.

# Glossary of Terms

**Action:** The use, possession, production, storage, enrichment, processing, reprocessing, conveying or disposal, or causing to be conveyed of radioactive material. Any action, the performance of which may result in persons accumulating a radiation dose resulting from exposure to ionising radiation. Any other action involving radioactive material.

**Assessment:** The process and the result of systematically analysing the hazards associated with sources and actions, and associated protection and safety measures aimed at quantifying performance measures for comparison with criteria.

**Becquerel (Bq):** The unit of radioactivity in nuclear transformations (or disintegrations) per second.

**Clearance:** The removal of radioactive materials or radioactive objects within actions authorised by a nuclear installation licence, nuclear vessel licence, or certificate of registration, from any further control by the Regulator.

**Collective dose:** An expression of the total radiation dose incurred by a population, defined as the product of the number of individuals exposed to a source and their average radiation dose. The collective dose is expressed in person-sievert (person.sv).

**Critical group:** A group of members of the public that is reasonably homogeneous with respect to its exposure to a given radiation source and given exposure pathway, and is typical of individuals receiving the highest effective dose or equivalent dose (as applicable) by the given exposure pathway, from the given source.

**Decommissioning:** Administrative and technical actions taken to allow the removal of all of the regulatory controls from a facility (except for a repository which is closed and not decommissioned).

**Defence in-depth:** The application of more than a single protective measure for a given radiation or nuclear safety objective, so that the objective is achieved, even if one of the protective measures fails.

**Discharge:** A planned and controlled release of radioactive nuclides into the environment.

**Disposal:** The emplacement of radioactive waste in an approved, specified facility without the intention of retrieval. The term "dispose of" has a corresponding meaning.

**Disused sealed source:** A radioactive source, comprising radioactive material that is permanently sealed in a capsule or closely bonded and in a solid form (excluding reactor fuel elements) that is no longer used and is not intended to be used for the action for which an authorisation had been granted.

**Dose:** The amount of radiation received, where the use of a more specific term, such as "effective dose" or "equivalent dose" is not necessary for defining the quantity of interest.

**Dose constraint:** A prospective and source-related restriction on the individual dose arising from the predicted operation of the authorised action, which serves exclusively as a bound on the optimisation of radiation protection and nuclear safety.

**Dose limit:** The value of the effective dose or equivalent dose to individuals from actions authorised by a nuclear installation licence, nuclear vessel licence or certificate of registration, which must not be exceeded.

**Emergency planning:** The process of developing and maintaining the capability to take action that will reduce the impact of an emergency on persons, property or the environment. The capability to promptly take action that will effectively reduce the impact of an emergency on persons, property or the environment.

**Emergency response:** The performance of action to reduce the impact of an emergency on persons, property or the environment.

**Environmental monitoring:** The measurement of external dose rates, due to sources in the environment, and of radioactive nuclide concentrations in environmental media.

**Exposure:** The act or condition of being subjected to radiation.

**Exposure pathways:** A route by which radioactive material can reach or irradiate humans

**Inspector:** The person appointed as such in terms of Section 41(1) of the NNR Act.

**Minister:** The Minister of Energy.

**Monitoring:** The continuous or periodic measurement of radiological and other parameters, or the determination of the status of a system.

**Nuclear accident:** Any event or succession of events having the same origin and resulting in an unintended/ exposure to radiation or the release of radioactive material, which is capable of giving rise to an effective dose in excess of 1msv to the public on-site within a year, or in excess of 50msv to a worker on-site, essentially received at the time of the event.

**Nuclear authorisation:** A nuclear installation licence, nuclear vessel licence, certificate of registration or certificate of exemption.

**Nuclear damage:** Any injury to or the death or any sickness or disease of a person; or other damage, including any damage to or any loss of use of property or damage to the environment, which arises out of, or from, or is attributable to, the ionising radiation associated with a nuclear installation, nuclear vessel or action.

**Nuclear incident:** Any unintended event that is reasonably capable of giving rise to an effective dose equal to, or in excess of 0.1msv to the public on-site received essentially at the time of the event, or the unintended spread of radioactive contamination or exposure to radiation, which could reasonably give rise to an effective dose in excess of 20msv to a worker on-site, received essentially at the time of the event, or significant failure of safety provisions.

**Nuclear installation:** A facility, installation, plant or structure, designed or adapted for, or which may involve the conducting of any process, other than the mining and processing of ore within the nuclear fuel cycle involving radioactive material, including, but not limited to:

A uranium or thorium refinement or conversion facility;

A uranium enrichment facility; A nuclear fuel fabrication facility;

A nuclear reactor, including a nuclear fusion reactor or any other facility intended to create nuclear fusion;

A spent nuclear fuel reprocessing facility;

A spent nuclear fuel storage facility;

An enriched uranium processing and storage facility; and

A facility specifically designed to handle, treat, condition, temporarily store or permanently dispose of any radioactive material that is intended to be disposed of as waste material; or

Any facility, installation, plant or structure declared to be a nuclear installation, in terms of section 2(3) of the NNR Act.

**Nuclear safety:** The achievement of safe operating conditions, the prevention of nuclear accidents or the limiting of nuclear accident consequences resulting in the protection of workers, the public and the environment against the potential harmful effects of ionising radiation or radioactive material. Radiation protection of people from the effects of exposure to ionising radiation, and the means of achieving this.

**Radiation protection monitor:** A person, technically competent in radiation protection matters relevant to a given type of action, who is designated by the holder of a nuclear authorisation to perform radiation measurements.

**Radiation protection officer:** A person, technically competent in radiation protection matters relevant for a given type of who is designated by the holder of a nuclear authorisation to oversee the application of relevant requirements.

**Radiation protection specialist:** A person trained in radiation protection and other areas of specialisation necessary to be able to assess radiological conditions, to limit radiological consequences or to control doses.

**Radioactive material:** Any substance consisting of or containing any radioactive nuclide whether natural or artificial, including, but not limited to, radioactive waste and spent nuclear fuel.

**Radioactive nuclide:** Any unstable atomic nucleus, which decays spontaneously with the accompanying emission of ionising radiation.

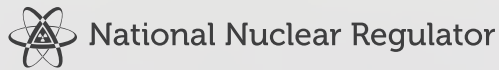
**Radioactive waste:** Any material, whatever its physical form, remaining from an action requiring a nuclear installation licence, nuclear vessel licence or certificate of registration and for which no further use is foreseen, and that contains or is contaminated with radioactive material and does not comply with the requirements for clearance. The quantitative or qualitative criteria specified by the operator and approved by the regulator, for radioactive waste to be accepted by the operator of a repository for disposal, or by the operator of a storage facility for storage.

**Risk:** (Qualitatively expressed), the probability of a specified health effect occurring in a person or a group of persons, as a result of exposure to radiation or (quantitatively expressed), a multi-attribute quantity expressing hazard, danger or chance of harmful or injurious consequences associated with actual or potential exposure relating to quantities, such as the probability that specific deleterious consequences may arise, as well as the magnitude and character of such consequences.

**Safety assessment:** An analysis to evaluate the performance of an overall system and its impact, where the performance measure is radiological impact or some other global measure of impact on safety.

**Safety case:** A collection of arguments and evidence in support of the safety of a facility or action. This normally includes the findings of a safety assessment and a statement of confidence in these findings.

**WCA:** Wonderfonteinspruit Catchment Area

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