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1 National Nuclear Regulator's Organisational Profile



2

The National Nuclear Regulator is mandated in terms of The National Nuclear Regulator Act, (Act No. 47 of 1999).

1.1 Vision

To be a leading impartial authority for the regulation of the safe use and handling of nuclear and radioactive materials.

1.2 Mission

To provide an effective and efficient national regulatory framework for the protection of persons, property and the environment against nuclear damage through:

- Application of safety standards and regulatory practices; and
- Human resources and transformation practices best suited to the nuclear regulatory needs of the nation.

1.3 Mandate

The NNR is mandated, through the NNR Act and as the competent authority for nuclear regulation in South Africa, to provide for the protection of persons (the public and workers), property and the environment against nuclear damage.

The NNR's regulatory practices include prescriptive and descriptive approaches, as appropriate, and focuses on holders of authorisations instituting appropriate processes for compliance with regulatory requirements.

Section 5 of the NNR Act provides that the objectives of the Regulator are to:

1. Provide for the protection of persons, property and the environment against nuclear damage through the establishment of safety standards and regulatory practices;
2. Exercise regulatory control related to safety over the siting, design, construction, operation, manufacture of component parts, and decontamination, decommissioning and closure of nuclear installations;
3. Exercise regulatory control over other actions, to which this Act applies, through the granting of nuclear authorisations;
4. Provide assurance of compliance with the conditions of nuclear authorisations through the implementation of a system of compliance inspections;
5. Fulfil national obligations in respect of international legal instruments concerning nuclear safety; and
6. Ensure that provisions for nuclear emergency planning are in place.

Furthermore, the NNR Act stipulates that the functions of the Regulator are to:

1. Grant or amend nuclear authorisations;
2. Employ assets and deploy resources (hire, purchase, acquire);
3. Collaborate with other institutions for the collection and dissemination of scientific and technical information regarding nuclear energy;
4. Collaborate with other institutions regarding provision of instruction for or training of persons required by the NNR;
5. Provide financial and other assistance for the training of people to enable the NNR to perform its functions;
6. Insure itself against loss, damage, risk or liability;
7. Advise the Minister on:
 - a. Conditions that may cause nuclear damage
 - b. Items the Minister has referred to the NNR
 - c. What the NNR thinks necessary;
8. Act as the national competent authority in connection with the International Atomic Energy Agency (IAEA) Regulations for the Safe Transportation of Radioactive Material;
9. Conclude contracts to enhance the value of the services rendered by the NNR; and
10. Prepare and submit an annual report on the health and safety of workers, the public and the environment associated with all sites.

I have pleasure in submitting the annual report of the National Nuclear Regulator (NNR) for the year 2007/08 to the Honourable Minister of Minerals and Energy, Ms BP Sonjica, in accordance with section 7(1) (j) of the National Nuclear Regulator Act (Act No. 47 of 1999) (NNR Act).

The NNR is established in terms of the NNR Act which came into effect on 20 February 2000. The facilities and actions regulated by the NNR are diverse, including the operation of nuclear power reactors, research reactors, nuclear fuel fabrication, nuclear technology applications and the mining and processing of uranium and other radioactive ores.

The mandate of the NNR is to provide for the protection of persons, property and the environment against nuclear damage through:

- The establishment of safety standards and regulatory practices;
- The exercise of regulatory control over nuclear installations, vessels propelled by nuclear power or having radioactive material, capable of causing nuclear damage on board and any action capable of causing nuclear damage, to which the NNR Act applies; through the issue of nuclear authorisations and the provision of assurance of compliance thereto;
- Ensuring that provisions for nuclear emergency planning are in place; and
- Acting as the national competent authority in connection with the International Atomic Energy Agency's Regulations for the Safe Transport of Radioactive Material.

In ensuring that the nuclear sector in South Africa is regulated in an effective and efficient manner, the NNR facilitated the conclusion of 11 co-operative agreements with organs of state. The conclusion of these agreements will ensure there is an integrated approach to the effective monitoring and control of nuclear hazards, proper co-ordination, exercise the regulatory function and minimise the duplication of such functions.

During the reporting period, the NNR Board has actively monitored the state of compliance in safety matters by the licence holders, in particular the public and worker doses. In general the NNR authorisation holders demonstrated compliance with the conditions of authorisation and in particular the dose limits for workers and members of



the public. Where non-compliance with the conditions of authorisation was identified, the NNR has initiated enforcement actions. Enforcement actions are designed to respond to non-compliances with specified conditions and requirements. The enforcement actions are commensurate with the seriousness of the non-compliance and may take the form of written warnings, penalties, curtailment of operations, suspension of the authorisation, or ultimately withdrawal of the authorisation. In all cases, the holder of the authorisation is required to:

- Remedy the non-compliance;
- Perform a thorough investigation in accordance with an agreed timescale; and
- Take all necessary measures to prevent recurrence.

The NNR has also prioritised the need to create nuclear safety awareness by reviewing the stakeholder engagement process in order to enhance the efficacy and frequency of face-to-face stakeholder Management especially with the affected communities.

The increasing population and resultant developments surrounding nuclear installations has been a concern for the NNR and revised regulations in this regard are being contemplated currently to ensure the safety of the public and the viability of the emergency plans.

The draft Nuclear Strategy and Policy made pronouncement of rapid expansion in the nuclear sector. The NNR has commenced with the preparatory work to evaluate different technologies and strategies to build in-house capacity in responding to the challenge. This eminent change broadens the scope of the NNR's oversight and breadth of its activities.

The most daunting challenge still facing the NNR is the ability to attract and retain skilled and experienced personnel to carry out its mandate. This is primarily due to the current general competition for talent across a number of industries in the country. It is therefore important for the NNR, as a matter of priority, to proactively focus on rebuilding the Human Resources function and capability is a key strategic imperative.

The NNR's total operating revenue for the year was R71 million, of which R53 million was derived from services rendered to holders of nuclear licences (Koeberg Nuclear Power Station, the PBMR project, and the South African Nuclear Energy Corporation (Necsa)) and holders of certificates of registration (mines and small users of radioactive materials and processes). R18 million came by way of a direct Government grant.

Unfortunately the NNR received a qualified audit for this reporting period. The main causes for the qualification have been noted and scheduled for urgent attention. The capacity challenges in the finance department are a recent concern which the NNR Board and the Executive is committed to address urgently in order to ensure that the required finance processes are put in place.

In conclusion, I wish to thank all the staff and managers of the NNR for their sustained efforts during the year. I look forward to working with the Board, Management and staff during the coming year, in meeting the mandate of the NNR and its responsibilities to the people of South Africa.



May A Hermanus

Chairperson: National Nuclear Regulator

3.1 Overview

My appointment as Acting Chief Executive Officer of the NNR took effect on 1 July 2008, and accordingly I wish to thank my predecessor in this office, Mr Maurice Magugumela, and the Board of Directors for their efforts and diligence in their stewardship.

The NNR has made good progress in a number of strategic objectives set at the beginning of the 2007/08 period. I will present the highlights of the year under review, the details of which are found elsewhere in the report.

3.2 Major Milestones in the Regulatory Programmes

Authorisations for the Mining and Mineral Processing Facilities

A total of eighteen (18) nuclear authorisations in the form of Certificates of Registration (COR) were issued by the NNR in the reporting period for the regulatory oversight of Naturally Occurring Radioactive Material (NORM) facilities.

Nuclear Vessel Licence

In the reporting period the NNR received an application for a nuclear vessel licence from the South African Navy on behalf of the British Royal Navy, for a UK nuclear power propelled submarine to visit the naval base at Simon's Town from 27 September to 6 October 2007. Following the satisfactory completion of the technical review and public participation process a nuclear vessel licence was granted to the applicant. The NNR conducted an independent radiological monitoring programme, including ambient radiation monitoring, water and shellfish samples, in the vicinity of the vessel prior to and during the visit as well as once the ship had left the Simon's Town naval base. No anomalies were recorded.

Preparation for New Build Programme

In July 2006, Eskom officially notified the NNR that it was investigating and undertaking feasibility studies into the choice of technology towards new nuclear generating capacity, in addition to that to be supplied by the Pebble Bed Modular Reactor (PBMR). An essential step in the process has been the establishment of a strategic framework for licensing the selected technology, and the site(s) where the technology is intended to be built.



The NNR is in the process of developing regulatory criteria for siting of prospective new nuclear installations and a strategy for the licensing of such plants. These developments go hand-in-hand with developments on regulatory processes, international participation and capacity building.

Wonderfonteinspruit Catchment Area

The NNR commissioned a study in November 2006 to assess the radiological impacts of mining activities in the Wonderfonteinspruit Catchment Area (WCA). The study set out to determine the radiological impacts of the current mine water discharges, the diffuse emissions of seepage and runoff from slime dams and legacies of past radioactive contamination, now present as radionuclides that have accumulated in sediments and soils. The study indicated the presence of elevated levels of contamination via various pathways in the area. In light of the fact that the pattern of contamination is complex and includes chemical and radiological contaminants the proposed solutions to this problem will involve several stakeholders both in Government, industry, and the public domain.

In order for the NNR to fulfil its mandate for the protection of persons, property and the environment from nuclear and radiological hazards, the contamination problems in the WCA must be addressed and the NNR has drawn up an integrated project plan to address the problems in the WCA. A national

initiative has been launched by the NNR and other key role players such as the Department of Water Affairs and Forestry (DWAF) to establish a national committee, namely, the Steering Committee for the Remediation of Mining Related Radioactive Contamination. This committee consists of other key Government role players including, the Department of Environmental Affairs and Forestry (DEAT), the Department of Minerals and Energy (DME) and the Department of Agriculture (DoA). The primary objective of this national committee is to oversee the remediation of the WCA, ensuring that regulatory imperatives are met and that the mining industry plays an active role in the problem solving for the area.

Directives were issued, by the NNR, to the mines operating in the area to ensure that operations are conducted in a safe and secure manner while protecting members of the public, the affected communities and the surrounding environment from further radiological hazards. All short term actions that were stipulated have been checked for compliance with the details specified by the NNR.

The affected communities have been apprised of the risk posed by the contamination in the area and the national initiatives that will provide a sustainable solution to ensuring that the WCA is made safe for all.

The solutions going forward will involve Government, industry, and the affected communities of the WCA. The NNR will continue to implement relevant measures where possible, to ensure that protection of the public and the environment is being monitored.

Memorandum of Agreement with Technical Support Organisations

The NNR and the IRSN (the technical support organisation to the French Nuclear Safety Authority (ASN)) concluded a Memorandum of Agreement (MoA) to provide support for the NNR assessment mainly associated with, but not limited to, its regulation of the Koeberg Nuclear Power Plant and the South African Nuclear Energy Corporation (Necsa) facilities.

3.3 Status of Compliance with Regulatory Requirements

Koeberg Nuclear Power Station

There is an acceptable level of compliance with the conditions of the nuclear licence over the reporting period. However, substandard performance was identified in configuration control and record keeping. The NNR is closely monitoring the corrective actions identified to address these shortcomings.

Necsa

There is an acceptable level of compliance with the conditions of the nuclear licence over the reporting period. However, following a security breach at the Pelindaba site, the NNR issued two directives to Necsa and undertook an independent investigation into the event.

The NNR investigation identified a number of deficiencies in the existing Necsa security provisions. These deficiencies require that Necsa undertake a detailed review of all current security provisions and make detailed proposals for the upgrading of the system. The NNR will be monitoring the implementation of corrective actions identified to address the deficiencies.

Mining and Minerals Processing

The NNR increased the frequency of conducting compliance assurance inspections at all facilities whose projected cumulative dose, namely, the so-called Special Case Mines (SCMs), indicated a possibility of exceeding the regulatory annual dose limit. This has ensured that the engineering and administrative controls are effectively implemented and monitored and the doses are considerably reduced. The compliance assurance audits indicated a significant improvement as shown in the reduction of non-conformities with regard to the quality management systems at various audited facilities.

As reported previously, some intervention strategies have been put in place, which include improvement of the engineering, administrative controls and the introduction of avertable annual doses in these facilities and the NNR will continue to monitor these facilities.

3.4 Regulatory Enforcement Actions Taken

As a result of the routine inspections conducted by the NNR, tougher action was taken to enforce compliance with conditions of authorisation and several directives were issued to COR holders to cease all operation until identified non-compliances had been satisfactorily addressed.

Regulatory Action in Respect of the Manufacturing of Components Important to Safety by PBMR

As reported in the previous annual report, in October 2006, following the discovery by the NNR that certain activities relating to the manufacturing of components for the PBMR Demonstration Power Plant (DPP) had commenced without the necessary regulatory control as required in terms of the

NNR Act, the NNR directed PBMR (Pty) Ltd, through Eskom, to suspend all such activities.

The stop-work directive was issued when the NNR felt that the regulatory principles, requirements and processes were in danger of being severely compromised and that the NNR was not in a position to exercise its regulatory mandate.

The NNR directed that the manufacturing activities remain suspended until such time that:

- The NNR is satisfied that appropriate corrective actions arising from the investigation to be undertaken by Eskom, have been accepted and implemented;
- Appropriate processes have been agreed with the NNR;
- The necessary monitoring programmes are completed; and
- The relevant technical documents have been submitted by Eskom/PBMR and have been reviewed and accepted by the NNR.

Following an urgent intervention by the applicant during the reporting period, the NNR is now satisfied that measures subsequently implemented satisfactorily address the matters that led to the suspension. The NNR is confident that robust processes are in place at Eskom and PBMR to allow for the lifting of the suspension on manufacturing related activities. The suspension was therefore lifted in December 2007. Material produced prior to the lifting of the suspension is currently under quarantine at the respective PBMR suppliers. Eskom and PBMR will have to demonstrate and justify on a case-by-case basis that the materials are fit for application in the PBMR DPP.

3.5 Key Highlights in Support Services

Market Related Remuneration System

The Board of the NNR approved a market-related based remuneration system to enhance the NNR's ability to attract and retain skilled personnel. This has now been implemented.

Co-operative Agreements

To give effect to the principles of co-operative Government and intergovernmental relations contemplated in Chapter 3 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), all organs of state, as defined in section 239 of the Constitution, on which functions in respect of the monitoring and control of radioactive material or exposure to

ionising radiation are conferred by this Act or other legislation, must co-operate with one another in order to:

- Ensure the effective monitoring and control of the nuclear hazard;
- Co-ordinate the exercise of such functions;
- Minimise the duplication of such functions and procedures regarding the exercise of such functions; and
- Promote consistency in the exercise of such functions.

Although the NNR has faced challenges in the finalisation of co-operative agreements, as required by the provisions of Section 6 of the NNR Act, 11 co-operative agreements have been finalised with every relevant organ of state and submitted to the Minister of Minerals and Energy for final publication.

3.6 Progress with the Information Communication and Technology (ICT) Strategy

The NNR has streamlined and optimised its business processes and systems to enable it to more efficiently and effectively carry out its mandate. The ICT strategy was approved by the NNR Board and in the reporting period, 50% of the strategy initiatives were implemented in order to align information systems and technology with the strategic business direction of the organisation. Implementation of the remaining initiatives will continue in the next two financial years.

3.7 International Co-operation

Internationally, the NNR continued to participate in multilateral activities at various forums. These activities included:

- Participation in the development of safety standards at the IAEA;
- Liasing with international counterparts as part of its commitment to keep abreast of international developments in the regulation of the nuclear industry. Co-operation with the French Regulator, the ASN, continued to strengthen, with a steering committee meeting having taken place in Paris, France hosted by the ASN. The NNR signed a new bilateral agreement with the Argentine regulatory authority and is in negotiations to renew others which have lapsed; and
- Co-operation with other Regulators in the Multi National Evaluation Programme (MDEP), which brings together

regulators who are facing the same challenges in terms of licensing new reactor designs.

Convention on Nuclear Safety

South Africa is a contracting party to the IAEA Convention on Nuclear Safety (CNS) having ratified the convention in 1996. South Africa's obligations under the CNS entered into force on 24 March 1997.

The obligations of the contracting parties are based on the principles contained in the IAEA Safety Fundamentals document "The Safety of Nuclear Installations". These obligations cover aspects such as siting, design, construction and operation, the availability of adequate financial and human resources, the assessment and verification of safety, quality assurance and emergency preparedness.

During the review period, the NNR co-ordinated the compilation of South Africa's 4th National Report which was submitted to the IAEA on 21 September 2007. The scope of the Report covered Articles 6-19 of the CNS, which apply in whole or in part to two South African nuclear installations, namely Koeberg Nuclear Power Station and the PBMR.

At the CNS organisational meeting, held from 24-28 September 2007, to finalise the arrangements for the April 2008 CNS Review Meeting, the NNR's Chief Executive Officer, Mr M Magugumela, was elected President of the 4th CNS Review Meeting.

3.8 Challenges

The NNR continued to experience challenges in other areas indicated below.

Developments around Koeberg:

As a result of a court ruling to set aside Regulation 3 of Regulations #287, as recorded in the NNR Regulatory Requirements Document RD-0015, which specifically apply to developments within a 16 km radius of Koeberg, the document has been formulated into new draft regulations which will specifically apply to the control of developments in this area.

The City of Cape Town authorities have indicated that in the interim, until the draft regulations have been published, they will enforce the NNR requirements as stipulated in RD 0015, as if the original regulations were still in force, to ensure proper control of developments around Koeberg Nuclear Power Station.

Core Business:

The NNR continued to experience difficulties in sustaining an appropriate level of in-house technical capacity (engineers and scientists) to deliver on its core business. This challenge is expected to grow as a result of increased competition for scarce skills. As a matter of priority then, the NNR has proactively engaged in strengthening its in-house capacity, identifying strategic initiatives that will enable it to develop the technical expertise of its human resources, and also enhancing its ability to attract and retain scarce talent. The NNR has developed remuneration and performance management systems that, in the short to medium term, will allow the NNR to attract, develop and retain staff to maximise internal capacity with the long-term view of implementing a comprehensive talent management programme.

Support Business:

There has been lack of leadership continuity in the support business of the NNR, especially in the Finance, Human Resources and Stakeholder Management Departments. These resulted in poor service delivery and lack of strategic support as the Departments became more transactional due to lack of leadership and required competencies. To address the challenges faced, NNR Management embarked on a drive to recruit an experienced and competent Chief Financial Officer, Human Resources Executive and Stakeholder Manager to develop and implement comprehensive business plans that will stabilise the support required to enable the core business to perform its key technical functions. We foresee that this area of the business will stabilise by the second quarter of the next financial year.

Notwithstanding the challenges faced, the NNR has managed to carry out its core business mandate successfully.

3.9 Looking Forward

For the next reporting period, the strategic priorities of the NNR include:

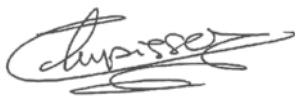
- Development, review and implementation of an appropriate regulatory philosophy and framework (including standards policies, practices and effective compliance monitoring) to provide for the protection of persons, property and the environment against nuclear damage;
- Building stakeholder confidence in South Africa's nuclear regulatory system through the implementation of a communications policy to improve public understanding of the issues relating to the nuclear

sector; providing accurate and timely information to stakeholders about the safety performance of authorisation holders and enhancing the efficacy and frequency of face-to-face stakeholder engagement processes;

- Improving and strengthening internal business processes, aligned to best practice and responsive to environmental dynamics, through the implementation of an integrated management system to ensure excellence in internal business processes, sound financial administration and good corporate governance; and
- Attracting, developing and retaining staff to maximise internal capacity through the use of an innovative talent management strategy to achieve a high quality, diverse work force with the skills needed to achieve the NNR's vision, reducing the NNR's reliance on external technical support by building capacity within the organisation, realignment of policies, procedures and practices to advance the transformation imperative, and ensuring a sustainable safety assessment capability in order to conduct safety assessment reviews for the granting or refusal of authorisations for new actions and the approval of changes to existing actions.

3.10 Appreciation

I wish to convey my sincere appreciation to the Minister of Minerals and Energy and the Director-General and his staff for their support. I thank both the outgoing Chief Executive Officer, Mr Maurice Magugumela, and the Board of the Regulator for their guidance and unwavering support. I thank and pay tribute to the Management and staff of the NNR for their efforts and hard work during the year in the execution of our mandate, and I wish to assure all stakeholders of our sustained endeavours in their respective interests.

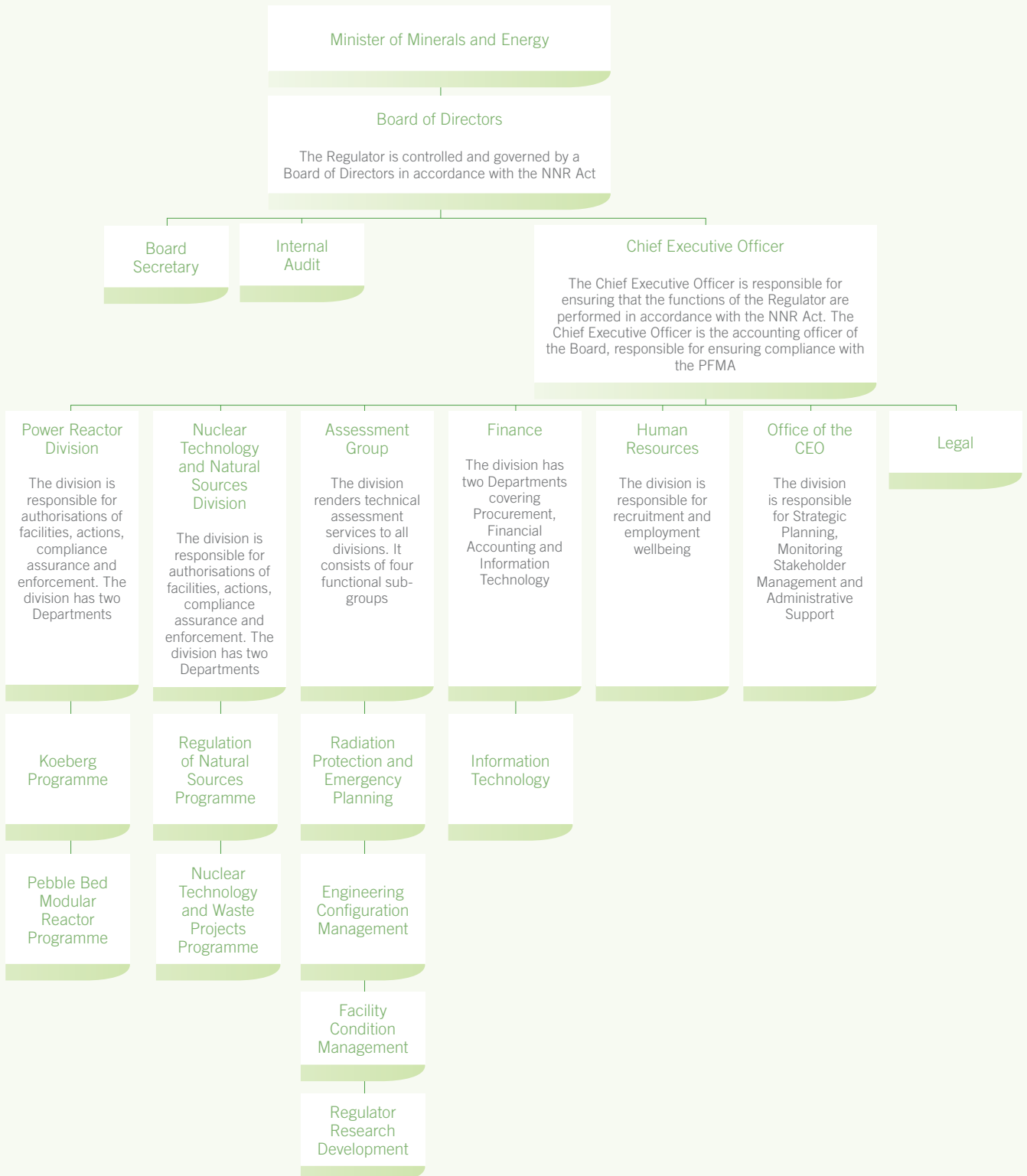


Guy Clapisson
Acting Chief Executive Officer

4 Corporate Governance

4.1 Organisational Structure

The National Nuclear Regulator is accountable to the Minister of Minerals and Energy, who, in terms of the Public Finance Management Act (PFMA), is the executive authority.



4.2 National Nuclear Regulator as an Entity

The NNR is established in terms of the National Nuclear Regulator Act, (Act No. 47 of 1999), which came into effect on 20 February 2000. The facilities and actions regulated by the NNR are diverse, including the operation of nuclear power reactors, research reactors, nuclear fuel fabrication, nuclear technology applications and the mining and processing of uranium and other radioactive ores.

The mandate of the NNR is to provide for the protection of persons, property and the environment against nuclear damage through:

- The establishment of safety standards and regulatory practices;
- The exercise of regulatory control over nuclear installations, vessels propelled by nuclear power or having radioactive material, capable of causing nuclear damage on board and any action capable of causing nuclear damage, to which the NNR Act applies; through the issue of nuclear authorisations and the provision of assurance of compliance thereto;
- Ensuring that provisions for nuclear emergency planning are in place; and
- Acting as the national competent authority in connection with the International Atomic Energy Agency's Regulations for the Safe Transport of Radioactive Material.

The NNR is also mandated to:

- Advise the Minister of Minerals and Energy on matters falling within its purview; and
- Fulfil national obligations in respect of international legal instruments concerning nuclear safety.

4.3 Code of Practice and Conduct

The Board of the NNR has adopted a Code of Conduct and good ethics, which requires the Board Members and employees to conduct themselves with integrity, openness and accountability when dealing with all stakeholders. In terms of the Code, declaration of interest has to be made by both Board Members and staff of the NNR which is updated on an annual basis and which seeks to avoid real, perceived or potential conflict of interest.

4.4 Board of Directors

The Board of Directors, appointed by the Minister of Minerals and Energy (the Executive Authority) in terms of the NNR Act, derives its powers from Section 8 of the NNR Act. It acts as the NNR's accounting authority in terms of the Public Finance Management Act (PFMA). The Board of the NNR has adopted a Board Charter which expands on the responsibilities of the Board of Directors as set out in the above-mentioned Acts and defines the responsibilities of the Board as a unitary working group and those of individual Directors, covering the areas that are not explicitly dealt with in the Acts. The Board Charter is reviewed annually to ensure that it meets best practice as far as reasonably possible within the Regulator's unique environment.

The role of the Board is to ensure that the NNR effectively carries out its mandate as set out in the NNR Act and PFMA by collectively directing the affairs of NNR whilst meeting the interest of the stakeholders including the Executive Authority. The Board fully appreciates the demand for accountability, honesty and transparency in fulfilling its fiduciary duties towards the shareholder and the organisation. To this end, the Board is striving to ensure that the NNR complies with the obligations imposed by various laws and regulations that are applicable to the NNR and the Protocol on Corporate Governance which includes the King II Report.

The Board consists of one Executive Member and twelve Non-Executive members who are independently appointed by the Minister of Minerals and Energy in terms of the NNR Act. Board Members, including the CEO, hold office for a maximum of three years, but are eligible for re-appointment.

Non-Executive Directors



Ms MA Hermanus (Chairperson)
(appointed 1 December 2006)

Ms Mavis (May) Ann Hermanus is Director and Adjunct-Professor of the Centre for Sustainability in Mining and Industry (CSMI) of the School of

Mining Engineering, Faculty of Engineering and the Built Environment, University of the Witwatersrand. She gained her BSc (Geology) at the University of Cape Town and MSc (Engineering, Physical Metallurgy) at the University of the Witwatersrand.



Ms TN Mgoduso (Deputy Chairperson)
(re-appointed 1 December 2006)

Ms Mgoduso has held the position of Director, Imperial Logistics since September 2004. Prior to that, she was the CEO of Freight dynamics, a Transnet business unit. She gained her BA and BA Honours at the University of Fort Hare, followed by scholarships in Germany. She completed her Management (MA) in Clinical Psychology at the University of the Witwatersrand, followed by Management studies at the Wits Business School and specialised courses in the US, UK and Singapore.



Adv BM Mkhize
(re-appointed 1 December 2006)

Adv Mkhize is the Registrar and CEO of the Health Professions Council of South Africa. He gained his BJuris and LLB degrees from the University of Zululand, Advanced Diploma in Labour Law (cum laude) and Business Management Programme from UNISA, and was admitted as an Advocate of the high Court of South Africa. He has served on numerous church, community and training bodies.



Mr D Elbrecht
(re-appointed 1 December 2006)

Mr Elbrecht represents organised labour and is the National Treasurer and a member of the National Executive of the National Union of Mineworkers. He holds an NTC 6 certificate and numerous Management and leadership qualifications.



Mr BA Ramahlo
(appointed 1 December 2006)

Mr Abel Ramahlo is the Security Executive with Sentech Limited. He has a Diploma in International Relations and Diplomacy and Bachelor of Arts (BA) (Political Science) from UNISA.



Mr K Govender
(appointed 1 December 2006)

Mr Krishna Govender is Financial Manager at M-Net. He completed his BCom at the University of Natal (Pietermaritzburg) and his Honours in Accounting at the University's Durban campus. He obtained his CA (SA Institute of Chartered Accountants) in 2001 followed by the Public Practice Examination (Public Accountants' and Auditors' Board) in 2005.



Mr J Rocha
(appointed 1 December 2006)

Mr Rocha is the Deputy Director-General: Minerals Regulation at the Department of Minerals and Energy. He holds a BA Honours in Political Science, BSc Honours in Geology and GDE in Mining, and is currently engaged in studies for his LLB. He led the team that drafted the new Mining and Minerals Policy.



Rev PJ Grove
(re-appointed 1 December 2006)

Rev Grove, who represents communities that may be affected by nuclear activities, is a Minister of Religion, currently attached to the Bureau for Continuing Theological Education and Research at Stellenbosch University. His academic qualifications are BA Hons (Sociology) and BTh (UWC).



Dr DG van der Merwe
(appointed 1 December 2006)

Dr Debbie van der Merwe is Head of Medical Physics at Johannesburg Hospital/University of the Witwatersrand. She is registered as a Medical Physicist (Ionising Radiation) with the Health Professions Council of South Africa and holds, amongst others, memberships of the American Association of Physicists in Medicine and the European Society of Therapeutic and Radiation Oncologists.



Mr WN Lesufi
(appointed 1 December 2006)

Mr Wilson Nikisi Lesufi is the Environmental Adviser to the Chamber of Mines. He gained his BPharm at the University of the North (1985), his BSc (Hons) in Biological Sciences at the University of Leicester (UK) (1989), and his MSc in Microbiology at the University of London (1991).



Ms J Yawitch
(appointed 1 December 2006)

Ms Joanne Yawitch is the Deputy Director-General: Environmental Quality and Protection at the Department of Environmental Affairs and Tourism. She received her BA, BA Hons and MA Development Studies from the University of the Witwatersrand, and her MSc Agriculture Development (with distinction) from the University of London.



Mr T Mofokeng
(appointed 1 February 2007)

Mr Mofokeng is a Director: Internal Audit at the Department of Minerals and Energy. He completed his BCom and Honours in Accounting with the

University of Witwatersrand. He is a Chartered Accountant and a Certified Internal Auditor.

Executive Directors



Mr MT Magugumela (Chief Executive Officer: NNR) (appointed 1 April 2005)

Mr Magugumela is the Chief Executive Officer of the NNR. Mr Magugumela holds a BSc in Physics and Mathematics from Allegheny College, USA and an MA

in Physics from Rice University, USA. He is a member of the IAEA's Commission on Safety Standards (CSS), which advises the Director-General of the IAEA on nuclear safety matters.

Changes in Membership of Non-Executive Directors

Ms TN Zungu resigned and was replaced by Mr T Mofokeng in February 2007 (resigned April 2008)

4.5 Board Secretary's Report

The NNR is committed to the principles of good corporate governance and application of ethical standards in the conduct of its business. Corporate governance embodies processes and systems by which organisations are directed, controlled and held to account. It is concerned with the organisational arrangements that are in place to provide an appropriate set of checks and balances.

The Board regularly reviews governance structures and processes in order to ensure that the organisation operates within the required legislative framework and in accordance with best practices. Issues of governance will continue to receive the consideration and attention of the Board and its Committees during the year ahead.

4.5.1 Board Meetings

The Board meets regularly and retains full and effective control over the organisation. The Board met three times to discuss and review the NNR's operational performance and to address issues of strategic importance. It monitors Management in implementing Board plans and strategies. Special Board meetings are convened when necessary to consider issues that require Board resolutions between scheduled meetings. Members of Management are periodically invited to attend Board meetings.

All Directors have access to the services of the Board Secretary, who is responsible for ensuring that Board procedure is followed.

Attendance at Board Meetings for the Year Ended 31 March 2008						
		Attended	Total Held	Dates Meeting Held		
				26 July 2007	13 September 2007	29 November 2007
Prof MA Hermanus	Chairperson	3	3	P	P	P
Ms TN Mgoduso	Deputy Chairperson	2	3	P	A	P
Mr MT Magugumela	Chief Executive Officer	3	3	P	P	P
Mr D Elbrecht	Member	2	3	P	A	P
Rev. P Grove	Member	3	3	P	P	P
Adv. BM Mkhize	Member	1	3	P	A	A
Ms TN Zungu*	Member	Resigned	3	N/A	N/A	N/A
Mr J Rocha	Member	1	3	P	A	A
Mr K Govender	Member	2	3	P	P	A
Mr WN Lesufi	Member	3	3	P	P	P
Mr BA Ramahlo	Member	3	3	P	P	P
Prof. D Van der Merwe	Member	3	3	P	P	P
Ms J Yawitch	Member	2	3	P	P	A
Mr T Mofokeng*	Member	3	3	P	P	P

*Mr T Mofokeng replaced Ms TN Zungu in February 2007

4.5.2 Committees of the Board

The Board is advised and assisted by three Board Committees i.e. the Audit and Risk Management Committee, the Finance Committee and the Transformation and Development Committee. Board Committees are mechanisms that aid and assist the Board to discharge its responsibilities and its Directors in giving detailed attention to specific areas of their duties and responsibilities such as audit, risk management, human resources and finance. Board Committees meet at least once per quarter and all of the Committees have adopted formal terms of reference (TOR) and provide the required feedback to the Board through committee reports.

The CEO is an *ex officio* member of all these committees. Executive managers are invited to attend relevant meetings of the various committees as appropriate.

Transformation and Development Committee

The Transformation and Development Committee is responsible for determining human resource strategies and policies and recommends these to the Board for approval. These include staff remuneration, human resource development as well as conditions of service.

The Transformation and Development Committee comprises five Non-Executive Directors as follows:

- Ms TN Mgoduso
- Prof. DG van der Merwe
- Mr BA Ramahlo
- Mr D Elbrecht
- Rev. PJ Grove

The Transformation and Development Committee convened five times during the year. Attendance at meetings was as follows:

		Attended	Total Held	Dates Meeting Held				
				12 Apr 07	17 Apr 07	14 Jun 07	11 Oct 07	13 Feb 08
Ms TN Mgoduso	Chair-person	5	5	P	P	P	P	P
Prof. DG van der Merwe	Member	5	5	P	P	P	P	P
Mr BA Ramahlo	Member	5	5	P	P	P	P	P

		Attended	Total Held	Dates Meeting Held				
				12 Apr 07	17 Apr 07	14 Jun 07	11 Oct 07	13 Feb 08
Mr DP Elbrecht	Member	1	5	A	A	A	A	P
Rev. PJ Grove	Member	2	5	A	A	A	P	P

Audit and Risk Management Committee

The Audit and Risk Management Committee comprises three Non-Executive Directors and one Independent Non-Executive Member. A Non-Executive Director who is not the Chairman of the Board chairs the committee. The Audit Committee assists the Board in overseeing:

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

The Members of the Committee are:

- Adv. BM Mkhize;
- Mr J Rocha;
- Mr N Lesufi; and
- Ms P Mzizi.

The Audit and Risk Management committee convened four times during the year. Attendance at meetings was as follows:

		Attended	Total Held	Dates Meeting Held			
				17 May 07	05 Jul 07	30 Oct 07	18 Mar 08
Adv. BM Mkhize	Chair-person	4	4	P	P	P	P
Mr J Rocha	Member	0	4	A	A	A	A
Mr N Lesufi	Member	4	4	P	P	P	P
Ms P Mzizi*	Member	4	4	P	P	P	P

*Ms P Mzizi is an independent audit and risk committee member

Finance Committee

The Finance Committee assists the Board with all related financial matters with a view to optimising the financial resources of the NNR. It is responsible for financial management reporting, organisational financial planning, budget developments and budget control. Furthermore, it is responsible for Information Technology and information management of the organisation.

The Finance Committee comprises three Non-Executive Directors as follows:

- Mr K Govender;
- Mr D Elbrecht; and
- Mr T Mofokeng.

The Finance committee convened five times during the year. Attendance at meetings was as follows:

		Attended	Total Held	Dates Meeting Held				
				5 Jul 07	23 Aug 07	1 Nov 07	22 Jan 08	6 Mar 08
Mr K Govender	Chair-person	4	5	A	P	P	P	P
Mr D Elbrecht	Member	3	5	A	P	A	P	P
Mr T Mofokeng	Member	3	5	A	P	P	P	A

4.6 Executive Committee

The Executive Committee is constituted to assist the CEO to manage the entity in terms of the authority delegated by the Board. Furthermore, the Executive Committee assists the Chief Executive Officer to guide and control the overall direction of the business and acts as a medium of communication and co-ordination between business units and the Board.

The Executive Committee for the reporting period comprised five Executive members as follows:

- Mr M Magugumela - Chief Executive Officer;
- Mr Guy Clapison - Senior Manager, Acting Assessment Group Co-ordinator;
- Mr Orion Phillips - Senior Manager, Nuclear Technology and Natural Sources Division;

- Dr Tim Hill - Acting Senior Manager, Power Reactor Division; and
- Mr Moeketsi Khoahli - Chief Financial Officer.

4.7 Board and Executive Remuneration

Remuneration details are set out in the annual financial statements on pages 87 to 88 of this report.

4.8 Internal Audit and Risk Management Report

The Executives are ultimately responsible for the organisation's system of internal control, designed to provide reasonable assurance against material misstatement and loss. The organisation maintains a system of internal financial control designed to provide the Executives with assurance on the maintenance of proper accounting records and the reliability of financial information used within the business and for publication.

The internal control system includes:

- A documented organisational structure and reasonable division of responsibility;
- Established policies and procedures (including a Code of Ethics to foster a strong ethical climate); and
- Established mechanisms to ensure compliance.

Internal Audit

The internal audit function is responsible for:

- Assisting the Board and Management in monitoring the effectiveness of the Organisation's Risk management process;
- Assisting the Board and Management in maintaining effective controls by evaluating those controls continuously to determine their efficiency and effectiveness and recommending improvements; and
- Assisting the Board and Management in achieving their objectives by evaluating the performance of units and Departments to determine their effectiveness and efficiency and recommending improvements.

The controls subject to evaluation encompass:

- The information management environment;
- The reliability and integrity of financial operating information;
- The safeguarding of assets; and
- The effective and efficient use of the organisation's resources.

Audit plans are based in an assessment of risk areas, as well as on issues highlighted by the Audit and Finance Committee and Management. Audit plans are updated as is appropriate to ensure they are responsive to changes in the business. Significant findings are reported to the Audit and Finance Committee at each of their scheduled meetings. Follow-up audits are conducted in areas where significant internal control weaknesses are found.

Corporate governance best practice requires that the internal audit function reports directly to the Audit and Finance Committee. Such direct reporting is ensured by the Audit and Finance Committee's mandate and practice to:

- Evaluate the effectiveness of the internal audit;
- Review and approve the internal audit charter, internal audit plans and internal audit conclusions about internal control;
- Review significant internal audit findings and the adequacy of corrective actions taken;
- Assess the performance of the internal audit function and the adequacy of available audit resources;
- Review significant differences of opinion between Management and the internal audit function; and
- Consider the appointment dismissal or reassignment of the head of internal audit.

Risk Management

The Board is responsible for governing risk management processes in accordance with corporate governance requirements. The establishment of a more formalised enterprise-wide risk management process was initiated during the 2007/08 financial year with the following principal objectives:

- Providing the Board with assurance that significant business risks are systematically identified, assessed and reduced to acceptable levels in order to achieve an optimal risk reward balance; and
- Making risk identification and risk management an integral part of the daily activities of everyone in the organisation.

Substantial progress has been made to date in achieving the above objectives. Certain components of the process need to be further developed and embedded and programmes are in place to address these. The NNR's enterprise-wide risk management process is guided by the following key principles:

- A clear assignment of responsibilities and accountability;
- A common enterprise-wide risk management framework and process;
- The identification of uncertain future events that may influence the achievement of business plans and strategic objectives; and
- The integration of risk management activities within the company and across its value chains.

The NNR's integrated risk management implementation approach, among others, entails the development of strategic, functional and process risk profiles. Strategic risk is typically defined as those risks that may influence the achievement of strategic business objectives. Similarly, functional and process risks are defined as risks that may influence the achievement of functional and process objectives respectively.

Most Significant Risks

The most significant risks currently faced by the organisation are:

- Business continuity;
- Core verification enforcement;
- Governance;
- Human resources; and
- Stakeholder Management.

The responsibility, by line Management, for monitoring the Management of each of these risks is assigned to an Executive Management Committee member.

Disaster recovery plans are continually reviewed for critical information management systems that could have a material impact on the organisation's continuing operations.

4.9 Public Finance Management Act

Financial Planning and Management

All financial reporting processes were carried out in accordance with the requirements of the Public Finance Management Act, 1999 (Act No.1 of 1999) (PFMA), the National Nuclear Regulator Act of 1999 (Act No.47 of 1999), Treasury Regulations and the Generally Accepted Accounting Practice (GAAP). The Strategic Plan and the Business Plan with Budget were prepared, approved by the Regulator and submitted to the Ministry of Minerals and Energy for approval as required in terms of the PFMA.

Section 17 of the NNR Act states that for the purposes of regulation of nuclear industries, the funds of the NNR consist of, amongst others, authorisation fees imposed by or under separate legislation. The final step in the development process of the NNR Strategic and Business Plans with Budget is the determination of the levies to be imposed on the regulated industries. The total budget for each of the regulated industries is used as one of the elements in determining the authorisation fees for each industry.

Administration and Procurement

The NNR's Black Economic Empowerment (BEE) policy is aligned to national legislative prescripts and enables the NNR to contribute to implementation of the Broad-Based Black Economic Empowerment Act. A substantial portion of total procurement was spent on BEE service providers during the year under review.

4.10 Regulatory Framework

The NNR is established in terms of the NNR Act, which came into effect on 20 February 2000. The mandate of the NNR is to provide for the protection of persons, property and the environment against nuclear damage through:

- The establishment of safety standards and regulatory practices;

- The exercise of regulatory control over nuclear installations, vessels propelled by nuclear power or having radioactive material, capable of causing nuclear damage, on board and any action capable of causing nuclear damage through the issue of nuclear authorisations and the provision of assurance of compliance thereto;
- Ensuring that provisions for nuclear emergency planning are in place; and
- Act as the national competent authority in connection with the International Atomic Energy Agency's Regulations for the Safe transport of Radioactive Material.

The facilities and actions regulated by the NNR cover a diverse range of facilities including the operation of nuclear power reactors, research reactors, nuclear fuel fabrication, nuclear technology applications and the mining and processing of uranium and other radioactive ores.

The NNR is also mandated to:

- Advise the Minister of Minerals and Energy on matters falling within its purview; and
- Fulfil national obligations in respect of international legal instruments concerning nuclear safety.

The NNR Act does not apply to:

- Exposure to cosmic radiation or Potassium-40 in the body;
- Group III Hazardous Substances;
- Group IV Hazardous Substances; and
- Any action where the radioactivity concentration is below the exclusion level specified in the Regulations on Safety Standards and Regulatory Practices (RSRP).

The following Regulations/Notices have been published, in terms of the provisions of the NNR Act:

Table 1: Regulations/Notices

Section in the NNR Act	Description	Reference	Date Published
6(3)	Co-operative Governance in respect of the monitoring and control of radioactive material or exposure to ionizing radiation	GN 709 of 2004	24 May 2002
38(4)	Development Surrounding any Nuclear Installation	GN 287 of 2004	5 March 2004
47 read with section 26(4)	Establishment of Public Safety Information Forums	GN 299 of 2004	12 March 2004
29(1) and 29(2)	Categorisation of nuclear regulator's level of financial security to be provided	GN 581 of 2004	7 May 2004
28	Fees for Nuclear Authorisations (FY 2004/2005)	GN 1033 of 2004	10 September 2004
28	Fees for Nuclear Authorisations (FY 2005/2006)	GN 762 of 2005	29 July 2005
36	Safety Standards and Regulatory Practices	GNR.388 of 2006	28 April 2006
7(1)(j)	Contents of the Annual Public Report	GNR. 716 of 2006	26 July 2006
37(3)(a)	Keeping of Records of all Persons in a Nuclear Accident Defined Area	GN 778 of 2006	4 August 2006
47 read with sections 21 and 22	Format for the Application for a Nuclear Installation Licence or a Certificate of Registration or a Certificate of Exemption	GN 1219 of 2007 (Repealed regulations published under GNR. 479 of 12 May 2000)	21 December 2007

In terms of the regulatory framework, the requirements on applicants or holders of authorisations are further defined in the conditions of authorisation and associated requirements

documents and regulatory guides. Presently there are 48 requirements documents, and 23 regulatory guides. The NNR has 63 administrative documents governing its internal processes.

Co-operative Agreements

In accordance with the provisions of Section 6 of the NNR Act, the NNR is required to enter into Co-operative agreements with other organs of state that have overlapping functions or responsibilities. The purpose of the agreements is to:

- Ensure the effective monitoring and control of nuclear hazards;
- Co-ordinate and minimise the duplication and procedures for the exercise of such functions; and
- Promote consistency in the exercise of such functions.

The NNR has finalised 11 out of 11 co-operative agreements with its counterparts and submitted these for final publication by the Minister of Minerals and Energy. The Minister of Minerals and Energy has, in terms of section 6 (4) of the NNR Act, published the following co-operative agreements as final agreed co-operative agreements between the NNR and its counterparts, namely:

- Department of Minerals and Energy (Mineral Regulation);
- South African Maritime Authority;
- Department of Minerals and Energy (Electricity and Nuclear);
- Department of Minerals and Energy (Mine Health and Safety Inspectorate);
- Department of Health (Directorate Radiation Control);
- Department of Transport (Railway Safety Regulator);
- Department of Transport (Civil Aviation Authority);
- Department of Water Affairs and Forestry;
- Department of Environmental Affairs and Tourism;
- Department of Labour; and
- Department of Transport (RTMC).

International Conventions

International Conventions are legally binding international instruments which must be ratified by country legislatures before they can be implemented. The NNR is the competent national organisation with respect to the Conventions to which South Africa is a signatory or contracting party.

Convention on Nuclear Safety

South Africa is a contracting party to the International Atomic Energy Agency (IAEA) Convention on Nuclear Safety (CNS) having ratified the convention in 1996. South Africa's obligations under the CNS entered into force on 24 March 1997.

The obligations of the contracting parties are based on the principles contained in the IAEA Safety Fundamentals document "The Safety of Nuclear Installations". These obligations cover aspects such as siting, design, construction, and operation, the availability of adequate financial and human resources, the assessment and verification of safety, quality assurance and emergency preparedness.

The CNS is an incentive instrument and is based on the common interest of parties to achieve higher levels of safety, which will be developed and promoted through regular meetings of the parties. The CNS obliges parties to submit reports on the implementation of their obligations for 'peer review' at meetings of the Parties to be held at the IAEA.

Since the Convention's entry into force, three review meetings have been held (April 1999, April 2002 and April 2005). The fourth Review Meeting will take place at the IAEA offices in Vienna – Austria from 14-25 April 2008. Six months prior to the Review Meeting, contracting parties submit their National Reports which are then presented at the Review Meeting. According to the schedule, the 4th South African National Report will be presented on 15 April 2008.

In terms of section 5(e) of the NNR Act one of the objects of the Regulator is to "fulfil national obligations in respect of international legal instruments concerning nuclear safety" and as such the compilation of the report is co-ordinated by the NNR with input solicited from Eskom and the Department of Minerals and Energy (DME) as required by the Articles of the Convention.

During the review period, the NNR co-ordinated the compilation of South Africa's 4th National Report which was submitted to the IAEA on 21 September 2007. The scope of the Report covered Articles 6-19 of the CNS, which apply in whole or in part to two South African nuclear installations,

namely Koeberg Nuclear Power Station and the Pebble Bed Modular Reactor (PBMR).

The information provided in the 4th National Report addressed:

- Changes in the national situation since the previous report, which was presented at the 3rd Review Meeting in April 2005; and
- Comments, suggestions and additional information as requested during the 3rd Review Meeting.

At the CNS organisational meeting, held from 24-28 September 2007, to finalise the arrangements for the April 2008 CNS Review Meeting, the NNR's Chief Executive Officer, Mr M Magugumela, was elected President of the 4th CNS Review Meeting.

The Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management

South Africa is a contracting party to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, having deposited its instrument of accession to the Joint Convention on 15 November 2006. South Africa's obligations entered into force on 13 February 2007.

The Joint Convention applies to spent fuel and radioactive waste resulting from civilian nuclear reactors and applications and military or defence programmes, if and when such materials are transferred permanently to and managed exclusively within civilian programmes, or when declared as spent fuel or radioactive waste for the purposes of the Joint Convention by the contracting party. In addition the Joint Convention applies to planned and controlled releases of liquid or gaseous radioactive materials from regulated nuclear facilities into the environment.

The obligations of the contracting parties with respect to the safety of spent fuel and radioactive waste management are based to a large extent on the principles contained in the IAEA Safety Fundamentals document, "The Principles of Radioactive Waste Management", published in 1995.

They include, in particular, the obligation to establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management and the obligation to ensure that individuals, society and the environment are adequately protected against radiological and other hazards, inter alia, by appropriate siting, design and construction of facilities and by making provisions to ensure the safety of facilities both during their operation and after their closure.

The convention imposes obligations on contracting parties in relation to the transboundary movement of spent fuel and radioactive waste based on concepts contained in the IAEA Code of Practice on the International Transboundary Movement of Radioactive Waste. Contracting parties are also obliged to take appropriate steps to ensure that disused sealed sources are managed safely.

As required in terms of Article 30 of the Joint Convention, Review Meetings are held at the headquarters of the IAEA in Vienna, Austria. The first meeting was held from 3-14 November 2003 and the second from 15-24 May 2006. The 3rd Review Meeting is scheduled to take place from 11-22 May 2009.

The NNR has commenced with the compilation and co-ordination of the National Report and plans to submit the said report to the IAEA on 10 October 2008.

4.11 Materiality/Significance Framework

A materiality and significance framework has been developed for reporting losses through criminal conduct and irregular, fruitless and wasteful expenditure, as well as for significant transactions envisaged per section 54(2) of the PFMA that requires ministerial approval. The framework was finalised after consultation with the external auditors and was approved by the Executive Authority.

5.1 Performance against Objectives

The NNR's Strategic Plan and achievements during the reporting period are outlined in the table below. This is an account of progress achieved in the reporting period against the annual targets as outlined in the Strategic plan 2007/2010.

Table 1: Legend Explaining Scorecard Headings

Strategic Goals	Broad, long-term aims that define accomplishment of the strategic objective. (as defined in the strategic plan 2007/2010)
Initiatives	Specific activities to be undertaken in order to achieve the goal. (as defined in the strategic plan 2007/2010)
Measures	Indicators of measuring the success of achieving the goal. (as defined in the strategic plan 2007/2010)
Targets	Targets that measure the accomplishment of a goal. (as defined in the strategic plan 2007/2010)

The annual performance and achievements is captured under the column labelled "Status" and also under the "Comments" column which provides commentary in cases where a deliverable was not achieved or where special circumstances existed.

Table 2: Legend explaining the status column in the scorecards

Achieved	Planned tasks have been completed and approved.
Not Achieved	The planned tasks were not fully achieved. The percentage achievement will be reflected in the "Comments" column.
Not Applicable	Tasks were not due in the financial year under review.



In summary, the performance against strategic objectives is as follows:

- Achieved = 27;
- Not achieved = 18 with all deliverables being more than 70% complete; and
- Not applicable = 9, as they were not due in the financial year under review.

Scorecard tables below are extracted from the strategic plan for 2007/2010.

5.1.1 Safety and Regulation Scorecard

Strategic Objective: Develop, review and implement appropriate regulatory, policies practices and effective compliance monitoring that provide for the protection of persons, property and the environment against nuclear damage						
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
1	Enforce regulatory standards and practices to ensure that an acceptable level of safety and full compliance with conditions of nuclear authorization and regulatory requirements is being maintained by the regulated operating organisations	Develop a harmonized system of safety indicators (including specific measures regarding administrative compliance)	Harmonised system of safety indicators in place	August 2007	Not Achieved	The systems of safety indicators currently exist and are in use for compliance assurance monitoring at authorisation holders. However, a need was identified to harmonise these across the NNR. Because of the new National nuclear policy and strategy and a regulatory self assessment exercise done by the NNR, a complete review of the regulatory framework was identified as necessary. This exercise has been fully planned for in the new strategic plan for 2008/09 to 2010/11. The harmonisation of safety indicators deliverable has thus been re-planned in line with this new strategic objective. The new date of delivery will now be in December 2010
% compliance in terms of reporting by regulated operating organisations			100% per quarter	Achieved Koeberg		
				Achieved NTWP		
				Achieved RENS		
2	Strengthen the analytical verification capability and capacity of the NNR Laboratory	Develop strategy to strengthen analytical verification capability of the NNR Laboratory	Strategy in place	April 2007	Achieved	

Strategic Objective:	Develop, review and implement appropriate regulatory, policies practices and effective compliance monitoring that provide for the protection of persons, property and the environment against nuclear damage					
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
2 (continued)		Establish new laboratory	New laboratory established	June 2007	Not Achieved	New dates have been provided in the strategic plan for 2008/2011 according to which a new laboratory will have been established by September 2008 and achieve full functionality by March 2009. The target date for achievement of accreditation remains unchanged (March 2010)
			Fully functional laboratory in place	June 2008	Not applicable	
		Accreditation of new laboratory	New laboratory accredited	March 2010	Not applicable	
3	Strengthen the regulatory enforcement regime	Develop and apply an effective Enforcement Policy	Enforcement Policy in place	June 2007	Achieved	
		Make and submit recommendations for updating the NNR legislation	Recommendations with regards to legislative changes made and submitted to relevant authority	April 2007	Achieved	
4	Ensure that where emergency plans are required in terms of the Act, there are effective emergency plans which are developed, approved, implemented and managed	Develop and implement a framework and standardised criteria for the harmonisation of the evaluation of emergency plans	Framework and identified criteria in place	August 2007	Achieved	
5	Strengthening the NNR's regulatory research programs in support of the regulatory process	Develop a strategy to strengthen the research program	Strategy in place	June 2007	Achieved	
			No. of research projects completed against plan	100% Against planned time frames	Achieved	

5.1.2 Stakeholder Management Scorecard

Strategy Objectives: Build stakeholder confidence in South Africa's nuclear regulatory system						
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
1	Create an environment where the NNR is recognised as a credible custodian of public health and safety with regards to nuclear and radioactive material	Develop and implement a profile building initiative including: Defining the NNR's desired profile and key messages for target stakeholders	% of profile building milestones met	100% March 2007 (development) 100% December 2007 (implementation)	Not achieved Not achieved	Stakeholder and Communication strategy has been developed. The desired profile will be defined against this
		Raise the profile of the organisation and thought leadership in target media	% profiles published against plan	100%	Not achieved	
		2	Implement an effective communications policy to improve public understanding of the issues related to the nuclear sector	Update and implement the current communication policy	% policy complete and approved	
3	Provide accurate and timely information about the safety performance of authorisation holders to stakeholders	Collect necessary and accurate information regarding safety performance of authorization holders	Reports factually correct	% compliance with plan	Achieved	
		Prepare and submit reports in timely fashion	Reports submitted on time	100%	Achieved	
4	Enhance the efficacy and frequency of face-to-face stakeholder engagement processes	Review current efficacy of stakeholders engagement processes	Complete review	April 2007	Achieved	
		Develop and implement a stakeholder engagement plan	Stakeholder engagement plan in place	100% in June 2007	Achieved	

5.1.3 Internal Business Processes Scorecard

Strategy Objectives: Improve and strengthen internal business processes, aligned to best practices and responsive to environmental dynamics						
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
1	Implement Process-Based Licensing (PBL)	Roll-out PBL implementation at authorization holders	% implementation of PBL at holders	30% by April 2008	Achieved Koeberg	
			% of milestones met against plan	100%	Achieved NTWP	

Strategy Objectives: Improve and strengthen internal business processes, aligned to best practices and responsive to environmental dynamics						
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
1 (continued)		Develop a tool to measure the efficiency of implementation (PBL efficiency index) and monitor its output	% PBL efficiency index	30% by April 2008	Achieved	
2	Implement an integrated management system to ensure excellence in business processes	Development and implementation of an integrated and accredited management system, covering safety, quality, corporate, etc.	% of management system implementation milestones met		Achieved Not applicable Not applicable	
		<ul style="list-style-type: none"> • Business requirements identified • Systems selected • Implementation initiated and monitored 		50% March 2008 75% March 2009 100% March 2010		
3	Ensure sound financial administration and good corporate governance	Implement the NNR's ICT strategy, including developing and implementing an effective Electronic Document Management System (EDMS) and library management system	% of ICT strategy implementation milestones met	50% March 2008 75% March 2009 100% March 2011	Achieved Not applicable Not applicable	The NNR achieved a qualified audit for this reporting period. The main causes for the qualification have been noted and scheduled for urgent attention. The capacity challenges in the finance department are a recent concern which the NNR Board and the Executive is committed to address urgently in order to ensure that required finance processes are put in place
		Implement an effective system of internal control (financial)	% compliance with financial targets	100% Annually	Achieved	
		Implement sound corporate governance	% compliance to financial legislation % compliance with King II	100% Annually 100% Annually	Not achieved Achieved	

5.1.4 Human Resources Scorecard

Strategy Objectives: Attract, develop and retain staff						
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
1	Use of an innovative talent management strategy to achieve a high quality, diverse work force with the skills needs to achieve the NNR's vision	Conduct a skills audit to determine available vs. required competencies Review on annual basis	Skills audit completed	April 2007	Not achieved	80% of tasks completed. Skills audit report to be approved by NNR Management in May 2008
			Annual updated skills audit conducted			
		Develop and implement a pipeline management strategy to address skills gaps	Pipeline management strategy developed and implemented	June 2007	Not achieved	80% of tasks completed. The Pipeline Management has been developed as part of an overall Talent Management plan
			% of pipeline management strategy milestones met	100%	Not achieved	The implementation of the strategy above will commence once the Board approval has been obtained
		Develop and implement a robust retention strategy which includes succession planning	Attraction and retention strategies developed and implemented	April 2007	Not achieved	80% of tasks completed The Retention Strategy has been developed as part of an overall Talent Management plan
				Annual review starting April 2008	Not applicable	The implementation of the strategy above will commence once the approval has been obtained However, an interim Retention Strategy has also been developed to deal with short term challenges
Succession plans in place for critical positions		April 2007	Not achieved	80% of tasks completed. Succession Plan has been developed as part of an overall Talent Management plan		
		Annual review starting April 2008	Not applicable	The implementation of the strategy above will commence once the approval has been obtained		

Strategy Objectives: Attract, develop and retain staff						
	Strategic Goals	Initiatives	Measures	Targets	Status	Comments
1 (continued)		Research, develop and implement a dual career path programme (Managerial and Technical)	Feasibility study completed	April 2007	Achieved	The Patterson grading system has now been implemented which allows for dual career path
			Detailed program developed	Sept 2007	Achieved	
			Dual career paths implemented	Dec 2007	Achieved	
		Improve existing management capacity	360 Assessment for Management and EXCO Committee Members completed	June 2007	Not achieved	This assessment has been delayed. It will now be done at the end of June 2008. The outcome will be used for management personal development programmes
2	Reduction in reliance of the NNR on external technical support by building capacity within the organisation	Develop and implement a comprehensive capacity building plan to strengthen in-house technical capacity as part of employee Personal Development Plans (PDP)	Capacity building plan developed and implemented	June 2007	Not achieved	Capacity building plan has been developed, to be implemented once approval has been obtained
			Updated PDP's annually based on actions from capacity building plan	Annual starting April 2008	Not applicable	
		Facilitate knowledge and skills transfer to less experienced staff	Knowledge/skills transfer programs developed and implemented for critical positions	Dec 2007	Achieved	Skill audit undertaken but not completed during the review period.
100% Annually	Not achieved					
3	Realignment of policies, procedures and practices to take forward the transformation imperative	Review organisational policies and procedures in line with legislative requirement	% completion of review	100% June 2007	Not achieved	20 policies and 20 procedures were identified and have been finalised. Consultations with the Unions are due to commence
			% compliance	100% June 2007	Not achieved	
		Conduct culture assessment	Culture assessment complete and the roll-out of culture change strategy	June 2007	Achieved	
No of milestones met against plan	100% Annually	Not achieved				
4	Ensure a sustainable safety assessment capability in order to conduct safety assessment reviews for granting or refusing authorizations of new actions and approval of changes to existing actions	Form strategic partnerships to leverage capacity from relevant organizations pending the expansion of internal capacity	Capacity support partnership agreements and programs in place	June 2007	Achieved	
			No. of program milestones against plan	100% Annually	Achieved	



In accordance with the provisions of the NNR Act, the NNR is mandated to exercise regulatory control over nuclear installations, nuclear vessels and other actions capable of causing nuclear damage.

The purpose of the regulatory process is to ensure the protection of persons, property and the environment from nuclear damage. The regulatory process entails authorisation, safety case review and assessment, and the undertaking of compliance assurance and enforcement activities as appropriate.

6.1 Nuclear Authorisation Process

Prior to the granting of an authorisation the applicant is required to apply to the NNR, in the prescribed format, detailing the intended activities, and demonstrating the capability to comply with the NNR requirements.

The authorisation conditions represent the framework within which the applicant or holder of the nuclear authorisation is obliged to operate to particular requirements in respect of design, operation and decommissioning of the facilities. The conditions of authorisation also oblige the holder of the authorisation to demonstrate compliance through the submission of routine and non-routine reports.

Standard conditions included in a nuclear authorisation address the following:

- Description and configuration of the authorised facility or action;
- Medical surveillance and Health Register;
- Safety documentation;
- Operational requirements in the form of procedures or programmes as appropriate;
- Maintenance and Inspection requirements;
- Operational radiation protection programmes;
- Radioactive waste management programmes;
- Emergency planning and preparedness requirements as appropriate;
- Physical security;
- Transport of radioactive material;
- Quality assurance; and
- Reporting.

The NNR Act makes provision for the granting of four categories of nuclear authorisation. These are:

- Nuclear Installation Licences;
- Nuclear Vessel Licences;
- Certificates of Registration; and
- Certificates of Exemption.

These enable the NNR to issue authorisations that are commensurate with the hazards posed by the relevant facility or action.

6.2 Safety Case Review and Assessment

The safety case is 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.

The safety case provided must identify and characterise all sources of radiation associated with the facility and all possible pathways of exposure of persons that may arise from such sources, under normal operating conditions and under accident situations. The safety case must also take into account exposures that are likely to take place both now and in the future.

The NNR undertakes an evaluation of the submitted documentation to ensure that the action or facility will meet the standards and requirements. From the evaluation, the NNR identifies conditions for inclusion in the nuclear authorisation.

6.3 Compliance Assurance

The NNR conducts compliance assurance activities to determine the extent to which holders of nuclear authorisations comply with the conditions of authorisation. The nature of the NNR's compliance assurance activities are commensurate with the nature of authorisation issued and the risk posed by the facility or action.

The compliance assurance activities involve a combination of audits, routine inspections, non-routine inspections, reviews of routine reports and reviews of occurrence reports.

6.4 Enforcement

Where non-compliance with the conditions of authorisation is identified, the NNR may initiate enforcement actions. Enforcement actions are designed to respond to non-compliances with specified conditions and requirements. The enforcement actions are commensurate with the seriousness of the non-compliance and may take the form of a written letter, penalties, curtailment of operations, suspension of the authorisation, or ultimately withdrawal of the authorisation. In all cases, the holder of the authorisation is required to:

- Remedy the non-compliance;
- Perform a thorough investigation in accordance with an agreed timescale; and
- Take all necessary measures to prevent recurrence.

In certain instances, the NNR performs its own investigation.

6.5 Nuclear Authorisations Issued by the NNR

The following table details the holders of nuclear authorisations granted by the NNR as at the end of March 2008.

Table 2: Nuclear Authorisation Holders

Nuclear Installation Licences	
1.	NL-1 to Eskom for the Koeberg Nuclear Power Station
2.	NL-27 to Necsa (Pelindaba)
3.	NL-28 to Necsa (Vaalputs)

Nuclear Vessel Licence	
Granted to SA Navy on behalf of the British Royal Navy for a UK nuclear power propelled submarine to visit the naval base of Simon's Town from 27 September to 6 October 2007	

Certificates of Registration

Holders of Nuclear Authorisation		
1	COR-8	African Rainbow Minerals Gold Limited (Orkney Operations)
2	COR-7	African Rainbow Minerals Gold Limited (Welkom Operations)
3	COR-68	Alnieuwco Recycling (Pty) Ltd
4	COR-77	Anglo American Research Laboratories (Pty) Limited
5	COR-24	Anglo Operations Limited (Namakwa Sands)
6	COR-44	Anglo Operations Limited (Scaw Metals)
7	COR-45	Anglo Operations Limited (Rand Scrap Iron)
8	COR-4	Anglogold Ashanti Limited (Ergo Operations)
9	COR-3	Anglogold Ashanti Limited (West Wits Operations)
10	COR-4	Anglogold Ashanti Limited (Vaal River Operations)
11	COR-40	ARMgold/Harmony Freegold Joint Venture Company (Pty) Ltd (St Helena Operations)
12	COR-5	ARMgold/Harmony Freegold Joint Venture Company (Pty) Ltd (Tshepong, Matjhabeng & Bambani Operations)
13	COR-10	Avgold Limited (Target Division)
14	COR-98	B G Scrap Metals (Pty) Ltd
15	COR-75	BHP Billiton
16	COR-41	Blyvooruitzicht Gold Mining Company Limited
17	COR-32	CJN Metal Dealers cc
18	COR-6	ARMgold/Harmony Freegold Joint Venture Company (Pty) Ltd (Joel Operation)
19	COR-51	Consolidated Modderfontein (Pty) Ltd
20	NL-68	Cronimet (RSA) (Pty) Ltd
21	COR-57	Crown Gold Recoveries (Pty) Ltd
22	COR-126	Denel
23	COR-96	Donnlee Engineering (Pty) Ltd

Holders of Nuclear Authorisation		
24	NL-108	Durban Roodepoort Deep Limited (Durban Roodepoort Deep)
25	COR-63	East Rand Proprietary Mines Limited
26	COR-25	Eggerding SA (Pty) Ltd
27	COR-46	Evander Gold Mines Limited
28	COR-12	Extratech (Pty) Ltd
29	COR-22	Fer-Min-Ore (Pty) Ltd (Zirtile Milling)
30	NL-62	First Wesgold Mining (Pty) Ltd
31	COR-20	Foskor Limited (Phalaborwa)
32	COR-27	Foskor Limited (Richards Bay)
33	COR-97	Geratech Zirconium Beneficiation Limited
34	COR-70	GFI Mining SA (Pty) Ltd (Kloof Operation)
35	COR-71	GFI Mining SA (Pty) Ltd (Beatrix Operation)
36	COR-69	GFI Mining SA (Pty) Ltd (Driefontein Operations)
37	COR-86	Glenover Phosphate Limited (Mining Site Operation)
38	COR-65	Glenover Phosphate Limited (Germiston Site)
39	COR-118	GoldPlats Recovery Limited
40	COR-11	Gravelotte Mines Limited
41	COR-47	Grootvlei Mines (Pty) Ltd
42	COR-58	Harmony Gold Mining Company Limited (Randfontein Operations)
43	COR-37	Harmony Gold Mining Company Limited (Free State Operations)
44	COR-93	Hi-Energy Mining Supplies cc
45	COR-119	Huntrex 196 (Pty) Ltd (trading as Ceracast)
46	COR-82	Hydro Power Equipment (Pty) Ltd
47	COR-59	Industrial Zone Limited
48	COR-73	Kusasa Logistics (Pty) Ltd
49	COR-39	Kynoch Fertilizer Limited
50	NL-101	Kynoch Modderfontein (Pty) Ltd
51	COR-103	Linbeck Metal Trading (Pty) Ltd
52	COR-81	Metrec
53	COR-95	Microzone Trading 69 cc
54	COR-30	Mine Waste Solutions (Pty) Ltd
55	COR-88	Mineworkers Recycling Services
56	COR-66	Mintek
57	COR-67	Mr David Salomon
58	COR-13	MTC Demolition
59	COR-52	Nigel Gold Mining Company Limited
60	COR-159	North West Reclaiming
61	COR-16	Nuclear Fuels Corporation of SA (Pty) Ltd
62	COR-38	Omnia Phosphates (Pty) Ltd
63	COR-19	Palabora Mining Company (Pty) Ltd
64	COR-18	Placer Dome Western Areas Joint Venture

Holders of Nuclear Authorisation		
65	COR-64	Potchefstroom Plastiek Herwinning BK
66	COR-15	President Steyn Gold Mines (Free State) (Pty) Ltd
67	COR-33	Rampete Metal Processors (Pty) Ltd
68	COR-87	Rand Refinery Limited
69	COR-28	Randfontein Estates Limited (Elandskraal Section)
70	COR-26	Richards Bay Iron and Titanium (Pty) Ltd
71	COR-21	Sasol Chemical Industries Limited
72	COR-191	Simmer & Jack Mines Limited - Buffelsfontein Gold Mine (Buffelsfontein site)
73	COR-182	Simmer & Jack Mines Limited - Buffelsfontein Gold Mine (Hartebeestfontein site)
74	COR-104	South African Port Operations (Dry Bulk Terminal - Richards Bay a Division of Transnet Limited)
75	COR-23	Steenkampskraal Monazite Mine (Pty) Ltd
76	COR-36	Stilfontein Gold Mining Company Limited
77	COR-84	The Big Bin cc
78	COR-92	The Forensic Science Laboratory, SA Police
79	COR-94	The Reclamation Group (Pty) Ltd (Welkom Operations)
80	COR-43	Exxaro Sands (Pty) Ltd
81	COR-102	Turbomeca Africa
82	COR-108	UCG Recycling (Pty) Ltd
83	COR-89	Uhuru Transformers Refurbishment cc
84	COR-49	Umicore SA (Pty) Ltd
85	COR-160	Uranium One
86	COR-107	Vesuvius South Africa (Pty) Ltd
87	COR-117	Vic Ramos cc
88	NL-105	Village Main Reef Gold Mining Company Limited
89	COR-50	Waste Product Utilisation (Pty) Ltd
90	NL-109	West Witwatersrand Gold Mines Limited
91	COR-166	Weston Scrap Metal
92	COR-31	Ya-Rona Scrap Metals
93	COR-90	Zestcor
94	COR-198	Set Point Industrial Technologies (Pty) Ltd (Isando)
95	COR-207	Set Point Industrial Technologies (Pty) Ltd (Mokopane)
96	COR-189	SGS Lakefield Research Africa
97	COR-204	Holgoun Energy (Pty) Ltd
98	COR-194	Exxaro Resources
99	COR-184	HVH Gold (Pty) Ltd
100	COR-80	Mogale Gold (Pty) Ltd
101	COR-180	SA Port Operations - Container Terminal Cape Town

Holders of Nuclear Authorisation		
102	COR-178	Durban Container Terminal - Business Unit of SA Port Operations
103	COR-183	Tasman Pacific Minerals
104	COR-210	Tasman Pacific Minerals
105	COR-211	Tasman Pacific Minerals
106	COR-221	Tasman Pacific Minerals
107	COR-222	Tasman Pacific Minerals
108	COR-223	Tasman Pacific Minerals
109	COR-165	Uramin Mago Lukisa
110	COR-199	Uramin Mago Lukisa
111	COR-200	Uramin Mago Lukisa
112	COR-167	Western Uranium (Pty) Ltd
113	COR-203	Cemo Pumps (Pty) Ltd
114	COR-209	Neethling Plastics cc
115	COR-214	MoriaMining
116	COR-132	Grifo Engineering (Pty) Ltd
117	COR-197	Gold Reef City Theme Park
118	COR-110	Geotron Systems (Pty) Ltd
119	COR-206	Uranium One and Micawber (Pty) Ltd
120	COR-164	Sulzer Pumps (SA) Limited
121	COR-76	Blastrite (Pty) Ltd
122	COR-156	Necsa Calibration PADS
123	COR-196	INVAP S.E.

Independent Regulatory Verification of Radiological Environmental Analysis

Verification and enforcement are undertaken by the NNR to ensure the protection of the public, environment and property against nuclear damage. These actions are important mechanisms used by the NNR as part of the compliance assurance programme for the Koeberg Nuclear Power Plant, Necsa facilities and mining and mineral processing facilities. Independent verification analysis of environmental samples collected around the regulated facilities forms part of the NNR's compliance assurance programme.

A project to upgrade the NNR laboratory was initiated in the 2006/07 financial year and will continue into the next few years. The feasibility study was completed, aimed at ensuring a sound basis for decision making on the best approach to strengthening the NNR's analytical verification capability.

During the reporting period the NNR completed the feasibility study which considered NNR needs and then identified all the necessary capacity, systems and processes which form input into the strategy.

The strategy presented takes into account the current requirements of the NNR verification programme as well as future implications due to nuclear expansion in South Africa. In particular the strategy recognises that the number of samples that need to be analysed in the laboratory from NNR programmes has increased, following the increased activities around the mining and mineral processing facilities.

A detailed project plan for the establishment and development of the laboratory has been developed. Implementation will be progressed in the next financial year. Alternative provisions have been made for the analysis of urgent samples from NNR Programmes in the interim.

6.6 Koeberg Nuclear Power Station

Background

Eskom operates the Koeberg Nuclear Power Station (KNPS), comprising two 900 megawatt electrical (MWe) pressurised water reactors (PWRs), on the Atlantic coast 40 kilometres north of Cape Town. The station was built by a French consortium, with Framatome being responsible for the nuclear island, Alsthom Atlantique for the conventional island, Spie Batignolles for the civil works and Framateg for the overall project co-ordination. The first Nuclear Licence, NL-1, was issued to Eskom for the construction of the power station, which commenced in 1976. The two units were brought into commercial operation in July 1984 and November 1985 respectively.

In terms of the NNR Act, nuclear installation licences contain conditions deemed necessary to ensure the protection of persons, property and the environment against nuclear damage. The current Koeberg Nuclear Installation Licence, NL-1 variation 16, contains 16 conditions, including specific licensing requirements and control pertaining to:

- Plant description and configuration;
- Safety assessment;
- Scope of activities that may be undertaken;
- Controls and limitations on operation;
- Maintenance and in-service inspection;
- Operational radiation protection;
- Effluent management;
- Waste management;
- Environmental monitoring;
- Emergency planning and preparedness;

- Transport;
- Physical security;
- Quality management;
- Acceptance and approval;
- Reports; and
- General.

In terms of Section 26(2) of the NNR Act, Eskom, as the nuclear licence holder, implements an inspection programme to ensure compliance with the conditions of the Nuclear Installation Licence, NL-1. The NNR implements an independent system of compliance inspections to provide assurance of compliance with the conditions of the nuclear licence in terms of section 5(d) of the NNR Act. The regulatory approach to the licensing of nuclear installations such as KNPS is largely based on risk and the application of international safety standards and practices.

Occupational Exposure to Radiation

In achieving the objectives for the control of occupational exposure, the regulatory body requires that no individual shall receive an annual dose in excess of the dose limits and that all exposures are as low as is reasonably achievable (ALARA). The regulatory criteria prescribed by the Regulator for the occupationally exposed workforce are referenced in the nuclear licence and are given below.

Table 3: Regulatory criteria prescribed by the Regulator

Workforce	Regulatory Criteria
Maximum individual worker dose	Maximum effective dose of 50 mSv in any year (and 20 mSv averaged over 5 consecutive years)
Average individual worker dose	Controlled by application of the ALARA principle. The ALARA target for the annual average individual dose is less than 4 mSv per annum

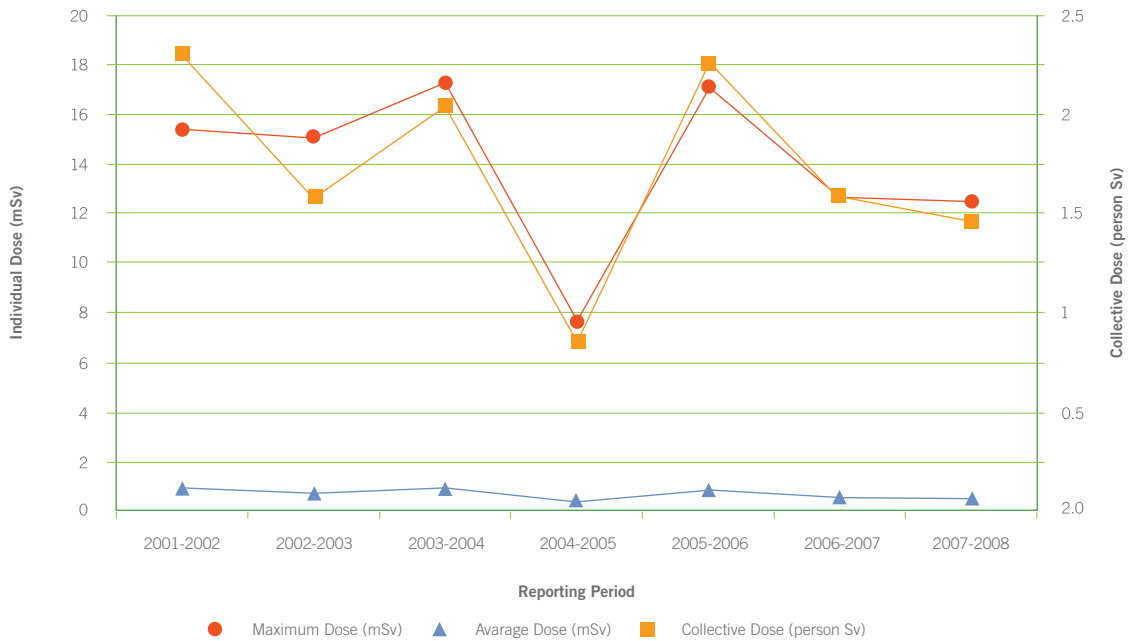
In achieving these objectives, it is necessary to evaluate the facets of radiation protection design against the dose limits' and then establish complementary operational programmes which are sufficiently comprehensive to ensure compliance with those limits. These are augmented by operational verification programmes on aspects relating to radiation protection in design in order to ensure that the parameters of the safety assessment remain current and to aid in ensuring

that the operational programmes are not compromised. The nuclear licence makes reference to the principles upon which these verification programmes and the facets of the operational radiation protection programme are established. All these principles are embodied in both the nuclear licence and the licence holder's Corporate Standards on Radiological Protection, which cover the following areas:

- Establishment of the radiation protection organisation;
- Qualification of radiation protection personnel;
- The system of operational radiological protection;
- The radiological surveillance programme;
- The optimisation of radiation protection (ALARA programme);
- The control of portable radiation monitoring instrumentation;
- The appointment of medical practitioners;
- Qualification of radiation workers;
- The establishment and maintenance of a Health Register for radiation workers;
- The establishment and maintenance of a Dose Register for radiation workers;
- The external and internal dosimetry programme;
- The respiratory protection programme;
- The control of fabricated radio-isotopes;
- The radiation shielding verification programme;
- The radiological effluent management programme;
- The radwaste management programme;
- The environmental surveillance programme; and
- The technical audit programme.

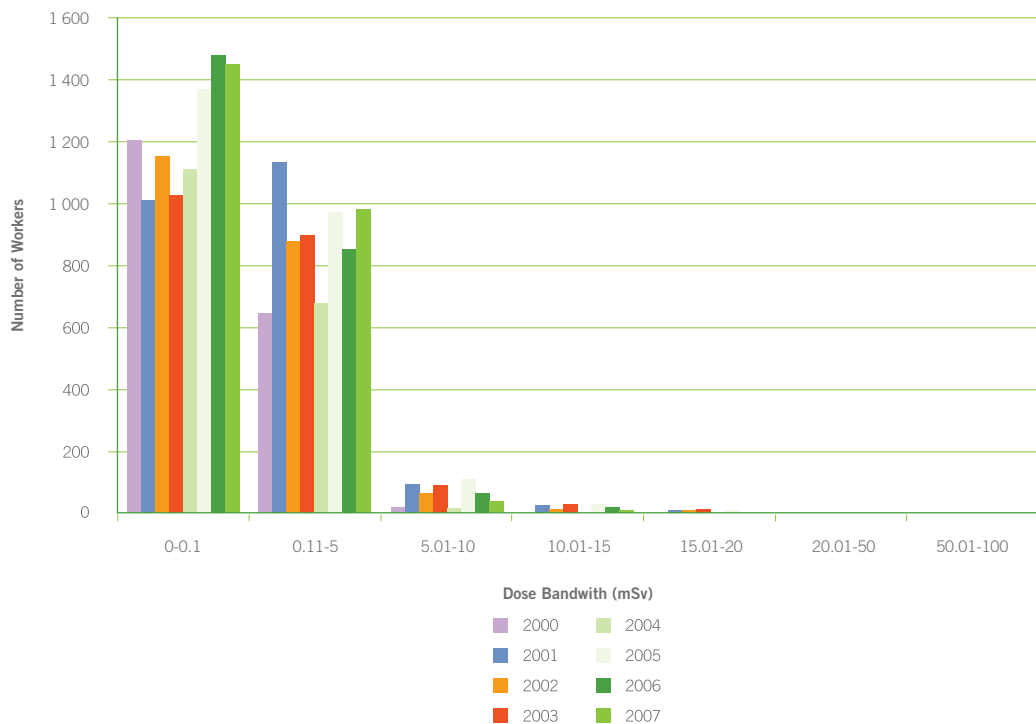
The highest annual individual dose accrued during 2007 was 12.5 mSv (2006: 12.7 mSv), compared to the regulatory limit of 50 mSv per annum (and 20 mSv averaged over 5 consecutive years). The total annual collective dose to the workforce for the year was 1.5 person Sv (2006: 1.6 person Sv). The total occupationally exposed workforce during 2007 numbered 2 492 (2006: 2 490), indicating an average annual individual dose of approximately 0.59 mSv (2006: approximately 0.64 mSv), well within the ALARA target of 4 mSv.

Figure 1: Maximum, average and cumulative worker dose arising from individual exposures accrued from 2001 to 2007



In terms of occupational exposure the worker doses at KNPS over the reporting period were within regulatory limits, and reflected an overall improvement over the previous reporting period.

Figure 2: Dose distribution arising from individual exposures accrued from 2000 to 2007



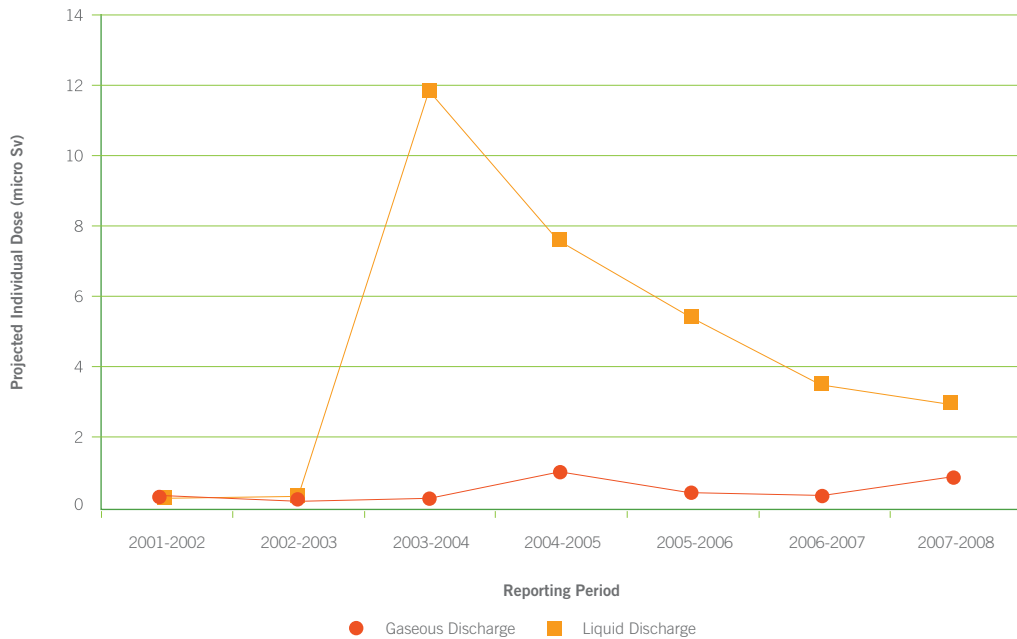
Public Exposure to Radiation

Various gaseous and liquid radioactive effluents are produced during the process of nuclear power generation. These effluents are treated using dedicated clean-up systems, which remove most of the radioactivity prior to discharge to the environment. However, during the operation of any nuclear power station it is inevitable that small amounts of radioactivity will be released to the environment. Public exposure is controlled within strictly defined limits through the implementation of a radiological effluent management programme, which ensures that the discharges of radioactivity from Koeberg result in no significant risk to the public. A key feature of this programme is the control of radioactivity in effluent discharges to within the Annual Authorised Discharge Quantities (AADQ). In addition to continuous monitoring of radioactivity in effluent,

radiological surveillance of the environment is also carried out. In this way an independent and strict control on public exposure to radioactive releases is maintained.

Radioactivity in liquid and gaseous discharges from Koeberg during 2007 contributed a projected total individual dose of 0.004 mSv to the hypothetically most exposed public group (2006: 0.004 mSv). The projected doses as a result of gaseous and liquid discharges were 0.00094 mSv and 0.003 mSv respectively (2006: 0.0004 mSv and 0.0036 mSv respectively), which is well within the NNR limit of 0.250 mSv per annum, and meets the ALARA dose target of 0.010 mSv, which is applicable for an annual period in which there is one refuelling outage.

Figure 3: Projected public dose for Koeberg from 2001 to 2007



Koeberg's AADQ system is based on an activity migration model that features the migration of activity from the fuel via the clean-up systems, effluent treatment systems and various drain systems up to the point of discharge. The ultimate

result of the activity migration exercise is the annual amount of effluent on a nuclide-specific basis. The radionuclides contributing the highest doses as a result of atmospheric and liquid discharges are shown in the table below:

Table 4: Percentage of AADQ in effluent discharged during 2007

Liquid Transport Pathway		Atmospheric Transport Pathway	
Radionuclide	% of AADQ	Radionuclide	% of AADQ
Ag-110m	27.42	I-132	45.14
Co-57	20.13	I-133	6.63
Co-58	7.34	I-134	67.35
Co-60	12.52	I-135	18.05
Sb-125	10.13		

There were no concerns regarding the safety of the public living around KNPS during the reporting period.

Nuclear Safety

As in previous years, a major part of the NNR's work in the area of nuclear safety related to in-depth safety assessments associated with KNPS. During this period the NNR focused its safety assessment activities primarily on the areas summarised below:

Plant Refuelling Outage Modifications

The NNR concluded the assessments of a significant number of major safety related modifications, scheduled for implementation during refuelling outage 216 for Unit 2. The outage was completed in March 2008.

All modifications were approved and subsequently implemented, with the exception of one modification, namely "overpressure protection". This was rejected due to shortcomings in the design.

Closure of the Findings of the First Koeberg Periodic Review

In terms of the first Koeberg periodic review, reported on previously, although many corrective actions are at an advanced stage of completion, not all corrective actions will have been concluded before the start of the second periodic review, which will commence in April 2008. The delays relate to plant modifications as well as operating and equipment testing requirements which will significantly improve the safety of the plant. Plant modifications, which will close most of the outstanding corrective actions, are scheduled for implementation during outage 117 which will commence in February 2009. The NNR will continue to monitor the implementation of these projects.

Second Koeberg Periodic Review

The NNR concluded discussions with Eskom on the scope of the second Koeberg periodic review, to commence in April 2008. The NNR regards this project as an effective way to compare the Koeberg plant design and operations with current international safety standards and practices.

The project will follow IAEA guidelines (NS-G2.10) and the scope will take into consideration safety improvements implemented in the French nuclear programme, referred to as "VD3 projects". The following scope for the review has been agreed upon with Eskom:

- Plant design review;
- Actual conditions of systems structures and components;
- Equipment qualification review;
- Plant ageing and plant life extension;
- Deterministic safety analysis of all changes from the first Koeberg periodic review project;
- Review and benchmark of Koeberg Public Safety Assessment (PSA) level 1 and 2;
- Hazard Analysis;
- Plant safety performance over the last 10 years;
- Use of operational experience feedback and research findings;
- Organisation, staffing and administration; and
- Radiological impact on the environment.

The NNR continues to receive support from the French regulatory authority on technical issues.

Damaged Fuel Elements

During visual inspections conducted by Eskom of fuel elements unloaded from the Unit 2 reactor it was discovered that 12 fuel assemblies for the cycle 16 core and one (1) fuel assembly from the cycle 15 core had sustained varied degrees of damage to the assembly grids. The fuel manufacturers have confirmed that this type of damage can be attributed to deficiencies in the assembly grid design. No fuel pin leaks were found in any of the grid damaged fuel.

Corrective actions have subsequently been implemented and the NNR has requested the technical support organisation, the IRSN, of the French regulatory authority, ASN, to provide an independent evaluation, as this type of fuel is also widely used in French plants. French operational experience will

be discussed with ASN during the next bilateral meeting, scheduled for October 2008.

Containment Sump Clogging

This issue, recognised internationally as a generic safety concern for many nuclear power plant designs, relates to the possibility of containment sump filters becoming clogged by debris created in the containment in the event of a loss of coolant accident (LOCA). The French regulatory authority, ASN, reported this matter at level 2 on the International Nuclear Event Scale (INES) for the French family of nuclear power reactors. Eskom selected a solution developed by AREVA for CP-1 plants similar to Koeberg. The NNR completed its review of the design of the new sump filters and approved the implementation of this modification, which was subsequently implemented on both Koeberg units during refuelling outages 116 and 216.

Koeberg Nuclear Fuel Management Strategy

Spent Fuel Pool

The NNR assessed the final modification of an alternative spent fuel pool cooling system which will provide a completely independent third cooling system. After discussions with Eskom on the detailed specifications for the design, the modification package was finalised and subsequently submitted to the NNR for assessment. Implementation of this modification will commence during outage 117.

Dry Storage

Eskom submitted a temporary licence change request for extension of the use of dry spent fuel storage until the year 2013. The application was reviewed by the NNR with specific attention to material degradation, and subsequently approved.

New RFA 2 Fuel

Eskom submitted a proposal to licence Westinghouse RFA 2 type fuel for Koeberg as well as the corresponding fuel transport container for future reloads. The NNR is currently evaluating the relevant documentation.

Plant Condition Management

Materials must meet the standards and requirements of their design and fabrication. At the design stage of a nuclear plant the design lifetime of the materials is determined considering the effects of operational conditions (e.g. radiation and chemical environment, and single and periodic loads). In addition, effects of design based accidents on the materials characteristics and performance must be considered. An appropriate safety margin must be adopted to allow for the anticipated properties of materials at the end of their useful lifetime. Where insufficient data are available on materials, a suitable programme of inspection and periodic testing must be put in place and the results that are obtained in this programme must be used in reviewing the adequacy of the design at appropriate intervals. This may require the implementation of a material surveillance programme for the reactor coolant pressure boundary, particularly in locations of high irradiation, such as the reactor pressure vessel (RPV), and for safety, important components as appropriate, in order to determine the metallurgical effects of factors such as irradiation, stress corrosion cracking, thermal embrittlement and ageing.

Nuclear plant structures, systems, components (SSCs) and equipment important to safety must be designed to be calibrated, tested, maintained, repaired, replaced, inspected and/or monitored with respect to their functional integrity over the lifetime of the nuclear plant to demonstrate that the required reliability, availability and safety targets are being met in accordance with the requirements of the plant safety and risk analysis. The plant layout must be such that these activities are facilitated and can be performed to standards commensurate with the importance of the safety functions to be performed, with no significant reduction in system availability and without undue exposure of or risk to the workforce or the public.

Effective maintenance, surveillance, in-service inspection, and testing are essential for the safe operation of a nuclear power plant or a nuclear research reactor. These processes and programmes ensure not only that the levels of reliability and availability of all SSCs and equipment important to safety

remain in accordance with the assumptions and intent of the design, but also that the safety of the plant is not adversely affected after the commencement of operation.

The maintenance processes for a nuclear plant must cover all preventive and remedial measures, both administrative and technical, that are necessary to detect and mitigate degradation of a functioning SSC or to restore to an acceptable level the performance of design functions of a failed SSC.

The objectives of the operations surveillance programmes are to maintain and improve SSC availability, to confirm compliance with operational limits and conditions and to detect and correct any abnormal condition before it can give rise to significant consequences for safety.

Over the nuclear plant's operating lifetime, SSCs important to safety must be examined for possible deterioration so as to determine whether they are acceptable for continued safe operation or whether remedial measures should be taken. In-service inspection programmes place emphasis on examination of the pressure boundaries of the primary and secondary coolant systems, because of their importance to safety and the potentially severe consequences of their failure. Baseline data are collected and maintained for future reference. These data are normally collected in the pre-service inspection carried out before the start of plant operation. They give information on initial conditions that supplements manufacturing and construction data in providing a basis for comparison with the data from subsequent examinations. In the pre-service inspection the same methods, techniques and types of equipment should be used as those which are to be used for in-service inspection. Whenever an SSC has been repaired or replaced, a pre-service inspection must be performed before putting it into operation. When new inspection methods are introduced, a comparison with the previous methods must be made to provide a revised baseline for future inspections.

The purpose of testing is to confirm that the SSCs continue to meet the design intent and consists of post-maintenance testing, surveillance testing, and in-service inspection testing.

The following were focus areas for plant condition management during the reporting period and into 2008:

- Steam generator integrity;
- Primary loop cast elbows;
- Nickel alloys and welds in the primary circuit;
- Reactor pressure vessel (RPV) integrity;
- Unit 1 vessel head replacement and reconciliation of US and French manufacturing codes;
- In-service inspection (ISI) Second Interval Programme;
- In-service inspection Third Interval Programme;
- Risk-informed in-service inspection;
- Non-destructive evaluation (NDE) inspection qualification;
- Power uprating; and
- Fuel cladding.

In-service inspection (ISI) Third Interval

Eskom submitted its proposed ISI programme for the third interval at Koeberg. The NNR is conducting a detailed assessment of this programme with the support of international experts in the field.

Reactor Pressure Vessel (RPV) Head Replacement

The RPV head for unit 1 was replaced during outage 116 using a new vessel head obtained from Electricite de France (EdF). In preparation for this activity, two NNR inspectors observed the RPV head replacement process at an EdF plant that is similar to Koeberg. In addition, as part of the NNR safety oversight process, two NNR experts performed an inspection at the RPV manufacturing facility in France and witnessed pre-service inspections of the Koeberg RPV head manufactured there.

Licensing of Koeberg Reactor Operators

The biennial evaluation of Koeberg reactor operators is an integral part of the licensed operator re-qualification training and is designed to measure the effectiveness of the re-qualification training programme and to provide long-term maintenance of established standards. This measure is derived from a full scope assessment of individual and team skills and knowledge, and consists of written, walkthrough and dynamic simulator evaluations.

The biennial evaluations for existing licence holders were successfully completed in 2007.

The NNR issued initial licences to three Senior Reactor Operators and five Reactor Operator candidates during this reporting period. The initial training examinations were held during February 2008.

Developments around Koeberg

As a result of a court ruling to set aside Regulation 3 of Regulations #287, the requirements of the NNR Regulatory Requirements Document RD-0015, which specifically apply to developments within a 16 km of Koeberg, have been formulated into new draft regulations which will specifically apply to the control of developments in this area.

The City of Cape Town authorities have indicated that in the interim, until the draft regulations have been published, they will enforce the requirements of RD-0015 as if the original regulation were still in force.

Transport Safety

The following table indicates the number of shipments of nuclear fuel to Koeberg, and low and intermediate level radioactive waste from Koeberg to Vaalputs.

Table 5: Consignments in 2007

Consignments	Number 2007/08	Number 2006/07
Fuel consignments on site	2	1
Radioactive waste consignments to Vaalputs	919	60
Other materials (sealed sources) acquired during 2007	5	0

No safety concerns arose as a result of the transport of radioactive material in 2007.

Radioactive Waste Safety

Liquid radioactive waste released to the sea during 2007 totalled a volume of 9 822 m³ (2006: 9 360 m³). The quantity of solid radioactive waste produced and drummed is indicated in table 6.

Table 6: Inventory of solid radioactive waste produced and drummed

Type of Solid Radioactive Waste	Number of Drums 2007/08	Number of Drums 2006/07
C1 drums containing non-compressible waste	17	16
C1 drums containing concentrates	40	85
C1 drums containing resin	23	0
C2 drums containing resin	0	0
C4 drums containing filters	5	6
C2F drums containing filters	5	3
210 litre metal drums containing general trash	592	471
210 litre metal drums containing resin	189	184

No safety concerns arose due to radioactive waste during the review period.

Environmental Protection

The Koeberg Environmental Surveillance Programme, involving sampling and analysis of representative environmental media, is performed to verify that effective control has been maintained over effluent discharges. In addition a widespread network of Environmental Thermo-Luminescent Dosimeters (TLDs) around Koeberg monitors external exposure to active gaseous effluents from Koeberg.

The results of the 2007 environmental surveillance programme do not indicate any significant increase in the levels of radioactivity in environmental samples over pre-operational levels, with the exception of marine and sewage sludge samples, which contain traces of radionuclides derived from Koeberg. These trace quantities included Ag-110m, I-131, Co-60 and Cs-137.

Investigation proved that the presence of I-131 was again due to nuclear medicine usage and not to the power plant.

There were no safety concerns regarding the public living around KNPS during the reporting period.

Nuclear Emergency Planning and Preparedness

The evaluation of Koeberg's emergency preparedness and response is based on the following elements:

- Emergency exercises – NNR and holder emergency exercises;
- Audit/Surveillance activities; and
- Review and assessment activities.

NNR Emergency Exercise

The corrective actions identified subsequent to the 15 February 2006 NNR emergency exercise (reported in the previous annual report) were submitted to the NNR in accordance with the required timelines. In-depth reviews were performed by the NNR for every proposed corrective action, followed by discussions and inspections where necessary. All findings and observations from the regulatory exercise were closed out satisfactorily, with the exception of one observation. The NNR has agreed to an extension of the deadline for the project implemented to address the observation due to the nature and extent of the work to be performed. In the interim, adequate measures have been implemented to prevent a recurrence in future.

Koeberg Annual Internal Emergency Exercise

During the reporting period, KNPS conducted a programme of emergency exercises consisting of one station exercise, one joint decision making exercise involving the three spheres of Government, and two exercises involving plant and international (AREVA) technical support.

The outcome of these exercises proved successful, in that changes to the emergency preparedness and response processes were adequately tested and responded to by the role-players.

Inspection Activities

As part of assessing the adequacy of the KNPS nuclear emergency preparedness and response arrangements, an inspection was performed by the NNR, during February 2007, Eskom licensing documentation and audit reports.

The NNR inspection specifically focussed on compliance with requirements in the following areas related to emergency preparedness and response:

- Roles and responsibilities;
- Plans and procedures;
- Training of personnel;
- Interface with other role-players; and
- Change management.

Based on the inspection of the Eskom documentation, the team concluded that there was overall compliance with regulatory standards and requirements and arrangements for emergency preparedness and response can be regarded as adequate.

Physical Security

The licensing requirements pertaining to physical security, to which Eskom must comply, are contained in Condition 12 of the Koeberg Nuclear Licence NL-1 variation 16. This condition specifically refers to a security standard which was developed by Eskom in consultation with the security establishment in South Africa. The NNR compliance assurance programme includes regular inspections against these requirements.

No concerns were raised regarding physical security at KNPS during the reporting period.

Safety of Sealed Radioactive Sources

The safety of sealed radioactive sources, which falls under the jurisdiction of the NNR, is included in the compliance assurance programme.

No concerns were raised with regard to the safety of these sources.

Nuclear Incidents/Accidents Reported

The NNR monitors incidents/occurrences at Koeberg through:

- Audits conducted on the Eskom processes relating to occurrences (i.e. plant monitoring, reporting, follow-up and close-out);
- Monitoring of the implementation of these processes;
- Monthly meetings between Eskom and the NNR at which experience feedback is discussed;
- Review of Eskom reports on experience feedback and safety indicators, which reflect occurrences and trends thereof; and
- Direct assessment of selected significant occurrences.

These are reported to the NNR in the form of problem notifications. A total of 707 Problem Notifications (PNs) (occurrences) were reported in the following categories:

Table 7: Problem Notifications/Occurrences

Category	Number of Incidents/Occurrences 2007/08	Number of Incidents/Occurrences 2006/07
1 (Notify the NNR immediately)	0	0
2 (Notify the NNR within 24 hrs)	6	2
3 (Notify the NNR within 5 working days)	701	470

None of these PNs were classified as nuclear incidents or accidents as defined in the NNR Act.

The reporting and follow-up of problems, occurrences and events at Koeberg represent a thorough, fully procedurised and ongoing process of investigation. The duration of a given investigation until final close-out may vary from a few weeks to several months, depending upon the complexity of the issues involved.

International events were monitored by Eskom and the NNR. Eskom monitored information from sources such as the World Association of Nuclear Operators (WANO), Institute of Nuclear Power Operators (INPO), the IAEA and EdF. Apart from monitoring Eskom processes in this regard, the NNR also monitored information from the IAEA and information exchanged with other regulatory bodies through bilateral agreements.

The NNR was satisfied that the processes implemented at Koeberg relating to incidents/occurrences are acceptable and that plant safety performance was acceptable.

Regulatory Compliance

Compliance Assurance Programme

In order to verify the degree of compliance with the conditions of authorisation, the NNR undertakes independent inspections and audits. For the year under review a total of 209 inspections were conducted in 30 process areas (2006: 320 inspections in 30 process areas).

Safety Culture

The NNR is monitoring Eskom's safety culture programme at Koeberg, which includes the following:

- A Nuclear Safety Culture Awareness Seminar;
- Nuclear Safety Culture feedback sessions for each Department;
- Development of a Nuclear Safety Training module that can be delivered to managers, supervisors and leadership;
- An improved Management Observation Programme;
- Twelve Nuclear Safety Culture Awareness articles;
- General flyer to the Station on results of the Nuclear Safety Culture Survey;
- Development of a Monthly Nuclear Safety newsletter; and
- A Nuclear Safety Culture survey planned for the latter part of 2008.

Safety Indicators

A safety indicator system is used by the NNR to record and grade findings arising from the compliance assurance programme, inspections and assessment activities. The regulatory concerns are ranked according to a colour-coded system in terms of their severity, with:

- red being unacceptable;
- orange being tolerably high;
- yellow being tolerably medium;
- blue being tolerably low; and
- green being below regulatory concern.

The main findings of the compliance assurance programme were recorded as per the NNR safety indicators classification and are summarised below:

Table 8: Compliance assurance programme findings

Safety Indicator Classification and Number	Finding
Red (Unacceptable) – None	n/a
Orange (Tolerably high) – Two	<ul style="list-style-type: none"> • Configuration control Various inconsistencies and incomplete information were found on the work management system on the plant. This could challenge the configuration of the plant and the integrity thereof. Eskom has initiated a project to revisit the relevant databases and initiate corrective actions where required. The project is currently ongoing

Safety Indicator Classification and Number	Finding
Orange (Tolerably high) – Two (continued)	<ul style="list-style-type: none"> Record keeping This finding relates to inconsistencies and non-conformance within the different record keeping processes applied in the radiation protection area. Although there was never a question about the availability of records, Eskom was requested to strengthen and update the individual processes to comply with governing standards. These corrective actions have been completed

Regulatory Warnings or Directives to Stop Work

There were no regulatory warnings or directives to stop work during the reporting period.

Competency and Sufficiency of Eskom's Workforce to Work Safely

Although in recent years Koeberg has experienced problems with high turnover of staff, particularly with regard to engineers, technicians, physicists and project managers, the competency index has improved, largely due to an aggressive recruitment and training strategy. The NNR is satisfied that all safety related work is performed by suitably qualified individuals. However the NNR considers that production pressure together with inexperience in some areas are contributing factors to the substandard performance.

Appeals to the Chief Executive Officer

No appeals were lodged during the review period.

6.7 South African Nuclear Energy Corporation (Necsa) – Pelindaba Site

Background

Situated in the magisterial district of Madibeng in the North-West Province, approximately 25 kilometres west of Pretoria and 55 kilometres north-west of Johannesburg, the South African Nuclear Energy Corporation (Necsa) was established as a public company in terms of the Nuclear Energy Act, (Act No. 46 of 1999). This wholly state-owned organisation has its headquarters on the Pelindaba site, comprising 658 hectares of land and 54 hectares of buildings and other facilities.

Necsa undertakes and promotes research and development in the field of nuclear energy and related technologies; processes and stores nuclear material and other restricted material and co-operates with other organisations in matters falling within these areas.

Necsa supplies a wide range of high-technology nuclear products and services to South African and foreign market sectors, with the SAFARI-1 research reactor as the cornerstone of the commercial isotope production programme. SAFARI-1 is currently the most commercialised nuclear reactor in the world.

The conditions of the licence, issued by the NNR, require Necsa to ensure that:

- Arrangements acceptable to the NNR are established and implemented for the purposes of ensuring radiological protection of employees, members of the public and the environment, both on the site and off the site, as a consequence of authorised actions;
- Normal operational exposure of individuals is restricted to ensure that neither the effective dose nor the equivalent dose to relevant organs or tissues exceeds any relevant dose limit specified by the NNR; and
- The radiological protection must, under all operating states of the authorised actions or facilities ensure that:
 - Effective radiation doses, including committed effective doses to persons; are kept as low as reasonably achievable.
 - The number of people who are exposed is kept minimised; and
 - The likelihood of incurring exposures to radiation is kept as low as reasonably achievable.

Occupational Exposure to Radiation

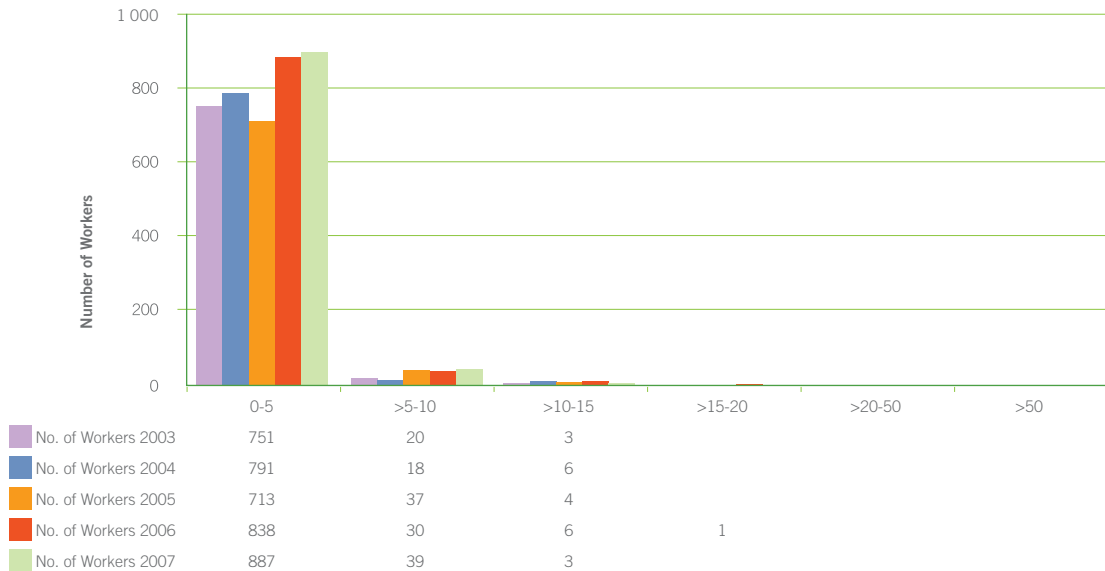
The average effective doses for occupationally exposed persons demonstrated that Necsa was in good compliance with the dose limitation system for individual workers over the reporting period. The average effective radiation dose for the 2007 calendar year was 0.63 mSv per occupationally exposed person (2006: 0.63 mSv), which is 12% of the ALARA objective of 4 mSv per annum. The total collective dose for the 929 radiation workers was 0.58 person-Sv and the maximum cumulative dose accrued for an individual during the calendar year was 13.2 mSv (2006: 15.6 mSv).

Table 9: Occupational exposure to radiation

Exposure Type	Dose 2007/08	Dose 2006/07
Maximum Dose (mSv)	13.2	15.6
Average Dose (mSv)	0.63	0.63
Total Collective Dose (Person-sievert)	0.58	0.6

Figure 4: Occupational Exposure at Necsca – Pelindaba

The following figure details the occupational exposure trends for the past five years.



Public Exposure to Radiation

In accordance with the conditions of licence and the Regulations on Safety Standards and Regulatory Practices published as Regulation No. R388 dated 28 April 2006, the public doses resulting from effluent discharges from the Necsca Pelindaba site must comply with the dose constraint of 0.25 mSv per annum and the system of AADQs applicable to the site. Necsca demonstrated good compliance with the AADQs and the projected public doses resulting from the

effluent releases (both liquid and gaseous) were well within the dose constraint for the 2007 calendar year. The projected annual dose to members of the public was calculated to be 0.0085 mSv, with the liquid effluent contributing 0.0072 mSv and the gaseous effluent contributing 0.0013 mSv.

The following figure shows the trend of estimated public doses for the period 1998 to 2007.

Figure 5: Projected public dose due to liquid effluent from Necsca from 1998 – 2007



Nuclear Safety

Process Based Licensing

The application of Process Based Licensing (PBL) at Necsa run facilities commenced in the 2002/03 financial year. In terms of PBL the authorisation holder more clearly 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.

Once completed, the Necsa PBL system will consist of 204 Necsa designed documents, dealing with the full spectrum of process areas, including policy, quality management, safety assessment and other regulatory processes.

At the end of the reporting period 109 of these documents had been submitted to the NNR and 31 had been approved.

LEU Conversion for SAFARI-1 Fuel

SAFARI-1 is a tank-in-pool type, light-water-moderated and cooled, beryllium and water reflected research reactor, designed and built as a general research tool, falling into the class of research reactors commonly known as Material Test Reactors (MTR).

SAFARI-1 is designed to accommodate a wide variety of irradiation experiments for medical, industrial and research applications. The reactor vessel is located in the reactor pool, which is surrounded by a high-density concrete biological (radiation-absorbing) shield. This provides the necessary shielding for operations from above the core and at poolside facilities whilst the reactor is in operation.

The reactor is currently fuelled by Highly Enriched Uranium (HEU) contained in plate-type fuel elements. It uses light water for coolant and neutron moderation purposes and is currently licensed to operate at a maximum thermal power level of 20 MW.

In line with international trends and nuclear non-proliferation, Necsa sought approval from the Department of Minerals and Energy for the conversion of the SAFARI-1 Research Reactor to Low Enriched Uranium (LEU) fuel. Following receipt of approval in 2005, Necsa purchased two LEU fuel elements from Cerca in France for irradiation tests. These elements were irradiated in SAFARI-1 research reactor during the 2006/07 review period. Further tests were carried out in

the review period to verify the suitability of LEU fuel in the reactor core. Necsa is in the process of revising the chapters of the SAFARI-1 safety case affected by the core conversion to validate that the reactor can be safely operated using the LEU fuel. The safety case will be submitted to the NNR for review and approval.

Transport Safety

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

At the beginning of the reporting period, the NNR adopted the requirements specified in the IAEA Standard Series No. TS-R-1, "Regulation for the Safe Transport of Radioactive Materials", 2005 edition, Vienna 2005. With effect from 1 November 2007, Necsa was required to demonstrate full compliance with the requirements specified in the document.

Transport actions undertaken during the reporting period included the following:

- Import of LEU fuel plates from Cerca in France;
- Import of LEU (oxide) from Russia;
- Export of sources; and
- Transport of calibration sources between the Vaalputs and Pelindaba sites.

Radioactive Waste Safety

There were no safety concerns relating to radioactive waste Management during the reporting period.

The conditions of licence require Necsa to:

- Establish and implement arrangements for the minimisation and safe management of radioactive waste on the site; and
- Established, implement and maintain a radioactive waste management programme for each facility on the site, in order to:
 - Ensure the identification, quantification, characterisation and classification of any radioactive waste generated;
 - Provide for the necessary steps leading to safe clearance, authorised discharge, disposal, re-use or recycling; and
 - Provide for the safe storage of radioactive waste between any waste management processes.

The following are some of the primary principles that apply to the management of solid radioactive waste on the Necsa Pelindaba site:

- Waste Management is aimed at optimisation of the processes from waste generation to waste disposal;
- The responsibility for solid waste management with respect to the development of facility-specific programmes, application of standards, quality assurance, optimisation and compliance with waste acceptance requirements is vested in the waste generator;
- All waste generated and processed on the Necsa site shall, after completion of the relevant predisposal activities, be channelled via a single gate-keeping entity (the Nuclear Liabilities Management Department [NLM]) for further predisposal activities (as applicable) followed by either long-term storage or disposal; and
- The waste generator is responsible for waste up to the point at which it has been formally transferred and accepted by NLM.

Waste Stored on the Necsa Pelindaba Site – Pelstore

Pelstore is the centralised storage facility for radioactive waste. During the 2007 calendar year a total of 2 472 radioactive waste containers were transferred to the Pelstore (2006: 3 868). The total number of radioactive waste containers within the Pelstore, as at 31 December 2007, was 47 333 (2006: 44 861).

The following table reflects the radioactive waste received at the Pelstore during the reporting period:

Table 10: Waste accrued and stored at the Pelstore 2007/08

Waste Type	Waste Container	Number of Containers
Isotope Waste	4 ton	48
Medical Waste	100 ℓ	11
Medical Waste	160 ℓ	17
Solidified Waste	100 ℓ	822
Compressible Waste	160 ℓ	1 464
Non-Compressible Waste	200 ℓ	110
Safeguard Enriched Waste	200 ℓ	0

In addition, 35 120 Separation Element Assemblies were transferred to and stored at Pelstore, packed in 878 pallets (40 per pallet).

Waste Stored on the Necsa Pelindaba Site – Thabana Pipe Store

The Thabana Pipe Store became operational in 1969 and is a storage facility used for the spent nuclear fuel from the SAFARI-1 research reactor. It comprised 30 pipes that contain 20 elements per pipe. With the 30 pipes already filled, the extension of storage capacity became necessary. With the approval of the NNR, the facility was extended by an additional 30 pipes and the NNR approved the transfer of a further 76 spent fuel elements from the SAFARI-1 research reactor. The transfer occurred during the period 25 February 2008 to 20 March 2008.

Environmental Protection

There were no concerns regarding safety of the environment around Necsa in the 2007 reporting period.

In addition to the monitoring and control of effluent discharges, NECSA is required to institute an environmental monitoring programme to ensure that discharges do not result in environmental build-up of radioactivity.

Samples are collected from various media in the environment around the Pelindaba site. These are analysed and results are submitted to the NNR on a quarterly and annual basis. The sample media include:

- Air filter monitoring on the Pelindaba site;
- Milk from cows in surrounding farms;
- Plant material in the surrounding area; as well as
- Water and fish samples from the Crocodile River and Hartbeespoort Dam.

The NNR employs a system of reporting levels, investigation levels and intervention levels to ensure an appropriate level of control and detection of radioactivity in the environment. The system is designed to rapidly detect any increases in environmental radioactivity and to ensure that appropriate action is taken to correct the situation.

Nuclear Emergency Preparedness and Response

The NNR has, in accordance with the National Nuclear Regulator Act (Act No. 47 of 1999) Section 38, the responsibility to ensure that the holder of a nuclear authorisation, in this case Necsa, has an effective emergency plan in place for the protection of workers, the public and the environment in the event of a nuclear accident. To fulfil this responsibility the NNR developed a requirements

document, RD-014 “Emergency Preparedness and Response Requirements for Nuclear Installations (Rev. 0). Necsa was directed to implement the requirements document by having the necessary preparedness and response arrangements in place.

In order to assess the effectiveness of the Necsa preparedness and response arrangements the NNR normally performs audits and arranges an emergency exercise during which the response to a given scenario is tested. To actively involve stakeholders, the NNR invites Observers to its regulatory exercises. This regulatory exercise for Necsa was conducted on 18 January 2008.

The simulated accident scenario involved a gaseous release from the SAFARI-1 research reactor resulting in mainly on-site consequences and responses. The scenario required Necsa to implement protective actions on site and only communication aspects for off-site organisations were evaluated. These actions included activation of on-site functionaries who assisted in managing the consequences of the ‘release’. On-site procedures, processes, equipment and personnel responses were tested by the NNR.

Evaluation of the response to the exercise against the specific objectives revealed the following:

- The response of Necsa Emergency Functionaries was generally in accordance with the emergency procedures;
- The activation of the Alternative Emergency Control Centre (AECC) as a result of the unavailability of the Emergency Control Centre (ECC) was activated promptly as soon as it was noticed that the plume was covering the ECC. The objective was therefore met by Necsa;
- Treatment at an off-site hospital for people who had been injured and contaminated with radiation was satisfactorily performed. This was limited to communication only;
- Communication and co-ordination between the AECC and off-site organisations was not appropriately performed;
- The ability to locate the plume was undertaken in accordance with the procedures;
- The absence of a logged record from Necsa reveals that Radio messages were not sent to Jacaranda FM;
- Overall mustering of people on site was done according to procedures although in some buildings and outside certain others, there was total disrespect for the mustering processes and procedures;

- Implementation of the Joint decision-making process by the Local and Provincial Governments and the DME was satisfactorily performed according to procedures. This aspect was limited to communication only; and
- Evacuation of people from the Necsa site was not appropriate in that evacuees and transport used were not monitored for contamination.

The storage locations for Potassium Iodate tablets were found to be generally inappropriate. The inspection of these locations was conducted on 29 November 2007 and revealed that some locations were inaccessible and that the ‘use by date’ of some tablets had expired. A report to this effect was sent to Necsa at the time.

Physical Security

Following the report of a security breach at the Pelindaba site, the NNR issued two directives to Necsa and undertook an independent investigation into the event. Representatives from the Government Security Regulator (National Key Points) as well as the SAPS Security Advisory Services participated jointly with the NNR in undertaking the independent investigation.

The NNR investigation identified a number of deficiencies in the current Necsa security provisions. These deficiencies require that Necsa undertakes a detailed review of all existing security provisions and makes detailed proposals for the upgrading of the system.

The NNR submitted the investigation findings to Necsa on 6 March 2008 for corrective and preventative actions to be implemented. These findings were included in the interim report on the corrective actions taken with regards to the breach of Necsa’s security measures which is reported to the NNR every two weeks. Also these actions are monitored by the NNR on a regular basis. The NNR will be monitoring the implementation of the corrective actions.

Safety of Sealed Radioactive Sources

The control of radioactive sources is managed in accordance with the stipulations of the Necsa PBL document HSE-INS-8100, being “Control of Radioactive Sources”. In terms of the stipulation in document HSE-INS-8100, Necsa is required to maintain a source register of all sources on the site. The source register must, as a minimum requirement, contain the following information:

- Nuclear facility in which the source(s) are located;
- Name of person responsible for the source;

- Radionuclide or radionuclide composition;
- Original activity;
- Identification number;
- Reference date (date produced);
- Form of the source (e.g. sealed source, anodised disk, solution, powder, etc);
- Company or facility of origin;
- Location or storage space;
- Date transferred; and
- Details of company or facility transferred to.

The source register is submitted to the NNR annually at the end of the calendar year and Necsa provides a status report twice a year (March and September). No irregularities were detected in this regard.

Nuclear Events, Incidents and Accidents Reported

The Regulations on Safety Standards and Regulatory Practices (SSRP) define a nuclear accident as 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 a worker on site received essentially at the same time of the event.

The SSRP further defines a nuclear incident as any unintended event which is capable of giving rise to an effective dose equal to or in excess of 0.1 mSv to the public off site, received essentially at the same 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 a worker on site, received essentially at the same time of the event, or significant failure of safety provisions.

The International Nuclear Event Scale (INES) was introduced in 1990 to facilitate communication and understanding between the nuclear community, the media and the public on the safety significance of events occurring at nuclear installations. "The International Nuclear Event Scale (INES) User's manual, 2001 Edition", classifies events on the scale of seven levels. The upper levels (4-7) are termed "accidents" and the lower levels (1-3) "incidents". Events which have no safety significance are classified below scale at level 0 and are termed "deviations".

A total of 123 category 2 events and 13 category 3 nuclear events (internal Necsa categorisation) were reported during the calendar year. None of these events represented a nuclear

accident or nuclear incident as defined in the SSRP and all the events had an INES rating of 0.

Regulatory Compliance

Inspections and Audits

The NNR conducts independent inspections and audits of Necsa facilities in order to verify the degree of compliance with the conditions of authorisation.

During the year under review a total of 484 inspections were conducted in 10 technical areas. The inspections showed good compliance with the NNR requirements and conditions of licence.

During the reporting period the NNR also conducted two audits. These audits were related to the UChem facility (P2700) and Radioactive Effluent Treatment Facility (P2400). Generally, the audits observed good compliance with the conditions of licence, although some findings were raised on both facilities.

Safety Culture Audit

The NNR had previously directed Necsa to provide the status of the organisation's safety culture in meeting the requirement of the SSRP and conditions of licence. In so doing, Necsa was required to commission an organisation-wide safety culture audit and implement the necessary corrective actions as identified in the audit.

The audit was undertaken in the reporting period and the report was submitted to the NNR in November 2007. The report concluded, among others, that:

- The historical situation has impacted detrimentally on the organisation's safety culture; and
- Although there is an improving safety culture, Necsa needs to do more to meet international standards.

Necsa was required to provide a plan of corrective actions and the NNR will be monitoring the implementation of these corrective actions.

Regulatory Warnings or Directives to Stop Work

Necsa complied with the directives that were issued by the NNR during the previous reporting period and the three facilities that were affected were allowed to operate again.

The NNR issued three directives to Necsa during the reporting period.

Two of the directives related to the security breach reported above. The NNR submitted the investigation findings to Necsa for Necsa to implement corrective and preventative action measures. Necsa is providing the NNR with regular reports on the progress of these actions.

The third directive pertained to the management of BLUE laboratories in Building P-1600. Necsa was directed to conduct an audit at both Radio Analysis and Tracer Laboratories facilities within P-1600 following a number of incidents relating to transgressions of radiological practices. The audit was based on the Safety Standards and Regulatory Practices, Conditions of the Licence and applicable SHEQ-INS documents. The NNR witnessed the conducting of the audits and was satisfied with the outcome and the facility was granted permission to continue to operate.

Competency and Sufficiency of Necsa's Workforce to Work Safely

In addition to the requirements in the SSRP, the conditions of licence require that Necsa must establish and implement arrangements to ensure that only 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 licence. Such arrangements must make provision for the appointment, as appropriate, of duly authorised persons to control and supervise operations, which may affect plant or facility safety.

Necsa generally complies with the above requirements but it has been noted that some additional capacity is required, particularly in the area of safety case development. This is of particular importance noting the planned expansion in the nuclear activities on the Pelindaba site.

Appeals to the Chief Executive Officer

No appeals were lodged during the reporting period.

Appeals to the Minister

The NNR issued the revised Nuclear Installation Licence, NL-27, variation 26 in April 2006. The main reasons for issuing a new variation were:

- The need to give effect to the name change of the authorisation holder from "Atomic Energy Corporation" to "South African Nuclear Energy Corporation";
- General revision of the licence to better define the scope of authorised activities;

- The need to more clearly define the NNR requirements taking into account international experience and stakeholder feedback; and
- To progress the application of Process Based Licensing at facilities run by Necsa.

The issuing of the licence was the subject of an appeal by Necsa, to the Minister of Minerals and Energy, on the grounds that the issuing of a site licence was contrary to the provisions of the NNR Act.

The decision on the Necsa appeal was handed down by the Minister of Minerals and Energy in June 2007. The decision requires that the NNR issue separate authorisations for the various facilities on the Pelindaba site. The NNR and Necsa have engaged in discussions to give effect to this decision.

6.8 South African Nuclear Energy Corporation (Necsa) – Vaalputs Site

Background

Vaalputs is the South African National Radioactive Waste Disposal Facility and is situated in the Northern Cape Province. Vaalputs is approximately 90 km southeast of Springbok, which is the closest town to the repository and approximately 200 km from the Namibian border. Vaalputs falls within the borders of the Kamiesberg Municipality. The greater Vaalputs site extends from the Bushmanland Plateau into the rocky hills of Namaqualand.

The Vaalputs site covers an area of approximately 10 000 ha. The disposal site itself is 99.54 ha (900 m x 1 106 m) including a 200 m exclusion zone along the perimeter. Vaalputs came into operation in 1986 and is used mainly for the disposal of low-and intermediate level waste from Koeberg in near surface trenches. Vaalputs underwent a detailed screening, selection and characterisation process and a nuclear licence for the disposal of radioactive waste at Vaalputs was granted in February 1990 (Licence No. NL-28).

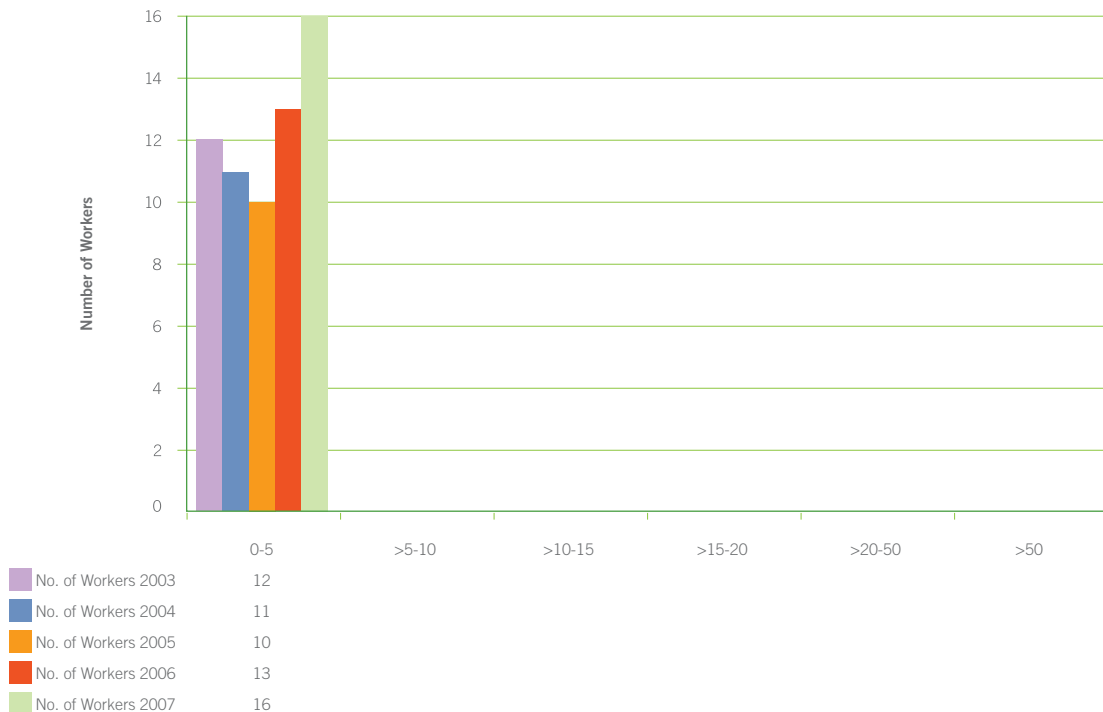
Occupational Exposure to Radiation

The average effective radiation dose per occupationally exposed worker for the calendar year 2007 was 0.6 mSv (2006: 0.64 mSv). The controls over occupational exposure at Vaalputs are comparable to best practice internationally.

Table 11: Occupational exposure to radiation

Exposure Type	Dose 2007/08	Dose 2006/07
Maximum Dose (mSv)	1.2	1.0
Average Dose (mSv)	0.7	0.64
Total Collective Dose (Person-Sievert)	0.01	0.008

Figure 6: Occupational exposure at Vaalputs



Transport Safety

Transport of waste to the Vaalputs site is the responsibility of the waste generator/s. The generator/s, or appointed contractor/s can, under normal conditions, transport the waste to the trench where the waste is offloaded by Vaalputs personnel and disposed of in the trenches.

The Vaalputs waste acceptance criteria require that transport is performed in compliance with the relevant provisions of the IAEA governing the safe transport of radioactive material. Waste transport is regulated by the NNR.

Public Exposure to Radiation

The environmental surveillance programme for Vaalputs has shown no measurable radiological impact on the public living in the vicinity of Vaalputs.

Only suitably qualified and appointed personnel from the waste disposal facility are allowed to operate motorised equipment transporting waste containers and to perform tasks related to the waste disposal activities on the Vaalputs site.

Nuclear Safety

In terms of plant and operations, a revised post-closure safety assessment was submitted to the NNR for review during the reporting period and a safety analysis report for Vaalputs is scheduled to be submitted to the Regulator for approval during the next reporting period.

Transport of radioactive sources to and from the service provider responsible for calibration of such instruments is reported to the Regulator as and when such sources are transported.

Radioactive Waste Safety

During the reporting period 46 shipments, consisting of 919 radioactive waste packages were received at Vaalputs from Koeberg for final disposal (2006: 60 shipments, consisting of 1 332 radioactive waste packages). The following table summarises the number and types of waste packages disposed of:

Table 12: Packages disposed of at Vaalputs in 2007

Type of Waste	Amount	Shipment
Concrete drums	199	40
Metal drums	720	6
Total	919	46

The Vaalputs nuclide inventory, including the number of waste packages in each trench, as at 31 December 2007, is summarised in the following table:

Table 13: Vaalputs nuclide inventory

Trench	Number of Waste Packages	Total Activity Received and Decayed up to 31 December 2007	
		Total Activity Received to Date (GBq)	Total Activity Corrected for Decay (GBq)
A01	9 940	1.09 E +05	9.705 E+04
A02	840	4.070 E + 02	1.44 E +02
A03	1 639	8.534 E +02	5.963 E+02
B01	3 177	1.019 E+05	3.080 E+04
B02	199	8.596 E+03	8.266 E+03
Total	15 795	2.22 E+05	1.37E+05

Environmental Protection

Routine environmental monitoring on and around the Vaalputs site has been done since 1984. This programme is conducted to confirm that there have not been any releases from the Vaalputs site into the environment. The monitoring programme is mainly focused on borehole water, soil and vegetation in the area.

Most of the nuclides were below the lower level of detection of the analytical equipment. Detectable concentrations, mainly uranium, alpha and beta activities were from natural radioactivity and did not have any unnatural impact on the environment.

Nuclear Emergency Planning and Preparedness

The facility has an emergency team which is fully trained and retrained and duly appointed to perform their different functions during an emergency situation.

Four Emergency exercises were held during the reporting period, including mustering as well as evacuation exercises. No deficiencies or non-compliances were identified.

Physical Security

No safety concerns arose at Vaalputs during the reporting period. With respect to physical security the Vaalputs site has the added advantage of being remotely situated in Namaqualand and the population density in the vicinity of the facility is very low.

Nevertheless, the physical security arrangements at Vaalputs were reviewed and some improvements are in an advanced stage of implementation. Further improvements will be implemented in due course.

Safety of Sealed Radioactive Sources

The sealed radioactive sources that are utilised on the Vaalputs site are mainly test sources which are used to test and calibrate radiological protection instruments utilised in the day-to-day activities on the site. These sources are stored in accordance with Necsa approved procedures.

Nuclear Incidents/Accidents Reported

No nuclear incidents were reported at Vaalputs during the reporting period.

Regulatory Compliance Inspections

NNR inspections undertaken at Vaalputs during the reporting period indicated adequate compliance with the Vaalputs Licence conditions. A total of 29 inspections were planned and carried out. The following table reflects the number of inspections and the inspection discipline.

Table 14: Inspections carried out at Vaalputs

Inspection Discipline	Number of Inspections
Engineering, maintenance and in-service inspection	3
Inspection and testing of waste handling equipment	3
Operational technical specifications	3
Radiation protection – Workers	3
Radiation protection – Public	3
Waste management	6
Quality assurance	1
Security	3
Training of personnel	2
Physical security	2
Total	29

Regulatory Warnings or Directives to Stop Work

No warnings or directives were issued during the reporting period.

Competency and Sufficiency of Vaalput's Workforce to Work Safely

The conditions of the Vaalputs licence as well the process based licensing documents require Necsa to only allow suitably qualified and authorised personnel to perform actions that may have an influence on radiation and conventional safety. There remains a need for additional capacity in the area of safety case development.

Appeals to the Chief Executive Officer

No appeals were lodged during the reporting period.

6.9 Regulation of Natural Sources

Background

Naturally occurring radionuclides are present in all minerals and raw materials of natural origin, of which the most important for the purposes of radiation protection are the radionuclides in the U²³⁸ and Th²³² decay series and K⁴⁰. These materials are commonly referred to as Naturally Occurring Radioactive Materials (NORM). In some materials the levels of NORM are significantly high, to the extent that regulatory control may be required for radiation protection purposes. In terms of the NNR Act (Act No.46 of 1999),

the NNR is responsible for exercising regulatory control over mining and mineral processing facilities handling NORM and require authorisation in terms of this Act. In terms of section 22 (1) of the NNR Act such facilities are authorised by means of a certificate of registration (COR).

The NNR at present issues six types of COR namely:

- Mining and mineral processing facilities;
- Scrap smelters;
- Fertiliser manufacturers;
- Scrap processors;
- Small users; and
- Service providers.

Typical activities at facilities handling NORM include actions such as:

- Mining and processing of gold, copper, uranium, heavy minerals and phosphate rock;
- Clearance of sites contaminated with NORM residue;
- Recycling of scrap material (i.e. ferrous and non-ferrous metals, plastic, stainless steel, etc) that is contaminated with NORM residues; and
- Conducting tests in laboratories on small quantities of NORM samples for verification of proposed and existing actions, including samples from prospecting activities.

The NNR received several applications for nuclear authorisation during the reporting period. A total of 18 new CORs were issued, bringing the total number of authorised NORM facilities to 123. As a result of the uranium expansion programme, the NNR has, to date, processed about thirteen (13) applications for uranium prospecting and mining activities and issued ten (10) CORs for uranium prospecting and is currently processing three (3) applications which will be issued in the next reporting period.

All these authorised facilities are required to pay a nuclear authorisation fee as determined and published in the Government Gazette, and a typical authorisation would include the following authorisation conditions:

- Operational Radiation Protection;
- Radioactive Waste;
- Transportation;

- Physical Security;
- Hazard Assessment;
- Operational Limitations;
- Requirements for Occurrences; and
- Quality Management.

Having issued the nuclear authorisation, the NNR ensures that the holder adheres to the conditions of authorisation contained in a COR. This is achieved through the implementation of a compliance assurance system, which comprises independent inspections, audits, investigations, monitoring, review of reports and enforcement actions, in order to provide regulatory oversight in accordance with the issued nuclear authorisations and the conditions contained therein.

Occupational Exposure to Radiation

The NNR has increased the frequency of compliance assurance inspections at all facilities, i.e. so-called Special Case Mines (SCMs), whose projected cumulative radiation dose indicates the possibility of exceeding the regulatory annual dose limit. This has ensured that engineering and administrative controls, introduced previously, are effectively implemented and monitored.

Regulatory limits are as indicated in Safety Standards and Regulatory Practises (SSRP) R388, which came into effect in April 2006. Workshops were conducted by the NNR with worker representatives in the affected areas on the practical implications of the SSRP.

The following table reflects progress in reducing the number of workers exposed to radiation levels in excess of the dose limit.

Table 15: Number of workers exposed above the dose limit

Year	Number of Workers
2003	424
2004	3
2005	5
2006	2
2007	0

During the reporting period, no worker exceeded the annual regulatory dose limit.

Holders are required to put in place adequately designed and properly controlled ventilation systems to reduce the occupational exposures to as low as reasonable achievable. Good engineering controls have, over the years, been the only practicable way of reducing the doses in the working environment. In the areas where no other practical means of controlling the radiation exposures are available, administrative measures such as job and worker relocation systems have been successfully implemented.

The NNR proactively engaged worker representatives at the mines to indicate the possibility of the relocation of workers should the dose reduction strategies implemented fail. Action plans included the identification and implementation of engineering controls and the use of action levels to relocate workers from high exposure areas to the identified low exposure areas.

The improvement in observed doses can be ascribed to the more rigorous compliance assurance measures implemented by the NNR at SCMs. Routine inspections conducted by the NNR resulted in tougher action being taken to enforce compliance with the conditions of authorisation. Some of these actions included the issuing of directives to the affected facilities as reported on page 55 in the section "Regulatory Warnings and Directives to Stop Work."

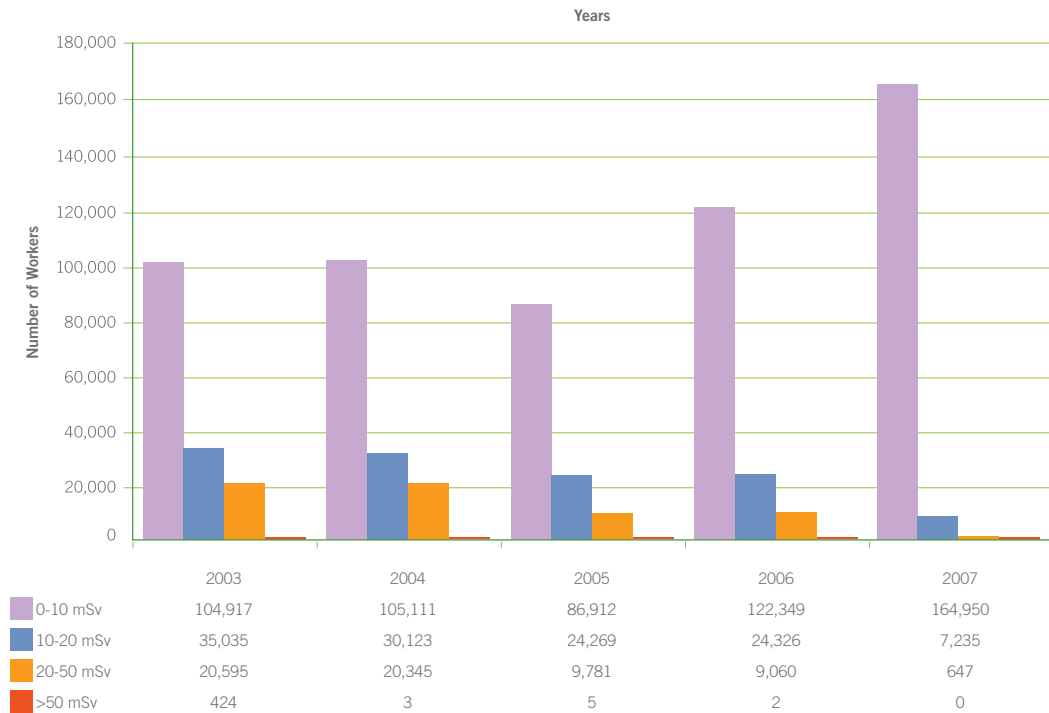
The NNR will continue to monitor the implemented measures to reduce worker doses in accordance with the ALARA principle and strengthen its system of compliance assurance to ensure that the dose to workers does not exceed the recommended regulatory limits as indicated in the SSRP R388.

The following graph compares the distribution of radiation doses to workers as reported by holders in their annual dose reports for the calendar years 2003 to 2007.

Public Exposure to Radiation

Authorisation holders are required to carry out safety assessments to identify and quantify the radiological risk to members of the public and the representative persons

Figure 7: Occupational exposure (2003-2007)



must submit these Public Safety Assessments (PSAs) to the NNR for approval. Based on these PSAs as well as the associated radiation protection programmes the holders must then establish and implement surveillance, monitoring and reporting procedures. This results in the prevention of an unacceptable radiation or contamination hazard to the public from actions on mines and discharges to the environment

PSAs were submitted and reviewed for adequacy by the NNR. From these it is apparent that there has been an improvement in the implementation of the radiation protection programme. Holders demonstrated that the doses from authorised facilities did not exceed the regulatory limit of 1 mSv per annum or, most importantly, the dose constraint of 0.25mSv per annum. The NNR expects, however, that there will be an increased need to apply more stringent requirements to manage radioactive discharges/effluents among the holders. This will be achieved with the introduction of a source specific Annual Authorised Discharge Quantity (AADQ) that takes into account the dose constraint not exceeding 0.25mSv per annum.

Transport Safety

The holders of nuclear authorisation continued to transport routine low specific activity (LSA-1) scrap materials on a daily basis in accordance with the conditions of authorisation.

Isolated incidences were reported to the NNR relating to trucks carrying potentially radioactive scrap to unauthorised facilities. These trucks were detected by bulk gamma monitors, located at some of the facilities, specifically designed to detect radioactive contamination in a truck load. The NNR was duly informed and the trucks were re-routed to appropriately authorised facilities. The NNR will investigate the possibility of locating more of these bulk gamma monitors at strategic points to avoid such occurrences.

In the review period, an isolated incident occurred during the transportation, per airfreight, of a test sample of Uranium Oxide from NUF COR to CAMECO in CANADA, as part of NUF COR's quality control. The sample was breached in the United Kingdom. All the relevant regulatory authorities were notified timeously and the sample was secured, repackaged and returned to South Africa. An investigation was conducted followed by a best practice workshop, held by AngloGold Ashanti, on the safe transport of Uranium. Revised transport control system processes, packaging, routes, emergency response, administration and general issues pertaining to transport of NORM were discussed.

The transportation of NORM and NORM contaminated scrap was generally carried out in accordance with the requirements

of the NNR and no other safety concerns arose relating to the transport of NORM during the reporting period.

Radioactive Waste Safety

Authorisation holders were required to manage their radioactive waste and associated waste products. Accordingly section 1.5 of the COR requires that a waste management procedure be submitted to demonstrate compliance with NNR requirement.

The main aspects of a typical radioactive waste management procedure include:

- Identification of radioactive waste and its sources;
- Segregation of radioactive waste into process and non-process waste;
- Categorisation of process waste into homogeneous and non-homogeneous waste;
- Radioactive waste management options;
- Record keeping and reporting; and
- Quality Assurance.

Routine and annual waste management reports were submitted to the NNR, summarising and interpreting the above programme and demonstrating compliance with NNR requirements.

Table 16: Type and quantities of radioactive waste material

Type of Waste	Quantity (tonnes)
Restricted Scrap	4.92E+05
Unrestricted Scrap	8.45E+06
Semi solids waste	4.33E+07
Gaseous waste	1.16E+12
Liquid waste	4.77E+07
Solid waste	3.18E+07
Other waste	3.22E+06

Environmental Protection

The NNR requires holders to establish, implement and maintain an environmental monitoring and surveillance programme, as outlined in the RSRP, to ensure and verify that the radioactive effluent discharged by the holders, complies with the conditions of nuclear authorisation. Monitoring, based on the outcome of the public safety and dose assessment reports, ensures that controls on the release of radioactive effluents are verified.

The NNR is currently considering the introduction of regional, rather than holder-specific, safety public assessments which would provide adequate information on the appropriate source specific AADQ for each action within that region.

Contaminated Sites

The NNR, together with the Chamber of Mines, previously identified 38 contaminated sites that needed to be cleaned up. Of these, 37 were cleaned, inspected and released from regulatory control. The remaining site will be authorised to handle and process radioactively contaminated scrap materials. A further 15 sites have been identified which will also have to be cleaned up. The Chamber will also need to know about the progress to date.

In addition, the NNR continuously receives applications for the removal of contaminated sites from regulatory control. These include tailings dam footprints, demolished plants and other areas which operated within the scope of an authorised



action. During the reporting period, the NNR also received several applications pertaining to land earmarked for township developments on sites previously used for mining purposes. With many of the mining and mineral processing facilities approaching the end of their lifespan, the NNR will need to brace itself and institutionalise the necessary technical understanding for the decommissioning and remediation requirements and measures applicable to these situations.

Nuclear Emergency Planning and Preparedness

The NNR required that an emergency and preparedness plan be established, to make provision for any occurrence involving radioactive material which has the potential to give rise to an unplanned exposure to radiation in excess of the respective annual effective dose limits for workers, visitors to the site, or members of the public. The scope and application of this

procedure was mainly limited to the transportation of NORM such as ammonium di-urate as in the case of NUF COR.

NUFCOR organised a best practice workshop on the safe transport of radioactive material during the reporting period, which covered some aspects of the emergency procedure requirements. All the additional emergency and preparedness measures identified during the workshop will be included in the revised NUF COR procedure. There were no other safety concerns related to the nuclear emergency planning and preparedness during the reporting period.

Physical Security

As part of the conditions of a nuclear authorisation, the holders of a nuclear authorisation are required to establish, implement and maintain a physical security system that is approved by the NNR. Such systems prevent, as far as reasonably possible, unauthorised access to areas containing radioactive material and prevent the unauthorised removal, diversion or theft of such material.

In general COR holders demonstrated compliance with the physical security requirements.

Safety of Sealed Radioactive Sources

All sealed radioactive sources maintained by holders of CORs are managed under the jurisdiction of the Directorate of Radiation Control within the Department of Health.

Nuclear Incidents/Accidents Reported

COR holders are required to notify the NNR of any occurrence that has taken place at the authorised facility, in accordance with an established procedure. Holders reported a total 27 of occurrences to the NNR during the reporting period.

No nuclear incidents or accidents, as defined in the NNR Act, were reported during the period.

Regulatory Compliance

Compliance Assurance Programme

In order to verify the degree of compliance with conditions of authorisation, the NNR undertakes independent inspections and audits at authorised facilities.

During the reporting period, the NNR increased the frequency of compliance assurance inspections at all authorised COR holders in line with its new graded approach. This entailed

frequent visits to facilities with a high potential for exposing their workers to radiation or where demolition activities were carried out.

A total of 237 inspections were planned for the year, of which 235 were achieved (2006/07: 127).

As a result of the increased frequency and consequently the visibility of the NNR at these facilities, the average compliance index for inspections improved to 85%, (2006/07: 81%). Holders were required to investigate the reasons for, and implement corrective actions related to, all non-compliances identified.

Over and above the inspections, the NNR conducted compliance assurance audits in terms of the quality management systems that are required to be established and maintained at all these facilities. A total of 24 audits were planned for the period, of which 22 were completed. The outstanding audits were postponed due to industrial action and the facilities subsequently ceased operation. Proof of closure was presented to the NNR.

The audits revealed a gradual improvement in the implementation of quality management systems. This is due, among other things, to COR holders attending quality management training and a better understanding of the NNR quality requirements. The NNR will hold regular workshop with holders in the future to continue to improve the implementation of these systems.

Where non-conformities were identified, holders were required to submit and implement action plans addressing corrective actions and preventative actions to avert recurrence. The NNR will continue to monitor the implementation of the corrective and preventive measures during the next reporting period.

In addition, several investigations were conducted by the NNR on facilities which the NNR suspected of handling radioactive material. The investigations extended to facilities where the owners had lodged applications for nuclear authorisation and then abandoned the process. A total of 15 such investigations were conducted, revealing that some applicants are no longer interested in handling radioactive material and will therefore not require nuclear authorisation. Others recommitted themselves to the process and subsequently addressed the outstanding issues raised and required by the NNR in terms of the review process.

Regulatory Warnings and Directives to Stop Work

As a result of the routine inspections conducted by the NNR, tougher action was taken to enforce compliance with the conditions of authorisation and several directives were issued to COR holders to cease all operation until identified non-compliances had been satisfactorily addressed. These are discussed below:

Kynoch Fertilizer (Pty) Ltd

The holder was found to be demolishing acid tanks and parts of a plant facility without an approved demolition procedure from the NNR. In terms of the directive the holder was instructed to cease all demolition activities with immediate effect until all the requirements of the directive were met.

Simmer & Jack Mines Limited Buffelsfontein Gold Mine (Buffelsfontein site)

The holder failed to submit all the revised operation procedures for approval to the NNR as required in terms of the conditions of the nuclear authorisation issued. The holder was directed to submit these operational procedures by 20 March 2008.

The holder failed to comply with the approved radiation protection procedure as required in the conditions of the COR. The NNR directed the holder to implement these procedures with immediate effect and submit a report to the NNR to indicate compliance with the directive by the end of January 2008.

Crown Gold Recoveries (Pty) Ltd

No evidence was found that all workers were assessed for possible radiation exposure. The mine was issued with a directive in December 2007 and required to fully comply by the end of January 2008. Failure to comply with the directive would result in workers being withdrawn from all working areas since their radiological status would not be known.

GFI Mining (Pty) Ltd (Kloof Division)

The authorisation holder failed to comply with most of the conditions of authorisation of the COR and other regulatory requirements. The authorisation holder was given 14 days to rectify all the non-compliances raised during the compliance assurance inspections and audits.

GFI Mining (Pty) Ltd (Beatrix Division)

A directive was issued to immediately address all the non-compliances raised during the compliance assurance audit conducted at the facility in November 2007. A schedule of compliance was submitted by the holder to demonstrate how the identified non-compliances would be addressed.

Blyvooruitzicht Gold Mining Company Limited

The NNR discovered during routine compliance assurance inspections that the mine was demolishing redundant sections of the Uranium Plant without the approved procedures for the demolition activities. The authorisation holder was directed to cease all work related to the demolition activities with immediate effect. The directive was lifted once all recommendations were fully implemented and a verification inspection had been conducted by the NNR.

Harmony-Evander Gold Mines Limited

The NNR discovered, during the review of the Public Safety Assessment which had been submitted as required in terms of the conditions of the COR, that the public had access to the mine's evaporation dams and used that water for recreational purposes.

The NNR directed the holder, among other things, to:

- Prohibit access by the public or animals as well as the use of the water from Leeuwan evaporation dam; and
- Provide a plan of action to prevent exposure to the public through any exposure pathway within seven days of receipt of the NNR directive.

Sediment samplings, undertaken at the Leeuwan evaporation dam, and fish samples were sent for analysis to DD science and the Necsa laboratory respectively. Soil sampling will be done once the sampling methodology is approved by the NNR.

East Rand Proprietary Mines (ERPM) Limited

The holder failed to comply with the approved radiation protection procedure as required in terms of the conditions of the COR. The NNR directed the holder to implement these procedures with immediate effect and submit a report to the NNR to indicate compliance with the directive within a set timeframe.

Zestcor Foundries (Pty) Ltd

The holder failed to comply with the approved radiation protection procedure as required in terms of the conditions of the COR. The NNR directed the holder to implement these procedures with immediate effect and submit a report to the NNR to indicate compliance with the directive by 30 April 2008.

East Rand Proprietary Mines (ERPM) Limited

The holder failed to comply with the approved radiation protection procedure as required in terms of the conditions

of the COR. The NNR directed the holder to implement these procedures with immediate effect and submit a report to the NNR to indicate compliance with the directive by the 30 April 2008.

Competency and Sufficiency of the Operator Workforce to Work Safely

The SSRP requires that the radiation protection function be sufficiently independent and be consulted on all decisions which may have an impact on radiation protection or nuclear safety. The NNR, through the regulatory documents issued to holders, requires holders to demonstrate that they have adequate competent, qualified and trained staff to execute the radiation protection function and to maintain an appropriate safety culture. To this effect, holders were required to submit appropriate documents showing compliance with these requirements. As a minimum, the staffing of the operator workforce must consist of a Radiation Protection Specialist (RPS); a Radiation Protection Officer (RPO) – an officer certified by the NNR that is responsible for the operational radiation protection programme of a NORM facility; and a Radiation Protection Monitor (RPM) – an officer that assists the RPO with basic functions of radiation protection such as monitoring.

From the inspections and audits conducted, the NNR was able to ensure that all holders demonstrated compliance with the above requirements, without exception.

Appeals to the Chief Executive Officer (CEO)

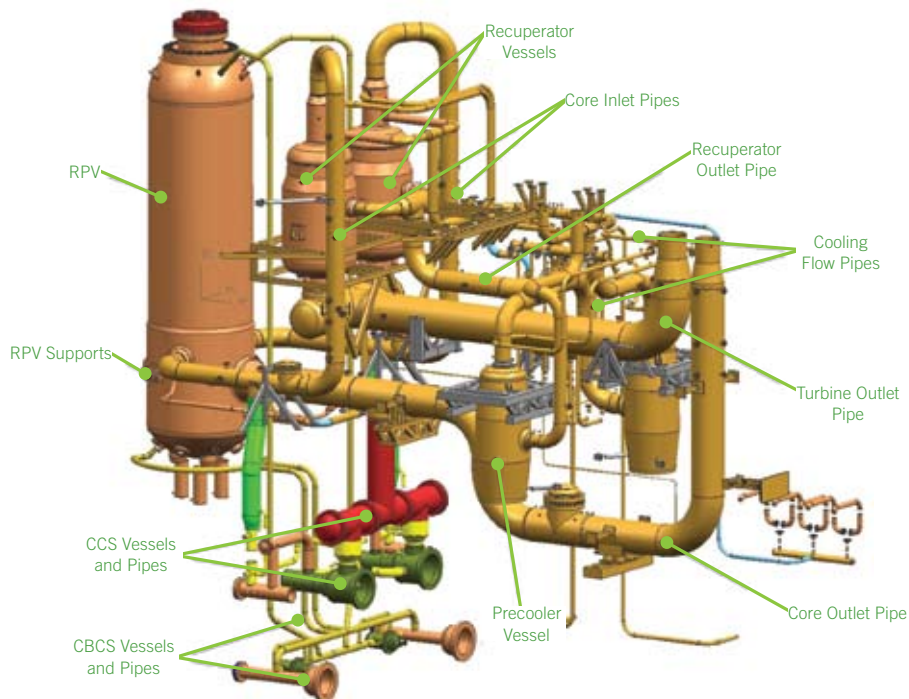
No appeals were lodged with the CEO of the NNR in terms of section 43 (1) of the NNR Act during the reporting period.

6.10 Pebble Bed Modular Reactor

In July 2000 Eskom applied for a construction licence for a PBMR DPP.

The proposed PBMR is a graphite moderated, helium cooled reactor using a direct gas cycle to convert heat, generated by nuclear fission in the reactor (pebble bed reactor core type design) and transferred to the coolant gas, into electrical energy by means of a helium turbo-generator.

Figure 8: Pebble Bed Modular Reactor Main Power System Layout



During the NNR review process some 25 Key Licensing Safety Issues were identified, which would require resolution at various stages of the licensing of the PBMR. The strategies for the resolution of these issues, developed by the PBMR (Pty) Ltd and Eskom, were accepted by the NNR in 2004.

Eskom and PBMR worked towards the resolution of these issues during the reporting period and will engage with the NNR on the outcomes during the next reporting period.

The issuing of the nuclear installation licence for the proposed PBMR reactor demonstration plant remains subject to finalisation of the NNR's public hearing process in accordance with the National Nuclear Regulator Act and the NNR's satisfactory assessment of the safety analysis report.

Regulatory Warnings and Directives to Stop Work

In October 2006, following the discovery by the NNR that certain activities relating to the manufacturing of components for the PBMR DPP had commenced without the necessary regulatory control, as required in terms of the National Nuclear Regulator Act, the NNR directed the PBMR, through Eskom, to suspend all such activities.

The NNR is mandated in terms of section 5 of the NNR Act to exercise regulatory control related to safety over the siting, design, construction, operation, *manufacturing of component parts*, decontamination, decommissioning and closure of installations.

The stop-work directive was issued when the NNR felt that the regulatory principles, requirements and processes were in danger of being severely compromised and that the NNR was not in a position to exercise its regulatory mandate.

The NNR directed that the manufacturing activities remain suspended until such time that:

- The NNR is satisfied that appropriate corrective actions arising from the investigation to be undertaken by Eskom, have been accepted and implemented;
- Appropriate processes have been agreed with the NNR;
- The necessary monitoring programmes are completed; and
- The relevant technical documents have been submitted by Eskom/PBMR and have been reviewed and accepted by the NNR.

Following an urgent intervention by the applicant during the reporting period, the NNR is now satisfied that measures subsequently implemented satisfactorily address the matters that led to the suspension. The NNR is confident that robust processes are in place at Eskom and PBMR to allow for the lifting of the suspension on manufacturing related activities. The suspension was therefore lifted in December 2007. Material produced prior to the lifting of the suspension is currently under quarantine at the respective PBMR suppliers. Eskom and PBMR will have to demonstrate and justify on a case-by-case basis that the materials are fit for application in the PBMR DPP.

Proposed Pebble Bed Modular Reactor Fuel Manufacturing Plant (PFP)

In December 2007, the PBMR wrote to the NNR withdrawing its application for a nuclear installation licence for the proposed PBMR Fuel Manufacturing Plant.

On 8 January 2008 the NNR received an application, dated 14 December 2007, from the South African Nuclear Energy Corporation (Necsa) Limited for a Nuclear Installation Licence for the proposed Pebble Bed Modular Reactor Fuel Manufacturing Plant (PFP). The application was for the siting, construction, operation, decontamination and decommissioning of the proposed PFP, to be built on the Necsa Pelindaba site in buildings B-D1, B-D2, B-C3 and B-C5. The proposed nuclear installation will manufacture fuel spheres and graphite spheres (non-fuel) for the proposed Pebble Bed Modular Reactor (PBMR) technology.

Following receipt of the application from Necsa, the NNR engaged in discussions with the applicant and, in accordance with the provisions of Section 21(1) of the NNR Act, the NNR wrote to Necsa on 28 March 2008 requesting further information as follows:

- A justification for the proposed facility;
- The intended lifetime of the proposed facility;
- The organisational structure and staffing for the proposed facility;
- A site plan showing the location of the boundary of the proposed site and every building, plant or facility on the proposed site;
- A strategy and safety case philosophy for the development of the required safety case for the proposed facility, including a schedule for the submission of the various aspects of the safety case;

- The strategy must include all applicable quality and document management arrangements and must make provision for the establishment of a safety committee or committees to oversee and manage the applicant's safety responsibilities and to which all safety policies, procedures, arrangements and documents must be referred, prior to them being submitted to the NNR;
- The safety case referred to above must include a risk assessment and demonstration of compliance with the safety criteria and other requirements of the NNR in accordance with the requirements of NNR documents LD-1091, LD-1094 (to be superseded by RD-0034), RD-0014, RD-0016, RD-0017, and the Regulations on Safety Standards and Regulatory Practices (SSRP) dated 28 April 2006; and
- A public information document, intended to provide background information on the proposed project including an identification of the hazards associated therewith. The language of the document must be such that it is easily and readily understood by the general public yet must contain sufficient detail to allow the public to make meaningful comment on the project.

The NNR awaits the submission of the safety case for the proposed PBMR Fuel Manufacturing Plant from Necsa. The NNR has also set up a forum in the form of a Licensing Project Meeting (LPM) to accommodate regular discussion on the application. These LPMS will take place on a monthly basis.

In accordance with the requirements of section 21(3), notice of the application will be published in the Government Gazette early in the new financial year.

6.11 Proposed Production Smelter at Necsa

Originating from Necsa's previous operations, approximately 14 000 tons of uranium-contaminated scrap metal is presently stored on the Pelindaba site. The greater portion of this metal consists of about 36 000 separation elements which, in accordance with non-proliferation agreements, should be destroyed completely. Necsa regards smelting as the most appropriate and cost-effective method to achieve this.

In February 2001 Necsa submitted an application for a nuclear installation licence for a production smelter. In terms of the provisions of section 21(3) of the National Nuclear Regulator Act (Act No. 47 of 1999) the licence application was

published in the Government Gazette and local newspapers. Further copies of the application were served on identified Government Departments, local and provincial authorities, community based organisations, organised labour groups, environmental groups, and chambers of business and commerce.

The above-mentioned bodies were granted a period of 30 days to make comment on the licence application. Following a review of the comments received, the NNR Board, in terms of section 21(4) of the NNR Act, determined a need for further public debate. Subsequently Necsa informed the NNR that the project would be delayed and no further review work was undertaken. Towards the latter part of 2006 Necsa informed the NNR that it wished to proceed with the project. This intention was confirmed by Necsa's CEO in February 2007.

The NNR completed its review of the submitted safety case for the proposed Necsa smelter and submitted comments to Necsa in January 2008. Following Necsa's satisfactory addressing of comments raised, the NNR will arrange for public hearings on the proposed smelter before considering issuing the licence.

6.12 Preparation for New Build Programme

In July 2006, Eskom officially notified the NNR that it was investigating and undertaking feasibility studies into the choice of technology towards new nuclear generating capacity, in addition to that to be supplied by the PBMR. An essential step in the process has been the establishment of a strategic framework for licensing the selected technology, and the site(s) where the technology is to be built.

The NNR is in the process of developing regulatory criteria for siting of prospective new plants and a strategy for the licensing of such plants. These developments go hand-in-hand with developments on regulatory processes, international participation and capacity building.

6.13 Application for a Nuclear Vessel License

The NNR received an application for a nuclear vessel licence from the SA Navy on behalf of the British Royal Navy for a UK nuclear power propelled submarine to visit the naval

base of Simons Town from 27 September to 6 October 2007. Following the satisfactory completion of the technical review and public participation process a nuclear vessel licence was granted to the applicant. The NNR conducted an independent radiological monitoring programme, including ambient radiation monitoring, water and shellfish samples, in the vicinity of the vessel prior to and during the visit as well as once the ship had left the Simons Town naval base. No anomalies were recorded.

6.14 Development of Regulatory Documents

The following regulatory documents were developed or reviewed during the reporting period:

Strategy for Minimisation of Waste

The NNR developed a strategy document for the minimisation of radioactive waste generated by facilities regulated by the NNR. The strategy presents the principles for waste minimisation to ensure optimal reduction of waste. The strategy forms the basis for the implementation of the Radioactive Waste Management Policy and Strategy for the Republic of South Africa.

Requirements on Decommissioning

The requirements on decommissioning document was developed to complement the NNR Safety Standards and Regulatory Practices by providing further details on the NNR's requirements in terms of decommissioning. The consultative process to finalise the document involved submission thereof to licensees for review and comments. The NNR considered all comments received and those relevant were incorporated into the document.

Strategy for the Development of the NNR Regulatory Research Programme

The role of regulatory research conducted at the NNR is to provide the technical basis needed for decision-making. In an effort to strengthen research and development within the NNR, a strategy document was developed which takes into account the current developments within the nuclear industry that directly impact on the NNR research imperatives. The research strategy was approved and will be implemented in the next reporting period.

Framework for Environmental Radiation Status Study in South Africa

Documented information regarding the environmental radiation status in South Africa is indispensable for the implementation of measures to ensure protection of the public, environment and property against harmful effects of radiation. The document was developed to provide a framework for the execution of the study into the status of environmental radioactivity, due to the varied actions in different areas of South Africa which could contribute to radioactivity in the environment. The document was finalised and will be implemented in the next reporting period. The framework identifies various activities including airborne measurements, field measurement and the development of maps by assembling different ground and airborne gamma spectrometry databases.

Strategy for Computer Codes and Models used in Safety Assessments

In evaluating safety submissions from licensees, it is often necessary to carry out a range of complementary analyses to inform regulatory decisions, making it necessary to maintain an analytical capacity in this regard. To this end, the NNR developed a strategy for the establishment of in-house capacity in the use of computer codes and models in safety assessments; safety assessment methodologies; and state of the art computer codes for accident analysis, the calculation of occupational doses and the calculation of doses to the public during normal operations.

The report provides the outcomes of a survey into the codes and models relevant for application at the NNR and a brief overview of the technical disciplines in which the NNR can use these computer codes and models. The survey revealed that a gap exists between the available capacity and the required capacity and highlights the need for adequate financial resources; human capacity development to use the codes; skills transfer from Technical Support organisations; and bi-lateral contracts.

Framework for a Harmonised System of NNR Safety Indicators

During the reporting period, the NNR initiated work to establish a harmonised compliance assurance programme across the NNR programmes. Linked to this project, a project to develop a framework for a harmonised system of NNR safety indicators was also initiated. A review of the current

compliance assurance programme was undertaken and areas for harmonisation were identified. Documents on both projects were drafted in parallel. The current draft will be progressed during the next review period and will take into account the new strategic initiatives in terms of the review and update of the NNR licensing philosophy and approach.

Policy on Emergency Preparedness and Response

The harmonisation of the NNR emergency planning framework and criteria in the form of an administration policy was finalised. The implementation of this policy will ensure a consistent approach to the regulation of emergency preparedness and response at all nuclear facilities by the NNR.

NNR Internal Preparedness and Response Arrangements

The development of the NNR's internal emergency preparedness and response facilities and processes are contained in the NNR procedures. An international peer review of these facilities was performed and will ensure compliance with international best practice. Once the final report is received, a project to upgrade the NNR system and update the procedures will be initiated.

6.15 Investigations and Regulatory Research

An important element of the regulatory strategy of the NNR is to proactively implement processes to improve its regulatory effectiveness. One of the means to achieve this goal is the establishment and implementation of a programme of regulatory research. Typically, the regulatory research activities of the NNR focus on selected initiatives including the review and survey of international literature, safety standards and regulatory practices with a view to informing NNR regulatory strategies, the development of new or the updating of existing regulatory requirements and the formulation of regulatory positions.

In-depth research is carried out on behalf of the NNR by expert consultants.

The following regulatory research projects, investigations and initiatives were undertaken during the review period:

Wonderfonteinspruit Project

An assessment of radiological impacts of mining activities in the Wonderfonteinspruit Catchment Area (WCA) was carried out in the previous reporting period, and the documented outcome was released during the reporting period.

The considered radiological risks in the WCA comprise both the effects of current mine water discharges and diffuse emissions of seepage and runoff from slimes dams, as well as legacies of past radioactive contamination, now present as radionuclides stored in sediments and soils. The study involved analysis of water and sediment/soil samples for naturally occurring radionuclides. Realistic and potential exposure scenarios and pathways were specified and the incremental doses (above natural background) for the public living in the WCA were calculated.

It was established that the (potential) use of contaminated water for drinking does not dominate radiation exposures. Three exposure pathways that could cause significantly elevated contamination of food were identified as: (1) interception of radionuclides by leaves due to irrigation of pasture and crop vegetation, in addition to the accumulation of radionuclides in the soil by long-lasting irrigation with contaminated mine water; (2) uptake of re-suspended sediments by cattle during watering at the banks of surface water bodies; and (3) agricultural use of land contaminated with slimes transported by storm water runoff from slimes dams. Potentially, these three exposure pathways could lead to radiation exposures to the public that are above the regulatory limit.

To prevent or diminish such impacts as reasonably achievable, the following comprehensive measures were taken:

- In December 2007 a Steering Committee was established, including the DME, DWAF, DEAT and the Department of Agriculture (DA), to jointly address the WCA problem and oversee remediation. The objectives and Terms of Reference of the Steering Committee are as follows:
 - Co-ordinate the facilitation and implementation of an integrated approach to the processes, solutions and decision-making related to the remediation of the radioactive contamination in the WCA;
 - Facilitate the co-ordination of the respective legislative requirements for the pollution/contamination footprints related thereto; and

- Ensure the proper and collective co-ordination of assessment, research, information and media matters related to cross-cutting issues that arise during the course of the work of the Steering Committee.
- The Steering Committee resolved to engage with and communicate the work of the Committee with affected communities, concerned stakeholders, the general public and the media on an ongoing basis. The NNR undertook several meetings with COR holders in the vicinity of the WCA to discuss progress and the implementation of an action plan as outlined in the NNR directives. These holders have established a forum, known as the Mining Interest Group (MIG), which will address some of the issues relating to the WCA that fall outside the scope of authorisation of these holders. Co-ordination by the Chamber of Mines (CoM) is also taking place. The NNR will continue to implement relevant measures where possible, to ensure that protection of the public and the environments are being monitored.

Project on Clean-up of Uranium-contaminated Sites in the Karoo

In the late 1970s and 1980s, several companies undertook uranium prospecting in the Karoo area, leaving sites that could pose a radiological hazard to members of the public and future generations. A plan was initiated to rehabilitate the sites. Subsequently, the entire area which was designated for rehabilitation has been prospected on and prospect holders have had to obtain requisite authorisation from the NNR. As a result, rehabilitation of these sites as an independent project is no longer required.

Financial Liability Project

Section 29 of the National Nuclear Regulator Act, (Act No. 47 of 1999), requires that the holder of a nuclear installation licence provides Financial Security and Liability for Nuclear Damage. The financial liability project provides the basis for recommendations to the Minister of Minerals and Energy by the Board of the level of security to be provided. Work undertaken in 2006/07 progressed to the point where a preliminary report was compiled and was under review.

During the review it became apparent that considerable economic and agricultural data was required to calculate the economic consequences of severe nuclear damage. The procurement process of appointing service providers to assist with the collection of the required data was finalised

during the reporting period and the collection of data around Koeberg Nuclear Power Station is in progress.

This data will provide input to finalise Phase I of the project that includes the following deliverables, based on the requirements of Section 29 of the NNR Act, (Act No. 47 of 1999):

- Report on details on the methodology used for determining the economic consequences of a nuclear accident at Koeberg Nuclear Power Station; and
- Report on the determination of possible quantum of claims that could result from a serious accident at the Koeberg Nuclear Power Station.

The above deliverables will provide the basis for recommendations to the Minister on the level of security to be provided by Eskom.

During Phase II of the project, the methodologies developed during Phase I will be adapted for application to the Necsa facilities.

NNR Colloquiums

The NNR organises regular feedback meetings and colloquiums to encourage the dissemination of research outputs and discussion on topical issues of interest to the NNR. This initiative is intended to increase and develop a scientific culture within the organisation. During the reporting period, the NNR hosted various colloquiums where local and international experts were invited to lead discussions on identified topics of interest. NNR staff members also used the colloquiums to present feedback from international forums and meetings attended.

6.16 International Participation in the Reporting Period

Obligatory/Statutory participation

The International Atomic Energy Agency (IAEA)

NNR participates actively in the IAEA Safety Standards Committees (CSS, NUSSC, WASSC, RASSC and TRANSSC), working groups and technical committee meetings to develop and approve draft safety standards. The NNR is also represented on the IAEA's International Nuclear Safety Group (INSAG).

NNR staff attended the following meetings at the IAEA Headquarters in Vienna during the reporting period:

- NUSSC meetings;
- RASSC meetings;
- WASSC meetings;
- TRANSSC meetings; and
- CSS meetings

The IAEA Standards have served as references and benchmarks for South African nuclear safety and radiation protection. This largely comprises reference to the IAEA standards in regulatory requirements and guidance documents. Further, indirect use of the IAEA material is also made in the development of standards and regulations and sometimes in dealing with issues for which there is no established South African standard.

The suite of IAEA Safety Standards and the current IAEA Basic Safety Standards in particular were used as references in the development of the recently published South African regulations on "Safety Standards and Regulatory Practices" that were established in terms of the provisions of the NNR Act.

IAEA General Conference

The IAEA General Conference is an important annual event during which international regulatory matters are discussed and agreed upon. Further, the Conference agrees on the scope of work to be undertaken by the IAEA during the year ahead.

The NNR participated in these discussions as part of the South African delegation, led by the Minister of Minerals and Energy. The 51st IAEA general conference was held in September 2007 in Vienna, Austria.

Other Important Participation

Participation in the Multinational Design Evaluation Programme (MDEP)

The NNR has been actively involved in all MDEP activities since its inception. Participation in this initiative is particularly important, given the licensing of the PBMR, benchmarking this with other new reactor designs and the potential building of further new reactors in South Africa.

The MDEP was initiated by the US Nuclear Regulatory Commission (NRC) to facilitate co-operation among nuclear

regulators involved in the safety review of new reactor designs which are intended for construction in worldwide markets or at least in more than one country. The purpose of MDEP is to ensure that a design found suitable in one country does not have to be substantially modified to meet licensing requirements elsewhere. This can be achieved if the requirements that must be satisfied in one country are consistent with, or at least not significantly different from, those that must be satisfied in another country.

Regulators from the USA, France, China, Japan, South Korea, Canada, UK, Russia, Finland and South Africa as well as the IAEA actively participate in this initiative. A Steering Technical Committee (STC) was tasked, by the MDEP Policy Group to assess the regulatory programmes and requirements associated with the licensing of new nuclear power plants. In addressing this subject, the STC focused on the broad issues of the Licensing Basis; the Scope of Design Reviews; and the use of Safety Goals for each participating country.

A Working Group on Component Manufacturing Oversight (WGCMO) was tasked by the STC to assess the regulatory requirements and review associated with the manufacturing processes for components for use in nuclear power plants as well as codes and standards. In addressing this subject, the working group focused on the manufacturing processes and codes and standards for components in the highest mechanical safety class for each participating country.

The initial phase of the STC work and associated Working Groups culminated in a report on the conclusions of the MDEP pilot project and the recommendations of the STC. The recommendations in this report, as approved by the Policy Group, will be carried out in the next phase of the MDEP.

Network of Regulators of Countries with Small Nuclear Programmes (NERS)

The NNR is a member of the Network of Regulators of Countries with Small Nuclear Programmes (NERS). The NNR participates in NERS to exchange information and experiences with other participating regulators. During the review period the NNR attended the 10th annual NERS meeting which was held at Hotel Zuiderduin, Egmond aan Zee in Netherlands. The following subjects were discussed during the meeting:

- Regulatory Body preparation for new build: maintenance and development of nuclear safety competences (including manpower management);

- Management of Safety Culture with a special view to the changing ownership structure of nuclear facilities; and
- A round table of actual capacity of the regulatory body and how it is financed.

The NNR provided input to the meeting through presentations and technical discussions with other regulators in attendance. Useful insights were gained from the experiences of other regulators, allowing the NNR to adopt a proactive approach to possible regulatory challenges. The meeting also provided the NNR with the opportunity to compare its regulatory oversight with practices in other countries.

International Nuclear Liability Expert Group (INLEX)

The NNR is represented on the IAEA International Nuclear Liability Expert Group whose membership is limited to persons recognised for their expertise in nuclear liability and the relevant international instruments. The INLEX meeting took place in Vienna. Topics deliberated on included:

- Issues related to the restricted period of insurance cover for nuclear liability and gaps in the insurance cover;
- Exclusion of small quantities of radioactive material from the liability conventions;
- Denial of shipments and the relevance of the nuclear liability principles;
- The disadvantages of not adhering to a global nuclear liability regime, in particular with regard to the possible difficulties of obtaining compensation outside the regime established by the nuclear liability instruments;
- Increasing the amounts of nuclear liability coverage through international pooling of operators' funds; and
- How to develop further the comprehensive legal framework on nuclear law.

As part of its outreach programme INLEX, in association with the NNR, conducted an African regional workshop on nuclear liability which was held from 11-13 February 2008 at Sun City. The workshop was attended by delegates from African countries.

International Nuclear Law Association (INLA)

Two meetings and the biennial conference of the International Law Association were attended in Brussels during 2007. The senior legal advisor of the NNR was elected to serve a further term of two years on the Board of Management of INLA.

Co-operation in the African Continent

Forum of African Regulators

Pursuant to the South African initiative to establish a forum of African Nuclear Safety Authorities, the NNR initiated the establishment of an African Nuclear Regulators Group.

The NNR is a member of the steering committee that was constituted during the project formulation task force meeting that took place at the IAEA headquarters in Vienna. The committee held a meeting where the status of the initiative to establish the regional African Regulatory Forum was reviewed. Discussions during the meeting focused on the mandate, administrative and financial matters. Feedback and further actions will be discussed at a meeting planned to coincide with the IAEA 2008 General Conference, when input from African member states will be consolidated as Terms of Reference for the Forum to agree upon.

At the sub-regional level, initial contact with countries in the SADC region has been established. Further actions on this initiative will be progressed during the next reporting cycle.

Assistance to Other African Countries

During the review period, the NNR provided assistance to the Ethiopian Radiation Protection Authority in the form of information pertaining to Personal monitoring services and food and environmental monitoring.

Integrated Regulatory Review Service (IRRS)

NNR staff participated in the international team of 11 experts in radiation and nuclear safety that carried out a full scope Integrated Regulatory Review Service (IRRS) at the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The purpose of this IRRS mission was to review ARPANSA's regulatory framework and regulatory activities in all regulated sources, facilities and activities; to review its regulatory effectiveness; and to exchange information and experience in the areas considered by IRRS.

The IRRS is intended to strengthen and enhance the effectiveness of the State's regulatory infrastructure in nuclear, radiation, radioactive waste and transport safety, whilst recognising the ultimate responsibility of each State to ensure the safety of nuclear facilities; protection against ionising radiation; the safety and security of radioactive sources; the safe management of radioactive waste; and the safe transport of radioactive material. The IRRS is carried out

using comparisons with IAEA regulatory safety standards and taking into account regulatory, technical and policy issues.

Other International Co-operation

NNR staff members extend their knowledge base and keep abreast of the latest international trends and developments through participation in International Forums, scientific and technical visits as well as attendance of technical meetings and conferences.

- NNR staff participated in the IAEA DeSa Project to develop a document called Safety Assessment Methodologies for Decommissioning of Facilities using Radioactive Material. The project commenced in 2004 and the document is scheduled for publication in 2008. The DeSa project developed a method for the safety assessment of facilities to be decommissioned. The method was demonstrated by application to three test cases. Furthermore the approach to safety assessment and regulatory review was captured in the document.;
- NNR staff attended an IAEA workshop on harmonisation of approaches to assuring safety within national radioactive waste management policies and strategies in Cape Town;
- NNR staff attended the eighth conference on Plant Life Management and Plant Licence Extension (PLIM + PLEX) in Paris, France. The conference was dedicated to nuclear aging management and related licensing issues;
- NNR staff participated in an IAEA project to develop a project proposal for Self Assessment Methods for Regulatory Bodies in Africa;
- As indicated above, NNR staff attended several meetings/workshops relating to the Multinational Design Evaluation Programme (MDEP); and
- A PBMR project meeting was held with the NNR Technical Support Organisations (TSOs) in Cologne, Germany, The project meeting was followed by a technical meeting at the Julich Research Institute and then a meeting with the TSO specialists, focusing primarily on computer code and model development, held in Knutsford, UK.

Bilateral Agreements

Within the framework of the bilateral agreement between the NNR and the French Nuclear Safety Authority (ASN/IRSN) the NNR/ASN (IRSN) bilateral meeting took place at ASN in Paris. Presentations were made on a wide range of issues of mutual interest to both organisations covering Power Reactors, Research Reactors and emergency preparedness. Technical support for the NNR from the ASN/IRSN on Koeberg related assessments was also discussed. Technical exchanges subsequently took place. The NNR concluded an agreement with the French Technical Support Organisation to the ASN, the Institut de Radioprotection et de Surete Nucleaire (IRSN) for ongoing technical safety assessment support to the NNR.

- NNR staff attended a transport exercise and Emergency Planning Working Group with ASN from 8-12 October 2007. One NNR Staff member attended the CODIRPA seminar in Paris; and
- Three NNR staff members participated in the NRC/NNR Technical bilateral Meeting on High Temperature Gas-Cooled Reactor Licensing Topics in Rockville, Maryland, USA. The purpose of the meeting was to exchange information on high temperature gas-cooled reactor licensing topics in support of: (1) the development of the NRC/US Department of Energy (DOE) Joint Licensing Strategy for the next generation nuclear plant (NGNP); (2) the NRC pre-application review of the pebble bed modular reactor (PBMR) for the USA and; (3) the NNR licence review of the PBMR demonstration reactor in South Africa. The NRC and (DOE) attendees expressed appreciation for the presentations made by the NNR participants and requested future interactions with the NNR in this regard.

6.17 Communications and Outreach Initiatives

Public Safety Information Forum

In accordance with the provisions of Government Notice No. 299, dated 12 March 2004 and section 26(4) of the NNR Act, Public Safety information forums are held on a quarterly basis by:

- Eskom, for the Koeberg Nuclear Power Station; and
- Necsa, for the Pelindaba site and Vaalputs respectively.

The three forums are aimed at informing the persons, living in the municipal areas in respect of which dedicated emergency plans have been established, about nuclear safety and radiation safety matters (including emergency planning) related to the relevant nuclear installation. The Chairperson and Deputy Chairperson of the forums are elected annually at the first meeting. The NNR attends the meetings and has made presentations related to the mandate of the NNR, outcomes of emergency planning and preparedness and NNR outreach initiatives.

Outreach Programmes

Emergency Preparedness Steering and Oversight Committee (EPSOC) – Koeberg

In terms of liaison with local/municipal and provincial authorities in the vicinity of Koeberg, the NNR participates in the EPSOC meeting which is held quarterly in Cape Town and chaired by the DME.

The main outcomes to date are outlined below:

- Control of development in the vicinity of Koeberg;
- Monitoring of the development of the late phase aspects of the Koeberg emergency plan;
- Reporting and follow-up on emergency exercises; and
- Follow-up on specific international issues such as intervention levels for the distribution of potassium iodate pills.

Science Unlimited 2007

The NNR actively participated as a partner in the 2007 Science Unlimited project. The NNR involvement in the project includes conducting career awareness sessions for various Grade 11 and 12 learners. The NNR also use exhibitions that are part of the project to provide the students and teachers with information on the NNR mandate; specific topics on nuclear safety and radiation protection; and the skills needed to work for the nuclear regulator. During the reporting period the NNR participated at Science Unlimited events that were organised in Gauteng and in KwaZulu-Natal.

Meetings between the NNR and Labour Union Representatives at Koeberg

The purpose of these meetings is to discuss matters of mutual interest or concern relating to nuclear safety and public communication. Meetings are held on an *ad hoc* basis on request by either party. No meetings were held during the reporting period.

National Forums

National Energy Summit

The NNR took part in the National Energy Summit held from 25-28 September 2007 and made a presentation on Safety Regulations and Safeguards during the Panel Session.

The harmonisation of the NNR emergency planning framework and criteria in the form of an administration policy were finalised. The implementation of this policy will ensure a consistent approach to the regulation of emergency preparedness and response at all nuclear facilities by the NNR.

Annual Financial Statements Contents



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The Public Finance Management Act (Act No. 1 of 1999, as amended) (PFMA), requires that the directors ensure that the entity maintains full and proper records of its financial affairs and that its annual financial statements fairly present the state of affairs of the entity, its financial results, its performance against predetermined objectives and its financial position at the end of the year in terms of Generally Accepted Accounting Practice (GAAP).

The external auditors are responsible for independently auditing and reporting on the financial statements. The Office of the Auditor-General has audited the financial statements and the Auditor-General's report appears on page 69.

The annual financial statements have been prepared in accordance with Statements of Generally Accepted Accounting Practice and the Companies Act. These annual financial statements are based on appropriate accounting policies, supported by reasonable and prudent judgments and estimates.

The Directors have reviewed the National Nuclear Regulator's budgets and cash flow forecasts for the year ending 31 March 2008. On the basis of review, and the view of the current financial position and existing borrowing facilities, the Directors have every reason to believe, and the auditors concur, that the National Nuclear Regulator will be a going concern in the year ahead and have continued to adopt the going concern basis in preparing the financial statements.

The Board of Directors sets standards and monitors the implementation of systems of internal control and risk management that are designed to provide reasonable, but not absolute assurance against material misstatements and losses. The national Nuclear Regulator maintains internal financial controls to provide assurance regarding:

- The safeguarding of assets against unauthorised use or disposal; and
- The maintenance of proper accounting records and the reliability of financial information used within the business or for publication.

The Directors have reviewed the entity's systems of internal control and risk management for the period 1 April 2007 to 31 March 2008. The Directors are of the opinion that the Regulator's systems of internal control and risk management were effective for the period under review and record that further improvements are being implemented.

In the opinion of the Directors, based on the information available the annual financial statements fairly present the financial position of the National Nuclear Regulator at 31 March 2008 and the results of its operations and cash flow information for the year.

The annual financial statements and performance against objectives for the year ended 31 March 2008, set out on pages 75 to 93, were approved by the Board of Directors of the National Nuclear Regulator on 29 July 2008, and are signed on its behalf by:



Prof. MA Hermanus
Chairperson



Mr G Clapison
Acting Chief Executive Officer

8 Report of the Audit and Risk Management Committee

The Audit and Risk Management Committee has adopted appropriate formal terms of reference, which have been confirmed to the Board, and has satisfied its responsibilities as set out in the terms of reference.

In performing its responsibilities the Audit and Risk Management Committee has reviewed the following:

- The effectiveness of internal control systems;
- The effectiveness of internal audit;
- The output of a risk assessment workshop to identify the major risks faced by the organisation;
- Risk areas of the entity's operations to be covered in the scope of internal and external audits;
- The adequacy, reliability and accuracy of financial information provided to management;
- The accounting or auditing concerns identified as a result of the internal or external audits;
- The adequacy of the policies and procedures considered necessary to comply with the requirements of the Public Finance Management Act;
- The entity's compliance with legal and regulatory provisions;
- The activities of the internal audit function, including its annual work programme, co-ordination with the external auditors, the reports of significant investigations and the responses of Management to specific recommendations;
- The adequacy of the terms of reference of the Audit Committee as well as other Board Committees; and
- The scope and results of the external audit and its effectiveness.

The Audit and Risk Management Committee has also been responsible for:

- Approving the Internal Auditing Charter and Work Plan;
- Approving the Fraud Prevention Policy and Plan;
- Approving the Risk Management Plan;
- Ensuring adequate segregation between non-audit services and the internal audit function, where these services were provided by the same accounting firm; and
- Encouraging improved co-ordination and liaison between Board Committees in those areas where responsibilities overlap.

The Audit and Risk Management Committee notes that, although the NNR financial performance has been satisfactory and a reliable system of internal controls had been in place during the year under review, there has nevertheless been some concerns regarding the capacity within the NNR to continuously ensure compliance with the Treasury Regulations and the PFMA. Notwithstanding the foregoing, the Committee considers that the system of internal controls has to a significant degree ensured that the organisation's major risks were reduced to an acceptable level. The Audit and Risk Management Committee is satisfied that there is a plan in place to maintain a reasonable system of controls that will ensure compliance with all relevant prescripts for the achievement of the organisation's objectives.

The Audit and Risk Management Committee has evaluated the annual financial statements of the National Nuclear Regulator for the year ended 31 March 2008 and concluded, except for the matters raised in the report of the Auditor-general, that these statements comply in all material respects with the requirements of the Public Finance Management Act (Act No. 1 of 1999), as amended, together with the associated Treasury Regulations and the South African Statements of Generally Accepted Accounting Practice.



Adv. BM Mkhize

Chairperson: Audit and Risk Management Committee

REPORT OF THE AUDITOR-GENERAL TO PARLIAMENT ON THE FINANCIAL STATEMENTS AND PERFORMANCE INFORMATION OF THE NATIONAL NUCLEAR REGULATOR FOR THE YEAR ENDED 31 MARCH 2008

REPORT ON THE FINANCIAL STATEMENTS

Introduction

1. I have audited the accompanying financial statements of the National Nuclear Regulator which comprise the statement of financial position as at 31 March 2008, statement of financial performance, statement of changes in net assets and cash flow statement for the year then ended, and a summary of significant accounting policies and other explanatory notes, and the authority's report, as set out on pages 73 to 93.

Responsibility of the accounting authority for the financial statements

2. The accounting authority is responsible for the preparation and fair presentation of these financial statements in accordance with the basis of accounting determined by the National Treasury, as set out in note 1 to the financial statements and in the manner required by the Public Finance Management Act, 1999 (Act No. 1 of 1999) (PFMA). This responsibility includes:
 - designing, implementing and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.
 - selecting and applying appropriate accounting policies.
 - making accounting estimates that are reasonable in the circumstances.

Responsibility of the Auditor-General

3. As required by section 188 of the Constitution of the Republic of South Africa, 1996 read with section 4 of the Public Audit Act, 2004 (Act No. 25 of 2004) (PAA) my responsibility is to express an opinion on these financial statements based on my audit.
4. I conducted my audit in accordance with the International Standards on Auditing and *General Notice 616 of 2008*, issued in *Government Gazette No. 31057 of 15 May 2008*. Those standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance on whether the financial statements are free from material misstatement.
5. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements 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 entity's internal control.
6. An audit also includes evaluating the:
 - appropriateness of accounting policies used
 - reasonableness of accounting estimates made by Management
 - overall presentation of the financial statements.
7. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Basis of accounting

8. The entity's policy is to prepare financial statements on the basis of accounting determined by the National Treasury, as set out in note 1 to the financial statements.

Basis for qualified opinion

Property, Plant and equipment

9. I was unable to obtain the necessary information on Management's assessment of the useful lives of property, plant and equipment as required by IAS 16 (AC123) *Property, Plant and Equipment*. I could not determine the effect on the financial statements.

Opinion

10. In my opinion, except for the effects of such adjustments, if any, as might have been determined to be necessary had I been able to satisfy myself as to the matter described in the Basis for qualified opinion paragraph, the financial statements present fairly, in all material respects, the financial position of the National Nuclear Regulator as at 31 March 2008 and its financial performance and cash flows for the year then ended, in accordance with the basis of accounting and in the manner required by the PFMA.

Emphasis of matter

11. I draw attention to the following matter.

Highlighting critically important matters presented or disclosed in the financial statements

Irregular or fruitless and wasteful expenditure as well as material losses through criminal conduct

12. As disclosed in note 19 to the financial statements, irregular expenditure to the amount of R4 426 064 was incurred.
- The NNR entered into finance lease contracts for periods in excess of that authorised by National Treasury and incurred expenditure amounting to R910 411.
 - The NNR did not comply with the requirements of the Preferential Procurement Policy Framework Act, 2005 and the thresholds specified in the Practice Notes issued by National Treasury, amounting to R3 515 653.

OTHER MATTER(S)

I draw attention to the following matter that relates to my responsibilities in the audit of the financial statements:

Internal controls

13. Section 51(1)(a)(i) of the PFMA states that the accounting authority must ensure that the company has and maintains effective, efficient and transparent systems of financial and risk management and internal control. The table below depicts the root causes that gave rise to the inefficiencies in the system of internal control, which led to the qualified opinion. The root causes are categorised according to the five components of an effective system of internal control. In some instances deficiencies exist in more than one internal control component.

Reporting item	Control environment	Risk assessment	Control activities	Information and communication	Monitoring
Property, Plant and Equipment			X		

Control environment: establishes the foundation for the internal control system by providing fundamental discipline and structure for financial reporting.

Risk assessment: involves the identification and analysis by Management of relevant financial reporting risks to achieve predetermined financial reporting objectives.

Control activities: policies, procedures and practices that ensure that Management’s financial reporting objectives are achieved and financial reporting risk mitigation strategies are carried out.

Information and communication: supports all other control components by communicating control responsibilities for financial reporting to employees and by providing financial reporting information in a form and time frame that allows people to carry out their financial reporting duties.

Monitoring: covers external oversight of internal controls over financial reporting by Management or other parties outside the process; or the application of independent methodologies, like customised procedures or standard checklists, by employees within a process.

Non-compliance with applicable legislation

Treasury Regulations

14. The following deviations from the Treasury Regulations were noted:

- Petty cash re-imburements were not paid into a National Treasury approved bank account as required by Treasury Regulation 31.2.

Matters of governance

15. The PFMA tasks the accounting authority with a number of responsibilities concerning financial and risk management and internal control. Fundamental to achieving this is the implementation of certain key governance responsibilities, which I have assessed as follows:

Matter of governance	Yes	No
Audit committee		
• The entity had an audit committee in operation throughout the financial year.	X	
• The audit committee operates in accordance with approved, written terms of reference.	X	
• The audit committee substantially fulfilled its responsibilities for the year, as set out in section 77 of the PFMA and Treasury Regulation 27.1.8.	X	
Internal audit		
• The entity had an internal audit function in operation throughout the financial year.	X	
• The internal audit function operates in terms of an approved internal audit plan.	X	
• The internal audit function substantially fulfilled its responsibilities for the year, as set out in Treasury Regulation 27.2.	X	
Other matters of governance		
The annual financial statements were submitted for audit as per the legislated deadlines section 55 of the PFMA.		X
The financial statements submitted for audit were not subject to any material amendments resulting from the audit.		X
No significant difficulties were experienced during the audit concerning delays or the unavailability of expected information and/or the unavailability of senior Management.		X
The prior year's external audit recommendations have been substantially implemented.	X	

OTHER REPORTING RESPONSIBILITIES

REPORT ON PERFORMANCE INFORMATION

16. I have reviewed the performance information as set out on pages 21 to 27.

Responsibility of the accounting authority for the performance information

17. The accounting authority has additional responsibilities as required by section 55(2) (a) of the PFMA to ensure that the annual report and audited financial statements fairly present the performance against predetermined objectives of the public entity.

Responsibility of the Auditor-General

18. I conducted my engagement in accordance with section 13 of the PAA read with *General Notice 616 of 2008*, issued in *Government Gazette No. 31057 of 15 May 2008*.

19. In terms of the foregoing my engagement included performing procedures of an audit nature to obtain sufficient appropriate evidence about the performance information and related systems, processes and procedures. The procedures selected depend on the auditor's judgement.

20. I believe that the evidence I have obtained is sufficient and appropriate to report that no significant findings have been identified as a result of my audit.

APPRECIATION

21. The assistance rendered by the staff of the National Nuclear Regulator during the audit is sincerely appreciated.

Auditor - General.

Pretoria

31 July 2008



AUDITOR - GENERAL

Introduction

The Directors present their annual report that forms part of the audited annual financial statements of the organisation for the year ended 31 March 2008. The annual financial statements have been prepared on the going concern basis since the directors have every reason to believe that the company has adequate resources in place to continue in operation for the foreseeable future.

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) to:

- a) Provide for the protection of persons, property and the environment against nuclear damage through the establishment of safety standards and regulatory practices;
- b) Exercise regulatory control related to safety over:
 - i) The siting, design, construction, operation, manufacture of component parts, and the decontamination, decommissioning and closure of nuclear installations; and
 - ii) Vessels propelled by nuclear power or having radioactive material on board which is capable of causing nuclear damage, through the granting of nuclear authorisations;
- c) Exercise regulatory control over other actions to which the Act applies, through the granting of nuclear authorisations;
- d) Provide assurance of compliance with the conditions of nuclear authorisations through the implementation of a system of compliance inspections;
- e) Fulfil national obligations in respect of international legal instruments concerning nuclear safety; and
- f) Ensure that provisions for nuclear emergency planning are in place.

The Board of Directors is the accounting authority in terms of the Public Finance Management Act.

Nature of Business

The NNR carries out effective regulatory control by developing and implementing regulatory standards and practices that are comparable to internationally accepted standards and practices. Quantitative and qualitative assessment techniques and safety assurance programmes are applied in an efficient and cost-effective manner.

In the course of implementing its mandate, the NNR maintained focus on its transformation objectives, which are captured in the NNR Strategic Plan. In this regard, the Report on Performance Against Objectives following, reflects NNR performance relating to core business, alignment of internal processes to strategy, improvement of stakeholder relations, as well as training and capacity development, employment equity, and preferential procurement.

Review of Operations

The total income for the NNR was R71,276 million (2006: R68,197 million) including the Government Grant of R18,029 million (2006: R14,742 million) and the operating costs amounted to R72,449 million (2006: R53,749 million)

Events Subsequent to Balance Sheet Date

The NNR Directors are not aware of any other matter or circumstance which may have arisen since the end of the financial year, not otherwise dealt with in the annual financial statements, which significantly affects the position of the organisation or the results of its operations.

Materiality and Significance Framework

A materiality and significance framework has been developed for reporting losses through criminal conduct and irregular, fruitless and wasteful expenditure, as well as for significant transactions envisaged per section 54(2) of the PFMA that requires ministerial approval. The framework was finalised after consultation with the external auditors and was approved by the executive authority.

Stakeholder Relations

A great deal of interaction, as part of the NNR's outreach initiatives, was carried out during the current reporting year through meetings and forums. The NNR maintained good relations with stakeholders, including the regulated industry (Minerals, Energy and Allied Industries Forum on Radiation), and policy/decision makers (the Parliamentary Portfolio Committee on Minerals and Energy, the Department of Minerals and Energy, Department of Water Affairs and Forestry, Department of Environmental Affairs and Tourism, and the Department of Health. Co-operative agreements were concluded with the afore-mentioned Government Departments as required by the NNR Act, (Act No. 47 of 1999). The NNR further interacted with Civil Society and Organised Labour, and maintained relations with other strategic co-operatives such as the media, Non-governmental Organisations (NGOs), international organisations, nuclear regulatory authorities in other countries, and the general public.

Shareholder Relations

The NNR reported to and held discussions with the Executive Authority on significant events, including interaction with the DME with regard to the publication of regulations in terms of the National Nuclear Regulator Act, such as regulations on the keeping of records of all persons in a nuclear accident area, prescribed content of the NNR annual report, and improvements required on the enforcement regime.

Social Responsibility and Capacity Building

For some time, the NNR has been involved in various national capacity building initiatives. These continued during the reporting period, and included participation in ARECSA, the MARST programme at the University of North West and participation in the post-graduate course in radiation protection at the University of the Witwatersrand. NNR staff provided lectures and training materials in support of the course and also made available a number of young recruits to gain valuable exposure.

The NNR actively participated in the Department of Minerals and Energy's joint initiative on Learners Focus Week in Energy, with other associated organisations within the DME. The objective of the initiative was to promote and stimulate awareness of and interest in mathematics, science and engineering career opportunities related to energy. The NNR also provided financial support to the South African Young Nuclear Professionals Society.

In addition the NNR continues to place great value on experiential learning for young graduates in nuclear related fields. Specifically, the NNR continued to provide internship opportunities to deserving graduates.



Guy Clapisson
Acting Chief Executive Officer

11 Statement of Financial Position

as at 31 March 2008

	Notes	2008 R	2007 R
Assets			
Non-current assets			
Property, plant and equipment	2	5,057,332	2,015,542
Retirement benefit asset	5	-	-
Current assets			
Trade and other receivables	3	7,076,146	7,854,526
Cash and cash equivalents	4	75,638,207	65,942,651
		82,714,353	73,797,177
		87,771,685	75,812,719
Equity and Liabilities			
Reserves			
Accumulated surplus/(deficit)		29,276,597	23,986,219
Non-current liabilities			
Finance lease obligation	17	628,281	-
Retirement medical benefits	5	28,499,867	29,718,000
Current liabilities			
Short-term portion of lease liability	17	310,213	-
Trade and other payables	6.1	6,405,581	1,567,522
Provisions	6.2	4,651,146	2,540,978
Deferred income - DME Grant	14	18,000,000	18,000,000
		29,366,940	22,108,500
		87,771,685	75,812,719

12 Statement of Financial Performance

for the year ended 31 March 2008

	Notes	2008 R	2007 R
Operating income	7.1	71,276,259	68,197,464
Operating expenses		(72,449,210)	(53,749,139)
Operating (deficit)/surplus		(1,172,951)	14,448,325
Interest received		6,644,578	4,361,233
Interest paid		(158,058)	-
Net surplus for the year		5,313,569	18,809,558

13 Statement of Changes in Net Assets

for the year ended 31 March 2008

	Accumulated surplus/(deficit) R
Balance at 31 March 2006	5,176,661
Surplus for the period	<u>18,809,558</u>
Balance at 31 March 2007	23,986,219
<i>Prior year adjustment</i>	(23,191)
Surplus for the period	5,313,569
Balance at 31 March 2008	<u>29,276,597</u>

14 Cash Flow Statement

for the year ended 31 March 2008

	Notes	2008 R	2007 R
Cash flow from operating activities		13,419,086	15,587,723
Cash receipts from authorisation holders and applicants		72,054,639	62,857,500
Cash paid to suppliers and employees		(65,122,073)	(51,631,010)
Cash generated from operations	12.1	6,932,565	11,226,490
Interest paid		(158,058)	-
Interest received		6,644,578	4,361,233
Cash flow from investing activities			
Acquisition of equipment		(4,351,810)	(628,697)
Cash flow from financing activities			
Finance lease	17	628,281	-
Net increase in cash and cash equivalents		9,695,557	14,959,026
Cash and cash equivalents at beginning of the period		65,942,650	50,983,624
Cash and cash equivalents at end of the period	12.2	75,638,207	65,942,650

1 Accounting Policy

The annual financial statements have been prepared in accordance with South African Statements of Generally Accepted Accounting Practice (GAAP) including any interpretations of such Statements issued by the Accounting Practices Board, with the prescribed Standards of Generally Recognised Accounting Practices (GRAP) issued by the Accounting Standards Board replacing the equivalent GAAP Statement as follows:

Standard of GRAP	Replaced Statement of GAAP
GRAP1: Presentation of Financial Statements	AC101: Presentation of Financial Statements
GRAP2: Cash flow statements	AC118: Cash flow statements
GRAP3: Accounting policies, changes in accounting estimates and errors	AC103: Accounting policies, changes in accounting estimates and errors

The recognition and measurement principles in the above GRAP and GAAP statements do not differ or result in material differences in items presented and disclosed in the financial statements. The implementation of GRAP 1, 2 and 3 has resulted in the following significant changes in the presentation of the financial statements:

Terminology differences:

Standard of GRAP	Replaced Statement of GAAP
Statement of financial performance	Income Statement
Statement of financial position	Balance Sheet
Statement of changes in net assets	Statement of changes in equity
Net assets	Equity
Surplus/deficit for the period	Profit/loss for the period
Accumulated surplus/deficit	Retained Earnings
Contribution from owners	Share Capital
Distribution to owners	Dividends
Reporting date	Balance Sheet date

The cash flow statement can only be prepared in accordance with the direct method.

Specific information, such as those documented directly below, must be presented separately on the statement of financial position:

- a) Receivables from non-exchange transactions, including taxes and transfers;
- b) Taxes and transfers payable; and
- c) Trade and other payables from non-exchange transactions.

The amount and nature of any restrictions on cash balances is required to be disclosed.

Paragraph 11-15 of GRAP 1 has not been implemented as the budget reporting standard is in the process of being developed by the international and local standard authorities. Although the inclusion of budget information would enhance the usefulness of the financial statements, non disclosure will not affect fair presentation.

1.1 Basis of Preparation

The financial statements have been prepared on the historical cost basis.

1.2 Going Concern Assumption

The financial statements have been prepared on a going concern assumption and will continue in operation for the foreseeable future.

1.3 Revenue Recognition

Revenue is recognised when it is probable that future economic benefits will flow to the enterprise and these benefits can be measured reliably. Revenue comprises of authorisation fees and other special projects. Revenue arising from authorisation fees is recognised on an accrual basis in accordance with the substance of the relevant agreements.

1.4 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.

1.5 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 Statement of Financial Performance.

1.6 Property, Plant and Equipment

All property, plant and equipment is initially recorded at cost and is carried at cost less accumulated depreciation and any accumulated impairment losses at reporting date. An item of property, plant and equipment is derecognised upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the Statement of Financial Performance in the year it is derecognised. The assets' residual values, useful lives and methods of depreciation are reviewed, and adjusted if appropriate, at each financial year end. Depreciation is provided on the straight-line basis which, it is estimated, will reduce the carrying amount of the assets to their residual values at the end of their useful lives. Land is not depreciated as it is deemed to have an indefinite life. Where an item of property, plant and equipment comprises major components, it is accounted for as separate items of property, plant and equipment.

The major components of assets are depreciated at the following rates:

Property - Land	Not depreciated
Property - Buildings	20 years
Office Furniture	10 years
Office Equipment	5 years
Computer Equipment	3 years
Scientific and Technical Equipment	5 years
Computer Software	3 years

1.7 Accounting for Leases

Leases for assets under which all the risks and benefits of ownership are effectively retained by the lessor are classified as operating leases. Payments made under operating leases are charged to the Statement of Financial Performance on a straight line basis over the period of the lease after taking into account any fixed escalation clauses.

1.8 Financial Instruments

Financial assets and financial liabilities are recognised on the

Statement of Financial Position when NNR becomes a party to the contractual provisions of the instruments. They are initially measured at fair value plus transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability. They are subsequently measured as follows:

Trade receivables are measured at amortised cost using effective interest method, less impairment losses.

Cash and cash equivalents, loans and borrowings and trade and other payables are measured at amortised cost using the effective interest method.

1.9 Provisions

Provisions are recognised for a present legal or constructive obligation when, as a result of past events, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation, and a reliable estimate of the obligation can be made.

1.10 Interest Received

Interest income is accrued on a time proportionate basis, by reference to the principal outstanding and at the effective interest rate applicable, which is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount.

1.11 Comparative Figures

Where necessary, comparative figures have been adjusted to conform to changes in the presentation in the current year.

1.12 Impairment

The carrying amounts of the NNR assets are reviewed at each reporting date to determine whether there is any indication of impairment. If there is any indication that an asset may be impaired, its recoverable amount is estimated. The recoverable amount is the greater of its fair value less cost to sell and its value in use. In assessing value in use, the expected future cashflows from the asset are discounted to their present value using a discount rate that reflects the current market assessments of the time value money and the risks specific to the asset. An impairment loss is recognised whenever the carrying amount of the cash generating unit exceeds its recoverable amount. A previously recognised impairment loss is reversed if the recoverable amount increases as a result of a change in the estimates used to determine the recoverable amount, but not to an

amount higher than the carrying amount that would have been determined (net of depreciation) had no impairment loss been recognised in prior years.

1.13 Government Grants

Government grants are recognised as income on a systematic basis over the period necessary to match the grants with the related costs which they are intended to compensate.

1.14 Post-retirement Obligations

Post-retirement Pension Benefit

NNR provides benefits to employees through a defined benefit plan in terms of Pension Funds Act, 1956 (Act of 1956). The pension plans are funded by payments from employees and the NNR, taking into account the recommendations of independent actuaries. Obligations arising from the defined benefit plan are assessed using the Projected Unit Credit Method. Under this method, the cost of providing pensions is charged to the income statement to spread the regular cost over service period of employees in accordance with the advice of the actuaries who carry out a full valuation of the fund every three years. The pension obligation is measured as the present value of the estimated future cashflows using interest rates on Government bonds that have terms to maturity approximating the terms of the related liability. Any actuarial gain or loss is recognised in the income statement

as it occurs.

Post-retirement Medical Benefits

The NNR has made provision for a medical aid scheme covering employees who were in its employ on or before 1 July 1990 and who retire from its service. The NNR has also made provision to cover a portion of the subscription to the medical scheme in respect of those members of staff who joined the NNR between 1 July 1990 and 31 December 1995 and who retire from its service.

1.15 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 employees 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. The provision has been calculated at undiscounted amounts based on salary rates.

1.16 Currency of Presentation and Rounding of Amounts

All amounts are expressed in South African rands unless otherwise stated. Amounts in the financial statements have been rounded off to the nearest rand.

2 Property, Plant and Equipment

	2008			2007		
	R Cost	R Accumulated depreciation	R Book value	R Cost	R Accumulated depreciation	R Book value
2.1 Carrying Amount as at the Beginning of Year	12,059,004	(10,043,462)	2,015,543	11,462,945	(9,262,509)	2,200,436
Furniture	1,081,289	(619,898)	461,391	1,031,578	(537,198)	494,380
Office equipment	1,049,849	(822,041)	227,807	1,044,677	(728,922)	315,755
Computer equipment	5,160,153	(4,658,796)	501,358	4,917,387	(4,364,165)	553,222
Scientific and technical equipment	2,528,891	(2,386,324)	142,567	2,528,891	(2,327,568)	201,323
Computer software	1,811,322	(1,460,547)	350,776	1,512,912	(1,219,487)	293,425
Property - Buildings	213,750	(95,857)	117,894	213,750	(85,169)	128,581
Property - Land	213,750	-	213,750	213,750	-	213,750

2 Property, Plant and Equipment (continued)

	2008			2007		
	R Cost	R Accumulated depreciation	R Book value	R Cost	R Accumulated depreciation	R Book value
2.2 Additions	4,351,810	-	4,351,810	628,696	-	628,696
Furniture	117,786	-	117,786	50,562	-	50,562
Office equipment	1,387,757	-	1,387,757	6,201	-	6,201
Computer equipment	1,876,021	-	1,876,021	273,522	-	273,522
Scientific and technical equipment	-	-	-	-	-	-
Computer software	970,247	-	970,247	298,410	-	298,410
Property - Buildings	-	-	-	-	-	-
Property - Land	-	-	-	-	-	-
2.3 Disposals/ Impairment	-	-	-	(32,637)	-	(32,637)
Furniture	-	-	-	(851)	-	(851)
Office equipment	-	-	-	(1,029)	-	(1,029)
Computer equipment	-	-	-	(30,756)	-	(30,756)
Scientific and technical equipment	-	-	-	-	-	-
Computer software	-	-	-	-	-	-
Property - Buildings	-	-	-	-	-	-
Property - Land	-	-	-	-	-	-
2.4 Depreciation	-	(1,310,025)	(1,310,025)	-	(780,953)	(780,953)
Furniture	-	(83,686)	(83,686)	-	(82,700)	(82,700)
Office equipment	-	(367,756)	(367,756)	-	(93,119)	(93,119)
Computer equipment	-	(358,270)	(358,270)	-	(294,631)	(294,631)
Scientific and technical equipment	-	(47,830)	(47,830)	-	(58,756)	(58,756)
Computer software	-	(441,795)	(441,795)	-	(241,060)	(241,060)
Property - Buildings	-	(10,689)	(10,689)	-	(10,688)	(10,688)
Property - Land	-	-	-	-	-	-
2.5 Carrying Amount as at the End of Year	16,410,815	(11,353,487)	5,057,332	12,059,004	(10,043,462)	2,015,543
Furniture	1,199,075	(703,584)	495,491	1,081,289	(619,898)	461,391
Office equipment	2,437,605	(1,189,797)	1,247,812	1,049,849	(822,041)	227,807
Computer equipment	7,036,174	(5,017,065)	2,019,109	5,160,153	(4,658,796)	501,358
Scientific and technical equipment	2,528,891	(2,434,154)	94,737	2,528,891	(2,386,324)	142,567
Computer software	2,781,569	(1,902,342)	879,227	1,811,322	(1,460,547)	350,776
Property - Buildings	213,750	(106,545)	107,205	213,750	(95,857)	117,894
Property - Land	213,750	-	213,750	213,750	-	213,750

The property (land and buildings) consists of an office block situated on Erf 3187 Melkbosch Strand in the Blaauberg Municipality, Cape Division, Western Cape Province.

3 Trade and Other Receivables

	2008 R	2007 R
Trade receivables	6,625,698	7,134,759
Less: Provision for doubtful debts	(641,481)	(394,340)
Less: Fair value adjustment	(80,271)	-
Net trade receivables	5,903,947	6,740,419
Other receivables	1,172,201	1,114,107
	7,076,146	7,854,526

Trade receivables are measured at amortised cost using effective interest rate in terms of para 9 of IAS 39. The difference between the fair value and carrying amount is treated as interest received in accordance with the statement.

4 Cash and Cash Equivalents

Bank balances and cash comprise cash. The carrying amount approximates to its fair value.

Bank balance	39,630,707	29,682,905
Call account	36,000,000	36,252,246
Petty cash	7,500	7,500
	75,638,207	65,942,651

5 Retirement Medical Benefits

Post-retirement Medical Benefits

The NNR has made provision for a medical aid scheme covering employees who were in its employ on or before 1 July 1990 and who retire from its service. The NNR has also made provision to cover a portion of the subscription to the medical scheme in respect of those members of staff who joined the NNR between 1 July 1990 and 31 December 1995 and who retire from its service.

	Defined benefit pension plan		Post-employment medical benefit	
	2008	2007	2008	2007
Discount rate at 31 March 2008	9.30%	7.70%	9.30%	7.70%
Expected return on plan assets at 31 March 2008	10.80%	9.00%	10.80%	9.00%
Annual increase in health care costs	7.80%	8.00%	7.80%	8.00%

The defined benefit plans are actuarially valued at an interval of not more than three years and was last actuarially valued at 31 March 2008.

5 Retirement Medical Benefits (continued)

Employee Benefit Obligations

The amount included in the Statement of Financial Position arising from the NNR obligation in respect of the defined Retirement benefits asset plans are as follows:

	Defined benefit pension plan		Post-employment medical benefit	
	2008 R	2007 R	2008 R	2007 R
Amounts recognised in the Statement of Financial Position				
Present value of funded obligations	64,740,000	46,920,000	28,499,867	29,718,000
Fair value of plan assets	(89,931,000)	(76,699,000)	-	-
	(25,191,000)	(29,779,000)	28,499,867	29,718,000
Unrecognised actuarial loss	-	(1,650,000)	-	-
Unrecognised post employment benefit asset	25,191,000	31,429,000	-	-
Net liability in Statement of Financial Position	-	-	28,499,867	29,718,000
Movements in the net liability recognised in the Statement of Financial Position are as follows				
Beginning of the year	46,920,000	43,880,000	27,937,000	27,937,000
Interest cost	3,613,000	3,182,000	1,781,000	1,781,000
	50,533,000	47,062,000	29,718,000	29,718,000
Current service cost	5,551,000	4,604,000	2,756,592	-
Benefits paid	(2,554,000)	(6,396,000)	(1,124,430)	-
Actuarial loss	11,210,000	1,650,000	(2,850,295)	-
	64,740,000	46,920,000	28,499,867	29,718,000
Movements in plan assets is as follows				
Beginning of the year	76,699,000	62,267,000	-	-
Expected return	7,071,000	5,183,000	-	-
Contributions	6,361,000	5,251,000	-	-
Benefits Paid	(2,554,000)	(6,396,000)	-	-
Actuarial gain on assets	2,354,000	10,394,000	-	-
	89,931,000	76,699,000	-	-

6 Trade Payables and Provisions

	2008 R	2007 R
6.1 Trade and other payables		
Trade payables	5,270,807	1,567,522
Less: Fair Value adjustment	(152,287)	-
Net trade payables	5,118,520	1,567,522
Other payables	1,287,059	-
	6,405,581	1,567,522

6.2 Provisions

	Leave pay 2008 R	Bonus 2008 R	Leave pay 2007 R	Bonus 2007 R
Opening balance	1,936,886	604,093	2,133,886	566,932
Additional provision	1,519,457	869,540	-	37,161
Utilisation of provisions	(278,830)	-	(197,000)	-
Closing balance	3,177,513	1,473,633	1,936,886	604,093

7 Operating Surplus

Operating surplus is stated after taking into account the following:

	Notes	2008 R	2007 R
7.1 Operating Income			
7.1.1 Revenue		53,247,259	53,455,464
Authorisation fees		52,663,136	53,271,958
Other		584,123	183,506
State contributions	11	18,029,000	14,742,000
7.1.2 Foreign Exchange Gain		-	-
Total operating income		71,276,259	68,197,464
7.2 Expenditure			
7.2.1 Auditor's Remuneration		599,642	444,070
Audit fees			
- current year		599,642	444,070
- prior year		-	-
Expenses			
- current year		-	-
- prior year		-	-
7.2.2 Depreciation		1,310,025	780,953
Office furniture		83,686	82,700
Office equipment		367,756	93,119
Computer equipment		358,270	294,631
Scientific and technical equipment		47,830	58,756
Computer software		441,795	241,060
Property - buildings		10,689	10,688
7.2.3 Fees for Services		10,729,403	1,990,894
Technical services		9,289,525	767,676
Administration services		980,832	793,404
Internal audit and related services		459,046	429,814

7 Operating Surplus (continued)

	Notes	2008 R	2007 R
7.2.4 Directors' and Executive staff emoluments	9	246,292	316,378
Service fee		246,292	316,378
Expenses		-	-
7.2.5 Staff Costs		42,614,727	36,709,987
Salaries, allowances and annual payments		38,491,694	33,255,274
Included in staff costs are:			
Defined benefit plan expenses		(6,499,000)	5,251,000
- current service cost		5,551,000	4,604,000
- interest cost		3,613,000	3,182,000
- return on assets		(9,425,000)	(5,183,000)
- actuarial gain recognised			(6,523,000)
- reversal of prior year un-recognised post-employment benefit asset		(31,429,000)	(22,258,000)
- Unrecognised post employment benefit asset		25,191,000	31,429,000
Post-retirement medical benefit		(1,218,133)	1,781,000
Post-retirement medical benefit		(1,218,133)	1,781,000
Change in accounting estimate (Being change in past services cost, non-vested benefits)		-	-
7.2.6 Loss on Scrapping of Assets		-	32,637
7.2.7 Bursaries		393,793	27,782
7.2.8 Operating Leases		4,296,521	3,444,903
Office building		4,120,641	2,212,053
Equipment		133,466	793,404
Vehicles		42,414	40,973

8 Special Project

In terms of section 5(b)(i) of the NNR Act, (Act No. 47 of 1999) the Regulator should exercise regulatory control related to safety over the siting, design, construction, operation, manufacture of component parts, and decontamination, decommissioning and closure of nuclear installations. In compliance with the foregoing during the financial year the NNR had an arrangement with Eskom, the applicant for the Pebble Bed Modular Reactor nuclear installation licence, for certain fees, disbursements and expenses necessarily incurred and not provided for in the licence application fee as contemplated in section 28 of the NNR Act project. The full income and expenditure associated with the project has been:

	2008 R	2007 R
Fees recovered from Eskom	16,922,408	31,648,145
Fees paid to outside consultant (Foreign consultants)	(16,922,408)	(31,648,145)

9 Directors' and Executive Staff Emoluments

For the year ended 31 March 2008	Months in service	Salaries/fees R	Bonuses R	Pension contributions R	Other contributions R	Total R
Non-Executive Directors						
Prof MA Hermanus	12	24,899	-	-	-	24,899
Mr DP Elbrecht	12	20,594	-	-	-	20,594
Mr K Govender	12	31,000	-	-	-	31,000
Rev. P Grove	12	12,498	-	-	-	12,498
Mr WN Lesufi	12	20,358	-	-	-	20,358
Ms TN Mgoduso	12	39,986	-	-	-	39,986
Adv. BM Mkhize	12	24,524	-	-	-	24,524
Mr BA Ramahlo	12	28,926	-	-	-	28,926
Prof. D van der Merwe	12	33,092	-	-	-	33,092
Mr T Mofokeng (not paid)	12	-	-	-	-	-
Ms J Yawitch (not paid)	12	-	-	-	-	-
Mr J Rocha (not paid)	11	-	-	-	-	-
		235,877	-	-	-	235,877

Note: These emoluments are for all Directors, including existing as well as past Directors. Certain members participated in various other Board Committees

Independent Audit Committee Member

Ms PS Mzizi	11	10,415	-	-	-	10,415
		10,415	-	-	-	10,415

Executive Director

Mr M Magugmela (CEO)	12	1,029,871	-	-	-	1,029,871
		1,029,871	-	-	-	1,029,871

Executive Staff

Mr GA Clapison	12	713,951	40,560	109,092	26,341	889,944
Mr ME Khoahli	4	240,882	-	31,624	10,550	283,056
Mr CO Phillips	12	697,432	49,919	109,092	29,342	885,785
Dr T Hill	12	688,034	36,972	99,958	15,470	840,434
		2,340,299	127,451	349,766	81,703	2,899,219

9 Directors' and Executive Staff Emoluments (continued)

For the year ended 31 March 2007	Months in service	Salaries/fees R	Bonuses R	Pension contributions R	Other contributions R	Total R
Non-Executive Directors						
Prof K Bharuth-Ram	8	50,274	-	-	-	50,274
Mr D Elbrecht	12	31,440	-	-	-	31,440
Rev. P Grove	12	15,720	-	-	-	15,720
Dr T Lesoli	8	21,615	-	-	-	21,615
Ms TNM Mashanda	8	3,930	-	-	-	3,930
Ms TN Mgoduso	12	46,559	-	-	-	46,559
Adv. BM Mkhize	12	37,335	-	-	-	37,335
Mr AHCH Motaung	8	21,615	-	-	-	21,615
Dr J M Stewart	8	33,405	-	-	-	33,405
Mr K Govender	4	7,860	-	-	-	7,860
Prof. MA Hermanus	4	10,584	-	-	-	10,584
Mr WN Lesufi	4	11,790	-	-	-	11,790
Mr BA Ramahlo	4	7,860	-	-	-	7,860
Prof. D Van der Merwe	4	7,860	-	-	-	7,860
		307,847	-	-	-	307,847

Note: These emoluments are for all directors, including existing as well as past directors.

Independent Member

Ms SN Koyana	8	8,531	-	-	-	8,531
		8,531	-	-	-	8,531

Executive Director

Mr MT Magugumela (CEO)	12	762,969	-	-	-	762,969
		762,969	-	-	-	762,969

Executive Staff

Mr GA Clapison	12	508,653	62,786	81,457	28,054	680,950
Mr KE Mkhize	12	509,698	62,786	81,457	24,857	678,798
Mr AE Muller	10	401,995	48,808	59,539	20,555	530,897
Mr CO Phillips	12	508,653	39,367	81,457	27,142	656,619
		1,928,999	213,747	303,910	100,608	2,547,264

10 Future Operating Lease Commitments

	2008 R	2007 R
10.1 Office building	4,120,641	2,212,053
Equipment	133,466	793,404
Vehicles	42,414	40,973
Up to 1 year	4,296,521	3,046,430
10.2 Office Building*	4,120,641	4,424,106
Equipment	880,478	2,776,912
Vehicles	-	-
1 to 5 years	5,001,119	7,201,018

*The NNR has signed a two year lease on the building with an option to renew annually.

11 Related Party Transactions

During the year under review, the NNR, in the ordinary course of its business, entered into various transactions with related parties which terms are no less favourable than with third parties.

Directors

Details of directors' emoluments are disclosed under note 9.

Transactions with Directors

All directors have given general declarations of interest in terms of section 243 (3a) of the Companies Act. These declarations indicate that no member of the Board hold other directorships in South African entities with whom transactions are conducted by NNR in terms of a customer/supplier relationship.

Transactions with National Departments of Government

All National Departments of Government are regarded to be related parties in accordance with circular 4 of 2005: Guidance on the term "State controlled entities" in the context of IAS 24 (AC 126) - Related Parties, issued by the South African Institute of Chartered Accountants. No transactions are implicated by simply the nature of the existence of the relationship between entities. However, the following transactions were recorded relating to transactions with related parties as defined above:

Name of related party	Nature of transaction	Income	
		2008 R	2007 R
Department of Minerals and Energy	Contribution	18,029,000.00	14,472,000.00
Eskom	Authorisation fees	27,452,740.00	27,452,740.00
Eskom	Special projects	16,922,408.46	-
Pebble Modular Reactor	Authorisation fees	8,974,934.00	8,974,934.00
PBMR Fuel Fabrication Plant	Authorisation fees	2,111,749.00	2,111,749.00
NECSA - Pelindaba	Authorisation fees	967,885.00	967,885.00
NECSA - Vaalputs	Authorisation fees	351,958.00	351,958.00

The authorisation fees for the current year were not gazetted and 2007 fees were used.

11 Related Party Transactions (continued)

Name of related party	Nature of transaction	Expenditure	
		2008 R	2007 R
Eskom	Special projects	16,922,408.46	-
SA Post Office Ltd	Deliveries	-	721.00
Telkom	Telephone	669,543.66	724,444.00
SARS	PAYE	11,897,307.00	6,681,577.00
CSIR	Publications	-	7,553.00
SA Bureau of Standards	Staff Welfare	-	38,177.00

12 Notes to the Cash Flow Statement

	2008 R	2007 R
12.1 Cash Generated from Operations		
Operating surplus/(deficit)	(1,196,142)	14,448,325
Adjustment for:	2,202,056	2,434,749
Depreciation	1,310,021	780,953
Net loss on disposal of obsolete assets	-	32,637
Increase/(Decrease) in provision for leave pay and bonuses	2,110,168	(159,841)
Increase/(Decrease) in provision for retirement medical benefit	(1,218,133)	1,781,000
Working capital changes	5,926,652	(5,656,584)
(Increase)/Decrease in accounts receivable	778,380	(5,339,964)
Increase/(Decrease) in lease liability	310,213	
Increase/(Decrease) in accounts payable	4,838,059	(316,620)
	6,932,565	11,226,490
12.2 Cash and Cash Equivalents at the End of the Period		
Cash and cash equivalents consist of cash on hand. The carrying amount of these assets approximate their fair value. Cash and cash equivalents at year-end are represented by the following balance:		
	75,638,207	65,942,651

13 Financial Instruments

Financial instruments consist of cash and cash equivalents, trade and other receivables, and trade and other payables.

13.1 Credit Risk

Financial assets, which potentially subject the NNR to concentrations of credit risk, consist principally of cash and trade receivables. Trade receivables are presented net of the allowance for doubtful debts. Credit risk with respect to trade receivables is limited owing to the large number of customers being dispersed across different industries. Accordingly the NNR has no significant concentration of credit risk. The carrying amounts of financial assets included in the Statement of Financial Position represent the exposure of the NNR to credit risk in relation to those assets. Trade and other receivables are controlled by policies and procedures. The NNR does not have any significant exposure to any individual customer or counterparty.

13.2 Interest Rate Risk

The company's exposure to interest rate risk and the effective interest rates on the financial instruments at the Statement of Financial Position date are:

	Weighted average effective interest rate %
Assets	
Cash	6.25%

13.3 Foreign Currency Risk

The NNR undertakes certain transactions denominated in foreign currencies; hence exposure to exchange rate fluctuations arises. It is not the policy of the NNR to take out cover on these outstanding foreign currency transactions because these transactions take place on an ad-hoc basis.

13.4 Fair Value of Financial Instruments

At 31 March 2008 the carrying amounts of cash, accounts receivable and accounts payable approximated their fair values due to the short-term maturities of these assets and liabilities. The net fair value of the assets and liabilities of the NNR are stated below:

	2008 R	2007 R
Assets		
Cash and cash equivalents	75,638,207	65,942,651
Trade and other receivables	7,076,146	7,854,526
Liabilities		
Trade and other payables	6,405,581	1,567,522

14 Deferred Income - Accounting for Government Grant in terms of AC 134 and IAS 20

14.1 Nature and Extent of Government Grant Recognised

DME has approved the allocation of the funds towards the establishment of a laboratory.

14.2 Unfulfilled Conditions in Terms of the Grant Recognised

Government grant received	18,000,000
Expenditure recognised in the Statement of Financial Performance	-
	<u>18,000,000</u>

15 Contingent Liability

	2008 R	2007 R
Surplus	5,313,569.36	18,809,558.00

A contingent liability has arisen as a result of NNR having a surplus for the reporting period. The extent to which an outflow of funds will be required is dependent on the outcome of the application to retain the funds in terms of Section 53 (3) of the PFMA.

16 Post Balance Sheet Events

No events after the Reporting date either adjusting or non adjusting have come to our attention.

17 Finance Lease Liabilities

Finance lease liabilities are payable as follows:

	2008			2007		
	Future minimum lease payments	Interest	Present value of minimum lease payments	Future minimum lease payments	Interest	Present value of minimum lease payments
Less than one year	426,289	116,076	310,213	426,289	158,058	268,231
Between one and 4.33 years	711,229	82,949	628,280	1,137,518	199,025	938,493
	1,137,518	199,025	938,493	1,563,807	357,083	1,206,724

Finance leases are in respect of photocopiers. Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. This represents a change in accounting policy (see note 18).

Leases under 5 year contract were previously treated as operating leases and have now been reclassified as finance leases. The average term of finance leases is 4.33 years. The interest rate inherent in the leases is at the prime interest rate for the duration of the lease term. The effective interest rate contracted is approximately 8% (2007: 12%).

18 Change in Accounting Policy

18.1 Finance Leases

Previously all photocopiers on lease were classified as operating lease agreements. Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. This was done to give fairer account of the total resources and present obligations of the entity. The change in policy has been applied retrospectively and comparative figures have been appropriately restated.

	2008	2007
Statement of Financial Performance		
Decrease in operating expense	426,289	284,193
Increase in depreciation	(273,123)	(182,082)
Increase in finance charges	(158,058)	(125,301)
Decrease in surplus for the year	(4,892)	(23,191)
Statement of Financial Position		
Increase in carrying amount of plant and equipment	910,411	1,183,534
Increase in liabilities	(938,493)	(1,206,724)
Increase in non-current liabilities	(628,280)	(938,493)
Increase in current liabilities	(310,213)	(268,231)
Decrease in reserves	(28,083)	(23,191)
Reserves		
Adjustment against accumulated reserves at the beginning of the year.	(23,191)	-
	910,411	-
Irregular expenditure awaiting condonement	910,411	-

19 Irregular Expenditure

19.1 Finance Leases - Office Equipment

Irregular expenditure has been recognised due to the reclassification of operating leases to finance leases as shown in Note 17. The expenditure has been treated as an asset in the statement of financial position until it is recovered or written off as irrecoverable. As required by PFMA appropriate investigations are current in progress to ascertain the root cause of non-compliance.

19.2 Consultancy fees

Printing works	209,918	-
Technical services	450,505	-
Communication	222,215	-
Human resources	2,633,015	-
Irregular expenditure awaiting condonement	3,515,653	-

Irregular expenditure has been recognised as a result of non-compliance with Treasury Regulation Practice note 8 of 2007/08. The total expenditure has been treated as operating expenses in the statement of financial performance until it is recovered or written off as irrecoverable. As required by PFMA appropriate investigations are current in progress to ascertain the root cause of non-compliance.



Challenges in the Human Resources Environment

The NNR is facing many challenges in the Human resources environment, amongst others:

- The small pool of appropriately skilled persons and local technical support organisations is insufficient to sustain the nation's current and growing needs. This skills shortage cuts across all levels and spheres of the industry and is set to increase in the medium- to long term as competition for expertise within the nuclear industry grows;
- Pressure is increasing on South Africa, as a major player in the African nuclear industry, to lead the setting of regional and continental nuclear standards; and
- The international resurgence of nuclear power as an environmentally sound energy option will lead to the building of new nuclear power plants, which will put additional strain on limited local resources.

As an effective regulator, the NNR needs to retain its current skilled staff and attract additional staff members. During the reporting period, salaries were benchmarked and market-related salaries implemented. A new performance management system was developed and will be introduced on 1 April 2008. In addition, a new organisational structure

was approved and will be implemented in the near future.

Staff Complement and Employment Equity

The approved staff complement of the NNR is 122. This was approved to be phased in over a period of three years starting in the 2006/2007 financial year. The staff complement of the NNR at the end of the reporting period was 84.

During the reporting period, seven (7) resignations were received and one (1) employee retired due to ill health. Eleven (11) new members of staff were appointed. It is envisaged that existing vacancies will be filled within the next two financial years.

Table 17: Employment equity

	Total	White Males	Black Males	White Females	Black Females
Chief Executive Officer	1		1		
Senior Management	4	2	2		
Departmental Management	8	2	5		1
Process/ Functional Sub-Group Co-ordination	9	5	4		
Regulatory Officials and Specialists	42	10	22	2	8
Administrative, Secretarial and Support Staff	20	1	4	7	8
Total	84	20	38	9	17

Table 19: Staff composition by age

Age Group	Number of staff	Percentage
18 - 30	13	16%
31 - 40	33	39%
41 - 50	20	23%
51 - 65	18	22%

National Capacity Building

The NNR contributes towards National Capacity Building through the provision of bursaries to students. A two-year

Internship Programme is also offered to students who have completed their qualifications. The NNR currently has 4 interns.

Internal Capacity Building

Through the implementation of its integrated talent management strategy the NNR intends to continue to build internal capacity by attracting, developing and retaining talented individuals who have key competencies. The talent pipeline will be enhanced and will assist in reducing dependency on external consultants. Aspects of this strategy include:

- The development of Personal Development Plans (PDPs) which are updated each year. The outcomes of the Skills Audit are also incorporated in the PDPs;
- The appointment of interns; and
- The involvement of NNR staff in submitting inputs towards the development of university curricula and supervision of post graduate students.

NNR Regulatory Capacity

The NNR staff is proficient in a wide range of disciplines including engineering, plant maintenance, nuclear safety, transport safety, radiation protection, waste safety and physical protection.

All new staff members serve a period of induction during which they are introduced to:

- Applicable legislation;
- The facilities being regulated; and
- The conditions of authorisation associated therewith.

Koeberg Programme

The Koeberg Programme has eleven positions including, the manager, secretary, two co-ordinators and seven regulatory officers. All these posts are presently filled except for two regulatory officers.

Nuclear Technology and Waste Projects Programme (NTWP)

The NTWP Programme has nine positions, including the

manager, secretary, two co-ordinators and five regulatory officers. Eight posts are presently filled and one is in the process of being filled.

Regulation of Natural Sources Programme (RENS)

The RENS Programme has twelve positions, including the manager, two co-ordinators and seven regulatory officers. All these posts are presently filled.

Pebble Bed Modular Reactor Programme (PBMR)

The PBMR Programme has eight technical positions, including the manager, two co-ordinators and five regulatory officers. Five of these posts are presently filled. The positions which still need to be filled are two process co-ordinators and a regulatory officer.

Assessment Group and Regulatory Research Department

The Assessment Group and Regulatory Research Department have thirty two positions, including the senior manager, five managers, secretary, and specialists. Twenty of these positions are filled and the remaining vacancies are currently in the process of being filled.

AADQ	Annual Authorised Discharge Quantity	MWe	Megawatt Electrical
AFRA	African Regional Co-operative Agreement	NDE	Non-destructive Evaluation
ALARA	As Low as Reasonably Achievable	Necsa	South African Nuclear Energy Corporation
AECC	Alternative Emergency Control Centre	NEPROC	Nuclear Emergency Preparedness Regulatory Oversight Committee
ARN	Argentinean Nuclear Regulatory Authority	NERS	Network of Regulators of Countries with Small Nuclear Programmes
ARPANSA	Australian Radiation Protection and Nuclear Safety Authority	NGO	Non-governmental Organisation
ASN	French Nuclear Regulatory Authority	NIA	National Intelligence Agency
Bq	Becquerel	NLM	Nuclear Liabilities Management
CAA	Civil Aviation Authority	NNR	National Nuclear Regulator
CBO	Community Based Organisations	NNR Act	National Nuclear Regulator Act
CEO	Chief Executive Officer	NORM	Naturally Occurring Radioactive Material
CMC	Cape Metropolitan Council	NRC	Nuclear Regulatory Commission
CNS	Convention on Nuclear Safety	NTWP	Nuclear Technology and Waste Products
CoCT	City of Cape Town	NUSSC	Nuclear Safety Standards Committee
CODIRPA	Committee for the Post Accident Management Phase	OTS	Operating Technical Specification
COM	Chamber of Mines	PAM	Protective Action Management System
COR	Certificate of Registration	PAZ	Protective Action Zone
CSS	Commission on Safety Standards	PBL	Process Based Licensing
DEAT	Department of Environmental Affairs and Tourism	PBMR	Pebble Bed Modular Reactor
DGSNR	Directorate of Nuclear and Radiation Protection	PFMA	Public Finance Management Act
DME	Department of Minerals and Energy	PFM	Proposed Pebble Bed Modular Reactor Fuel Manufacturing Plant
DoA	Department of Agriculture	PN	Problem Notification
DOC	Disaster Operations Centre	PRPP	Public Radiation Protection Programme
DOE	US Department of Energy	PSA	Public Safety Assessments
DoL	Department of Labour	PWR	Pressurised Water Reactor
DPP	Demonstration Power Plant	QFD	Quartz Fibre Dosimeter
DWAF	Department of Water Affairs and Forestry	RaSIA	Radiation Safety Infrastructure Appraisal
ECC	Emergency Control Centre	RASSC	Radiation Safety Standards Committee
EdF	Electricite de France	RD	Requirement Document
EPR	European Pressurised Reactor	RENS	Regulation of Natural Sources
EPSOC	Emergency Planning Steering and Oversight Committee	RO	Regulatory Officers
HEU	Highly Enriched Uranium	RPM	Radiation Protection Monitor
HPC	Health Physics Controller	RPO	Radiation Protection Officer
HTGR	High Temperature Gas Cooled Reactor	RPS	Radiation Protection Specialist
IAEA	International Atomic Energy Agency	RPV	Reactor Pressure Vessel
ICT	Information Communication and Technology	RSR	Railway Safety Regulator
INES	International Nuclear Event Scale	RSRP	Regulations on Safety Standards and Regulatory Practices
INPO	International Nuclear Power Operations	RTMC	Road Transport Management Corporation
INSAG	International Nuclear Safety Group of the IAEA	SAG	European Union Safety Advisory Group
IRRS	Integrated Regulatory Review Service	SAMSA	South African Maritime Safety Authority
IRSN	Institute of Radiation Protection and Nuclear Safety	SAR	Safety Analysis Report
INLA	International Nuclear Law Association	SCM	Special Case Mine
INLEX	International Nuclear Liability Expert Group	SSC	Structure, System, Component
ISI	In-service inspection	SSRP	Safety Standards and Regulatory Practises
KEDC	Koeberg Environs Development Committee	STC	Steering Technical Committee
KLI	Key Licensing Issue	TLD	Thermo-Luminescent Dosimeter
KNPS	Koeberg Nuclear Power Statio	TSC	Technical Support Centre
LEU	Low Enriched Uranium	TRANSSC	Transport Safety Standards Committee
LOCA	Loss of Coolant Accident	TSO	Technical Support Organisation
LPM	Licensing Project Meeting	US-NRC	United States Nuclear Regulatory Commission
LSA	Low Specific Activity	WANO	World Association of Nuclear Operators
LUA	Lead Use Assembly	WASSC	Waste Safety Standards Committee
MDEP	Multinational Design Evaluation Programme	WCA	Wonderfonteinspruit Catchment Area
µSv	microSievert	WGCMO	Working Group on Component Manufacturing Oversight
mSv	milliSievert	WHO	World Health Organisation
MIG	Mining Interest Group		
MoA	Memorandum of Agreement		
MTR	Material Test Reactors		

Term	Definition
Action	<ul style="list-style-type: none"> • 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; or • Any other action involving radioactive material.
Assessment	The process, and the result, of analysing systematically 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	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 which 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 to the environment.
Disposal	The emplacement of radioactive waste in an approved, specified facility without the intention of retrieval. The term “dispose of” has the 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.

Term	Definition
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: <ul style="list-style-type: none"> • To limit the range of options considered in the optimisation process; and • To restrict the doses via all exposure pathways to the average member of the critical group, in order to ensure that the sum of the doses received by that individual from all controlled sources remains within the dose limit, and which, if found retrospectively to have been exceeded, should not be regarded as an infringement of regulatory requirements but rather as a call for the reassessment of the optimisation of radiation protection.
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, that must not be exceeded.
Emergency planning	The process of developing and maintaining the capability to take actions that will mitigate the impact of an emergency on persons, property or the environment.
Emergency preparedness	The capability to promptly take actions that will effectively mitigate the impact of an emergency on persons, property or the environment.
Emergency response	The performance of actions to mitigate 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 subject to irradiation.
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 Minerals and Energy.
Monitoring	The continuous or periodic measurement of radiological and other parameters or determination of the status of a system.
Nuclear accident	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 a worker on site received essentially at the time of the event.

Term	Definition
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 which is reasonably capable of giving rise to an effective dose equal to or in excess of 0.1 msv to the public off 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 20 msv 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 carrying out of any process, other than the mining and processing of ore, within the nuclear fuel cycle involving radioactive material, including but not limited to: <ul style="list-style-type: none"> • A uranium or thorium refinement or conversion facility; • A uranium enrichment facility; • A nuclear fuel fabrication facility; • A nuclear reactor, including a nuclear fission 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 which 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, prevention of nuclear accidents or mitigation 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	The protection of people from the effects of exposure to ionising radiation, and the means for achieving this.
Radiation protection monitor	A person technically competent in radiation protection matters relevant for 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 action who is designated by the holder of a nuclear authorisation to oversee the application of relevant requirements.

Term	Definition
Radiation protection specialist	A person trained in radiation protection and other areas of specialisation necessary in order to be able to assess radiological conditions, to mitigate 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.
Radioactive waste acceptance criteria	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 group 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 exposures relating to quantities such as the probability that specific deleterious consequences may arise and 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.
Safety culture	The assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance.
Source	Anything that may cause radiation exposure, such as by emitting ionising radiation or releasing radioactive substances or materials; a complex or multiple installation situated at one location or site may, as appropriate, be considered as a single source.