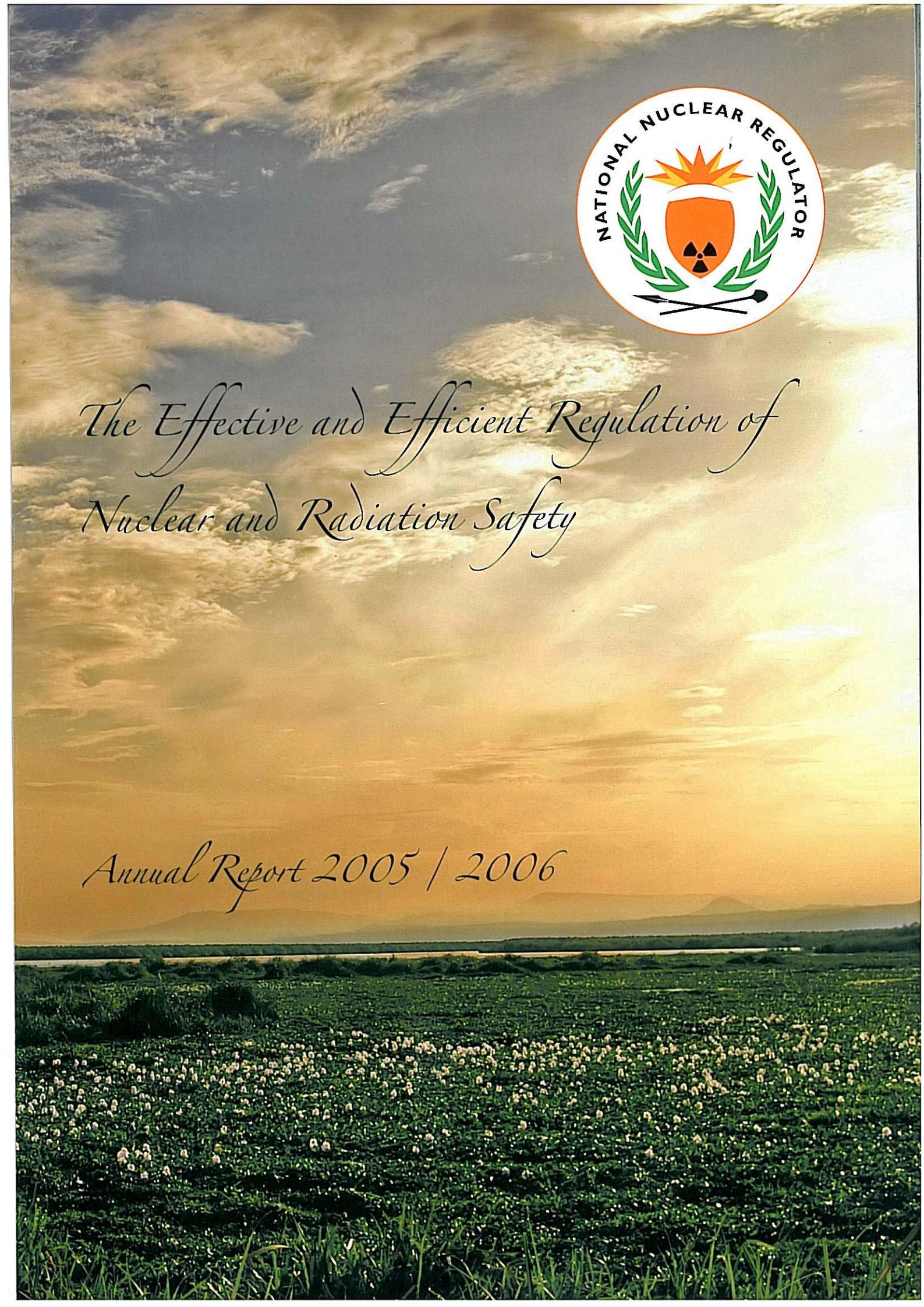


The Effective and Efficient Regulation of Nuclear and Radiation Safety

Annual Report 2005 / 2006

This Annual Report is submitted to the Minister of Minerals and Energy in accordance with section 7(1)j of the NNR Act, (Act no 47 of 1999). This report reflects the NNR's activities on the health and safety of workers, the public and the environment associated with nuclear authorised sites and the financial aspects in accordance with Section 55 of the PFMA, (Act no 1 of 1999).

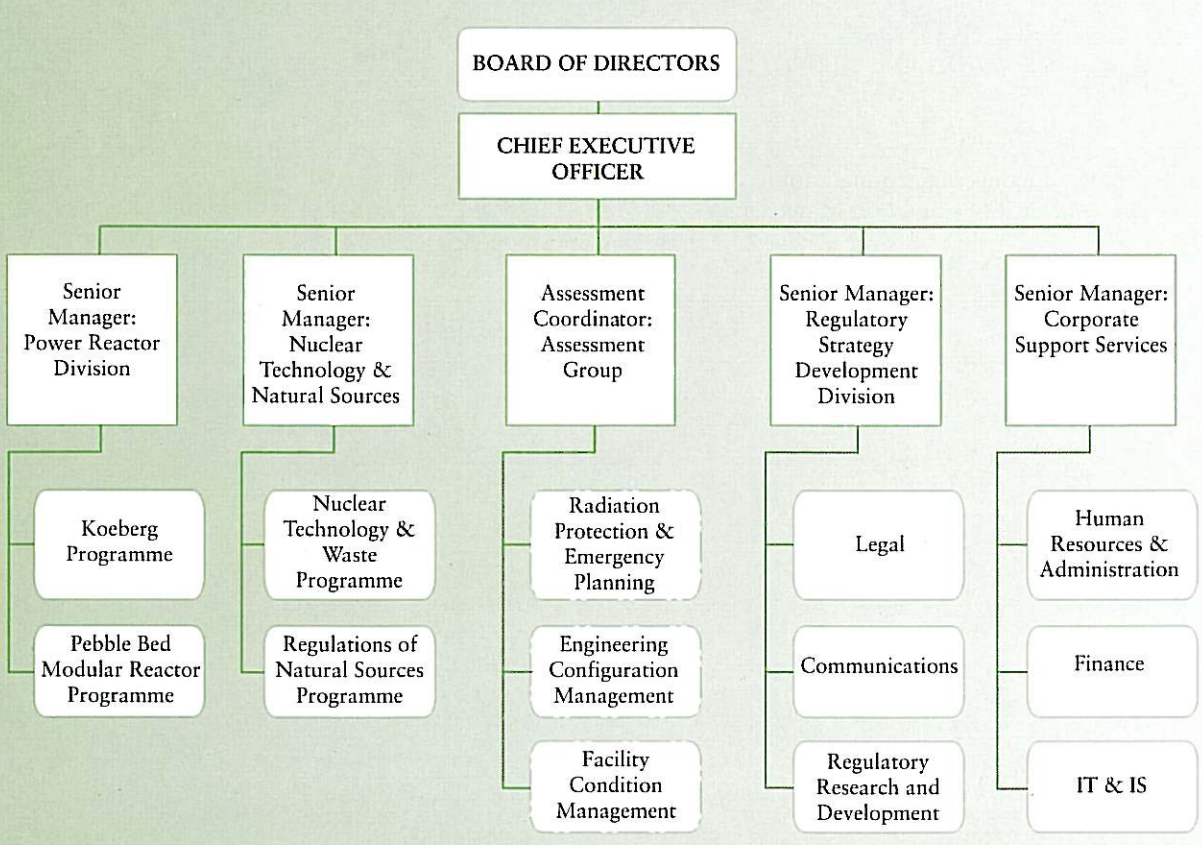
Vision

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

Mission

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

- Excellence in nuclear regulatory practices, and
- Human resources and transformation practices best suited for the nuclear regulatory needs of the nation.



Note on the cover of the 2005 / 2006 Annual Report:
Break of day with promise of light and warmth... over expansive sheets of water, the source of life... and verdant vegetation with Spring flowers... an unimpeded view of South Africa's golden future for all its inhabitants.

The structure of the Regulator

The Board of Directors

The Regulator is controlled and governed in accordance with the NNR Act by Board of Directors.

The Chief Executive Officer

The Chief Executive Officer is the accounting officer of the Board and has the responsibility to ensure that the functions of the Regulator are performed in accordance with the NNR Act and the PFMA.

The Staff of the Regulator

The NNR's organisational structure consists of the following core groups:

a) Power Reactor Division

The division has two departments, namely:

- Koeberg Nuclear Power Station Programme
- Pebble Bed Modular Reactor Programme

b) Nuclear Technology and Natural Sources Division

The division has two departments, namely:

- Regulation of Natural Sources Programme
- Nuclear Technology and Waste Projects Programme

c) Assessment Group

The Assessment Group renders technical assessment services to all the divisions. It consists of three functional subgroups, namely:

- Radiation Protection and Emergency Planning
- Engineering Configuration Management
- Facility Condition Management

d) Regulatory Strategy Development Division

The division comprises the following specialist services:

- Regulatory Research Development
- Legal Services
- Communications
- Board Secretariat

e) Corporate Support Services

The division has two departments covering the following functions:

- Human Resources and Administration
- Finance, Information Technology and Information Services

Contents

1. THE STRUCTURE OF THE REGULATOR 1
1.1. The Board of Directors 4
1.2. Chairperson's Foreword 6
1.3. Chief Executive Officer's Report 7

2. KOEBERG NUCLEAR POWER STATION 10
2.1. Background 10
2.2. Safety Assurance 10
2.2.1. Occupational Exposure 10
2.2.2. Public Exposure 11
2.2.3. Environmental safety 12
2.2.4. Nuclear safety 12
2.2.5. Licensing of Koeberg reactor operators 14
2.2.6. Radioactive waste safety 14
2.2.7. Transport safety 15
2.2.8. Emergency planning and preparedness 15
2.2.9. Physical security 17
2.2.10. Inspections and audits 17
2.2.11. Koeberg compliance index 18
2.2.12. Incidents/occurrences 19

3. SOUTH AFRICAN NUCLEAR ENERGY CORPORATION (NECSA), PELINDABA .. 20
3.1. Background 20
3.2. Safety Assurance 21
3.2.1. Occupational Exposure 21
3.2.2. Public Exposure 21
3.3. Environmental safety 21
3.4. Nuclear safety 22
3.4.1. Major projects 22
3.5. Radioactive waste safety 23
3.5.1. Thabana pipe store 23
3.5.2. Pelstore 23
3.6. Transport safety 23
3.7. Emergency planning and preparedness 23
3.8. Physical security 24
3.9. Inspections and audits 24
3.9.1. Necsa medical surveillance practices 24
3.10. Incidents and occurrences 24
3.10.1. Necsa calibration facility 24
3.10.2. Breaches of physical security 25
3.10.3. Contamination event in P-1500 25

4. VAALPUTS 26
4.1. Background 26
4.2. Safety Assurance 27
4.2.1. Occupational Exposure 27
4.2.2. Public Exposure 27
4.2.3. Environmental safety 28
4.2.4. Radioactive waste safety 28
4.2.5. Inspections and audits 28

5. REGULATION OF NATURAL SOURCES 29
5.1.Background 29
5.2.Nuclear authorisations 29
5.3.Safety assurance 30
5.3.1. Occupational Exposure 30
5.3.2. Public Exposure 30
5.3.3. Radioactive waste management 30
5.3.4. Transport safety 31
5.3.5. Inspections and audits 31
5.4.Incidents and occurrences 31

6. PROSPECTIVE LICENSING AND OTHER PROJECTS 32
6.1.Proposed Pebble Bed Modular Reactor 32
6.2.Proposed PBMR Fuel Manufacturing Plant 33

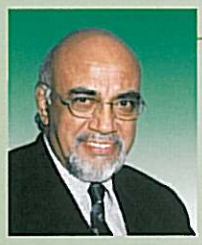
7. STANDARDS AND REGULATORY PRACTICES 34
7.1.Investigations and regulatory research projects 34
7.1.1. Iodine prophylaxis -potassium iodate distribution 34
7.1.2. Radon survey in the Kango caves 34
7.1.3. Karoo uranium-contaminated sites 34
7.1.4. Development of regulatory documents 34
7.1.5. Financial liability project 34
7.2.Developmental work 34
7.2.1. International activities 34
7.2.2. Cooperative governance agreements 37
7.3.Technical services 37
7.3.1. Laboratory and instrumentation 37
7.4.Radioactive waste management policy and strategy. 37

8. COMMUNICATIONS AND OUTREACH INITIATIVES 38
8.1.Nuclear emergency preparedness regulatory oversight committee at Koeberg 38
8.2.Meeting between the NNR and labour union representatives at Koeberg 38
8.3.International co-operation and liaison 38

9. HUMAN RESOURCES 40
9.1.Key human resources statistics 40
9.2.Capacity building 41
9.3.Staff training and development 41
9.4.Bursary scheme 41
9.5.Internship programme 41
9.6.University involvement 41
9.6.1. Post-graduate course in nuclear safety 41
9.7.Transformation process 42

10. ANNUAL FINANCIAL STATEMENTS 43
10.1. Statement of Responsibility 43
10.2. Report of the Auditor-General 44
10.2.1. Audit assignment 44
10.2.2. Scope 44
10.2.3. Audit opinion 44
10.2.4. Appreciation 44
10.3. Report of the Audit and Risk Management Committee 45
10.4. Directors' Report/Accounting Authority 46
10.5. Report on Performance Against Objectives 49
10.6. Financial Statements 60
10.7. Abbreviations 76
10.8. Management Structure 77

Board of Directors



Prof K BHARUTH-RAM (Chairperson)

Prof Krish Bharuth-Ram, the Chairperson of the NNR Board, is currently Director of iThemba LABS, our national research facility for nuclear sciences. He holds a doctorate in nuclear physics from the University of Oxford and holds Honorary Professorships from the Universities of Cape Town, Stellenbosch, KwaZulu-Natal and Witwatersrand. He is internationally rated as a "researcher who enjoys considerable international recognition as independent researcher of high quality". His current research activity is mainly focused on applications of radioactive ion beams in materials research, in collaboration with colleagues at universities in Germany, Denmark, the UK and Portugal. He has published more than 130 research papers in international scientific journals, made more than 100 contributions to international conferences, presented invited papers at several international conferences, has served on many international and national conference committees, and is a member of numerous research, academic and sporting (cricket) committees and associations.



Ms T N MGODUSO (Deputy Chairperson)

Ms Mgoduso is the Director of Imperial Logistics (since September 2004). Prior to that, she was the CEO of Freightdynamics, a Transnet business unit, and has held numerous other Transnet responsibilities, largely in the human resources and training fields, since 1994. Other previous employment was with Wesbank as Manager: Human Resources, the Health Psychology Unit of Unisa, engaged mainly in research, lecturing and psychotherapy, and as a clinical psychologist at the Chris Hani and Valkenberg/Groote Schuur Hospitals. She gained her BA and BA Hons at the University of Fort Hare, followed by scholarships in Germany, and her 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. She serves on numerous social, community and parastatal bodies.



Mr G M ABOOBAKER

Mr Aboobaker, Deputy Head (and Deputy Director-General) of the Policy Co-ordination and Advisory Services in the Presidency, joined the Office of the President in 1995 as Director: Cabinet Research. He has been responsible for numerous studies (e.g. into poverty and inequality in South Africa), special projects and the organisation of top-level summits. He holds a B.Sc (Mathematics and Physics) and B.Sc Hons (Cum Laude) from the University of Durban-Westville and M.Sc (Economics of Africa) from the SOAS, University of London. His studies included a course in theoretical nuclear physics at Unisa. In 1979 he registered with the then Atomic Energy Board and SA Medical and Dental Council, and worked with radionuclides and X-rays for diagnostic and therapeutic use. He was a Senior Lecturer at UCT Medical School and served as a medical physicist at the King Edward (Durban) and Groote Schuur Hospitals (Cape Town).



Mr A H C H MOTAUNG

Mr Motaung is the vice-president of the African Mining Association and COO of Anooraq Resources Corporation, a North American-listed entity. He is a B.Sc Engineering (Mining) graduate of the University of the Witwatersrand, and holds an MBA degree. He has numerous prizes and awards to his name, including winner of the Maths Science Olympiad, and played extensive leadership and sporting roles during his education. He was a mining engineer with Anglo American prior to joining the Department of Minerals and Energy as a principal inspector, rising to Deputy Chief Inspector. He was involved in the implementation of the Mine Health and Safety Act throughout the mining industry, and represented the Department at numerous international conferences on mine health and safety. He has served on numerous statutory committees, including SAQA and Nedlac. His community work includes facilitating the mathematics and science preparedness of matriculants from underprivileged communities.



Ms T MASHANDA

Ms Mashanda is the Executive Finance Manager (Africa) at Multichoice (Africa) (Pty) Ltd. Previous employment was as senior audit manager with Nkonki Sizwe Ntsaluba Inc and as articled clerk with Coopers and Lybrand. She qualified as a chartered accountant in South Africa in 2000, after gaining her BA Hons (Accounting) at Thames Valley University (UK).



Adv B M MKHIZE

Adv Mkhize is the Registrar and CEO of the Health Professions Council of SA. Previous employment was as Chief Legal Adviser and Company Secretary of the Atomic Energy Corporation of SA, the Director: Human Resource Management of the Department of Home Affairs, Executive Assistant to the Minister and Head of Ministry in the Department of Public Service and Administration, and training and advisory posts with the Constitutional Assembly, Community Law Centre and University of Zululand. He gained his BJuris and LLB at the University of Zululand, Advanced Diploma in Labour Law (cum laude) and Business Management Programme at Unisa, and was admitted as an advocate of the High Court of SA. He has served on numerous church, community and training bodies.



Ms Z MVUSI

Ms Mvusi is Chief Director: Pollution and Waste Management in the Department of Environmental Affairs and Tourism with responsibility for strategic management of the pollution and waste management programme. She holds a BSc degree in civil engineering from the University of the Witwatersrand, a diploma in project management from Damelin Management School and B.Com (Economics and Business Management) from Unisa. She was employed by private sector engineering companies in engineering design, construction and project management, and the Swaziland Water Services Corporation as construction engineer, before joining the Department of Arts, Culture, Science and Technology as Deputy Director: Technology Transfer. Subsequently she served in the Department of Science and Technology as Deputy Director: Institutional Performance Management and the Department of Environmental Affairs and Tourism as Director: Environmental Economics, before promotion to her present post in 2006.



Mr D ELBRECHT

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. He worked at the Koeberg Nuclear Power Station for eight years, rising to manager of the Maintenance Centre. He was appointed non-executive chairperson of the Mineworkers Development Agency in 2002. His international exposure includes serving as a delegate to the international conferences on energy in Rio de Janeiro 2001 and Rome 2002, and vice-chair of the workers group at the ILO-Geneva conference in 2003. He took part in official study tours in 1994 and 1999.



Rev P GROVE

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. He is Associate Minister at the Sarepta congregation of the Uniting Reformed Church in Southern Africa, and is Moderator of Cape Synod of the Church. He also works as a Congregational Facilitator with focus on mobilizing congregations around issues of poverty, and is actively involved in development and environmental advocacy. His academic qualifications are BA Hons (Sociology), B.Th (UWC).



Ms T KUMALO

Ms Thembisile Kumalo is the Deputy Director: Hazard Management and Pollution Information at the Department of Environmental Affairs and Tourism. She gained her B.Sc Hons in Biochemistry and Microbiology at the University of the North, her M.Sc. in Biotechnology at University College, Dublin, and is working on a PhD in Applied Environmental Science. She represents DEAT at workshops, conferences and other functions, and represents South Africa at regional and international meetings, e.g. the Basel Convention on the Transboundary Movement of Hazardous Waste and the Stockholm Convention on Persistent Organic Pollutants. She is also involved in promoting women in technology and in community development projects.



Dr T LESOLI

Dr Lesoli manages a health products distribution company, Mother Earth Distributors, marketing branded food supplements and conducting health and nutrition education. Previous employment was largely in the hospital and healthcare fields, and in private medical practice in KwaZulu-Natal and Gauteng. Her school education was in Lesotho and the UK, followed by her MB BS at the University of London, and a Diploma in Child Health and AIDS counsellor's course in SA. She is a registered medical practitioner with the SA Medical and Dental Council and British General Medical Council. She serves on numerous community bodies, mainly in the fields of health care, children and women's interests.



Mr J ROCHA

Mr Rocha is the Deputy Director-General: Minerals Regulation in the Department of Minerals and Energy. He holds a BA Hons in Political Science, BSc Hons in Geology and GDE in Mining, and is currently engaged in studies for his LLB. He joined the Department of Minerals and Energy as Director: Mineral Laws and was promoted in 2002 to Chief Director: Mineral Resources Management and in 2005 to his present post. He led the team that drafted the new Mining and Minerals Policy and was the principal drafter of the MPRDA.



Dr J M STEWART

Dr Stewart, an independent engineering consultant, represents organised business on the NNR Board. He gained his B.Sc in Mechanical Engineering at the University of the Witwatersrand, followed by his M.Sc and PhD. He has 20 years' experience in mining-related research and 15 years in managing mining-related policy issues. He was CEO of the Chamber of Mines Research Organisation prior to moving to the Chamber's Head Office where he focused mainly on safety, the environment, technology and the economics of the South African mining industry. While employed by the Chamber he served on numerous academic and research bodies, and was chairman of many industry committees. As an independent consultant, his consultancy work has been concerned with safety, science, and technology, as well as sustainable development issues, mainly in relation to the mining industry.



Mrs T N ZUNGU

Mrs Zungu is the Chief Director: Audit Services in the Department of Minerals and Energy, and serves on four parastatal audit committees. She gained her B.Com (Accounting and Auditing) at the University of Zululand, followed by a post-graduate Higher Diploma in Education (Commercial) at the University of Durban-Westville and specialised in-house training with Unilever (SA) and Shell (London) while employed in those companies' accounting and auditing divisions. She also taught high school accounting and business economics for three years. She joined the internal audit division of the DME in 1999, was promoted to her present post in 2003.



Mr M T MAGUGUMELA
(Chief Executive Officer)

Mr Magugumela was appointed Chief Executive Officer with effect from April 2005. Prior to joining the Regulator, Mr Magugumela was employed by Eskom. At Eskom, he initially served as a physicist in the Nuclear Safety Division. He was promoted to Senior Physicist and was later seconded to PBMR where he held the position of Probabilistic Risk Assessment Manager. Until his appointment with the Regulator, he held the position of Licensing Manager at the PBMR. Earlier while at Eskom, Mr Magugumela served in the Treasury Department as a Senior Financial Risk advisor. He holds a B.S. in Physics and Mathematics from Allegheny College, USA and an M.A. in Physics from Rice University, USA

Chairperson's Foreword

In the year ended 31 March 2006, the NNR continued its regulatory oversight and monitoring of nuclear facilities in the country. This included oversight of some unprecedented events at Koeberg Nuclear Power Station, and compliance by the holders of nuclear authorisations and entities in the mining and minerals field.

The events at Koeberg Nuclear Power Station in December 2005 and February 2006, received extensive media coverage and gave understandable rise to concern over public safety. The resulting power cuts in Cape Town and its environs, while regrettable, were not the prime concern of the NNR but of Eskom. As per its mandate of protecting persons, property and the environment against nuclear damage, the NNR closely monitored the situation. A more detailed report is given in the report of the Power Reactor Division in this Annual Report. The incidents resulted from transmission line problems from off-site power supplies and generator damage downstream from the reactor, respectively, and which therefore fall outside the scope of the nuclear licence. Nonetheless the NNR responded immediately to the events with site inspections and inspections of all aspects of maintenance and corrective action. In the interests of public safety, the NNR also directed Eskom to keep the Koeberg plant shut down until assurance was provided that all Power Station safety requirements had been fulfilled. The NNR has also required Eskom to report on steps taken to assess and improve the reliability of the off-site power supplies. The NNR is satisfied with the corrective actions that have been implemented by Eskom, but will continue to assess the situation and conduct inspections on the off-site power supplies that affect Koeberg Nuclear Power Station operation.

In pursuing its regulatory functions, the NNR is ever mindful of the need to engage with Civil Society. To this end, the NNR met with representatives of Earthlife Africa during the year to address matters of concern raised by the organisation. The NNR is committed to further meetings with this important body. Regular meetings were also held with communities around nuclear facilities through the Public Safety Information Forums established for this purpose, as well as with other stakeholder groups.

During the reporting period the NNR continued to review the nuclear installation licence application submitted by Eskom in July 2000 for the Pebble Bed Modular Reactor (PBMR). The key issues in relation to licensing have been identified and a programme of assessment and resolution has been put in place. The issuing of a nuclear installation licence for the proposed demonstration plant will be subject to finalisation of the NNR's public hearing process in accordance with the NNR Act, and the NNR's satisfactory assessment of the associated Safety Case.

The NNR continued to enjoy international recognition of its expertise in regulation of the nuclear industry, with CEO Mr Magugumela nominated to serve on the IAEA's Commission for Safety Standards and the Forum of Senior Regulator Officials which reviews and approves the IAEA Safety Standards. The NNR also represents SA on the International Committee on Radiation Protection (ICRP).

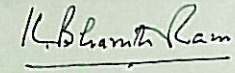
In our endeavours to foster greater capacity building initiatives across the African continent we have been actively involved in the IAEA's Afra project as well as peer review of its RaSSIA (Radiation Safety and Security of Radioactive Source Infrastructure Appraisal) activities.

In general, the safety of workers, the public and the environment has been carefully monitored and generally found to be satisfactory. Although action and preventive plans have been required from some mines and the compliance index has improved, four incidents have been reported where workers were exposed to radiation levels that exceeded the annual dose limit in the 2006 calendar year.

The total income for the NNR for year under review was R52.58 million, of which R44.51 million stemmed mainly from nuclear authorisation fees and R8.07 million by way of a Government grant.

The year saw the appointment of a new Chief Executive Officer, namely Mr Maurice T. Magugumela, who assumed duty on 1 May 2005. Amongst the internal challenges facing the NNR is the need to align its organisational and management structures to enhance its drive to recruit and retain good staff in the face of the broader issues in the nuclear industry, PBMR and the higher benefits that larger organisations can offer. For the NNR Board, as it moves forward, the challenge is to find mechanisms of establishing communication protocols with our Executive Authority, the Department of Minerals and Energy.

In conclusion, I wish to thank all Directors for their wise counsel and support during the last three years, and all staff and managers of the NNR for their support over the period that I have been a member of the Board.



Prof. K. Bharuth-Ram

Chairperson, NNR Board of Directors

Chief Executive Officer's Report

I joined the National Nuclear Regulator as Chief Executive Officer in April 2005, and am pleased to have an opportunity to report on the performance of the NNR for the year under review.

The Chairperson of the National Nuclear Regulator has commented in broad terms on the progress that the organisation has made over the review period in fulfilling its mandate to protect the public, property and environment against nuclear damage. My focus here is to provide the highlights of our achievements.

The emergency response of facilities regulated by the NNR continued to be a major area of focus by the Regulator. The NNR conducted one of its periodical emergency exercises at Koeberg Nuclear Power Station (KNPS) in February 2006. The overall objective of this exercise was to test the adequacy of the emergency plans by Koeberg and the local authorities. In particular, the emergency exercise sought to specifically test the late phase aspects of the emergency plan. This exercise involved local and international umpires and observers, including two officials from the French nuclear regulator's Technical Support Organisation (IRSN), labour unions, NNR Directors and civil society. Areas of improvement were identified and reported on at feedback sessions following the exercise. The emergency exercise report has been drafted and is undergoing internal review before being issued and presented to stakeholders.

The corrective actions arising from the previous exercise which was conducted in February 2004 have been followed up in various forums, primarily the Emergency Planning Steering and Oversight Committee, Emergency Planning Committee and Single Process Contact meetings, and are being monitored for progress by the NNR.

During the year under review, the Koeberg Nuclear Power Station experienced a series of events which resulted in the reactor shutting down. The first event was related to Unit 1 generator failure which was reported to have been caused by foreign material, including a loose bolt, left inside the generator. This resulted in the unit being shut down for generator repairs for a prolonged period of time. The NNR requested Eskom to provide reports on the investigations into the generator failure. Although the generator is not classified as nuclear safety related equipment, and therefore falls outside the scope of the operating licence of the power plant, the NNR was nonetheless concerned. The NNR's response to this event included inspection on maintenance, primarily focused on organisation, staffing, competencies, experience feedback aspects and corrective action processes. Although minor issues were highlighted no safety related issues were identified by the NNR.

Several corrective actions were identified by Eskom and these were reviewed and their implementation was monitored by the NNR. The discovery of the bolt inside the generator sparked an investigation by Eskom and security agencies into the security aspects in the power plant. This investigation is still continuing and the NNR will await the report.

Subsequent events that occurred resulted in the tripping of Unit 2. These events were mainly initiated as a result of external grid instability factors. The unit responded as expected. Eskom was directed by the NNR to keep the plant shut down until assurance could be provided that the safety requirements were fulfilled. These requirements included assurance that there was no security threat that would put the safety of the remaining unit, Unit 2, in jeopardy (in the light of Unit 1 generator failure investigation). Such assurances were provided to the NNR by the competent security agency.

Short to medium term corrective actions on off-site power supplies were identified and these are being closely monitored by the Regulator. These included actions involving, among others:

- Improved operation of Acacia and the grid
- Refurbishment of Acacia turbines
- NNR inspection on maintenance activities
- Koeberg and Acacia security upgrade

In general, these events, although they had operational consequences in terms of generation of electricity, were not directly indicative of any specific nuclear safety issues at the Koeberg site. The NNR is satisfied that a comprehensive plan of corrective actions to improve the reliability of the national grid and Acacia was implemented by Eskom. The NNR will assess the effectiveness of this plan by the end of 2006.

During the year under review, three incidents occurred at the Necsa Pelindaba site. The first incident involved calibration facility outside of the main Necsa campus which was reported by members of civil society to have been an abandoned "nuclear waste dump". The NNR immediately investigated this incident. The investigation revealed that there was no cause for concern for the safety of the public. Nevertheless, the NNR directed that corrective measures be undertaken by Necsa. The NNR was satisfied with the implementation of these measures. This incident highlighted the need for an improved working relationship between the Regulator and civil society. I am happy to report that this has been an area of focus by the Regulator during the year under review.

The second incident involved security breaches at the Pelindaba site. These involved the theft of redundant

equipment and material. Following an investigation by the NNR, Necsa management was directed to improve security arrangements at the site. The NNR is monitoring the implementation of these actions.

The last incident at Necsa involved a Group IV hazardous substance, which was used in a radiotracer experiment. This activity is regulated under the Hazardous Substances Act and thus falls under the jurisdiction of the Department of Radiation Control of the Department of Health. This incident resulted in the contamination of the building in which the experiment was conducted. The NNR conducted an independent investigation and found several inadequacies regarding radiation protection measures. The conditions in the building have been restored to an acceptable level of safety. The NNR has been in the process of following up on the corrective measures prescribed. This incident has highlighted the need for improved communication between the two regulators on the Necsa site.

Another area of focus for the NNR has been participation in the establishment of Public Safety Information Forums. These are required by the NNR Act to communicate with affected communities around facilities regulated by the NNR. The NNR engaged in quarterly meetings with the communities concerned. This has been a major leap forward in terms of transparency of the regulatory process.

The NNR continued its research in various topical areas. This includes the radon study in the Cango Caves to determine the levels of exposure to tour guides due to the relatively long times that they spend in the caves. This project will be completed at the end of the second quarter of 2006. Another project undertaken by the NNR involves the rehabilitation of four abandoned mines in the Karoo. The mines were contaminated following uranium prospecting in the late 1970s and early 1980s and were subsequently abandoned. While the planning for the rehabilitation work is complete, the commencement of the work was delayed due to increased uranium prospecting activities in the area. It is expected that the work will commence in the third quarter of 2006.

The NNR continued its licensing activities of the Pebble Bed Modular Reactor, both the power plant and the fuel manufacturing plant. The review and assessment of submissions from the applicant has continued; progress has been made in resolving key licensing issues. In-house capacity has forced the NNR to continue its use of technical support from international organisations.

The National Nuclear Regulator Act requires the holders of nuclear installation licences to provide financial security as determined by the Minister. This security is provided specifically for claims in respect of nuclear damage which may be suffered in the event of a nuclear accident.

The NNR continued to demonstrate its commitment to the development and transformation of the South African nuclear industry by investing in education and training. It hosted several workshops to introduce university students to the nuclear field and the role of the NNR. The NNR continued to support and supervise the research projects of two MSc students; it also took part in forums which seek to address the shortage of technical skills in South Africa, which included participation in ARECSA and attendance of conferences.

In the international sphere, the NNR has continued to play a major role in various forums:

- It has played a leading role at the IAEA in the area of development of various standards;
- The Chief Executive Officer was recently appointed to the Commission on Safety Standards (CSS), a Commission of the IAEA which oversees the development of safety standards.
- A number of NNR staff are members of committees of the Commission and are responsible for the development of the safety standards in various areas. These include the Nuclear Safety Standards Committee, Transport Safety Standards Committee, Waste Safety Standards Committee and Radiation Safety Standards Committee. Although the NNR is not a full member of the fourth committee, it continued to contribute to the discussions and stay abreast of developments in this area through the exchange of information with the South African representative on the committee, the Department of Health's Directorate of Radiation Control.

The NNR continued to liaise with its international counterparts as part of its commitment to keep abreast of international developments in the regulation of nuclear industry. It renewed existing bilateral agreements such as with the US Nuclear Regulatory Commission and entered into discussions on new ones. The NNR engaged in discussions with the French Regulator, DGSNR. The annual steering committee meeting between the two organisations was hosted by the DGSNR in France. Exploratory discussions also took place with the South Korean and the Chinese Regulators to establish bilateral agreements.

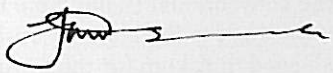
An issue of increasing international concern is the transport of radioactive material. As the national competent authority for South Africa, the NNR has adopted the revised IAEA regulations on transport and is considering an update of current nuclear authorisations to reflect the revised regulations.

In terms of Section 36 and 47 (3) of the NNR Act, the Minister of Minerals and Energy published draft national safety standards in 2003 to allow the public an opportunity to comment on them prior to their finalization. The DME and NNR worked closely in addressing these comments and have produced standards aligned to international recommendations and good practice. These have now been

published.

South Africa is a Contracting Party (CP) to the IAEA Convention on Nuclear Safety (CNS) and is required to submit a national report on the measures taken to implement the obligations of the Convention. This report is then subjected to peer review every three years. The 3rd review meeting of the Convention was held at the IAEA headquarters in Vienna in April 2005 at which the NNR presented the 3rd South African national report, which was well received.

In conclusion, I wish to convey my sincere appreciation to the Minister of Minerals and Energy, the Director-General and his staff, and the Board of the NNR for their support. I also wish to thank and pay tribute to the management and staff of the NNR for their efforts during the year in the execution of our mandate, and assure all our stakeholders of our sustained endeavours in their respective interests.



Maurice T. Magugumela

Chief Executive Officer

Koeberg Nuclear Power Station

2.1. BACKGROUND

Eskom operates the Koeberg Nuclear Power Station, comprising two 900 MWe pressurised water reactors (PWRs), on the Atlantic coast 40 kilometres north of Cape Town. A French consortium built the station, with Framatome having responsibility for the nuclear island, Alsthom Atlantique for the conventional island, Spie Batignolles for the civil works and Framateg for the overall project co-ordination. Following the Regulator's satisfactory review of the Nuclear Licence application, 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 National Nuclear Regulator Act (NNRA), nuclear installation licences are subject to 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 is subject to 17 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
- Medical surveilance
- Quality management
- Acceptance and approval
- Reports
- General

In terms of Section 26(2) of the NNRA, Eskom, as the nuclear licence holder, implements an inspection programme to ensure compliance with the conditions of the Nuclear Installation Licence NL-1. Likewise 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.

2.2. SAFETY ASSURANCE

2.2.1. OCCUPATIONAL EXPOSURE

Radiation exposures of personnel working at Koeberg are subject to control by the operational radiation protection programme. This programme ensures that control within the annual individual dose limit is achieved. In addition, the programme also serves to ensure that all doses are kept as low as reasonably achievable (ALARA).

The highest annual individual dose accrued during 2005 was 17.2 mSv, compared to the regulatory limit of 50 mSv per annum. The total annual collective dose to the workforce for the year was 2260 mSv. The total occupationally exposed workforce during 2005 numbered 2490, indicating an average annual individual dose of approximately 0.9 mSv. Figure 1 illustrates the dose distribution arising from the individual exposures accrued from 2000 to 2005.

The increase in occupational exposure for this reporting period as opposed to the previous period is due to the two refuelling outages compared to one during the previous period.

In terms of occupational exposure, therefore, the worker doses at KNPS over the reporting period were within the regulatory limits.

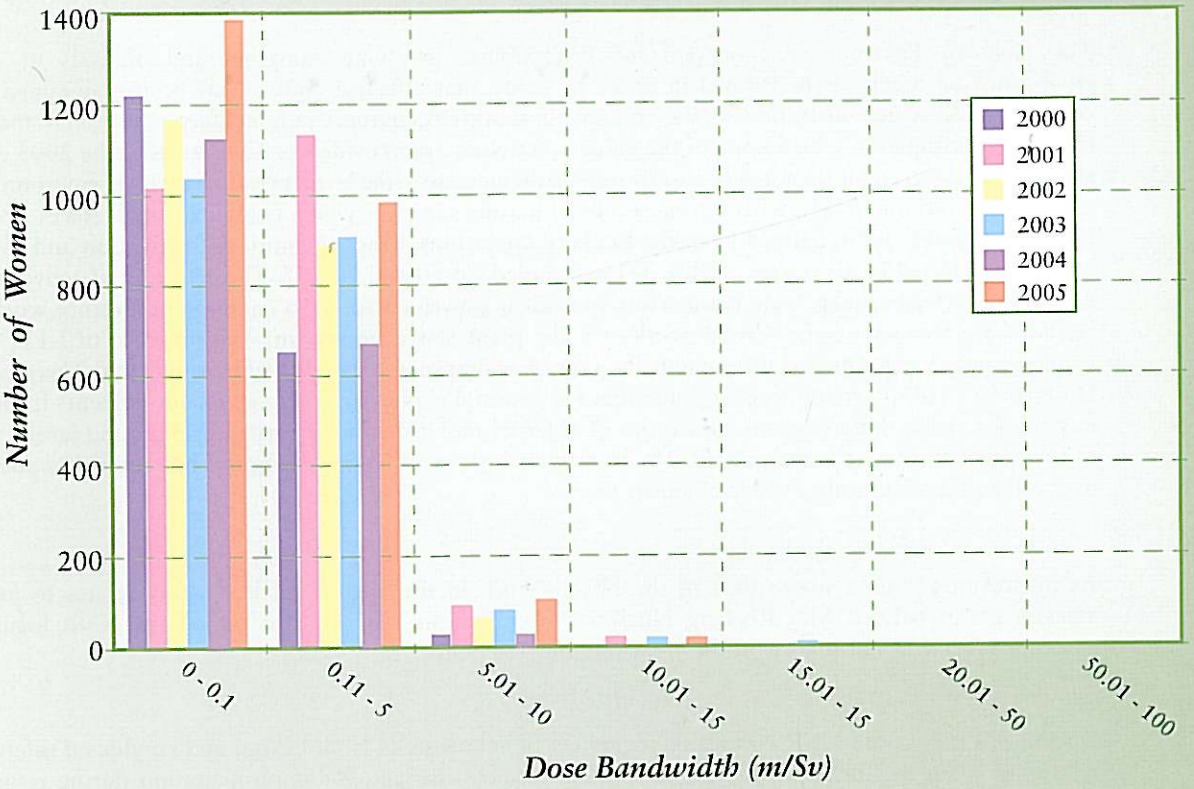


Figure 1: Occupational Exposure at Koeberg (2000-2005)

2.2.2. PUBLIC EXPOSURE

Various gaseous and liquid radioactive effluents are produced during the process of nuclear power generation. These effluents are treated by dedicated clean-up systems, which remove most of the radioactivity from them 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.

The liquid radioactive waste released to the sea resulting from the Koeberg operations during 2005 totalled a volume of 10390 m^3. Radioactivity in liquid and gaseous discharges from Koeberg during 2005 contributed a projected total individual dose of 6 µSv to the hypothetically most exposed group. The projected doses as a result of gaseous and liquid discharges were 0.5 µSv and 5.5 µSv respectively, which is well within the NNR limit of 250 µSv per annum, and meet the ALARA dose target of 13 µSv applicable for an annual period in which there are two refuelling outages.

The AADQ system of Koeberg is based on an activity migration model that features the migration of radioactivity from the fuel via the clean-up systems and effluent treatment systems and various drain systems up to the point of discharge. In the development of the model, design features and assumptions have been used. The ultimate result of the radioactivity migration exercise is the annual amount of effluent release in Bq on a nuclide-specific basis.

The radionuclides contributing the highest dose as a result of atmospheric and liquid discharges are shown in the following table.

Table 1: Percentage of AADQ discharged in effluent during 2005

Liquid Transport Pathway		Atmospheric Transport Pathway	
Radionuclide	% of AADQ	Radionuclide	% of AADQ
Ag-110m	45.48	I-132	44.16
Co-57	27.74	I-133	22.51
Co-58	15.52	I-134	57.50
Co-60	11.04	I-135	24.03
Sb-125	6.38	Co-60	16.32
		Nb-95	97.53

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

2.2.3. ENVIRONMENTAL SAFETY

The Koeberg Environmental Surveillance Programme, involving sampling and analysis of representative environmental media, is performed in order to verify that effective control has been maintained over effluent discharges. As a demonstration of the equipment sensitivity, natural radioactivity is routinely measured in the majority of samples in which none of the effluent activities are in evidence. The results of the 2005 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 samples, which contained small traces of radionuclides (Ag-110 m and C0-60), derived from the Koeberg operations. Trace quantities of activation and fission products were also detected in the sewage sludge. These included Co-60 and Cs-137. The detection of activation and fission products in sewage sludge from plants close to nuclear power stations is a common occurrence worldwide. These nuclides are released to the sewage works via the plant sewerage system. The presence of I-131 from nuclear medicine usage was detected throughout the year. A widespread network of Environmental Thermo-Luminescent Dosemeters (TLDs) around Koeberg monitors the external exposure to active gaseous effluents from Koeberg. As in previous years, there were no indications of external radiation above normal background levels, whether close to the power station or farther a field. The environmental surveillance programme has confirmed adequate control over effluent discharges in the period under review.

2.2.4. NUCLEAR SAFETY

As in previous years a major part of the NNR's work in the area of nuclear safety relates to in-depth safety assessments associated with Koeberg Nuclear Power Station. During this period the NNR focused its safety assessment activities primarily on the areas summarized below.

2.2.4.1 Plant Refuelling Outage Modifications

During this period the NNR completed its review of submissions from Eskom and conducted safety assessments related to plant modifications, and associated procedure changes, for implementation during refuelling reactor outages 115 (November-December 2005) and 215 (May-June 2006). These outages involved the largest number (24) of safety related modifications ever conducted in a single refuelling outage, and included containment pressure testing (outage 115). The NNR is satisfied that the CP-1 modifications, which will be conducted over a number of years, will close out the findings of the periodic safety review ranked as issues of "medium concern". There were no issues ranked "high".

All the nuclear safety related modifications were subjected to technical review by the NNR. This was complemented by a compliance inspection on the design and safety assessment processes followed by Eskom and their contractors and consultants, including a review of the documentary evidence of these processes. An international consultant company was contracted by the NNR to review two of the modifications. The outcome of the compliance inspection was that the processes and documentation of the contractors and consultants were found to be acceptable. Eskom was however required to provide additional documentary evidence of its review processes.

2.2.4.2 Koeberg alignment to French CP-1 plants

As reported in the previous report, Eskom submitted a licensing framework for 88 modifications considered necessary to upgrade Koeberg to bring it into closer alignment with the French CP-1 family of nuclear power plants in response to the findings of the Koeberg periodic review completed in 1998.

Twelve CP-1 modifications were submitted to the NNR for review and implementation during each of the two outages 115 and 215. The most important of these is a modification to the reactor protection system to remove the necessity of switching over from the main feedwater system to the auxiliary feed water system in the event of reactor trip.

2.2.4.3 Events at Koeberg

2.2.4.3.1 Failure of Unit 1 Generator

On 25 December 2005 Unit 1 at Koeberg was shut down for generator repairs. The problem was subsequently reported as foreign material, including a loose bolt (8 cm), left inside the generator. An interim report on the technical causes of the generator failure was provided to the NNR.

The NNR requested Eskom to provide final reports on the investigations into the technical, administrative and security aspects of the generator failure. Eskom has indicated to the NNR that the causes of the failure were still under investigation.

Although the generator is not classified as nuclear safety related equipment and therefore outside the scope of the licence, the NNR's response to this event included an inspection on maintenance, focusing on organization, staffing, competencies, experience, feedback aspects and corrective action processes. This inspection was conducted over the period 18-24 January (with subsequent analysis of data acquired over this period) with the objective of determining whether any serious issues existed with regard to maintenance at Koeberg, which could impact on safety-related equipment. Refer to section 2.2.10 for further information on this inspection.

During the next refuelling outage on Unit 2 (Outage 215 in May-June 2006) the NNR will conduct an inspection on the processes relating to foreign material exclusion.

2.2.4.3.2 *Failure of off-site power supplies*

On 19 February 2006 heavy mist and residual pollution from fires led to grid power supply problems, which also affected the power supply from the Acacia Power Station to Koeberg. Koeberg responded as expected and within 10 seconds drew emergency power from internal diesel generators. The NNR directed Eskom to keep the plant shut down until assurance was provided that the safety requirements were fulfilled. Such an assurance was provided to the NNR on 22 February and the restriction was lifted. The plant was synchronized to the national grid on 23 February.

On 28 February during the early hours of the morning one of the 400 kV lines supplying the Western Cape with power from the north experienced a fault. Unit 2 went into "house load condition" as per design, according to which the unit generates and supplies electrical power needed for cooling its reactor and spent fuel pool. The unit subsequently experienced a turbine trip and shut down completely. The 132 kV line from Acacia also experienced a problem due to a switching error at the Acacia Power Station, which tripped the generator sets at Acacia. The units then, as expected, drew power from the diesel generators. Connections to the 400 kV network and the 132 kV-dedicated line from Acacia Power Station were re-established.

Prior to permission being given by the NNR for start-up of Unit 2 following the event of 28 February 2006, the NNR advised Eskom that a written statement from the relevant competent authority on security would be required to provide assurance that it was acceptable from a security perspective to allow Unit 2 to restart. This assurance was provided to the NNR in writing by the National Intelligence Agency (NIA).

Eskom was directed to keep the plant shut down until assurance was provided as to the operability of the 400 kV and 132 kV power supplies. Such assurances were provided prior to the unit returning to power.

2.2.4.3.3 *NNR assessment and follow-up of these events*

Nuclear power plants such as Koeberg are designed to cope with loss of off-site power on the basis that such events are expected to occur, given the vulnerability of the electrical distribution system to environmental conditions. The NNR considers however that the frequency of such events needs to be kept as low as possible, and has required Eskom to report on steps taken to assess and improve the reliability of these power supplies.

In particular the NNR has required Eskom to provide reports on the reliability of off-site power supplies, addressing:

- Operation/reliability of the grid
- Operation/reliability of Acacia
- Risk analysis
- House load operation
- Procedures for station blackout
- Station blackout issues
- Staffing levels and competencies
- Operating experience feedback process

Eskom is presently responding to these requirements. The NNR is evaluating the responses received so far and will continue to assess the submissions referred to above and conduct inspections on off-site power supplies during 2006.

2.2.4.3.4 *Unit 1 low head safety injection pump motors cooling flow*

In December 2005 during the start-up tests following Outage 115, both low head safety injection pump motors on Unit 1 were declared inoperable because of reduced motor cooling water flow. In accordance with Operating Technical Specifications the unit was taken down to cold shutdown. This was reported to the NNR in accordance with reporting requirements. An investigation determined that an incorrect re-assembly of the motor coolers resulted in restriction of the cooling flow to the motors, and would have resulted in damage or failure of both pumps in the event of a loss of coolant accident. The event has been graded as an INES level 2 event on the basis of significant degradation of safety provisions.

Eskom has subsequently changed the test programme to include direct measurement of coolant flow rate to the motors rather than relying on measurement of pump motor temperature. It has been confirmed that coolant flow on Unit 2 is according to the specifications.

The NNR is satisfied with the corrective actions implemented by Eskom.

2.2.4.3.5 *Modifications linked to severe accidents*

In the light of developments in the vicinity of Koeberg, Eskom has implemented a number of improvements to enhance the safety of the plant, particularly relating to the prevention and mitigation of severe accidents. These include the Severe Accident Management Guidelines for accidents initiated from full power operation, the Koeberg strategy on hydrogen control, updating the Koeberg late phase emergency plan, and a revised probabilistic risk assessment for Koeberg using state-of-the-art modelling and computer codes. As part of these initiatives, Eskom is also investigating a number of modifications linked to severe accident management.

During 2003 Eskom submitted a request to implement a modification, which would provide an additional means of cooling the reactor vessel and core material in the reactor cavity in the event of a severe accident. In principle this would provide an additional level of protection for the second and third barriers (the reactor vessel and pipe-work

of the primary circuit, and the containment building). Since the issues associated with this and other modifications are part of ongoing international initiatives, the NNR requested the opinion of overseas nuclear regulators on the physical phenomena associated with this modification.

In February 2005 the NNR received an in-depth technical review report from an expert meeting held in Paris in December 2004 hosted by the French regulatory authority, DGSNR. The report was translated and an NNR team established to review this report and other available literature in order to establish a position on the issues relating to the modification. The outcome of the assessment was that there are still unresolved international generic issues, including one regarding the impact of reactor pit flooding on structural integrity in the event of an accident. Eskom has indicated that it intends to revisit the issues and ultimately resubmit the request to implement the modification.

The NNR has directed Eskom to provide its position and plan of action on the issue of containment sump filter blocking in the event of a loss of coolant accident (LOCA) at Koeberg, in the light of a decision by the DGSNR to report this issue at level 2 on the International Nuclear Event Scale (INES) for the French family of nuclear power reactors. Eskom has provided its plan of action, which takes into account the US and French approaches to this problem. Eskom wishes to follow the French approach and has proposed to implement the modification to the containment sump strainers – technically very similar to modification proposed by Electricité de France (EdF) for its CP-1 plants. This matter is one of a number of issues on which the NNR is engaging with the DGSNR.

2.2.4.4 Koeberg nuclear fuel management strategy

2.2.4.4.1 Spent fuel storage

During the previous reporting period the NNR reviewed and approved a series of modifications to the Spent Fuel Pool control and instrumentation systems – known as the ANSI Phase II modifications. These modifications were required to demonstrate compliance with the standard ANSI 57.2 adopted by Koeberg after installation of high-density storage racks in the Koeberg spent fuel pools. These modifications have subsequently been implemented at Koeberg. Further modifications to the spent fuel cooling system to provide a third cooling train are to be implemented in 2007.

2.2.4.5 Plant condition management

The NNR monitors plant condition management at Koeberg through specialist meetings, assessment of safety submissions by Eskom, and inspections and audits. The following are focus areas for plant condition management during the reporting period and into 2006:

- Steam generator integrity
- Primary loop cast elbows
- Reactor pressure vessel (RPV) integrity
- Unit 1 vessel head replacement
- In-service inspection Second Interval Programme
- In-service inspection Third Interval Programme
- Risk-based In-service Inspection Project
- USA Davis Besse Nuclear Power Plant incident

The NNR has assessed and accepted the outcome of repair and replacement work performed on piping in safety systems at Koeberg as a result of the environmentally induced stress corrosion cracking phenomena.

2.2.5. LICENSING OF KOEBERG REACTOR OPERATORS

The biennial evaluations of licensed operators, as required by the licence conditions, were completed at the end of 2005. Biennial evaluation 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. All operators passed the evaluations and were awarded operator licence extensions for 2 years. The next biennial evaluations are scheduled for the third quarter of 2007.

The psychometric evaluations by the NNR consultants on the operator licence holders were conducted in the first quarter of 2006. The consultants' report and the NNR report have been completed. The overall outcome of the assessments was positive, and also indicated a strong safety culture by the operators.

2.2.6. RADIOACTIVE WASTE SAFETY

The generation of solid radioactive waste amounted to 88.2 m^3 drummed in metal drums and 55.5 m^3 drummed in concrete drums. This compares to last year's figures of 75.8 m^3 and 46.5 m^3 respectively. The inventory of the drummed radioactive solid waste produced in 2005 appears in the following table. The comparable figures for 2004 are given in brackets.

Table 2: Solid Radioactive Waste

Type of solid radioactive waste	No. of drums
C1 drums containing non-compressible waste	29 (34)
C1 drums containing concentrates	66 (68)
C1 drums containing resin	47 (0)
C2 drums containing resin	27 (42)
C4 drums containing filters	3 (3)
C2F drums containing filters	7 (4)
210 litre metal drums containing general trash	423 (378)
210 litre metal drums containing resin	132 (108)

Radioactive waste shipped to Vaalputs in 2005 (which does not directly relate to what has been generated by Koeberg during that year) amounted to 33 m^3 in steel drums and 29 m^3 in concrete drums. This compares to 183 m^3 and 51 m^3 last year for these quantities respectively.

2.2.7. TRANSPORT SAFETY

There were no incidents involving the transport of radioactive material, and all consignments complied with the safety requirements. A summary of transportation data is provided below.

Table 3: Transport data

Fuel consignments on site	2
Radwaste consignments from site (to Vaalputs)	18
Other materials (sealed sources) transported to site during 2005	3

2.2.8. EMERGENCY PLANNING AND PREPAREDNESS

2.2.8.1 Koeberg Emergency Exercise

The NNR conducted an emergency exercise at Koeberg Nuclear Power Station (KNPS) on 15 February 2006. These exercises are one of the means by which the NNR tests the adequacy of Koeberg and local authorities to respond to a nuclear emergency.

The overall objective of the exercise was to test the response of both the on-site and off-site organizations. Specific objectives of the exercise included the testing of certain aspects of the new integrated emergency plan, which had been provisionally approved by the NNR.

Problems and potential improvements were recorded by the umpires and observers, and reported at feedback sessions following the exercise. As part of the exercise the NNR invited VIPs (local and international) to witness and observe the activities, responses and actions of the various organizations, which are involved, in the emergency plan of the Koeberg Nuclear Power Station. The VIPs included two officials from the French regulator's technical support organisation (IRSN), who provided useful comments and advice on their observations of the exercise. Overall the response of the licensee and intervening organizations was regarded as satisfactory, although the late phase aspects need to be further developed and tested. The 2006 Emergency Exercise Report has been drafted and is undergoing an internal review before being issued and presented to stakeholders towards the end of May 2006.

The implementation of the corrective actions from the February 2004 exercise has been followed up in various forums, primarily the Emergency Planning Committee chaired by Eskom and attended by local authorities, and monitored for progress by the NNR.

2.2.8.2 Emergency Plan late phase aspects

During 2002 it was decided that the late phase aspects currently in place in the Koeberg emergency plan should be revisited. This was prompted partly by new requirements from the NNR Act (e.g. responsibilities of the Western Cape Provincial Administration in the Koeberg emergency response), the development of other national legislation such as the Disaster Management Act, and discussions with the Chief Director: Emergency Management in the Western Cape. For this purpose the (Koeberg) Emergency Planning Steering and Oversight Committee (EPSOC) was established.

Eskom, in conjunction with the local authorities in Cape Town, has completed the project to improve upon the late phase aspects of the Koeberg emergency plan. The late phase aspects of the emergency plan typically commence several days after the accident when work commences to reduce radiation levels in the environment to permanently acceptable levels, and covers aspects such as food bans and decontamination of the environment. International guidelines such as those of the International Atomic Energy Agency were followed in developing the plan.

The process of integrating the early and late phase aspects of the emergency plan has been finalised and the integrated plan has been reviewed by the NNR. The plan was provisionally approved prior to the emergency exercise of February 2006 so that the late phase aspects could be tested as part of the exercise.

Once approved, based on an international review of emergency plans in other countries, Koeberg may be considered to be ahead of most utilities in the world in having such a well-developed late phase emergency plan.

2.2.8.3 Developments around Koeberg

In the mid-1970s consideration was given by the NNR to population projections in the Cape up to the end of the design life of Koeberg (approx 2025). Safety assessments against the risk criteria were carried out as a basis for consideration of the acceptability of these projected population levels in the vicinity of the plant.

In 1980 the Atlantis and Environs Guide Plan was promulgated, which puts forward that :

- No further development within a 5 km radius of Koeberg should be allowed unless place bound;
- No more than 650,000 people in the 20 km planning area;
- Development to take place respecting a distribution agreed with the licensing authority.

In the 1980s there was a low level of population growth in this area, but in the late 1980s an increased level of growth occurred in the Western Cape. In 1989 the Bloubergsvlei Urban Structure Planning Project commenced. At this point the presence of Koeberg was identified as a dominant constraint on developments in this plan.

In 1994-1995 accelerated development took place. In 1997 the Koeberg Environs Development Committee (KEDC) was established by the NNR as a forum to discuss developments and control thereof in the light of the Koeberg Emergency Plan. In 1998 an assessment of international siting criteria was conducted by the NNR as an interim measure until a more thorough (site specific) assessment had been conducted. The decision makers were kept informed of the conclusions. The outcome was a population density guideline largely based on siting criteria for nuclear power plants in the USA.

Over the period 1999-2000 a site specific assessment was initiated by Eskom and the NNR involving international consultants, and using updated population projections by the local authorities. This resulted in the consultants' report "Koeberg Nuclear Power Station Technical Basis for Emergency Planning" (Dec 1998) and the "NNR report on the technical basis for emergency planning at Koeberg Nuclear Power Station" (July 2000). Once again the relevant decision makers were kept informed of the conclusions.

In parallel with this development the evacuation model (traffic model) was developed by the erstwhile Cape Metropolitan Council (CMC) Traffic Directorate under a steering committee comprising the NNR, Eskom, CMC Traffic Directorate, CMC Transport, CMC Disaster Management, Blaauwberg Municipality and Provincial Authority Western Cape. The report "Koeberg Emergency Evacuation Modelling" was produced in July 2000.

In July 2001 the "Blaauwberg Spatial Development Framework" was circulated by the City of Cape Town for comment. Although this has still not been approved, it included demographic projections and developments up to 2031, which have been used to update the traffic model referred to above.

Although the traffic model indicates that the emergency plan is viable given the present population levels and infrastructure, it was recognised that this is only one aspect of the overall assessment process. The need was recognised for legally binding requirements on the relevant authorities responsible for spatial planning and disaster management.

The NNR therefore put forward a recommendation to the Minister of Minerals and Energy for regulations in terms of section 38(4) of the NNR Act. The Minister accepted the NNR recommendation and after consultation with the relevant provincial and municipal authorities Regulation No 287 was promulgated in April 2004. This regulation requires the NNR to lay down requirements on developments and for the provincial and municipal authorities to develop and implement the necessary processes.

The NNR then initiated the process of developing the requirements on developments as required by the regulation. The NNR informed the provincial and municipal authorities in the Western Cape in writing in June 2004 of the need for development of the requirements document as stipulated by the regulation, and requesting their participation in the process of consultation on establishing these requirements.

A discussion document comprising draft requirements for use in the consultation process with the provincial and municipal authorities was prepared. The requirements on developments are derived from the above-mentioned NNR technical basis report, taking cognisance of relevant International Atomic Energy Agency (IAEA) guidelines, and approaches followed internationally.

As regards the 0-5 km "Protective Action Zone" (PAZ), the requirements of this document are consistent with those currently enforced by the authorities in terms of which no further developments may be approved which could increase the population in this area. For the 5-16 km "Urgent Protective Action Zone" (UPZ), the requirements are essentially that it must be demonstrated that the emergency plan can be implemented for the existing level of development and future planned developments. Effectively, the main restriction is to demonstrate the ability to evacuate the public within the 5-16 km zone within a 67.5° sector within 16 hours. Provisional analysis performed by the authorities suggests that the evacuation time for the present population, including notification and other time delays, meets this requirement with an acceptable margin.

The NNR considers that these restrictions will be effective and that the NNR Requirement Document (RD-0015) "NNR requirements on then control and monitoring of developments in the formal emergency planning zone of Koeberg Nuclear Power Station" is necessary to ensure that the authorities responsible for spatial planning and disaster management work hand-in-hand to ensure that planning is conducted appropriately and that infrastructure is provided timeously. The requirements allow for developments to take place in the vicinity of Koeberg without conflicting with the emergency plan.

A meeting was held with the provincial and municipal authorities in September 2004 at the Council Chambers of

the Blaauwberg Administration in Milnerton, Cape Town, at which the proposed requirements were presented. It was agreed at the meeting that the NNR would reformat the requirements in the form of a Requirements Document (RD) and formally submit them to the authorities for comment. Draft 1 of the RD was developed and, after review within the NNR, was sent to the authorities in November 2004.

The provincial and municipal authorities commented on this document in writing. The comments were largely positive and supportive. The NNR responded to the comments in writing and prepared a second draft of the RD taking into account the comments where applicable. This was circulated to the authorities informing them that the document would be issued around mid-April 2005, following which a further meeting would be held to discuss the way forward in terms of the assessment processes, which the authorities have to develop in compliance with the regulation.

The requirements document RD-0015 was discussed at a mayoral council meeting held in May 2005. The outcome of this meeting was that RD-0015 was supported by the City of Cape Town. After approval by the NNR the document was submitted to the relevant authorities in June 2005.

At the Nuclear Emergency Planning Regulatory Oversight Committee (NEPROC) meeting held in March 2006, which meets quarterly and is chaired by the NNR, the Department of Environmental Affairs and Development Planning reported on the status of development of the processes for compliance with Regulation 287 and the NNR Requirements Document (RD-0015) by the provincial and municipal authorities. The procedures, which will cover the assessment and control of developments (including the traffic model), will be provided to the NNR for acceptance as required by the regulation. This was initially planned for December 2005, will be carried over to be completed by mid-2006. The NNR has received and is presently reviewing an advance copy of the Traffic Evacuation Model from the consulting engineers who developed the model and conducted the analysis for the authorities.

A further issue raised at the NEPROC forum concerns an application to subdivide a property within the 5 km zone into approximately 1100 erven. In spite of the Regulation 287 and RD-0015, over the reporting period the NNR has found it necessary to make legal representation to prevent approval of this application. As a result of the intervention by the NNR, the application was referred to the provincial authorities. Further development related to this application is that a "Notice of Motion", issued by the High Court of South Africa (Cape of Good Hope Division) was served on the NNR. In terms of the Notice, application is being made for an order declaring Regulation 287 unlawful and invalid and declaring the requirements of RD-0015 regarding the 5 km zone unlawful and invalid.

The application has been brought against the following:

1. The Minister of Minerals and Energy (First Respondent);
2. The National Nuclear Regulator (Second Respondent);
3. The Premier of the Western Cape (Third Respondent);
4. The City of Cape Town (Fourth Respondent); and
5. Eskom Holdings Limited (Fifth Respondent).

In accordance with this notice the NNR has prepared a complete copy of all proceedings, which led to the Regulation, and RD-0015 and this was provided to the firm of attorneys handling the issue for the NNR.

2.2.9. PHYSICAL SECURITY

The licensing requirements pertaining to physical security with 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 the country. The NNR accepted the standard, and compliance with it is effectively included in this condition of the licence. As part of its compliance assurance programme, the NNR conducts regular inspections (on a weekly basis) at Koeberg to verify conformance to this standard. The NNR is presently in discussion with various government agencies involved in oversight of national key points for assistance to the NNR in terms of technical reviews of security related submissions from licensees. On the basis of its own review as well as that of National Key Points (SAPS), the NNR recently approved a new security standard developed by Eskom, which formed the basis for a security upgrade at Koeberg.

2.2.10 INSPECTIONS AND AUDITS

The NNR conducts inspections at Koeberg as part of its compliance assurance programme to verify that Koeberg conforms to the conditions of its licence.

Over the period 207 inspections were carried out by the NNR at Koeberg.

2.2.10.1 Main inspection findings

The following main areas inspected by the NNR and associated findings/concerns are reported below.

2.2.10.1.1 Medical surveillance at KNPS

The NNR conducted an audit on medical surveillance at Koeberg in January 2006. Professional medical services were acquired by the NNR for the audit. Overall the outcome of the audit was that apart from a number of findings of an administrative nature, medical surveillance at Koeberg is conducted in a satisfactory manner.

2.2.10.1.2 Inspection on maintenance at Koeberg

This inspection was conducted in January 2006 in the light of events at Koeberg involving the unscheduled shutdown of both units reported under section 2.2.4.3.2 above. No findings were raised, but the inspection highlighted a number of areas of concern relating to staffing and competency levels in the maintenance departments at Koeberg, and general lack of attention to detail affecting the quality of technical documents.

Koeberg management had already identified the above concerns themselves, and steps are being taken to address the concerns.

The NNR has directed Eskom to report on staffing and competency levels in all disciplines relevant to nuclear safety, and to report on improvements made in this regard wherever deficiencies are identified.

2.2.10.1.3 Civil monitoring

Failure by Eskom to conduct certain aspects of civil monitoring at Koeberg was raised by the NNR as an issue of licence condition non-compliance. Eskom responded by submitting an engineering position on this issue, which was presented and discussed with the NNR, as well a report on the oversight actions, root causes and closeout actions. The NNR conducted inspections and was satisfied with the implementation of corrective actions. Eskom has submitted an engineering report on the affected aspects. The report is still being assessed by the NNR.

2.2.10.1.4 Configuration control management

The NNR raised a concern with Eskom regarding configuration control management at Koeberg based on numbers of errors identified by the NNR in applications for modifications and procedure changes. Eskom has subsequently implemented a large number of corrective actions, which were acceptable to the NNR. The effectiveness of these corrective actions continues to be monitored by the NNR, particularly during plant refuelling outages.

Although the NNR has closed the licence non-compliance, the issue remains open based on recent inspection findings relating to operations and maintenance, and the NNR will continue its monitoring.

2.2.10.1.5 Refuelling water storage tank (PTR)

The NNR raised a concern regarding the degraded condition of the refuelling water storage tanks (PTR) and general housekeeping in this area as a result of Atmospheric Stress Corrosion Cracking (ASCC), on both Koeberg units. Eskom conducted a programme of repair of the tanks and cleanup of the PTR tank rooms and has submitted a proposal to restore the tanks to "as-new" condition by 2007. The NNR has approved the proposal and has verified that all short-term actions (e.g. repairs, painting, cleaning etc) have been performed.

2.2.10.1.6 Close-out of the Koeberg periodic safety review findings

Although no major safety concerns were identified during the Koeberg periodic safety review which was completed in 1998, the main outstanding NNR concern was related to the slow progress in closing out the findings of the review. Eskom presented a plan of implementation for closing these findings, which was accepted by the NNR. The NNR is now satisfied that the CP-1 modifications (as reported earlier in the report), which will be conducted over a number of years, will close out the findings of the periodic review ranked as issues of "medium concern".

2.2.10.1.7 Operability process

Inspections conducted by the NNR identified flaws in the procedures for determination of operability of safety related systems at Koeberg. Eskom is presently developing a new set of procedures.

2.2.10.1.8 Safety culture

The NNR raised the issue of oversight of safety culture at Koeberg, requiring Eskom to develop the necessary processes. Eskom responded with a plan to develop policies and procedures accordingly, and has provided the NNR with a programme. The NNR has verified that Eskom is implementing the programme, and the issue has been downgraded.

2.2.11 KOEBERG COMPLIANCE INDEX

The Koeberg compliance to the NNR Compliance Assurance Programme was 80%. This Compliance Index is derived according to the following process:

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. According to this system, red indicates unacceptable, orange indicates tolerable-high, yellow indicates tolerable-medium; blue indicates tolerable-low and green indicates below regulatory concern.

For the period under review the findings of the 207 inspections conducted by the NNR on 30 process areas were consolidated as follows:

- No red findings: red indicator carries a 100% weighting factor for ranking of non-compliance
- 6 orange (medium) findings with a weighting factor of 50% for ranking of non-compliance
- 11 yellow (low) findings with a weighting factor of 25% for ranking of non- compliance

Based on the above results the calculation for the non-compliance index translates to

((6x 0.5)+(11x 0.25))/30 = +/- 0.20 (20% non-compliance or 80% compliance)

2.2.12 INCIDENTS/OCCURRENCES

A total of 457 Problem Notifications (PNs) occurrences were reported in the following categories:

Table 4: Problem notifications

Category	Number of incidents AND occurrences
1	20
2	19
3	418

Category 1 requires immediate notification to the NNR, Category 2 requires 24 hour notification and Category 3 requires notification within five working days.

Although a total of 457 PNs were reported at KNPS, none of them were significant in terms of the category of incidents and accidents as defined in the NNR Act.

The NNR monitors incidents / occurrences at Koeberg in the following manner:

- 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 trending thereof
- Direct assessment of selected significant occurrences

Eskom and the NNR monitor international events. Eskom systematically scrutinises information from sources such as WANO (World Association of Nuclear Operators), INPO (International Nuclear Power Operations), IAEA (International Atomic Energy Agency) and EdF (Electricité de France). Apart from monitoring Eskom processes in this regard, the NNR similarly scrutinises information from the IAEA and information exchanged with other regulatory bodies through bilateral agreements.

Through the above means, the NNR satisfies itself that the processes implemented at Koeberg relating to incidents/ occurrences are acceptable and that plant safety performance is acceptable.

The reporting and follow-up of problems, occurrences and events at Koeberg represent a thorough, fully proceduralised and ongoing process of investigation. The duration of a given investigation until final closeout may vary from a few weeks to several months, depending upon the extent to which complicating factors are encountered.

Although as indicated above, the NNR monitors and tracks all events reported at Koeberg, the most important events (category 1) investigated and followed up by the NNR during this reporting period related to inadequate cooling flow through the motor coolers of both Unit 1 low head safety injection pumps, the failure of the Unit 1 generator, and the two loss of off-site power events (as reported in section 2.2.4.3.2 above).

The other 16 category 1 events involved a misplacement of a radioactive source within the power station, entries into incident procedures, outage related equipment malfunctions, and occurrences directly relating to the above-mentioned loss of off-site power events. The NNR is satisfied with the follow-up actions undertaken by Eskom to address these events.

South African Nuclear Energy Corporation, (Pelindaba)

3.1. BACKGROUND

The South African Nuclear Energy Corporation (Necsa) is a state-owned entity established in terms of the Nuclear Energy Act No. 46 of 1999, and is situated 25 km west of Pretoria and 55 km North-West of Johannesburg.

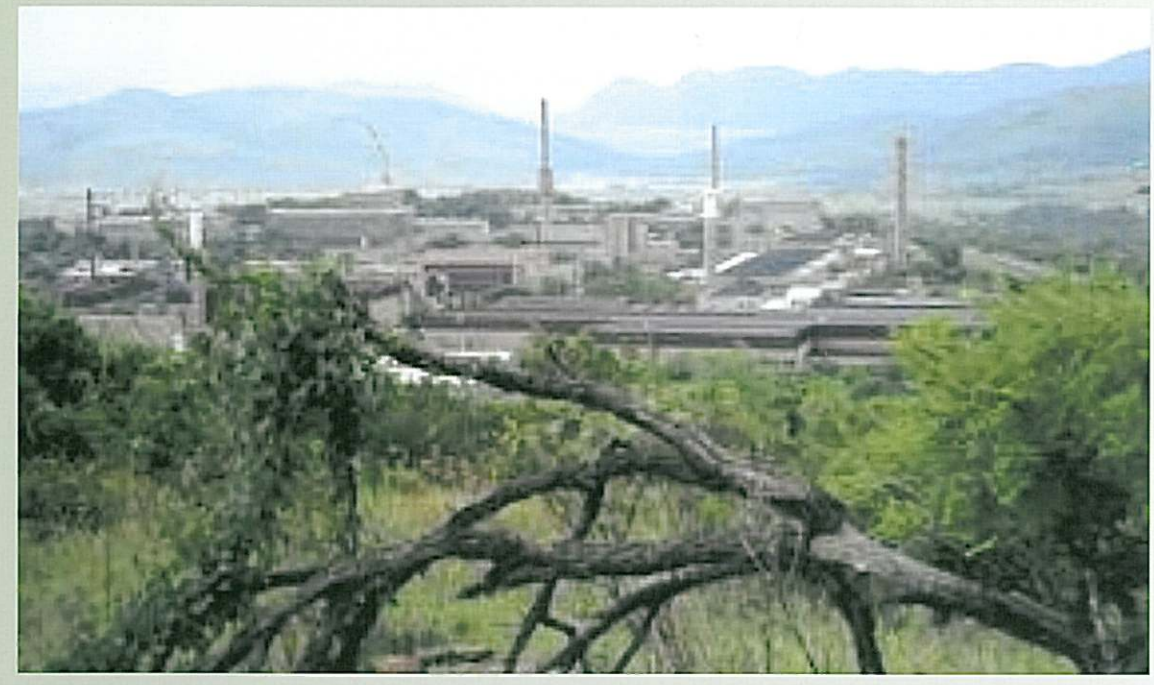


Figure 2: Overview of Necsa Pelindaba site

In terms of the National Nuclear Regulator Act (NNRA), nuclear installation licences are subject to conditions deemed necessary to ensure the protection of persons, property and the environment against nuclear damage. The current Necsa Nuclear Installation Licence NL-27 variation 25 is subject to conditions relating to:

- Plant description and configuration
- Safety and risk assessment
- Controls and limitations on operation
- Maintenance and in-service inspection
- Operational radiation protection
- Criticality control
- Effluent management
- Waste management
- Environmental monitoring and surveillance
- Medical surveillance
- Emergency planning and preparedness
- Control of radioactive sources
- Transport
- Physical security
- Quality management
- Training
- Routine reports

Further in terms of Section 26(2) of the NNRA, Necsa as the nuclear licence holder implements an inspection programme to ensure compliance with the conditions of the Nuclear Installation Licence NL-27.

The NNR implements an independent system of compliance assurance comprising of inspections, audits, surveillance and the review of routine reports to provide assurance of compliance with the conditions of the nuclear licence in terms of section 5(d) of the NNR Act.

3.2. SAFETY ASSURANCE

3.2.1. OCCUPATIONAL EXPOSURE

During the review period, Necsa demonstrated compliance with the NNR requirements in respect of radiation protection for the workforce. The average effective radiation dose per occupationally exposed worker for 2005 was 0.7 mSv, which is 14% of the ALARA objective of 5 $mSv.a^{-1}$. The highest cumulative dose accrued for an individual in the calendar year was 13 mSv. The ALARA objective for maximum individual dose (20 $mSv.a^{-1}$) was therefore not exceeded for the calendar year 2005.

It was mentioned in the previous annual report that the regulatory control of facilities working only with Group IV hazardous substances (viz. Isotope Centre, Lumitec and Sterisure) had been moved from the NNR to the Department of Health (DOH). However, the above-mentioned doses continue to include the exposure of workers employed in those facilities. Table 5 gives the occupational exposure measured over the period.

Table 5: Occupational Exposure for Necsa

Exposure Type	Dose
Maximum Dose (mSv)	13.0
Average Dose (mSv)	0.7
Total Collective Dose (milli-Person-sievert)	530.0

3.2.2. PUBLIC EXPOSURE

The public exposure arising from liquid and gaseous effluent discharges was 6.3 µSv, which is 2.5% of the annual dose limit of 250 µSv and therefore well below the annual dose limit. Liquid effluent discharges accounted for 4.1 µSv and gaseous discharges accounted for 2.1 µSv for the 2005 calendar year. There were no safety concerns regarding public exposure to the community living around Necsa.

The following figure compares the doses as a result of liquid effluent discharges to the Crocodile River for the past five years.

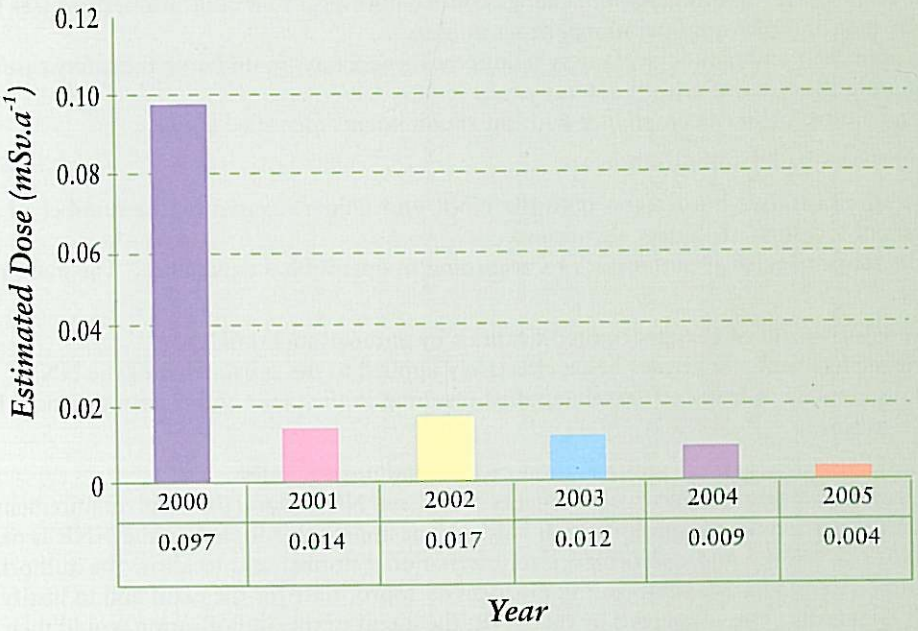


Figure 3: Public Exposure due to liquid effluent discharges to the Crocodile River

3.3. ENVIRONMENTAL SAFETY

Necsa is required to comply with licence requirements relating to environmental safety. Samples are collected from various sample media in the environment around the Pelindaba site. The sampling locations are based on the surrounding land use. The samples are analysed for following isotopes 54Mn, 59Fe, 58Co, 60Co, 65Zn, 143Cs, 137Cs, Zr/95Nb, Mo/99Tc, Ba/140La, 192Ir, 131I, 40K and natU. The sample media include:

- air filter monitoring on the Pelindaba site
- milk from surrounding farms
- plant material in the surrounding area
- water and fish samples from the Crocodile River and Hartbeespoort Dam

In order to ensure an appropriate level of control of radioactivity in the environment the NNR uses a system comprising of reporting levels, investigation levels and intervention levels. This system is designed to rapidly detect any increases in environmental levels of radioactivity and ensure that appropriate action is taken to correct the situation. The environmental surveillance programme has confirmed adequate control over effluent discharges during the period under review.

3.4. NUCLEAR SAFETY

The NNR reviewed and approved 99 licence change requests during the reporting period, as indicated in the following table:

Table 6: Necsa submissions approved by the NNR during 2005/2006

Submission Type	Number
Safety assessments	23
Facility in-service inspection manuals	6
System Documents (SHEQ-INS) including radiation protection standards	37
Facility security manuals	5
Facility quality management manuals	11
Transport containers (also revalidation of certificates, special form certificates & package design)	5
Facility decommissioning & decontamination procedures	12
Total	99

3.4.1. MAJOR PROJECTS

Two of the major projects undertaken during the review period are discussed below.

Process-based licensing

During the period under review the NNR progressed the application of processed-based licensing at Necsa facilities.

Process-based licensing places requirements on the processes established by the authorisation holders. These processes include:

- Identification of applicable fundamental nuclear and radiological safety standards;
- Identification of the basis for authorisation, change control in respect of modification, processes to update and maintain safety case and relevant operational programmes;
- Identification of nuclear and radiological safety requirements necessary to underpin the safety case and processes needed to maintain these in line with the safety case;
- Monitoring and enforcement of compliance with the requirements identified above.

The objectives of process-based authorisation are:

- To reduce the administrative burden (on both the NNR and holder) caused by the number of authorisation change requests of low (or zero) safety significance.
- To improve the scope of nuclear authorisations according to operational experience. The main problem areas identified were:

  o Screening and assessment of changes or modifications by authorisation holder.
  o Plant experience feedback not always being effectively applied to the satisfaction of the NNR.
  o International practice not being effectively applied resulting in the plant and certain practices falling behind international norms.

- To improve the transparency of the authorisation process and nuclear safety.
- To make a clear separation between requirements based on NNR standards and requirements relating to compliance with provisions of the authorisation holder. The approach adopted by the NNR is to set high level standards (dose, risk criteria and conformance to international norms) and to allow the authorisation holder freedom to adopt a design basis and operating practices as appropriate for the plant and to justify the choice in terms of NNR standards. Once accepted by the NNR, the intent of the authorisation would then effectively be to hold the authorisation holder to its provisions and commitments.

In line with the above, numerous discussions were held relating to the required changes in the Nuclear Installation Licence NL-27. A new variation of NL-27, variation 26 was prepared and this will be issued early in the next financial year.

Process-based licensing places the responsibility for technical details relating to nuclear safety more clearly in the hands of the authorisation holder who is ultimately responsible for nuclear safety. The Regulator would then monitor the implementation of these processes through surveillances, inspections and audits.

LEU conversion of SAFARI-1

The Department of Minerals and Energy, in July 2005, approved that the SAFARI-1 Research Reactor be converted to Low Enriched Uranium (LEU) fuel. This is in line with the international trends as part of nuclear non-proliferation. SAFARI-1 started during the reporting period with the preparation for the conversion and the process of qualifying the LEU fuel. The process entails two phases, namely:

Phase 1: Qualification of the routine use of LEU fuel in the reactor core with internationally manufactured fuel assemblies; and
Phase 2: Qualification of locally manufactured LEU fuel assemblies.

During the reporting period, Necsa applied to the NNR for a transport container validation certificate to import two LEU fuel assemblies. Subsequent to the approval of the certificate the two assemblies were imported from France.

Towards the latter part of this reporting period, SAFARI-1 started with the irradiation of the two imported LEU fuel assemblies. The data accumulated from the irradiation of these imported LEU fuel assemblies will form the baseline for the qualification of the locally manufactured LEU fuel assemblies.

3.5. RADIOACTIVE WASTE SAFETY

3.5.1. THABANA PIPE STORE

The Thabana Pipe Store Facility is situated on Thabana. The facility consists of pipes that can contain spent fuel elements from SAFARI-1 and waste produced in hot cells in Building P-1701. The Thabana Pipe Store is authorised as a storage facility for spent nuclear fuel from SAFARI-1 and waste from the production of radioisotopes in Building P-1701. No waste was transferred to the Thabana Pipe store facility over the reporting period due to the extension of the facility. Construction work for a further 30 boreholes for the storage of spent fuel elements started in November 2005.

3.5.2. PELSTORE

Pelstore, an under-roof storage area of approximately 260m x 60m in Area 14 of the Pelindaba site, is the centralised storage facility for radioactive waste. The Pelstore facility is authorised for the treatment and storage of solid radioactive waste in the following categories:

Category A: Classified waste that includes compacted fissile and non-fissile waste; non-compressible waste; non-uranium waste; ISO containers and ingots.
Category B: Classified waste that includes long-lived waste and containers with kg quantities of miscellaneous radioactive waste.
Category C: Unclassified waste that includes non-fissile uranium waste.
Category D: Unclassified waste that includes non-uranium waste.
Category E: Unclassified waste that includes fissile uranium waste and safeguard material.
Category F: Unclassified waste that includes depleted uranium material under safeguards.
Category G: Unclassified waste that includes contaminated scrap.

The total number of waste drums stored at the Pelstore as at 31 December 2005 was 46070. The following table reflects the waste received and stored in the Pelstore during the 2005 year:

Table 7: Radioactive waste transferred to Pelstore during 2005

Waste Type	Waste Container	Number of Containers
Isotope Waste	100 L	20
Medical Waste	160 L	62
Solidified Waste	100 L	363
Compressive Waste	160 L	1307
Non-Compressible Waste	160 L	99
Industrial Waste	160 L	4
Safeguard Enriched Waste	200 L	320

There were no safety concerns regarding radioactive waste management at Necsa (Pelindaba).

3.6. TRANSPORT SAFETY

The transport of radioactive materials is undertaken in terms of the NNR requirements and all consignments must comply with safety requirements in accordance with transport safety requirements. During the period under review, three new transport container certificates were issued. These were in addition to the 13 existing transport container certificates. Two previously issued certificates expired during this time.

3.7. EMERGENCY PLANNING AND PREPAREDNESS

The implementation of the corrective actions identified in the 2004/2005 financial year resulted in the updating of a number of facility-specific and corporate level emergency planning documents.

In July 2005 the NNR issued a new requirements document RD014, being "Emergency Preparedness and Response Requirements for Nuclear Installations". This document establishes the minimum requirements of the NNR for an adequate level of nuclear and radiological emergency preparedness and response for nuclear installations.

The NNR conducted an emergency exercise at the Pelindaba site on 18 November 2005. The scenario was designed around an incident at the SAFARI-1 Research Reactor, which led to a gaseous release of radioactive material. The

objectives of the exercise included an evaluation of:

- The effectiveness of the activation and implementation of the emergency plan;
- Communication amongst and actions of the Necsa emergency functionaries;
- Communication between Necsa emergency functionaries and the off-site emergency support functions.

Problems and potential improvements were recorded by the umpires and observers, and reported at feedback sessions following the exercise. The findings were communicated to Necsa in January 2006. Necsa has submitted a corrective action plan to address the findings and ensure full compliance with the requirements of RD-014. The NNR is monitoring the progress in the implementation of the corrective action plan.

3.8. PHYSICAL SECURITY

In accordance with the conditions of the licence, Necsa is required to have in place a security programme that is approved by the NNR. During the reporting period, Necsa reported a number of security breaches. These included theft of material and equipment. Investigations were conducted and directives were issued to Necsa by the NNR to institute corrective actions in regard to these security breaches. This is discussed in more detail in the section dealing with incidences and occurrences.

3.9. INSPECTIONS AND AUDITS

The NNR conducts inspections at Necsa (Pelindaba) as part of its compliance assurance programme to verify that Necsa conforms to its licence conditions. A total of 316 out of 428 planned compliance inspections were performed on the Necsa sites during the reporting period. These inspections covered all aspects of the licensing conditions. In addition, 32 unplanned inspections were performed on these sites in response to events. Percentage compliance was determined at 96% and therefore an acceptable level of compliance.

3.9.1. NECSA MEDICAL SURVEILLANCE PRACTICES

An audit was carried out during the reporting period and a report was completed. Twelve findings were registered during the audit. Necsa is in the process of upgrading its medical surveillance programmes. The NNR received a plan detailing the corrective actions, and the implementation of the plan is being monitored.

3.10. INCIDENTS AND OCCURRENCES

At Necsa a total of 30 Category 1 and Category 2 nuclear events were reported during the financial year. The following table reflects the events:

Table 8: Problem notification (Necsa)

Category	Number of Incidents and occurrences
1	1
2	29

Category 1 requires immediate notification to the NNR and Category 2 requires 24-hour notification in accordance with Licence Document LD-1001. It should be noted that the above-mentioned occurrences include those that occurred at facilities not under the NNR regulatory control and that Category 3 nuclear events were not included in this report due to their insignificant impact on safety.

Among the 30 nuclear events, 25 had an International Nuclear Event Scale (INES) rating of 0 and only 5 had INES rating of 1. INES is a means for promptly communicating to the public in consistent terms the safety significance of events reported at nuclear installations. According to INES, events are classified on scale levels. The lower levels (1-3) are termed incidents and the upper levels (4-7) accidents.

Three of the most significant occurrences investigated further by the NNR are summarised below:

3.10.1. NECSA CALIBRATION FACILITY

The calibration facility was constructed to address the need for the standardization and calibration of radiometric field-instruments for the uranium exploration activities during the 1970's. The calibration pad facility is situated on Necsa property, but not within the Pelindaba site perimeter. The facility comprises eleven flat-circular concrete slabs and four shallow boreholes containing known amounts of potassium, uranium and thorium. The radioactive material is fixed and is in its natural form (uranium and thorium in equilibrium with the daughter products). The calibration facility has been used extensively by a number of organizations since it was constructed. As uranium-prospecting work declined in the late 1980s the usage of the facility also diminished and consequently the facility was shut down.

The NNR launched an independent investigation into an incident involving the calibration pad facility outside of the Necsa Pelindaba site following a media report that the facility was a radioactive "waste dump" and posed a serious threat to members of the public. The NNR investigation established that:

- The site was a calibration facility consisting of concrete pads containing naturally occurring radioactive waste materials.
- There was no lose contamination which could be dispersed.
- Radiation levels outside the perimeter fence did not pose a radiation risk to members of the public.

- The perimeter fence was found to be inadequate.

Following this investigation, Necsa was directed to immediately improve the security arrangements around the site. These included:

- Erecting a security fence to standards acceptable to the NNR within 3 days;
- Ensuring that there was sign posting at the site in languages that are predominantly used in the area;
- Since the calibration facility was not in use, Necsa was directed to make an application for an appropriate nuclear authorisation for purposes of decommissioning of the facility and apply for a Certificate of Registration.

The NNR monitored the implementation of these corrective actions and was satisfied that there was full compliance by Necsa.

3.10.2. BREACHES OF PHYSICAL SECURITY

A number of breaches with regard to physical security were reported by Necsa in the latter half of 2005. This involved theft of material and equipment from within stores on the Pelindaba site. This resulted in the NNR questioning the adequacy of the security provisions at Necsa and triggered the need for the NNR to focus efforts on strengthening the physical security system requirements for Necsa. These events were regarded in a very serious light by the NNR and urgent actions undertaken in order to ensure that Necsa implemented the necessary corrective actions. Necsa was directed, as a matter of urgency, to evaluate its physical security provisions and to make immediate improvements to the system to prevent intrusion and theft of material.

Necsa was required to upgrade the security arrangements and demonstrate the adequacy of such arrangements on the Pelindaba site for protection against the theft or diversion of radioactive material. These improvements included increased searching of all vehicles entering and leaving the site, hardening of security arrangements at nuclear facilities, increased restrictions on site access outside of normal hours, and upgrading of security instrumentation and monitoring.

A security audit conducted in December 2005 raised a number of findings for which Necsa has submitted a corrective action plan. The progress with implementation of the corrective actions is being monitored by the NNR. Implementation of corrective actions is being monitored by the NNR.

Furthermore, as part of process-based licensing, the licence conditions related to physical security were strengthened and are included in conditions 3, 4, and 5 of variation 26 of NL-27 that will be issued early in the next financial year.

3.10.3. CONTAMINATION EVENT IN P-1500

A contamination incident was reported to the NNR in early December 2005. The incident occurred in Building P1500 during the preparation of samples consisting of radioactive tracers (gold and lanthanum). Samples were spilt, resulting in contamination of the building. On detection of the contamination, the Necsa emergency response plan was activated; all persons were removed and the building was sealed off. Because the experiments involved the Group IV substances, the Regulatory oversight fell under the Directorate of Radiation Control in the Department of Health.

The NNR launched its own investigation into the incident to identify the cause of the occurrence. The investigation concluded that the following inadequacies contributed to the occurrence:

- Non-observance of the Radiation Protection requirements
- Inadequate safety culture
- Inadequate control measures in place at the facility
- Inadequate material transfer system
- Carrying out a project without proper authorisation
- Disregard for the Safety Health and Environmental Safety control measures.

While there was no safety concern to the workers, this incident highlighted the need for coordinated response between the two regulators. The NNR and the Directorate of Radiation Control have signed a co-operative agreement which allows such exchange of information. Under this agreement, the oversight of the Necsa sight will be strengthened.

South African Nuclear Energy Corporation, (Vaalputs)

4.1. BACKGROUND

The Vaalputs National Radioactive Waste Disposal Facility, situated in the Northern Cape Province, covers an area of about 10 000 ha, measuring 16.5 km from east to west and 6.5 km from north to south at its narrowest point. It is approximately 90 km southeast of Springbok, which is the closest town, and 200 km from the Namibian border.

Vaalputs straddles the escarpment between Namaqualand in the west and Bushmanland in the east, and has a mean elevation above sea level of about 1 000 m. Namaqualand is characterised by a rugged granitic terrain with a well-developed drainage system towards the west. Bushmanland is extremely flat, often with ill-defined drainage systems and characterised by gently undulating consolidated sand dunes.

Namaqualand falls within the winter rainfall area and has a characteristic succulent type of vegetation, while Bushmanland falls within the summer rainfall area, with its own distinct flora of woody shrubs and grass. Vaalputs therefore falls within the transition zone between winter and summer rainfall and exhibits characteristics of both regimes.



Figure 4: Offloading a consignment of concrete containers from Koeberg at Vaalputs



Figure 5: Emplacement of a consignment of metal containers from Koeberg at Vaalputs



Figure 6: Rehabilitation of trenches to natural vegetation. (Following emplacement of the waste containers, the trenches are backfilled and capped and the natural vegetation is restored.)

4.2. SAFETY ASSURANCE

4.2.1. OCCUPATIONAL EXPOSURE

The controls over occupational exposure at Vaalputs were undertaken in terms of the NNR requirements. The average effective radiation dose per occupationally exposed worker for the calendar year 2005 was 0.9 mSv, and as a result there were no safety concerns regarding occupational exposure. Table 9 gives occupational exposure below.

Table 9: Vaalputs occupational exposure

Exposure Type	Dose
Maximum Dose (mSv)	1.7
Average Dose (mSv)	0.9
Total Collective Dose (milli-Person-sievert)	10.1



Figure 7: Vaalputs occupational exposure for last five years

4.2.2. PUBLIC EXPOSURE

The environmental surveillance programme for Vaalputs has shown no measurable radiological impact on the public living around the facility.

4.2.3. ENVIRONMENTAL SAFETY

A routine environmental monitoring programme on and around the Vaalputs site has been in place since 1984. Environmental monitoring is conducted around Vaalputs to verify that there have been no releases into the environment from the site. The monitoring programme is mainly focused on borehole water, soil and vegetation due to the climate in the area, where the evaporation rate is about 36 times higher than the rainfall. 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.

4.2.4. RADIOACTIVE WASTE SAFETY

During the reporting period 18 shipments, consisting of 319 radioactive waste packages, were received at Vaalputs from Koeberg for final disposal. The following table summarises the number and types of waste packages disposed:

Table 10: Radioactive waste drums shipped to Vaalputs

Type of waste	Number	Shipments
Concrete	79	16
Metal Drums	240	2
Total	319	18

The Vaalputs nuclide inventory, including the number of waste packages in each trench, as at 31 December 2005, is summarised in the following table:

Table 11: Vaalputs waste inventory

Trench	Number of Waste Packages	Total Activity Received and Decayed up to 31 December 2005	
		Total Activity Received to date (GBq)	Total Activity Corrected for Decay (GBq)
A01	8141	1.893 E + 05	1.282 E + 05
A02	840	4.070 E + 02	1.878 E + 02
A03	1639	8.534 E + 02	6.680 E + 02
B01	2924	9.998 E + 04	3.255 E + 04
TOTAL	13544	2.905 E + 05	1.616 E + 05

4.2.5. INSPECTIONS AND AUDITS

NNR inspections undertaken at Vaalputs during the reporting period indicated that there was adequate compliance with the Vaalputs licence conditions. A total of 23 inspections were planned and carried out at Vaalputs. The following table reflects the number of inspections and the inspection discipline.

Table 12: Inspections and inspection disciplines

Inspection discipline	Number of inspections
Engineering, maintenance and in-service inspection	6
Operational technical specifications	3
Radiation protection – workers	3
Radiation protection – public	3
Waste management	6
Quality assurance	1
Security	1
Total	23

Regulation of Natural Sources

5.1. BACKGROUND

The Regulation of Natural Sources (RENS) programme is tasked with the responsibility of providing regulatory oversight over activities involving naturally occurring radionuclides. The programme currently issues authorisations to at least six different types of facilities. These are, essentially, mining and mineral processing facilities, fertiliser manufacturing companies, scrap smelters, scrap processors, organisations that clean up contaminated land, and laboratories that handle small quantities of radioactive materials. Having a wide range of activities to control and regulate, and being subject to changing business dynamics, the programme plays a key role in the NNR. Considerable attention is however given to ensure that regulatory practices are conducted in a structured manner.

Regulation of NORM presents a range of new challenges for both regulators and operators. Unlike more traditional industries dealing with radionuclides, NORM industries have generally not had any radiological oversight and as such are not equipped or designed for radiological protection. The lack of appropriate design for radiological control in some mines normally results in overexposures to underground workers. The legacy of lack of radiation protection on NORM facilities has also led to the existence of contaminated sites/land throughout the country. The main challenge here is that the perpetrators cannot be easily identified.

Through the combined effort between the regulator and industry, it has become apparent that some consumer goods containing NORM, which have not traditionally been considered as a radiological problems, may require regulation, and this may have social and economic consequences. The transport and disposal of NORM are also a concern, particularly due to the large volumes which need to be considered.

5.2. NUCLEAR AUTHORISATIONS

To date the National Nuclear Regulator has issued 118 nuclear authorisations to NORM facilities (see table below). Of the 118 nuclear authorisations, 6 new authorisations were issued during the 2005/2006 financial year. Included in the total number are 28 licences issued to small users of which 23 are no longer active, bringing the total number of active holders to 95.

The NNR is currently considering a further 19 applications for authorisation. These applications relate to prospecting for uranium, scrap processing, and processing of zirconium. Some of these applications come from port authorities handling NORM material.

Table 13: Number of authorisation holders

Type of Authorisation	2004/2005	2005/2006
Mining and minerals processing	54	57
Scrap smelters	2	2
Scrap processors	17	20
Small users	28	28
Fertilizer manufacturers	4	5
Service providers	7	6
Total	112	118

In the table above:

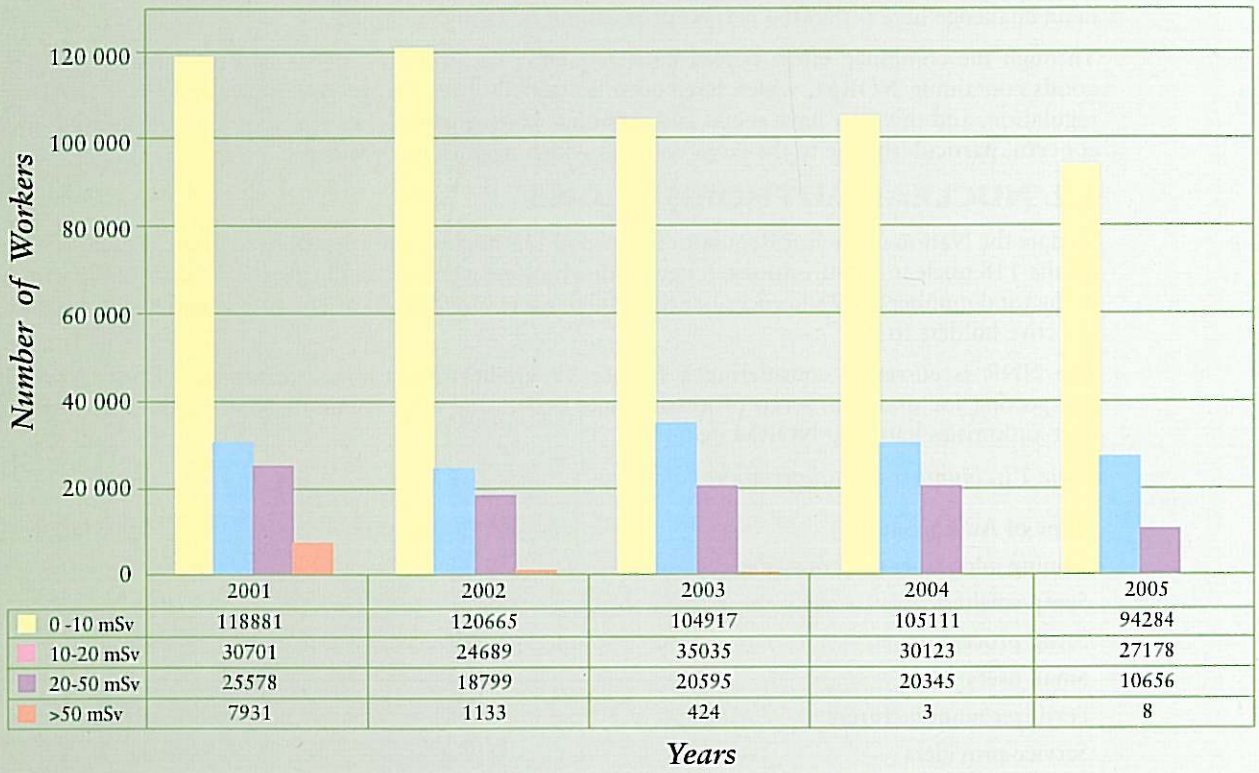
- Mining and mineral processing facilities include the production of minerals such as copper, gold, uranium, heavy minerals and phosphate rock.
- Scrap smelters are facilities involved in smelting scrap metal containing low levels of NORM.
- Scrap processors are mainly involved in the business of processing and selling scrap materials such as ferrous metal, plastic and stainless steel contaminated with NORM residue from the mining processes.
- Small users are laboratories or pilot plants for the testing of small quantities of NORM samples for verifying the viability of proposed mining projects.
- Service providers include companies such as refurbishers, rehabilitation of contaminated sites and conveyance of radioactive materials for shipment.

5.3. SAFETY ASSURANCE

5.3.1. OCCUPATIONAL EXPOSURE

In compliance with the conditions of authorisation, dose reports indicating levels of occupational exposures were received from holders. The summary of these reports indicated that in gold mines where mining activities are taking place in old working areas and mining of ore-bodies with high uranium content, there is always a higher probability for workers to be exposed to doses above the dose limit of 50 mSv.a^{-1}. This is the case in about 13 mines, namely, Anglogold Ashanti (Vaal River Operation), Anglogold Ashanti (Wes Wits), Harmony (Randfontein), Placer Dome Western Areas Joint Venture, Gravelotte, Nigel, Consolidated Modderfontein, Grootvlei, DRD (Blyvooruitzicht), Harmony (Orkney), Harmony (Virginia), Harmony (Welkom) and President Steyn.

Figure 8 below shows the comparison of the number of workers exposed to radiation levels for the period 2001 to 2005. The nature of the trend is downward. One of the factors that contributed to the improvement was the implementation of more rigorous compliance assurance measures by the NNR at those mines where dose limits had been exceeded or were likely to be exceeded. More frequent inspections were conducted and working groups have been established at all these mines in order to monitor progress with the action plans developed by the mines to reduce or prevent excessive occupational exposure. These action plans included the identification and implementation of engineering controls and the use of action levels to remove workers from high exposure areas. Activities of these working groups, which include representatives of the NNR, the mine, workers and the Mine Health and Safety Inspectorate, are ongoing. Eight persons exceeded the annual dose limit of 50 mSv and were relocated to areas where they would not be further occupationally exposed to radiation. The maximally exposed individual received a dose of 53.5 mSv.



	2001	2002	2003	2004	2005
0 -10 mSv	118881	120665	104917	105111	94284
10-20 mSv	30701	24689	35035	30123	27178
20-50 mSv	25578	18799	20595	20345	10656
>50 mSv	7931	1133	424	3	8

Figure 8: Trend of occupational exposure

5.3.2. PUBLIC EXPOSURE

Public exposure due to radioactive emissions from NORM facilities is controlled in terms of the public dose limit imposed by the NNR. Authorisation holders have submitted safety assessments to the NNR in order to demonstrate compliance with the requirements of the NNR. The information provided in the safety assessments provided by the NORM facilities, indicates that the dose limit applicable to the public is not exceeded. With respect to the prescribed risk criteria of the NNR, there is no significant risk to the public from the radioactive emissions arising from the operations of NORM facilities under the control of the NNR.

5.3.3. RADIOACTIVE WASTE MANAGEMENT

Table 14 reflects the summary of Annual Waste Reports submitted to the NNR to date by holders in line with Conditions of Authorisation issued to them and hence is not reflective of the total waste generated by the industry.

Table 14: Quantities and radioactivity content of waste material generated for the 2005 calendar year

Type of waste	Quantity (tonnes)	Maximum activity
Contaminated scrap	8.89 E + 06	10 Bq/g
Clean scrap	2.90 E + 06	0.04 Bq/cm² for alpha 0.4 Bq/cm² for beta
Semi solids waste	1.27 E + 08	21.4 Bq/g
Gaseous waste	7.22 E + 11	1.05 E + 09 Bq/m³
Liquid waste	1.03 E + 08	2.57 E + 04 Bq/l
Solid waste	1.43 E + 07	13.4 Bq/g
Other waste	2.34 E + 06	15.6 Bq/g

5.3.4. TRANSPORT SAFETY

Routine transportation of low specific activity (LSA-1) scrap material took place daily between the authorised mines, scrap dealers and smelters. Additionally 92 consignments of Ammonium Diuranate (ADU) were transported from Anglogold Ashanti-Vaal River Operation at Klerksdorp to Nufcor at Carletonville. A further 12 consignments of Uranium Oxide Concentrate were shipped to Anglogold Ashanti clients overseas. In all the above-mentioned transportation activities, no incidences of any significance nature were reported.

5.3.5. INSPECTIONS AND AUDITS

A total of 212 inspections were conducted during the reporting period and inspection reports resulting from this process were compiled, reviewed and approved. A specialised database has been developed to help with storage and easy retrievability of these reports. These inspections were conducted to verify the degree of compliance with the conditions of authorisation and the NNR Act. Inspection Reports indicated that of the 212 inspections conducted, 183 complied fully with NNR requirements, whereas 29 were found to be lacking with respect to required levels of compliance. Investigations have been done for almost 80% of the findings referred to above, and proper corrective actions identified and implemented. Currently about 20% of these findings are still open; these relate to cases where implementation of possible solutions is mostly long-term in nature. A compliance index of above 80% was achieved. Further improvements in compliance inspection programmes are being introduced to ensure continuous improvement of the inspection processes.

In addition, audits in line with RD-005 were conducted during the reporting period to ascertain the degree to which holders are implementing quality management systems as required in the terms of conditions of their nuclear authorisations. A total of 7 audits were undertaken and reports indicating non-conformances were compiled and presented to the affected holders for consideration and reaction. These audits revealed that most holders have not yet fully implemented a proper quality management system for radiation protection processes. Project plans indicating timeframes to effect corrective actions for identified problems have been submitted to the NNR and necessary compliance inspections and project review meetings are being undertaken by the NNR.

5.4. INCIDENTS AND OCCURRENCES

A total of 14 occurrences were reported by holders during the period. Four were regarded as Class 1. Class 1 is the most severe type of occurrence and is assigned to occurrences where workers or the public are exposed to radiation levels above the dose limit. These four occurrences related to those mines where workers were exposed to radiation levels that exceeded the annual dose limit of 50mSv during the 2005 calendar year. The occurrences were closed-out after reports were submitted by those mines indicating the corrective and preventive actions that were taken, which included the workers having been removed from the areas of high radiation exposures. The remainder of the occurrences were of lower safety significance. These involved mainly slimes spillages due to pipe bursts and release of potentially contaminated scrap to unauthorised facilities. All spillages were immediately cleaned up and scrap consignments were redirected to Scaw Metal which is authorised to receive this type of material.

Prospective Licensing and Other Projects

6.1. PROPOSED PEBBLE BED MODULAR REACTOR

The proposed Pebble Bed Modular Reactor (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. By design, provision has been made to accommodate the storage of spent fuel in the building for the 40-year design life of the plant and thereafter for a further period if so required. Radioactive material and waste will be managed and disposed of in accordance with regulatory and government legal requirements. Should construction be approved, it is proposed to locate the installation on Eskom property within the owner-controlled perimeter of Koeberg Nuclear Power Station.

An overview of the PBMR main power system layout is presented below:

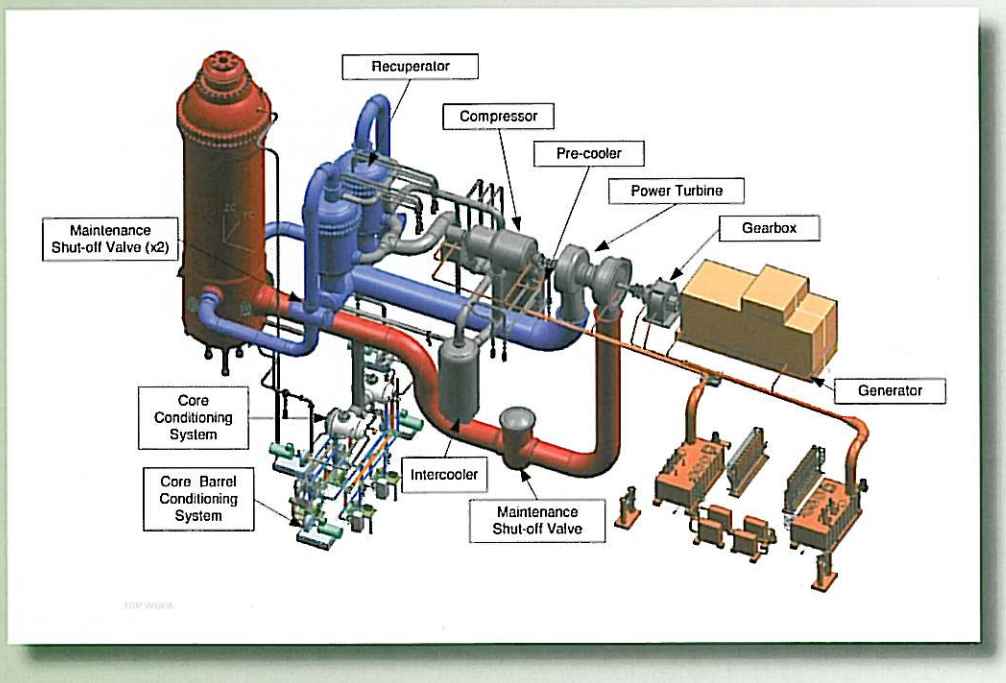


Figure 9: Pebble Red Modular Reactor main power system layout

During the reporting period the NNR continued to review the nuclear installation licence application submitted by Eskom in July 2000 and undertook a number of tasks in relation to the PBMR. A review process for the safety submissions has been in progress for some time; the key issues in relation to licensing have been identified and a programme of assessment and resolution has been put in place. A series of licensing documents and guides specific to the PBMR are in the course of development and many have been finalised. A series of audits has been undertaken to ensure that the applicant for the PBMR licence, the designer and respective suppliers comply with the requirements specified in the licensing documents.

The main activities are linked to the resolution of the Key Licensing Issues (KLIs) and safety issues identified during the NNR review of the PBMR safety case. These activities are currently being progressed by 10 working groups (WGs) composed of Eskom and PBMR staffs, which require significant NNR involvement.

In parallel to the process on resolution of the KLIs, Eskom and PBMR (Pty) Ltd are in the process of developing Revision 2 of the Safety Analysis Report (SAR). The NNR is in the process of performing preliminary reviews on draft SAR chapters as part of a SAR early intervention process. The standard for the Safety Case Submissions is detailed in a Safety Case Specification developed by Eskom and is generally agreed by the NNR. When necessary, workshops are being held for discussion of NNR concerns.

As part of its compliance assurance activities, the NNR performed and/or observed six audits on PBMR (Pty) Ltd and observed two audits on potential suppliers to PBMR (Pty) Ltd, in terms of the licensing requirements of Licence Document LD-1094 "Quality Management and Safety Management for the Pebble Bed Modular Reactor". The

main purpose of these audits was to verify compliance with LD-1094 related to all aspects of the PBMR (Pty) Ltd and associated suppliers' quality management programmes and to determine the effectiveness of these programmes. The NNR also performed two audits on the Eskom Client Office as part of the process to qualify the Eskom Client Office as a suitable licence holder.

During these audits a number of findings and observations were raised which are being followed up during the monthly Quality Assurance Forum meetings.

The issuing of a nuclear installation licence for the proposed PBMR reactor demonstration plant will be subject to finalisation of the NNR's public hearing process in accordance with the NNR Act and the NNR's satisfactory assessment of the associated Safety Case.

6.2. PROPOSED PBMR FUEL MANUFACTURING PLANT

In June 2000, the NNR received an application from Necsa for a nuclear installation licence for the prospective siting, construction, operation, decontamination and decommissioning of a Pebble Bed Modular Reactor fuel manufacturing plant. The stated purpose of the plant is the manufacture of nuclear fuel spheres as well as (non-fuel) graphite spheres for the proposed PBMR demonstration unit and the associated transport actions.

The licence application was, in accordance with the requirements of section 21(3) of the National Nuclear Regulator Act No. 47 of 1999 (NNRA), published for public comment. Following receipt and review of representations made in accordance with section 21(4) of the NNRA, the Board resolved that a public hearing had to be held for the proposed project.

In light of the fact that the applicant (Necsa) has not completed the development of the required safety case, no public hearings have been held for the project to date.

In July 2005 the PBMR Company and Necsa informed the NNR that the PBMR Company wished to apply for a nuclear installation licence for the prospective siting, construction, operation, decontamination and decommissioning of the proposed plant. Subsequently on 28 July 2005, Necsa wrote to the NNR withdrawing its application.

On 28 October 2005 the PBMR Company submitted an application for a nuclear installation licence for the prospective siting, construction, operation, decontamination and decommissioning of the proposed plant and for the transport of fuel fabrication material and fuel spheres. The application submitted by Necsa in 2000 was subsequently withdrawn.

The NNR is currently reviewing the application of the PBMR Company, and a public participation process will be held in the coming financial year. At present no authorisation has been issued for the proposed PBMR fuel manufacturing plant.

Standards and Regulatory Practices

7.1. INVESTIGATIONS AND REGULATORY RESEARCH PROJECTS

7.1.1. IODINE PROPHYLAXIS - POTASSIUM IODATE DISTRIBUTION

An internal project team was established to investigate and analyse other international reports and feedback in order to establish a technical basis for the NNR's position, as a result of the World Health Organisation's recommendation that a reduced 10 mSv intervention level be applied for the administration of potassium iodate in the case of children and neonates in the population around a nuclear installation.

A reference accident identified as part of the Koeberg Emergency Planning Technical Basis was used to determine the cut-off distances for different intervention levels for prophylaxis.

The results concluded that although the thyroid saving of 10 mSv interventions could be regarded as significant compared to the other intervention levels, it should be compared with the background of cancer incidence. Another consideration that must be taken into account is the huge logistical challenge of implementing this intervention level. It could result in delays in administering KIO3 tablets, which in turn could impact on the number of cancer cases due to the reference accident. The benefit in applying 10 mSv as an intervention level must therefore be balanced against these other factors, and in this regard it could be argued that the WHO's recommended intervention level of 10 mSv should not be adopted.

7.1.2. RADON SURVEY IN THE CANGO CAVES

The NNR commissioned a radon study of the Cango caves, near Oudtshoorn, through the University of Western Cape. The purpose of the study was to determine the levels of exposure to tour guides due to the relatively long time that they spend in the cave. The initial phase of the project was completed, but in order to conclude whether the tour guides are at risk or not, several parameters had to be investigated such as equilibrium factor, winter radon levels, and the average time guides spend in the cave.

The project has progressed to the second phase, to investigate all these parameters, and will be completed at the end of the second quarter of 2006. The findings will determine whether the guides are highly at risk.

7.1.3. KAROO URANIUM-CONTAMINATED SITES

Four abandoned sites contaminated with uranium ore were identified around Beaufort West and Laingsburg in the Western Cape and Edenburg in the Free State. The contamination followed uranium prospecting in the area in the late 1970s and early 1980s.

After identification, the NNR engaged the Department of Minerals and Energy (DME) and other stakeholders in order to determine a way forward. A decision was reached that the sites needed to be rehabilitated and efforts were made to secure the necessary funds. The DME has provided funds for this purpose.

7.1.4. DEVELOPMENT OF REGULATORY GUIDANCE DOCUMENTS

The NNR has to continually revise its regulatory documents and develop new ones in response to developments in the nuclear industry to ensure that they will serve as tools enabling the NNR to effectively deliver on its mandate.

The work undertaken to produce regulatory documents has progressed to the review stage. The work included the production of reports on decommissioning, plant life extension, research reactor core conversion and upgrades, and the optimal reduction of radioactive waste. The review of this work will be undertaken in the 2006/07 plan.

7.1.5. FINANCIAL LIABILITY PROJECT

In terms of section 29 of the NNR Act (NNRA), the holder of a nuclear installation licence must provide financial security in an amount and manner as determined by the Minister in regulations in order to meet any nuclear damage as contemplated in section 30 of the legislation. The NNRA also provides for a prescription period of 30 years in respect of any claim for nuclear damage.

Therefore the security as contemplated in section 29 of the NNRA would be required to meet any claim which is brought within a period of 30 years following an incident or accident resulting in nuclear damage.

Whilst the prescription period contained in the NNRA is in line with other international legislation requirements, this provision has, internationally, given rise to a difficulty in providing such security since the international nuclear insurance pool will provide insurance cover for a maximum of only 10 years.

As required by the NNRA, the NNR has requested the holders of nuclear installation licences to provide the NNR with proof that they are able to meet any claim for nuclear damage resulting from the installation in question. They advised the NNR that they are unable to obtain the financial security to meet the prescription requirements of the NNRA for the 30-year period. A committee of the Board is considering this matter.

7.2. DEVELOPMENTAL WORK

7.2.1. INTERNATIONAL ACTIVITIES (IAEA)

In executing its mandate the NNR relies to a great extent on IAEA recommendations for its standards and regulatory practices. The IAEA has set up safety standards committees to develop internationally agreed standards on nuclear safety, radiation protection, transport and radioactive waste safety. The NNR represents South Africa in three of these IAEA safety standards committees, namely the Transport Safety Standards Committee (TRANSSC), Nuclear Safety Standards Committee (NUSSC) and Waste Safety Standards Committee (WASSC). During the reporting period, various documents from these safety committees were approved. Documents at various stages in the review cycle were also submitted for review and comment. The NNR continues to make inputs through reviews and comments on those documents.

The African Regional Cooperative Agreement (AFRA) was established by Heads of State of African countries that are members states of the IAEA. The AFRA initiative is administered at an operational level by the AFRA Field Management Committee (FMC).

One of the many AFRA initiatives aimed at assisting AFRA member states focuses on research, development and training related to nuclear science and technology. As part of this specific AFRA initiative, the NNR was approached by the IAEA in 2002 to provide expert support to assist AFRA member states to sustain the national nuclear infrastructure through improved managerial practices as well as rational administrative procedures.

As part of this initiative the NNR provided technical expert support at a series of workshops organized by the IAEA in Cairo, Egypt in 2002, in Accra, Ghana in August 2003, again in Cairo in March 2004 and in Tunis, Tunisia in October 2004. The meeting in Cairo in March 2004 resulted in the compilation of a set of guidelines and indicators to be used by Nuclear Regulatory Authorities (NRAs) in AFRA member states to develop, monitor and sustain the national nuclear infrastructure through improved managerial practices as well as rational administrative procedures.

Following a request to the IAEA by the French-speaking AFRA member states, the NNR was requested to provide expert support at a workshop combining participants from both Nuclear Regulatory Authorities (NRAs) and National Nuclear Institutions (NNIs) in Tunis, Tunisia in July 2005.

These workshops were focused on the training of Heads/Managers of Regulatory and Radiation Protection institutions and decision-makers from AFRA member states in the use of AFRA guidelines and indicators of sustainability, with the aim of helping them monitor the progress of their institutions along the path to sustainability and to calibrate their progress. This included sensitisation about the challenges facing the NRAs in Africa. Through the exchange of experience and lessons learnt, these workshops were expected to influence changes in attitudes, strategic thinking and managerial practices in order to enhance the sustainability of these institutions.

Within the AFRA initiative the NNR was once again requested by the IAEA to provide expert support to the "Centre National des Sciences et Technologies Nucleaires (CNSTN)" of Tunisia. The workshop took place in November 2005. The main aim of this workshop was to initiate the personnel to the process of developing a Strategic Action Plan (SAP) with a view to compiling a draft SAP at the end of the workshop. The workshop succeded in the sensitisation and provision of concepts and tools for assessing current institutional processes and management practices. A draft Strategic Action Plan was compiled as planned.

7.2.1.1 The Convention on Nuclear Safety (CNS)

As part of its obligation in respect of international legal instruments concerning nuclear safety, South Africa is a Contracting Party (CP) to the IAEA Convention on Nuclear Safety (CNS). The Convention requires CPs to submit a national report on the measures taken to implement the obligations of the Convention, and to attend meetings of the CPs. This report is then subjected to a peer review process by other CPs during a review meeting of the CPs, which is held every three years.

To date there have been three such review meetings and South Africa presented its National Report at each of these, with the first review meeting having taken place in April 1999. The third review meeting was held in April 2005 at the IAEA. The report of the NNR was well received.

As a general conclusion the meeting identified some generic issues which should be addressed by the Contracting Parties in their next National Reports which, in terms of the Convention, should be submitted to the IAEA six months prior to the next review meeting planned for April 2008. The NNR will coordinate the compilation of the 4th South African National Report.

7.2.1.2 The Waste Safety Standards Committee (WASSC)

The Waste Safety Standards Committee (WASSC) is a standing body of senior experts in the safety of radioactive waste management; established by the IAEA Deputy Director General, Head of the Department of Nuclear Safety and Security. WASSC advises the Deputy Director General on the overall programme for the development, review and revision of standards relating to radioactive waste safety (i.e. waste management, waste treatment and safety of disposal facilities). Its objective is to achieve consensus, quality, coherence and consistency in the development of international standards for radioactive waste safety.

The functions of WASSC are:

- To advise on the approach to the development of the radioactive waste safety standards issued in the Agency's

Safety Standards Series, covering Safety Fundamentals, Safety Requirements and Safety Guides, both thematic and practice specific, and to advise on priorities.

- To review proposals for the development of new standards relating to waste safety and to approve the relevant document preparation profiles (DPPs) prior to their submission to the Commission on Safety Standards.
- To review draft waste safety standards, considering, throughout the preparation and review process, the value of each draft standard and the needs of users of the standards.
- To approve the text of draft waste safety standards prior to their submission to Member States for comment and again prior to their submission to the Commission, in accordance with the established procedure.
- To ensure a broad international input in the preparation and review of waste safety standards.
- To advise on waste safety standards, relevant regulatory issues and activities for supporting the use and application of the Agency's safety standards.
- To advise on the timely review of and the need for revision of published safety standards.

In January 2005 the IAEA appointed the NNR Manager of the Nuclear Technology and Waste Projects programme, as chairperson of WASSC for a three-year term (2005-2007). Other countries with representatives on WASSC include Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Peoples Republic of China, Republic of Croatia, Cuba, Cyprus, Czech Republic, Denmark, Egypt, Finland, France, Germany, Hungary, India, Indonesia, Islamic Republic of Iran, Iraq, Israel, Italy, Japan, Republic of Korea, Latvia, Lithuania, Mexico, Morocco, Netherlands, Norway, Pakistan, Paraguay, Portugal, Romania, Russian Federation, Slovak Republic, Republic of Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom and United States of America. In addition the European Commission (EC), International Standards Organisation (ISO), Nuclear Energy Agency (OECD/NEA) and World Nuclear Association (WNA) are also represented on WASSC.

7.2.1.3 Transport Safety Standards Committee (TRANSSC)

The IAEA's TRANSSC committee meets in Vienna in March and September every year to discuss proposed amendments to the Transport Regulations. South Africa has a permanent representative on this committee.

The transport of radioactive material is an international issue, and South Africa has its share of the international trade in radioactive material. As the National Competent Authority for South Africa, in terms of Section 7 (h) of the National Nuclear Regulator Act (Act 47 of 1999), the NNR adopted the revised IAEA Regulations TS-R-1. The NNR is currently considering a process to update nuclear transport authorisations to reflect the revised regulations.

7.2.1.4 Nuclear Safety Standards Committee (NUSSC)

The 19th and 20th meetings of NUSSC were held in Vienna in May and October 2005 respectively. Information on the Terms of Reference of NUSSC and its mandate as well as all the documents that were discussed at the meetings can be found on the website: http://www-ns.iaea.org/committees/nussc.asp.

NUSSC members provided input on the development of a number of documents including the unified Safety Fundamentals. During these meetings a number of new documents were discussed and approved for development as part of the IAEA Safety Standards. The following Document Preparation Profiles (DPPs) were approved by NUSSC and endorsed by the Commission on Safety Standards (CSS) for further development:

1. DPP DS 282: Seismic Evaluation of Existing Nuclear Facilities; Safety Guide
2. DPP DS 327: Compliance Assurance for the Safe Transport of Radioactive Material; Safety Guide
3. DPP DS 351: The Use of Graded Approach in the Application of the Safety Requirements for Research Reactors
4. DPP DS 376: Safety Assessment of Decommissioning of Nuclear Facilities; Safety Guide
5. DPP DS 377: Radiation Protection Programmes in Transport of Radioactive Material; Safety Guide
6. DPP DS 382: Ageing Management for Nuclear Power Plants and Research Reactors; Safety Guide
7. DPP DS 385: Severe Accident Management Programme for Nuclear Power Plants; Safety Guide

NUSSC has approved the following draft Safety Standards, which have subsequently been endorsed by the Commission on Safety Standards (CSS) for publication:

1. DS 288: A System for the Feedback of Experience from Events in Nuclear Installations; Safety Guide has been approved for publication by NUSSC and the Commission on Safety Standards (CSS)
2. DS 292: Storage of Radioactive Waste
3. DS 332: Release of Sites from Regulatory Control on Termination of Practices
4. DS 338: The Management System for Facilities and Activities; Safety Requirements
5. DS 339: Application of the Management System for Facilities and Activities
6. DS 397: Safety in the Use and Modification of Research Reactors
7. DS 393: Development and Application of Level 2 PSA for NPP
8. DS 394: Development and Application of Level 1 PSA for Nuclear Reactors
9. DS 395: Validation of Computational Tools for Accident Analysis for Nuclear Reactors

7.2.1.5 Commission on Safety Standards (CSS)

The Commission on Safety Standards (CSS) is a standing body of senior government officials holding national responsibilities for establishing standards and other regulatory documents relevant to nuclear, radiation, transport and waste safety.

The CSS provides oversight with regard to the Agency's safety standards and provides advice to the Director

General on safety matters.

The functions of the CSS are:

- To provide guidance on the approach and strategy for establishing the Agency's safety standards, particularly in order to ensure coherence and consistency between standards;
- To resolve outstanding issues referred to it by the committees involved in the Agency's preparation and review process for safety standards;
- To endorse, in accordance with the Agency's preparation and review process for safety standards, the texts of the Safety Fundamentals and Safety Requirements to be submitted to the Board of Governors for approval and to determine the suitability of Safety Guides to be issued under the authority of the Director General;
- To provide general advice and guidance on safety standards issues, relevant regulatory issues and the Agency's safety standards activities and related programmes, including those for promoting the worldwide application of the standards.

The NNR CEO was appointed to represent South Africa in the Commission.

7.2.1.6 National Standards Development

The NNR is represented on the International Nuclear Safety Group (INSAG) of the IAEA, which meets biannually. Members are invited on a four-yearly basis. The role of INSAG is to provide recommendations and opinions on current and emerging nuclear safety issues to the IAEA and the nuclear community. This forum is developing reports on the Global Nuclear Safety Regime, Stakeholder Communication, Operating Experience and Safety Goals.

7.2.2. COOPERATIVE GOVERNANCE AGREEMENTS

Activities of the NNR in pursuance of its responsibility to protect persons, property and the environment against radioactive nuclear hazards unavoidably impinge on the fields of responsibility of certain government departments. Cooperative governance agreements between the NNR and the government departments concerned are thus essential for the effective execution of duties and avoidance of duplication. Section 6(3) of the NNR Act requires the publication of regulations on co-operative governance with other state organisations on issues relating to nuclear and radiation safety.

Agreements are in place with the Department of Health: Directorate Radiation Control, the Department of Minerals and Energy: Mine Health and Safety Inspectorate, and the Department of Minerals and Energy: Electricity and Nuclear. Work is in progress to finalize agreements with the Department of Transport, Department of Labour and Department of Environmental Affairs and Tourism.

7.3. TECHNICAL SERVICES

7.3.1. LABORATORY AND INSTRUMENTATION

7.3.1.1 Laboratory and Portable Instrumentation

The NNR continued to perform environmental surveillance to provide assurance of adequate control over effluent discharges and to confirm that no unexpected accumulation of radioactive contaminants had arisen in the environment. This surveillance is done through the collection of samples from the environment followed by analysis in the laboratory. The results obtained are compared to the NNR's requirements for environmental safety.

The laboratory received a total of 86 solid samples and 52 liquid samples during the reporting period, from mining and mineral-reprocessing facilities authorised by the NNR, and from Koeberg and Necsa

The laboratory has various types of portable instrumentation, including equipment for underground radon monitoring and surface contamination. This equipment is used in compliance assurance inspections and during emergencies.

7.4. RADIOACTIVE WASTE MANAGEMENT POLICY AND STRATEGY

The Department of Minerals and Energy (DME) achieved a significant step forward when Cabinet approved the National Radioactive Waste Management policy and strategy towards the end of 2005. This policy and strategy has been developed over many years through a consultative process, which involved the NNR and various other stakeholders, both interested and affected parties. The national radioactive waste management policy and strategy lays down options to be considered for managing radioactive waste and more specifically spent fuel and high-level waste. The NNR together with other role players will implement the policy in order to ensure that the policy objectives are achieved and the mission of the NNR is achieved.

Communications and Outreach Initiatives

8.1. NUCLEAR EMERGENCY PREPAREDNESS REGULATORY OVERSIGHT COMMITTEE AT KOEBERG

The purpose of the Nuclear Emergency Preparedness Regulatory Oversight Committee (NEPROC) is to provide oversight on compliance with regulations pertaining to the Koeberg Emergency Plan and regional developments which impact on it.

Four meetings of this committee, chaired by the NNR, were held in Cape Town over the reporting period. Present and future developments in the vicinity of Koeberg, including the assessment and control thereof to ensure that the Koeberg emergency plan remains viable, were discussed at these meetings.

Issues relating to disaster management legislation, cooperative governance and progress in the various forums relating to the Koeberg emergency plan are monitored at these meetings. The main outcomes to date could be considered to be the requirements on developments 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.

8.2. MEETING BETWEEN THE NNR AND LABOUR UNION REPRESENTATIVES AT KOEBERG

The purpose of these meetings is to discuss matters of mutual interest relating to nuclear safety and public communication. Three meetings were held with representatives of the various unions at Koeberg (namely MWU, EEA, NUM, and NUMSA) during the reporting period. The main items of discussion were:

- Performance of workers at Koeberg in emergency exercises
- Control Zone Access and medical examinations
- Outsourcing to contractors
- Liaison between the NNR and the Atlantis community, and public communication generally.

8.3. INTERNATIONAL CO-OPERATION AND LIAISON

As part of its commitment to keep abreast of international developments in the regulation of nuclear industry, the NNR has entered into bilateral agreements on the regulation of nuclear industry. The NNR continued to use these agreements as a mechanism to facilitate the information exchange on common regulatory issues. Under the bilateral agreement between the NNR and DGSNR (the French nuclear regulator), the NNR hosted specialists who exchanged development work on nuclear emergency preparedness and response related topics.

The NNR made contributions during the review year to international forums like FRAREG, CNS and NERS.

One of the key issues of discussion was on Plant Lifetime Extension (PLEX) as related to the life management of aging nuclear installations. These discussions provided constructive feedback that will inform the proactive NNR approach on the PLEX issue.

The 8th bilateral meeting between the South African NNR and the French DGSNR (General Directorate of Nuclear Safety and Radiation Protection) /IRSN (Institute of Radiation Protection and Nuclear Safety) was held on 19-23 September 2005 in Paris, France. Presentations were made by the NNR on technical issues relating to power reactors, research reactors, the PBMR and nuclear waste. In terms of Koeberg, the DGSNR has agreed to provide assistance to the NNR on matters relating to operating technical specifications, in-service inspection, fire safety, emergency planning, assessment of modifications including severe accident modifications, and the exchange of inspectors.

The NNR has proposed technical follow-up meetings with the DGSNR, to be held around mid-2006, on the following issues:

- Updated technical specifications project
- Scope of second periodic safety review of Koeberg
- Classification system
- External flooding
- Sump blocking modification
- Risk-informed ISI
- Maintenance effectiveness
- Safety culture surveys
- Grid reliability

A proposal has also been made to the DGSNR regarding the exchange of inspectors between the NNR and DGSNR. Specific areas, which should be taken up, include inter alia fire safety, vessel head replacement, modifications and plant ageing. The next yearly bilateral meeting is scheduled for October 2006 at the NNR offices.

NNR staff members attended the joint NEA/IAEA meeting to exchange information on recent events in nuclear power plants, and the annual meeting of Incident Reporting System (IRS) national coordinators held in Paris on 26-30 September 2005.

NNR staff members attended the Framatome Reactor Regulators Group Meeting (FRAREG), in Seoul, South Korea on 21-24 June 2005, which included a visit to the Ulchin Nuclear Power Plant (Units 1&2 similar design to Koeberg).

Two NNR staff members attended the seminar on emergency risk zoning in Petten, Holland in April 2005, organised by the Joint Research Centre (JRC) in conjunction with the Organisation for Economic Cooperation and Development (OECD) and Nuclear Energy Agency (NEA). The two staff members made a presentation on the methodology used to derive the zones for Koeberg Nuclear Power Station. An international working group will be formed to compile a document that will be recommended to the IAEA for publication, stipulating the use of PSA Level 2 and 3 in consequence modelling and emergency zones determination.

Four NNR staff members within the Assessment Group division attended a bilateral meeting with the French regulator DGSNR in June 2005 to discuss various topics in emergency planning, as well as witnessing an emergency exercise at Penly Nuclear Power Plant. A report was finalised and forwarded to the French regulator and relevant stakeholders around Koeberg Nuclear Power Station. Observations and recommendations on the exercise were included in the report.

Another NNR staff member presented a paper "Scope of Regulatory Assessment of Accident Analysis for Licensing of the PBMR" at the IAEA technical meeting held from 31 August to 2 September 2005 to develop guidance on accident analysis specific to High Temperature Gas Cooled Reactors. Two representatives of AMEC/NNC and TUV Rheinland attended and presented papers on "Computer Code Development for the Assessment of the Safety Case for the Licensing of the PBMR in South Africa". The South African presentations were well received and were specifically acknowledged in the concluding remarks of the technical meeting.

9.1. KEY HUMAN RESOURCES STATISTICS

STAFF COMPLEMENT OF THE NNR

Chief Executive Officer	1
Senior Management	5
Departmental Management	8
Process /Functional Sub-group Coordination	9
Regulatory Officials and Specialists (all levels)	44
Administrative, Secretarial and Support staff	19
Total	86

EMPLOYMENT EQUITY

(a) **Total NNR Staff Composition**

White males	22	(29%)
Black males	29	(39%)
White females	11	(15%)
Black females	13	(17%)
Total	75	
Disabled	2*	

*Included in the permanent employees are 2 disabled persons. Another disabled person is an intern receptionist.

(b) **Composition of Staff by Race**

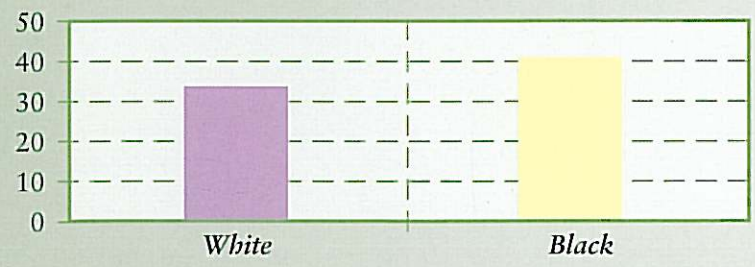


Figure 10: Staff composition by race

(c) **Composition of Staff by Gender**

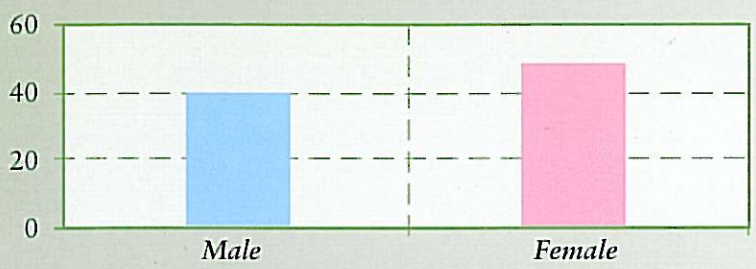


Figure 11: Staff composition by gender

(d) Management

Senior management

White males	1	(17%)
Black males	5	(83%)
White females	0	(0%)
Black females	0	(0%)
Disabled	0	(0%)
Total	6	

Departmental management

White males	2	(25%)
Black males	5	(62%)
White females	0	(0%)
Black females	1	(13%)
Total	8	
Disabled	2	(25%)

9.2. CAPACITY BUILDING

The continual ageing of the existing workforce, the growing pressures that are exerted on the viability of the future of nuclear power in many countries, including South Africa, the previous exclusion of other population groups from participating in the nuclear power professions and the consequential lack of interest of new professionals from designated groups to engage in the nuclear field represents a capacity building and development constraint for the NNR. In order to respond to this challenge the NNR has put in place various capacity building interventions.

The NNR continued to demonstrate its commitment to the development and transformation of the South African nuclear industry by investing in education and training. During 2005/06, the NNR hosted various workshops to introduce university students to the role that the Regulator plays in the nuclear industry. Also during 2005/06, the NNR supported and supervised the research work of two women students. These students successfully completed their research projects, which contributed towards attaining their M.Sc degrees.

9.3. STAFF TRAINING AND DEVELOPMENT

The NNR continues to look for ways to train and develop staff to carry out the mandate of the NNR successfully. Training and development of staff is regarded in a very serious light and this is why it has allocated approximately 10% of its personnel budget to staff training and development. Priorities in allocating resources to training and development gave specific emphasis to the accelerated training of staff from the designated groups.

In an effort to achieve the training objective, for example, the NNR, through its participation in the Science and Technology Education Fund (STEF), a skills development and funding initiative by NECSA, NNR, ESKOM, PBMR and France, sent 4 of its employees to attend a nuclear safety course in France. The other training that was attended was in radiation protection, which took place in London.

The training is intended to give an overview about the entire main issues dealing with PWR design and operation. The objective is to give the trainees a through understanding of the physical phenomena governing a PWR reactor, a good knowledge of the system, and to develop the safety culture needed to work in the nuclear field.

9.4. BURSARY SCHEME

Another avenue where the organisation strives to develop skills to prepare the industry for succession and the replacement of departing expertise has been to continue to provide bursaries to students in engineering and science studies. During the reporting period 5 students were allocated bursaries. All the bursaries were granted to students from previously disadvantaged groups. Bursaries were allocated as follows:

1) Civil engineering	(1 x University of Cape Town)
2) Radiation Science	(4 x University of North West)

9.5. INTERNSHIP PROGRAMME

The internship programme, termed NYALUSO (a Venda word for "development"), continues to help learners to acquire the experience and skills they need to enter and participate in the labour market.

This programme has helped the National Nuclear Regulator to contribute to the creation of a national skills pool in nuclear regulation and control matters in South Africa. The intern intake grew from 3 in 2003 to 10 in 2006. They cover areas of engineering, radiation protection, chemistry and physics. These interns attended training programmes locally.

9.6. UNIVERSITY INVOLVEMENT

9.6.1. POST-GRADUATE COURSE IN NUCLEAR SAFETY

The NNR continued its support of the post-graduate course in nuclear safety at the University of the Witwatersrand. The course was developed in 2004 and presented by NNR, NECSA, Eskom and the Pebble Bed Modular Reactor Company. The NNR staff continued to provide lectures in support of the course.

9.6.1.1 Post-graduate course in radiation science (University of North West)

The NNR is providing technical and administrative support to the post-graduate course in radiation science at the University of North West. The NNR staff provided training material and supervision of post-graduate students in support of the course.

9.7. TRANSFORMATION PROCESS

In early 2006, the NNR embarked an ambitious project to review its transformation plan to align it with the organisation's strategic objectives. The project entailed review of the entire business model of the Regulator and all four drivers of the transformation at the NNR, namely:

- Culture
- Structure
- Processes
- Technology

This project will have many benefits for the NNR. These include enhancing the Regulator's ability to attract and retain critical skills, ensuring that the policies reflect industry best practice, and improving the morale of the organisation's most important assets, its people. The result is the Regulator will be better able to meet its legislative mandate to protect people, property and the environment. This project commenced in January 2006 and is expected to conclude before the end of the financial year.

Annual Financial Statements

10.1. STATEMENT OF RESPONSIBILITY

The Public Finance Management Act, 1999 (Act No. 1 of 1999), as amended, requires the directors to ensure that the entity keeps full and proper records of its financial affairs. The annual financial statements fairly present the state of affairs of the National Nuclear Regulator, 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.

The annual financial statements are the responsibility of the directors. 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 Auditor-General's report appears on page 44.

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 2006. On the basis of this review, and in 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 disposition
- 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 from 1 April 2005 to 31 March 2006. 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 that further improvements are being implemented.

In the opinion of the directors, based on the information available to date, the annual financial statements fairly present the financial position of National Nuclear Regulator at 31 March 2006 and the results of its operations and cash flow information for the year.

The annual financial statements for the year ended 31 March 2006, set out on pages 60 to 75, were approved by the Audit and Risk Management Committee, on behalf of the Accounting Authority in terms of section 51(1) (f) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), as amended, on 27 July 2006, and are signed on its behalf by:

K BHARUTH-RAM
Chairperson

M T Magugumela
Chief Executive Officer

Report of the Auditor-General

10.2 Report of the Auditor-General to Parliament on the Financial Statements of National Nuclear Regulator for the year ended 31 March 2006

10.2.1. AUDIT ASSIGNMENT

The financial statements as set out on pages 60 to 75, for the year ended 31 March 2006, have been audited in terms of section 188 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), read with sections 4 and 20 of the Public Audit Act, 2004 (Act No. 25 of 2004) and section 7(1)j of the National Nuclear Regulator Act, 1999 (Act No. 47 of 1999). These financial statements are the responsibility of the accounting authority. My responsibility is to express an opinion on these financial statements, based on the audit.

10.2.2. SCOPE

The audit was conducted in accordance with Statements of South African Auditing Standards read with *General Notice 544 of 2006*, issued in *Government Gazette No. 28723* of 10 April 2006 and *General Notice 808 of 2006*, issued in *Government Gazette No 28954* of 23 June 2006. Those standards require that I plan and perform the audit to obtain reasonable assurance that the financial statements are free of material misstatement. An audit includes:

- examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements
- assessing the accounting principles used and significant estimates made by management
- evaluating the overall financial statement presentation.

I believe that the audit provides a reasonable basis for my opinion.

10.2.3. BASIS OF ACCOUNTING

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

10.2.4. AUDIT OPINION

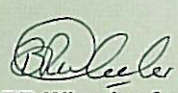
In my opinion the financial statements present fairly, in all material respects, the financial position of the National Nuclear Regulator at 31 March 2006 and the results of its operations and cash flows for the year then ended, in accordance with the basis of accounting determined by the National Treasury of South Africa, as described in note 1 to the financial statements, and in the manner required by the Public Finance Management Act, 1999 (Act No. 1 of 1999).

10.2.5. DELAY IN ISSUING OF REPORT

The delay in issuing the audit report was due to the internal review process as required by paragraph 60 of ISQC 1. This review was not completed as at 31 July 2006.

10.2.6. APPRECIATION

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



BR Wheeler *for* Auditor-General

Pretoria

10 August 2006

AUDITOR-GENERAL

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 by 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 the internal control systems;
- the effectiveness of internal audit;
- the output of a risk assessment workshop to identify the major risks faced by the organisation;
- the 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 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;
- the scope and results of the external audit, and its cost effectiveness.

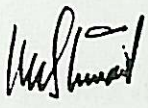
The Audit and Risk Management Committee has also been responsible for:

- approving the internal audit 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;
- encouraging improved coordination and liaison between board committees in those areas where their responsibilities overlap.

The Audit and Risk Management Committee notes that during the past year there has been further improvement in the internal controls and financial management systems. The Committee considers that the system of internal controls has ensured that the organisation's major risks have been reduced to an acceptable level.

The Audit and Risk Management Committee has evaluated the annual financial statements of the National Nuclear Regulator for the year ended 31 March 2006 and concluded that they comply, in all material respects, to the requirements of the Companies Act (Act 61 of 1973, as amended), the Public Finance Management Act (Act 1 of 1999, as amended), together with the associated Treasury Regulations, and South African Statements of Generally Accepted Accounting Practice.

The Audit and Risk Committee concurs with the going concern premise in preparing the annual financial statements, and has recommended their adoption by the Board of Directors.



Chairman
18 July 2006

Committee members:
Dr. JM Stewart (Chairman)
Adv B Mkhize
Ms. S Mabaso

Directors' Report / Accounting Authority

10.4.1 INTRODUCTION

The directors present their annual report that forms part of the audited annual financial statements of the organization for the year ended 31 March 2006. 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 1 of 1999, as amended) (PFMA). 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; and
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 PFMA.

10.4.2 BOARD OF DIRECTORS - 1 APRIL 2005 – 31 MARCH 2006

Prof K Bharuth-Ram (Chairperson)
Ms T Mgoduso (Deputy Chairperson)
Mr G Aboobaker
Mr D Elbrecht
Rev P Grove
Mr A H C H Motaung
Adv B Mkhize
Dr JM Stewart
Dr T Lesoli
Ms T Mashanda

Executive Director

Mr M T Magugumela (Chief Executive Officer)

Changes in membership

Mr J dos Santos Rocha	(appointed 28 November 2005)
Ms Z Mvusi	(appointed 06 March 2006)

Alternate Directors

Ms T N Zungu (alternate to Mr J dos Santos Rocha) and Ms T Kumalo (alternate to Ms Z Mvusi) were appointed from the Department of Minerals and Energy and the Department of Environmental Affairs and Tourism, respectively.

10.4.3 ORGANISATIONAL STRUCTURE

The National Nuclear Regulator is accountable to the Minister of Minerals and Energy, who, in terms of the PFMA, is the executive authority.

10.4.4 REVIEW OF OPERATIONS

The operating income for the NNR is R53, 256 (2005: R52, 598 million) including the Government Grant of R5, 417 (2005: R8, 067 million) and the operating expenses amounted to R52, 271 million (2005:R50.584 million).

10.4.5 PRINCIPAL ACTIVITIES

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, on page 49, 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.

10.4.6 EVENTS SUBSEQUENT TO BALANCE SHEET DATE

The NNR directors are not aware of any 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.

10.4.7 MATERIALITY AND SIGNIFICANT FRAMEWORK

A materiality and significant 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 finalized after consultation with the external auditors and was approved by the executive authority.

10.4.8 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. Cooperative agreements were also concluded with the afore-mentioned government departments as required by the NNR Act, No 47 of 1999. The NNR further interacted with civil society and organized labour, and maintained relations with other strategic cooperatives such as the media, NGO's, international organizations, nuclear regulatory authorities in other countries, and the general public.

10.4.9 SHAREHOLDER RELATIONS

The NNR Executive reported to and held discussions with the Executive Authority on significant events, including interaction 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 the NNR regulatory Safety Standards.

10.4.10 SOCIAL RESPONSIBILITY AND CAPACITY BUILDING

The NNR continued its active participation in various national capacity building initiatives. These included participation in the ARECSA, the MARST programme at the University of North West and participation in the post graduate course in radiation protection at the University of Witwatersrand. NNR staff provided lectures and training materials in support of the course. A number of young recruits attended the course to gain valuable exposure.

The NNR actively participated in the Department of Minerals and Energy's joint initiative on Learners Focus Week in Energy. 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 and participated in a national workshop of the South African Young Nuclear Professionals Society in Midrand in January 2006.

In keeping with the great value it places on experiential learning for young trainees in nuclear related fields, the NNR provided internship opportunities to 10 young graduates.

11. ADDRESSES

The business addresses of the National Nuclear Regulator are as follows:

Physical address:	Second Floor, Block A Old Mutual Centre Embankment Road Centurion 0046
Postal address:	PO Box 7106 Centurion 0046
Telephone:	(012) 674 7100
Facsimile	(012) 663 5513
Email	nnr@nnr.co.za

Report on performance against objectives

A. CORE BUSINESS

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
1) To conduct safety assessment review for the purpose of granting or refusing authorizations of new actions and approval of changes to existing actions.	Executive report listing: • Initial responses to all applicants within 4 weeks giving proposed timing of the review process • Completed application within the proposed timing • Explanation of instances where either of the above was not possible.	Report	Report as part of the main body of the Annual Report	Achieved	
		Average of < 90 days	KPNS 70 days	Achieved	
			PBMR 79 days	Achieved	
			RENS 93 days	Not achieved	This was a result of high volume of work due to increased number of authorisation holders without a matching increase in resources. The number of holders grew from 81 to 95. Also, the number of new applications for authorisation grew.
			NTWP 115 days	Not achieved	Although not achieved, there has been significant improvement from last year's 139 days.
2) To regulate the optimal reduction of public and workers' doses and risk for all facilities according to the ALARA principle	Report on verification of rehabilitation of contaminated sites	Conduct inspections on all cleaned-up sites upon submission of close-out reports and respond to all close-out reports	No inspections conducted	Not achieved	Of the 38 contaminated sites, 18 sites were cleaned up and inspected by the NNR in 2004/ 05; however close-out reports are still under consideration for approval. The remaining 20 site inspections were not conducted during the reporting period, as the holder has not met all the necessary NNR requirements to enable confirmatory surveys on sites in question. The finalization of the above outstanding sites will be concluded as soon as the holder has satisfied the NNR requirements.
	Ensuring that identified operations requiring to be authorised are within regulatory control and that appropriate legislative imperatives are applied	Authorising of the Necsa Calibration Pads	Certificate of Registration issued to Necsa in November 2005	Achieved	The objective was in response to the concerns raised by civil society
		Status report for all authorised facilities	Status report for all authorised facilities	Achieved	

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
	Policy on application of risk criteria to different holders developed	Developed policy document	Developed policy document	Achieved	
	Adequacy of emergency preparedness arrangements around nuclear installations reviewed	Review adequacy of NECSA emergency preparedness and response arrangements including attendance of emergency exercises and drills planned by NECSA	Participated in the planning and conduct of the NNR exercise at Necsa.	Achieved	A corrective action plan has been established. The NNR is monitoring the implementation thereof. The exercise concluded that an appropriate level of emergency planning and preparedness is in place for the Necsa Pelindaba site.
		To review and assess adequacy of emergency preparedness at Koeberg taking into account optimization of plant safety e.g. measures for mitigation of severe accidents	Assessment Reports produced and monitoring of 2004 emergency exercise corrective actions done. Another emergency exercise was conducted in Feb 06.	Achieved	The Koeberg February 2006 exercise is reported in the main body of the annual report. A corrective action plan is being finalised and implementation thereof will be monitored. In summary the exercise concluded that although several findings were identified, the Koeberg emergency plan is adequate.
		Conduct of planned emergency exercise at Necsa	Emergency exercise was held in November 2005	Achieved	A corrective action plan has been established. The NNR is monitoring the implementation thereof. The exercise concluded that an appropriate level of emergency planning and preparedness is in place for the Necsa Pelindaba site.
	Strategy for regulatory control (standard, assessment, compliance inspection) over physical security measures developed and implemented	Physical Security Strategy document	Draft Physical Security Strategy document developed	Not achieved	Documents undergoing final internal management review before implementation
		Review adequacy of physical security arrangements at Pelindaba, Vaalputs and Koeberg Nuclear Power Station sites.	Assessments and compliance activities completed.	Achieved	For Koeberg and Vaalputs all physical security inspections were carried out according to the NNR compliance assurance programme and no deviations from the licence conditions were identified. At Necsa an audit conducted in December identified some shortcomings. Necsa has submitted a corrective action plan and the NNR is monitoring progress.
	Strategy for regulatory control (standard, assessment, compliance inspection) over safety and security of sources measures developed and implemented	Safety and security of sources regulatory strategy document.	Draft strategy document	Not achieved	Strategy document undergoing final management review

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
	Operationalized (internal procedures) IAEA regulations for safe transport of radioactive material as national competent authority in respect of the matters falling in Act	Implement the operationalization of IAEA regulations for the safe transport of radioactive material as national competent authority in respect of the matters falling in the Act	Draft workflow and guidance procedures developed.	Not achieved	Documents undergoing final internal management review before implementation.
	Completed baseline report of public doses resulting from facilities authorised by RENS	Baseline report of public doses resulting from authorised facilities.	Public safety assessments submitted by authorisation holders.	Not achieved	Project to compile baseline report of public doses was delayed. Implementation to occur over three years.
	Risk optimisation strategy developed	Risk optimisation strategy	Draft Strategy document	Not achieved	Strategy document undergoing final management review
	Public dose (KNPS) (Limit – 1mSv/a)	KNPS NNR ALARA target of less than 0.013mSv/a	0.006mSv/a	Achieved	These dose values are based on calculated annual estimations (calendar year). They are not actual dose values received by members of the public.
	Worker dose (KNPS) (Limit 50mSv/a)	KNPS Maximum individual dose limit 50 mSv/a Average individual dose NNR ALARA target <5mSv/a	17.2 mSv/a 0.9 mSv/a	Achieved Achieved	
	Public risk (KNPS)	Av = 10^{-8}/a Max= 5 x 10^{-6}/a	2 x 10^{-9} 3 x 10^{-6}	Achieved	This performance factor was only applicable to the Koeberg Programme
	Workers risk (KNPS)	Av=10^{-5}/a Max=5x10^{-5}/a	2x10^{-6}/a 3x10^{-5}/a	Achieved	
	Worker dose (RENS)	Maximum individual dose 50mSv/a	Special case mines: 51.7 mSv	Not achieved	Although not achieved, there has been significant improvement from last year's 57.9 mSv.
			Other mines: 38.6 mSv	Achieved	
			Other facilities: 2.4 mSv	Achieved	

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
		Average individual dose < 5 mSv/a	Underground areas: o Special case mines: 16.3 mSv	Not achieved	The special case mines continue to present a challenge in terms of achieving the 5mSv average individual dose. The NNR will continue to monitor the implementation of the strict control measures that are in place at these mines. Although the actual average individual dose is greater than the target exposure, it is lower than the annual limit of 50mSv.
			o Other NNR authorised mines: 4.8 mSv	Achieved	
			All surface areas: 0.7 mSv	Achieved	
	Public dose (Necsa) (Limit – 1 mSv/a)	Necsa NNR ALARA target of 0.050 mSv/a	0.0063 mSv/a	Achieved	These dose values are based on calculated annual estimations (calendar year). They are not actual dose values received by members of the public.
		Vaalputs NNR ALARA target of 0.005 mSv/a	0. 00 mSv/a	Achieved	The value of 0.00 mSv is based on the fact that no critical groups exist in the immediate vicinity of Vaalputs and the limited discharges from Vaalputs.
	Worker dose (Necsa) (Limit is 50 mSv/a)	Necsa NNR ALARA limit on maximum individual dose 20mSv/a	12.9 mSv/a	Achieved	
		Necsa Average individual dose NNR ALARA target 5mSv/a	0.7 mSv/a	Achieved	
		Vaalputs NNR ALARA limit on maximum individual dose of 20 mSv/a	1.7 mSv/a	Achieved	
		Vaalputs Average individual dose NNR ALARA target 5mSv/a	0.9 mSv/a	Achieved	

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
3) To ensure a holistic compliance assurance approach including safety culture nhancement	Holistic compliance assurance system including safety culture enhancement programme developed and implemented	Compliance Index > 80%	Koeberg: 80%	Achieved	Compliance index is based on the NNR safety indicators system which ranks the findings of inspections in terms of safety significance. For the period under review the findings of 207 inspections conducted on 30 plant areas were consolidated and are reported on in the main body of the annual report.
			RENS: 86%	Achieved	A total of 212 inspections were conducted during the period. The number of non-compliances reported are as follows: 183 category 1 and 0; 29 category 2 (serious non-compliances) Category 2 are being addressed under NNR enforcement policy and the NNR is monitoring the situation very closely.
			NTWP: 96 %	Achieved	For the period under review the findings of 348 inspections conducted on 10 plant areas were consolidated and are reported on in the main body of the annual report.
			PBMR: 100%	Achieved	
4) To review and implement the current legislation (NNRA), update the associated regulatory rules, and continuously monitor SA's legislative environment.	Guidance Documents on further rules and regulations and requirements according to the NNRA including recommendations on regulations to the Minister as per NNR Act (section 28, 29(1&2), 36, 38(4))	Guidance Documents on further rules and regulations and requirements according to the NNRA. Recommendations on regulations to the Minister as per NNR Act (section 28, 29(1&2), 36, 38(4))	Document for rules, regulations and requirements of the NNRA Written recommendations as required	Achieved Achieved	
	Report on implementation and compliance with legislation relevant to the South African environment, and co-operating with other organs of state as per the NNR Act.	Compliance audits with regard to relevant legislation and report	Report on compliance	Achieved	Of the 30 legislations audited, 29 full compliance and the outstanding 1 in substantial compliance (The approval of the ICT strategy submitted to the Board and the implementation thereof will meet the requirements of the ICT Act).
	Authorisation fee system made available	Present updated final authorisation fee system	Work in progress.	Not achieved	Benchmark exercise was conducted with international regulators and reviews are ongoing, However, current authorisation fee system is being implemented.

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
5) To issue new conditions of authorisation	Authorisations with new conditions, to address relevant statutory requirements and fundamental safety standards in a holistic manner, issued to all holders.	Authorised changes to Koeberg nuclear licence	All changes processed and authorised	Achieved	
		Issue new conditions of authorisation (RENS)	No new conditions of authorisation were issued.	Not achieved	Issuance of new conditions was not necessary as it depends on the promulgation of Safety Standards, which had not been promulgated.
	Process based authorisations issued	Review all PBL submissions within agreed timeframes (NTWP)	Review reports, discussions with holder and responses provided to holder	Achieved	
		Process based authorisation issued (NTWP)	Revised conditions of authorisation approved by Board	Achieved	The revised Conditions of Authorisation were approved in November 2005 and were issued to Necsa in April 2006.
6) To fulfil relevant national obligations in respect of international legal instruments	A plan to fulfil identified obligations and ensure compliance with relevant international instruments	Identify obligations with respect to the Convention on Nuclear Safety	A plan to comply with obligations has been developed The South African national report to the IAEA Convention on Nuclear Safety was compiled and presented at the 3rd review meeting	Achieved	
	A report on continued monitoring changes and development of international instruments	Written reports on changes and developments	Quarterly reports have been produced.	Achieved	No changes were recorded during the reporting period.
7) To ensure that provisions for nuclear emergency planning are in place	Nuclear emergency planning provisions e.g. emergency plans in place at all nuclear installations	Emergency plans in place at all nuclear installations	Emergency plans in place and implemented	Achieved	
	Adequacy of emergency preparedness arrangements around nuclear installations reviewed and tested (linked to CB 2 above)	Conduct of a planned Emergency Exercise at nuclear installations	Planned Exercise was held in February 2006 at Koeberg Nuclear Power Station	Achieved	A corrective action plan is being finalized and implementation thereof will be monitored.
			Planned Exercise was held in November 2005 at Pelindaba	Achieved	A corrective action plan has been established. The NNR is monitoring the implementation thereof.

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
8) To review safety standards and regulatory practices including investigations.	Issued document on safety standards and regulatory practices	Revised current requirements and guidance documents	No requirements and guidance documents produced	Not achieved	Revision of requirements and guidance documents was not required as no new standards were promulgated. However, work on revision of requirements and guidance is in progress
	Research reports on NNR fundamental principles and guidelines (as appropriate) on the following aspects established				
	Radon Survey at Cango Caves	Research report on Cango Caves	Phase 2 Project has started	Not achieved	Phase 2 of project was rescheduled to allow measurements in 2006 winter, which are necessary.
	Methodology for investigating actions to be authorised	Research report on actions to be authorised.	Project completed	Achieved	
	Karoo uranium-contaminated sites	Research report on Karoo sites	In progress	Not achieved	Project initiation process in progress. Companies are being invited to tender. Internal procurement process needs finalization. Internal project implementation approval process not finalised.
	Financial liability	Research report on financial liability	A report on the review of international practices completed.	Not achieved	Not progressed due to resource constraints. This item will be progressed during 2006/7.
	Wonderfonteinspruit	Investigations into the Wonderfonteinspruit catchment area	A proposal from a consultant	Not achieved	Not progressed due to resource constraints. This item will be progressed during 2006/7.
	Establish NNR fundamental principles and guidelines (as appropriate) on the following: Research reactor core conversion and upgrades	Research reactor core conversion and upgrades	Draft report on international good practice has been produced.	In progress	Due for completion in 2007 in accordance with strategic plan Requirements and guides are still to be developed for implementation
	Decommissioning	Research report on fundamental principles on decommissioning	Research report has been produced	Achieved	
	Optimal reduction of radioactive waste	Report on optimal reduction of radioactive waste	Draft report has been produced	In progress	Undergoing management review and approval. Due for completion in 2007 in accordance with strategic plan
	Plant life extension	Plant life extension	Draft guideline document has been produced	In progress	Undergoing management review and approval. Due for completion in 2007 in accordance with strategic plan
	Protection of environment against nuclear damage	Report on protection of environment against nuclear damage	Draft report has been produced	In progress	Undergoing management review and approval. Due for completion in 2007 in accordance with strategic plan

B. STAKEHOLDER SATISFACTION

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
9) To ensure effectiveness of all bilateral agreements and other international collaboration	Report on bilateral meetings and other forums and activities of international collaboration	Quarterly report	Quarterly report	Achieved	Participation by NNR personnel during the financial year in IAEA safety committees meetings, AFRA missions, international committees such as NUREG, ICRP and several bilateral meetings. Reports were produced.
10) To improve stakeholder relation management	Established Public Safety Information Forums (by authorisation holders)	Establishment of Public Safety Information Forums (PSIF) at Pelindaba, Vaalputs and Koeberg Nuclear Power Station	PSIFs established at Pelindaba, Vaalputs and Koeberg Nuclear Power Station	Achieved	Forums meet on a quarterly basis.
	Report on the implementation of the communication plan	Quarterly reports	Reports on implementation of elements of the communication plan were produced	Not achieved	Numerous activities were carried out as part of the communication plan. These included stakeholder management, outreach activities with schools, civil society, organized labour and public representatives. However, other planned activities such as image building and awareness could not be undertaken. These will be undertaken in the 2006/07 plan.
	NNR publications (annual report, Tsebo, any other technical publication)	Printing of the NNR annual report 2004/5	Report to be tabled timeously in parliament	Achieved	
		Printing of NNR quarterly newsletters	Quarterly publications	Achieved	
	Annual report on the implementation of PAIA	Produce annual report on the implementation of PAIA	Report was submitted at the end of September 2005	Achieved	
	Report on the monitoring of regional stakeholder forums including interactions with Civil Society	Report on the monitoring of regional stakeholders.	Report produced on the monitoring of stakeholders.	Achieved	
	The plan to improve internal stakeholder relations implemented	Approved and implemented plan	Plan approved but not implemented	Not achieved	Intranet was one of the methods identified for staff communication. However, its implementation was put on hold pending review of the ICT strategy.
11) To contribute to social sustainability	Report on the implementation and monitoring of social responsibility policy and plan including a public awareness and education programme	Quarterly reports	Quarterly reports	Achieved	

C. INTERNAL BUSINESS PROCESSES

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
12) To improve business management practices	Procedure/guideline indicating integrated planning, budgeting and control system (ensuring effective internal processes and systems) developed and implemented	Integrated NNR plans document	Integrated NNR plans document	Achieved	
		Procedure/guideline on integrated planning	Draft procedure produced	Not achieved	Undergoing management review
	Security and disaster management processes developed and implemented	Processes implemented	Processes developed but not implemented	Not achieved	Delays have been experienced in the preparation of ICT strategy.
	Establish a quality standard document to address issues of quality outputs: on time, on budget and on brief and report on the implementation thereof.	Quality standard document developed and implemented	Format document for Board document developed and implemented.	Achieved	
	Quality management system developed and implemented	Quality management system developed and implemented	Draft documents developed	Not achieved	Initial estimation of completion date for this complex deliverable was unrealistic.
	Procedures for effectiveness of NNR Board processes developed and implemented	Procedures implemented	Procedures implemented	Achieved	Implementation is underway although there are challenges being experienced.
	Business Continuity Strategy and Plan developed and implemented	Business Continuity Strategy and Plan developed and implemented	Business Continuity Strategy and Plan developed	Not achieved	The ICT Disaster Recovery Plan, which is an integral part of the Business Continuity Strategy and Plan was developed but not implemented, as it needed to be reviewed within the overall implementation of the ICT Strategy. The implementation of the ICT Disaster Recovery Plan is scheduled for the 2006/07 Financial Year
13) To enter into institutional agreements	Cooperative governance agreements with other organs of state concluded and implemented	Conclude and ensure implementation of cooperative governance agreements with organs of state	4 out of 11 agreements have been signed, 7 are due for publication for public comment	Not achieved	Although difficulties are being experienced in terms of finalizing these agreements, they are nevertheless being implemented at operational level between the NNR and the counterparts.
14) To facilitate the implementation of the NNR transformation policy and plan	Report on the implementation of the transformation plan	Report on implementation of transformation policy and plan	Report produced	Achieved	
15) To implement preferential procurement	NNR procurement policy document	Procurement policy developed and approved	Procurement policy approved and implemented	Achieved	
	Database of BEE providers	Database developed	Database for BEE in place	Achieved	

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
16) To improve the NNR nuclear emergency response	Updated NNR emergency response procedures implemented	Procedures completed	Draft procedures completed	Not achieved	The draft procedures incorporate the Disaster Management Act requirements and are under NNR management review cycle for approval.
	Dedicated facilities for emergency response	Complete the set-up of dedicated emergency facilities	ECC room has been set-up and equipped.	Achieved	The ECC is operational.

D. HUMAN RESOURCES

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
17) To realign management style, policies and procedures for HR with SA legislation and objectives	Revised management policies, procedures and systems	Policies reviewed, consulted and approved	Policies are under review	Not achieved	HR policies currently under review
	Report on implementation of a people centred management strategy	Managers trained on people-centred management style	Competency assessment was done on all managers	Not achieved	A limited number of staff is enrolled in management courses
18) To implement capacity building and development	Capacity building of NNR staff and students/interns	NNR skills audit, training plans for staff, assistance to students/interns.	Skills audits carried out and analyzed. Personal development plans (PDPs) developed for staff	Achieved	
	<u>Organizational capacity:</u> A workplace skills plan for each year developed.	Capacity building and development programmes improving NNR performance	Participation in national nuclear-related education, training and skills development programmes	Achieved	NNR takes part in various capacity building initiatives. These include: • Participation in ARECSA. Difficulties experienced in 2005. • MARST programme • Wits Course
	Report on capacity building based on personal development plans for each employee	Individual development plan template submitted to managers	PDP submitted by departments.	Achieved	
	Report on implementation of succession planning policy	Succession strategy and plan developed	Succession Planning Policy was drafted.	Not achieved	HR policies currently under review. Draft to be finalized as part of the HR policies review process.
	Revised career development plan for each employee	Competencies required for each post agreed	Competencies done for each employee	Achieved	
		Draft career pathways for technical and for support staff	Career path guide was developed for technical and support staff	Achieved	

OBJECTIVES	KEY PERFORMANCE INDICATOR	TARGET	ACTUAL	PERFORMANCE RESULTS	NOTES/CHALLENGES/ COMMENTS
	Report on implementation of bursary scheme policy	Quarterly reports	Report is part of the Annual Report	Achieved	
	Plans for capacity development in the field of transport, and physical security developed and implemented	Documented plans for physical security and transport		Not achieved	
	External capacity: Report on NNR participation in university courses and research student supervision.	Report on research student supervision	Report on student supervision	Achieved	Three M.Sc students were supervised in this financial year and have completed their dissertations
	Report on the implementation of the improved AFRA participation	Quarterly report	Quarterly report	Achieved	NNR personnel participated in AFRA activities in some African countries during this financial year.
	An effective and inclusive schools programme plan developed and implemented	Quarterly reports	Quarterly reports	Achieved	
19) To leverage strategic partnerships and alliances to further the technical expertise of NNR staff	Report on the implementation of the plan for leveraging strategic partnership	Quarterly report	Quarterly report	Achieved	
	Report on the participation in the planning & implementation of national programme for development of expertise in the industry	Quarterly report	Quarterly report	Achieved	
20) To integrate the Balanced Scorecard approach in performance management	Report on the implementation of a plan to integrate the balanced scorecard within the performance management system	Performance Management Policy aligned to the Balanced Scorecard	The Draft Performance Management Policy was developed	Not achieved	Implementation of the Performance Management policy pending final review of the draft.

Statement of Financial Position at 31 March 2006

	Notes	2006 R	2005 R
Assets			
Non-current assets			
Property and equipment	2	2,200,436	2,104,390
Retirement benefit asset	5	-	-
		53,498,186	47,551,669
Current assets		2,514,562	9,733,486
Trade and other receivables	3	50,983,624	37,818,183
Cash and cash equivalents	12.2		
		55,698,622	49,656,059
Equity and liabilities			
Reserves			
Accumulated surplus / (deficit)		5,176,661	1,420,845
Non-current liabilities			
Retirement medical benefits	5	27,937,000	25,315,000
Current liabilities		22,584,961	22,920,214
Trade and other payables		1,884,142	2,124,117
Accruals	6	2,700,819	2,796,097
Deferred income - DME Grant	14	18,000,000	18,000,000
		55,698,622	49,656,059

Statement of Financial Performance for the year ended at 31 March 2006

	Notes	2006 R	2005 R
Operating income	7.1	**53,255,775**	52,598,040
Operating expenses		**(52,270,822)**	(50,584,356)
Operating surplus		**984,953**	2,013,684
Interest received		**2,770,863**	892,886
Net surplus for the year		**3,755,816**	2,906,570

Statement of changes in net assets for the year ended at 31 March 2006

	Accumulated surplus / (deficit)
	R
Balance at 31 March 2004	(1,485,725)
Surplus for the period	2,906,570
Balance at 31 March 2005	**1,420,845**
Surplus for the period	**3,755,816**
Balance at 31 March 2006	**5,176,661**

Cash flow statement for the year ended 31 March 2006

	Notes	2006 R	2005 R
Cash flow from operating activities		**14,174,154**	**23,456,787**
Cash receipts from authorisation holders and applicants		60,474,699	52,366,697
Cash paid to suppliers and employees		(49,071,408)	(29,802,796)
Cash generated from operations	12.1	**11,403,291**	**22,563,901**
Interest received		2,770,863	892,886
Cash flow from investing activities			
Acquisition of equipment		(1,008,713)	(845,974)
Net increase in cash and cash equivalents		**13,165,441**	**22,610,813**
Cash and cash equivalents at beginning of the period		37,818,183	15,207,370
Cash and cash equivalents at end of the period	12.2	**50,983,624**	**37,818,183**

Notes to the financial statement for the year ended 31 March 2006

1 Accounting policy

The annual financial statements have been prepared in accordance with South African Statements of Generally Accepted Accounting Practice 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: GRAP 1: Presentation of financial statements replaced statement of GAAP AC 101, GRAP 2 Cash flow statements replaced AC 118, GRAP 3: Accounting policies, changes in accounting estimates and errors replacing AC 103 . The following are the principal accounting policies of the National Nuclear Regulator which are, in all material respects, consistent with those applied in the previous year.

1.1 Basis of preparation

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

1.2 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.

1.3 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.

1.4 Retirement benefit cost

The NNR operates both a defined benefit plan in respect of post-retirement medical aid contributions as well as in respect of the pension fund. The defined benefit plans are subject to an annual actuarial valuation. The net actuarial losses of the current period and past service cost of the current period to the extent that they exceed any reduction in the present value of the economic benefits available in the form of refunds from the plan or reduction in future contributions to the plan. If there is no change or an increase or decrease in the present value of the economic benefits, the entire net actuarial losses of the current period and past service cost of the current period shall be recognised immediately in the Income Statement. Payments to the defined contribution benefit plan are charged to the income statement in the year to which they relate.

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 income statement.

1.6 Property and equipment

Property and equipment except for land are stated at historical cost less depreciation. Depreciation is calculated on the straight-line method to write off the cost of each asset over its estimated useful life:

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

Accounting policy (continued)

1.7 Leasing

Leases under which the risks and benefits of ownership are effectively retained by the lessor are classified as operating leases. Obligations incurred under operating leases are charged to the income statement in equal instalments over the period of the lease.

1.8 Financial instruments

Recognition

Financial assets and financial liabilities are recognised on the NNR's balance sheet when the NNR becomes a party to the contractual provisions of the instrument.

Financial Assets

The NNR's principle financial assets are accounts receivable and cash and cash equivalents.

Trade Receivables

Trade receivables are stated at their nominal value as reduced by appropriate allowances for estimated irrecoverable amounts.

Trade payables

Trade and other payables are stated at their nominal value.

Cash and cash equivalents

Cash and cash equivalents are measured at fair value.

1.9 Provisions

Provisions are recognised when the NNR has a present obligation as a result of past events, and it is probable that this will result in an outflow of economic benefits that can be estimated reliably.

1.10 Interest received

Interest is recognised on a time proportionate basis with reference to the principal amount receivable and the effective interest rate applicable.

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

At each balance sheet date, NNR reviews the carrying amounts of its tangible assets to determine whether there is any indication that those assets may be impaired. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). The assets residual values and useful lives are reviewed and adjusted if appropriate at each balance sheet date.

1.13 Government grant received

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

Notes to the financial statement for the year ended 31 March 2006

	2006			2005		
	R	R	R	R	R	R
2 Property and equipment						
	Cost	Accumulated Depreciation	Book value	Cost	Accumulated Depreciation	Book value
2.1 Carrying amount as at the beginning of year	**10,557,038**	**(8,452,648)**	**2,104,390**	**9,711,064**	**(7,758,147)**	**1,952,917**
Furniture	756,794	(450,114)	306,680	687,478	(394,174)	293,304
Office equipment	983,489	(628,359)	355,130	815,937	(511,137)	304,800
Computer equipment	4,634,453	(4,028,010)	606,443	4,255,640	(3,748,543)	507,097
Scientific and technical equipment	2,493,852	(2,259,389)	234,463	2,356,767	(2,206,129)	150,638
Computer software	1,260,950	(1,012,294)	248,656	1,167,742	(834,369)	333,373
Property - Buildings	213,750	(74,482)	139,268	213,750	(63,795)	149,955
Property - Land	213,750	-	213,750	213,750	-	213,750
2.2 Additions	**1,008,713**	**-**	**1,008,713**	**845,974**	**-**	**845,974**
Furniture	274,633	-	274,633	69,316	-	69,316
Office equipment	37,947	-	37,947	167,552	-	167,552
Computer equipment	287,683	-	287,683	378,813	-	378,813
Scientific and technical equipment	156,488	-	156,488	137,085	-	137,085
Computer software	251,962	-	251,962	93,208	-	93,208
Property - Buildings	-	-	-	-	-	-
Property - Land	-	-	-	-	-	-
2.3 Disposals / adjustments	**(102,806)**	**(333)**	**(103,139)**	**-**	**-**	**-**
Furniture	151	(351)	(200)	-	-	-
Office equipment	23,241	4,545	27,786	-	-	-
Computer equipment	(4,749)	(5,305)	(10,054)	-	-	-
Scientific and technical equipment	(121,449)	778	(120,671)	-	-	-
Computer software	-	-	-	-	-	-
Property - Buildings	-	-	-	-	-	-
Property - Land	-	-	-	-	-	-
2.4 Depreciation	**-**	**(809,528)**	**(809,528)**	**-**	**(694,501)**	**(694,501)**
Furniture	-	(86,733)	(86,733)	-	(55,940)	(55,940)
Office equipment	-	(105,108)	(105,108)	-	(117,222)	(117,222)
Computer equipment	-	(330,850)	(330,850)	-	(279,467)	(279,467)
Scientific and technical equipment	-	(68,957)	(68,957)	-	(53,260)	(53,260)
Computer software	-	(207,193)	(207,193)	-	(177,925)	(177,925)
Property - Buildings	-	(10,687)	(10,687)	-	(10,687)	(10,687)
Property - Land	-	-	-	-	-	-
2.5 Carrying amount as at the end of year	**11,462,945**	**(9,262,509)**	**2,200,436**	**10,557,038**	**(8,452,648)**	**2,104,390**
Furniture	1,031,578	(537,198)	494,380	756,794	(450,114)	306,680
Office equipment	1,044,677	(728,922)	315,755	983,489	(628,359)	355,130
Computer equipment	4,917,387	(4,364,165)	553,222	4,634,453	(4,028,010)	606,443
Scientific and technical equipment	2,528,891	(2,327,568)	201,323	2,493,852	(2,259,389)	234,463
Computer software	1,512,912	(1,219,487)	293,425	1,260,950	(1,012,294)	248,656
Property - Buildings	213,750	(85,169)	128,581	213,750	(74,482)	139,268
Property - Land	213,750	-	213,750	213,750	-	213,750

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

Notes to the financial statement for the year ended 31 March 2006

	2006 R	2005 R
3 Trade and other receivables		
Trade receivables	**3,071,641**	10,718,448
Less: Provision for doubtful debts	**(1,053,887)**	(1,593,474)
Net trade receivables	**2,017,754**	9,124,974
Other receivables	**496,808**	608,512
	2,514,562	9,733,486

4 Bank balances and cash

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

5 Retirement 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.

Post-retirement pension benefit

The NNR has made provision for a pension scheme covering all its permanent employees. The funds are governed by the Pension Funds Act, 1956 as amended.

The defined benefit schemes are valued actuarially at an interval of not more than 3 years using the projected unit credit method. The schemes were last actuarially valued during March 2006. In arriving at his conclusion, the actuary took into account the following assumptions at balance sheet date (expressed as weighted averages):

	Defined benefit pension plan		Post-employment medical benefit	
	2006	2005	**2006**	2005
Discount rate at 31 March 2006	**9.00%**	9.00%	**9.00%**	9.00%
Expected return on plan assets at 31 March 2006	**9.20%**	9.20%	-	-
Annual increase in health care costs	**8.00%**	8.00%	**8.20%**	8.20%

5 Retirement benefits (continued)

The amount included in the balance sheet arising from the NNR obligation in respect of the defined retirement benefit plans are as follows:

	Defined benefit pension plan		Post-employment medical benefit	
	2006	2005	**2006**	2005
	R	R	**R**	R
Amounts recognised in the balance sheet				
Present value of funded obligations	**43,880,000**	36,261,000	**27,937,000**	25,315,000
Fair value of plan assets	**(62,267,000)**	(42,557,000)	**-**	-
	(18,387,000)	(6,296,000)	**27,937,000**	25,315,000
Unrecognised actuarial loss	**(3,871,000)**	(3,871,000)	**-**	-
Unrecognised post employment benefit asset	**22,258,000**	10,167,000	**-**	-
Net liability in balance sheet	**-**	-	**27,937,000**	25,315,000
Movements in the net liability recognised in the balance sheet are as follows				
Net liability at beginning of the year	**-**	-	**25,315,000**	22,774,000
Change in accounting estimate	**-**	-	**-**	-
Net liability at beginning of the year	**-**	-	**25,315,000**	22,774,000
Net expense recognised in the income statement	**4,968,000**	4,657,000	**3,524,847**	3,405,371
Contributions	**(4,968,000)**	(4,657,000)	**(902,847)**	(864,371)
Net liability/(asset) at end of the year	**-**	-	**27,937,000**	25,315,000

Notes to the financial statement for the year ended 31 March 2006

6 Accruals

	Leave pay accruals R	Bonus accruals R	Total R
Opening balance	2,319,554	476,543	2,796,097
Additional accruals	-	90,389	90,389
Utilisation of accruals	(185,668)	-	(185,668)
Closing balance	2,133,886	566,932	2,700,818

	Notes	2006 R	2005 R
7 Operating surplus			
Operating surplus is stated after taking into account the following:			
7.1 Operating income			
7.1.1 Revenue		**47,824,884**	44,531,040
Authorisation fees		**47,646,569**	44,513,183
Other		**178,315**	17,857
State contributions	**11**	**5,417,000**	8,067,000
7.1.2 Foreign exchange gain		**13,891**	-
Total operating income		**53,255,775**	52,598,040

Notes to the financial statement for the year ended 31 March 2006

	Notes	2006 R	2005 R
7 Operating surplus (continued)			
7.2 Expenditure			
7.2.1 Auditor's remuneration		**379,955**	301,202
Audit fees			
- current year		**379,955**	301,202
- prior year		**-**	-
Expenses			
- current year		**-**	-
- prior year		**-**	-
7.2.2 Depreciation		**809,528**	694,501
Office furniture		**86,733**	55,940
Office equipment		**105,108**	117,222
Computer equipment		**330,850**	279,467
Scientific and technical equipment		**68,957**	53,260
Computer software		**207,193**	177,925
Property - buildings		**10,687**	10,687
7.2.3 Fees for services		**2,186,500**	2,291,348
Technical services		**781,061**	405,850
Administration services		**1,053,769**	763,386
Internal audit and services		**351,670**	1,122,112
7.2.4 Directors' emoluments	9	**464,433**	555,556
Service fee		**464,433**	555,556
Expenses		**-**	-
7.2.5 Staff costs		**35,805,785**	34,162,371
Salaries, allowances and annual payments		**31,613,353**	30,482,124
Included in staff costs are:			
Defined benefit plan expenses		**4,968,000**	4,657,000
- current service cost		**4,028,000**	3,440,000
- interest cost		**2,865,000**	2,666,000
- return on assets		**(3,302,000)**	(3,252,000)
- actuarial gain recognised		**(10,714,000)**	(351,000)
- reversal of prior year un-recognised post-employment benefit asset		**(10,167,000)**	(8,013,000)
- Unrecognised post employment benefit asset		**22,258,000**	10,167,000
Post-retirement medical benefit		**3,524,847**	3,405,371
Post-retirement medical benefit		**3,524,847**	3,405,371
Change in accounting estimate (Being change in past services cost, non-vested benefits)		**-**	-
7.2.6 Loss on scrapping of assets		**103,140**	-
7.2.7 Bursaries		**141,301**	125,286
7.2.8 Operating leases		**3,071,709**	1,914,621
Office building		**2,406,091**	1,215,826
Equipment		**636,396**	625,667
Vehicles		**29,222**	73,128

Notes to the financial statement for the year ended 31 March 2006

	2006 R	2005 R

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 aforegoing 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 National Nuclear Regulator Act project. The full income and expenditure associated with the project has been:

Income from Eskom	**21,719,057**	5,498,931
Expenditure		
(Foreign consultants)	**21,719,057**	5,498,931

9 Directors' and executive staff emoluments

For the year ended 31 March 2006	Months in service	Salaries/ fees R	Bonuses R	Pension contribu-tions R	Other contribu tions R	Total R
Non-Executive Directors						
Prof K Bharuth-Ram	12	61,479	-	-	-	61,479
Mr D Elbrecht	12	40,584	-	-	-	40,584
Rev P Grove	12	15,219	-	-	-	15,219
Dr T Lesoli	12	49,039	-	-	-	49,039
Ms TNM Mashanda	12	15,219	-	-	-	15,219
Ms TN Mgoduso	12	57,990	-	-	-	57,990
Adv BM Mkhize	12	77,786	-	-	-	77,786
Mr AHCH Motaung	12	47,348	-	-	-	47,348
Dr J M Stewart	12	82,859	-	-	-	82,859
		447,523	**-**	**-**	**-**	**447,523**
Independant member						
Ms SN Mabaso	7	16,910	-	-	-	16,910
		16,910	**-**	**-**	**-**	**16,910**
Executive Director						
Mr MT Magugumela (CEO)	12	756,611	-	-	-	756,611
		756,611	**-**	**-**	**-**	**756,611**
Executive staff						
Mr GA Clapisson	12	476,993	49,973	77,299	27,952	632,217
Mr J Mabaso	11	398,274	24,850	63,529	23,534	510,187
Mr KE Mkhize	7	270,380	6,638	42,747	22,093	341,858
Mr AE Muller	12	447,003	24,134	66,913	23,597	561,647
Mr CO Phillips	12	476,993	27,880	77,300	25,970	608,143
Dr AS Tsela	12	476,993	59,441	77,300	30,607	644,341
		2,546,636	**192,916**	**405,088**	**153,753**	**3,298,393**

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

Notes to the financial statement for the year ended 31 March 2006

		2006 R	2005 R
10 Future operating lease commitments			
10.1	Equipment	**555,400**	631,330
	Vehicles	**35,100**	20,797
	Property	**2,576,930**	2,400,867
	Up to 1 year	**3,167,430**	3,052,994
10.2	Equipment	**-**	1,262,660
	Vehicles	**73,685**	-
	* Property	**216,078**	4,993,804
	1 to 5 years	**289,763**	6,256,464

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

11 Related party transactions

		2006		2005	
Institution	Transaction type	Amount of transaction R	Amount received R	Amount of transaction R	Amount received R
Department of Minerals and Energy	State contributions	**5,417,000**	**5,417,000**	8,067,000	8,067,000
Department of Minerals and Energy	Government Grant	-	-	18,000,000	18,000,000

12 Notes to the cash flow statement

		2006 R	2005 R
12.1	**Cash generated by operations**		
	Operating surplus	**984,953**	2,013,684
	Adjustment for :	**3,439,389**	22,137,966
	Depreciation	**809,528**	694,501
	Net loss on disposal of obsolete assets	**103,139**	-
	Foreign exchange gain / loss	-	-
	Increase / (Decrease) in provision for leave pay and bonuses	**(95,278)**	211,412
	(Increase)/Decrease in provision for pension retirement benefit	-	-
	Increase / (Decrease) in provision for retirement medical benefit	**2,622,000**	2,541,000
	Increase / (Decrease) in provision for doubtful debts	-	691,053
	Increase / (Decrease) in defferred income	-	18,000,000
	Working capital changes	**6,978,949**	(1,587,749)
	(Increase) / Decrease in accounts receivable	**7,218,924**	(922,398)
	Increase / (Decrease) in accounts payable	**(239,975)**	(665,351)
		11,403,291	22,563,901
12.2	**Cash and cash equivalents**		
	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:		
	Cash at Bank	**50,983,624**	37,818,183

Notes to the financial statement for the year ended 31 March 2006

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 balance sheet 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 balance sheet date are:

31 March 2006

	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.

	2006 **R**	2005 R
13.4 Fair value of financial instruments		
At 31 March 2006 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:		
Assets		
Cash and cash equivalents	**50,983,624**	37,818,183
Trade and other receivables	**2,514,562**	9,733,486
Liabilities		
Trade and other payables	**1,884,142**	2,118,465

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

14.1 Nature and extent of Government Grant recognised

During October 2004, the Mine Environmental Management Directorate at the DME (Head Office) became aware of abandoned uranium mine sites in the Western Cape region. The Head Office of the DME received a report of abandoned uranium mines from the Regional Office of the Department of Water Affairs and Forestry (DWAF) in the Western Cape who, in turn, became aware of the problem via a PhD student of the University of the Free State. The PhD student was busy with geological studies in the area when he discovered the abandoned uranium mines and started making enquiries into who would be responsible for their rehabilitation.

The rehabilitation of the sites is a highly specific, technical task, which will require the attention of a multi-disciplinary team to be established in terms of the existing Co-operative Governance Agreement between the NNR and DME (Mine Health and Safety) to oversee all aspects of the project. Funds are also currently available to execute the rehabilitation of the sites.

Initial surveys of the area indicate that closure to standards approved by the NNR will amount to R18,000,000.00. This amount will be spent on the project over a period of two years.
These funds will be transferred to the NNR, "ring-fenced" for this task specifically under the existing Mine Health and Safety agreement with the NNR, which was published in the Government Notice Number 709 of 24 May 2002 and signed on 14 January 2003.
The NNR, in collaboration with the DME Mine Health and Safety Inspectorate, will establish a task team, composed of officials from the NNR, DME Mine Health and Safety Inspectorate, the DME Mine Environmental Management Directorate and the Nuclear Energy Directorate of the DME and other relevant Departments and institutions, to investigate, plan and execute this task in line with the agreement.

14.2 Unfulfilled conditions in terms of the Grant recognised

Government grant received	18,000,000
Expenditure recognised in the Income Statement	-
	18,000,000

Notes to the financial statement for the year ended 31 March 2006

15 Prior year restatement

The NNR has restated its comparative figures in respect of employee benefits to comply with IAS 19 par 58 and also to apply its accounting policy on employee benefits consistent with the current financial year

The aggregate effect of the restatement is as follows:	2006	2005
Balance sheet:		
Decrease in Retirement benefit asset	-	3,478,000
Decrease in Reserves (Accumulated surplus)	-	(3,478,000)
Income statement		
Increase/ (Decrease) in operating expenses	(3,478,000)	3,478,000
Increase/(Decrease) in operating surplus	3,478,000	(3,478,000)

16 Value-added statement	Notes	2006 R	2005 R
- Revenue		53,255,775	52,598,040
- Paid to suppliers for materials and services		(19,847,941)	(15,929,731)
- Interest earned		2,770,863	892,886
Total wealth created		36,178,697	37,561,195
- Salaries, wages and other benefits		31,613,353	30,482,124
- Providers of capital		-	-
- Net financing costs		-	-
- Dividends		-	-
- Central and local government		-	-
- Reinvested in the organisation to maintain and develop operations		4,565,344	7,079,071
- Depreciation and recoupments		809,528	694,501
- Retained income		3,755,816	6,384,570
Total wealth distribution		36,178,697	37,561,195
Value-added ratios			
- Number of employees		75	70
- Revenue per employee		710,077	751,401
- Wealth created per employee		482,383	536,589

THE MANAGEMENT STRUCTURE OF THE NNR

Executive Committee



Mr Maurice T Magugumela:
CEO



Dr Simanga Alex Tsela
Senior Manager: RSD



Mr Orion Phillips
Senior Manager: NTNS



Mr Guy Clapisson
Senior Manager: PRD



Mr Alan Muller
Acting: Assessment Coordinator



Mr KE Mkhize
Acting Senior Manager: CSS (CFO)

Management Committee



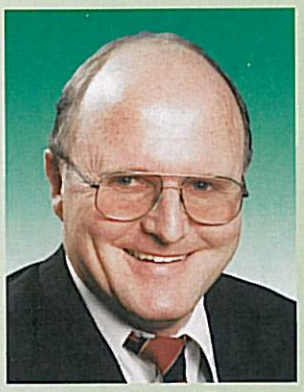
Mr Rodney Elk
Senior Legal Advisor



Mr Thiagan Pather
Manager: NTWP



Mr BP Nkhwashu Manager:
Communication & Liaison



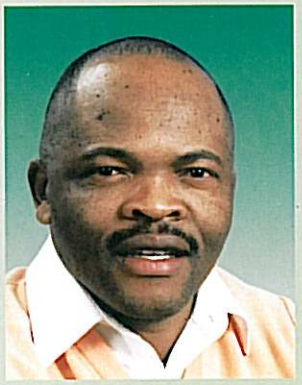
Dr Tim Hill
Manager:
Koeberg Programme



Mr Zama Zituta
Manager: RENS



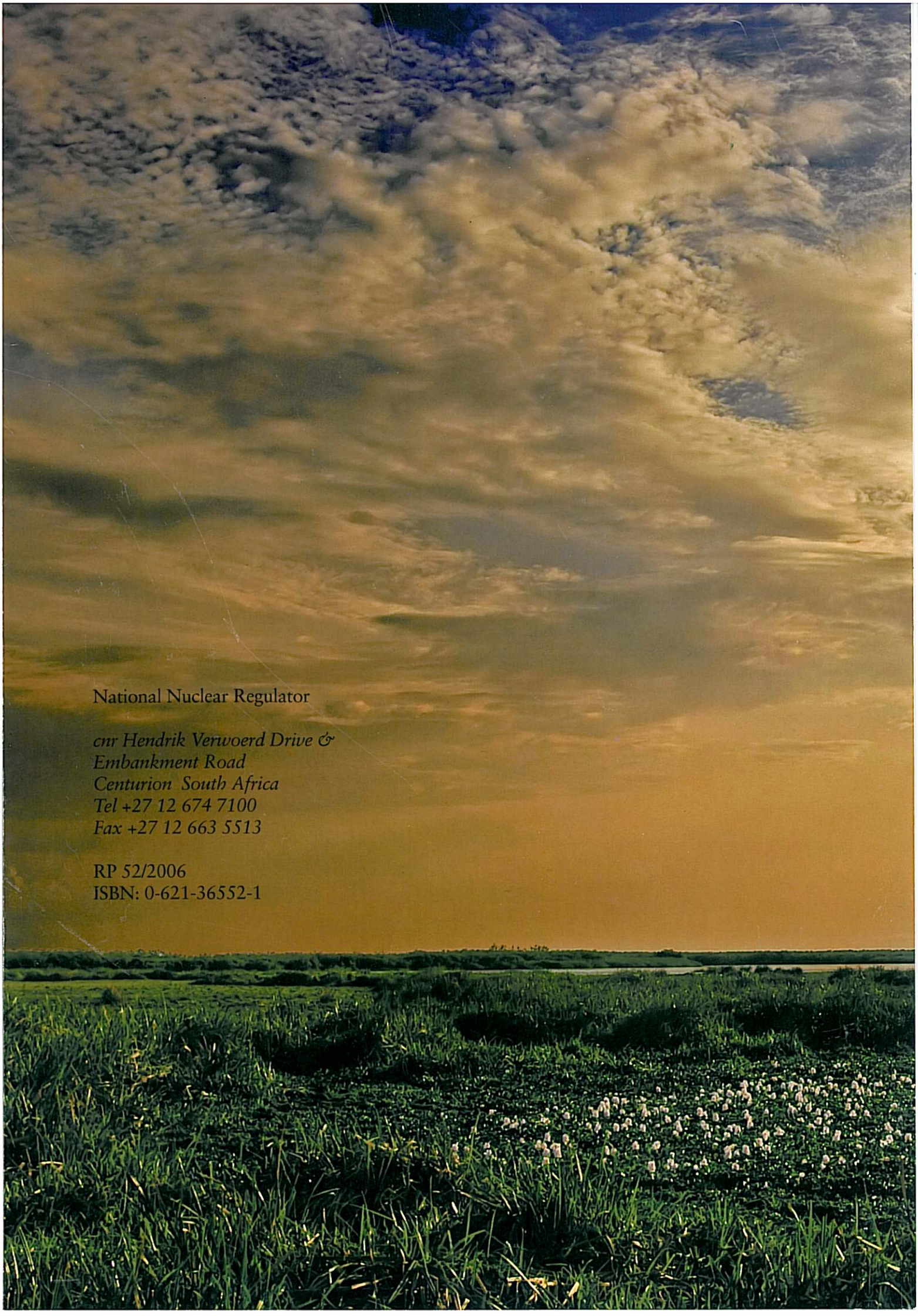
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Manager: RRD



Mr Jabu Mabaso
Manager: HR



Mr Peter Bester
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