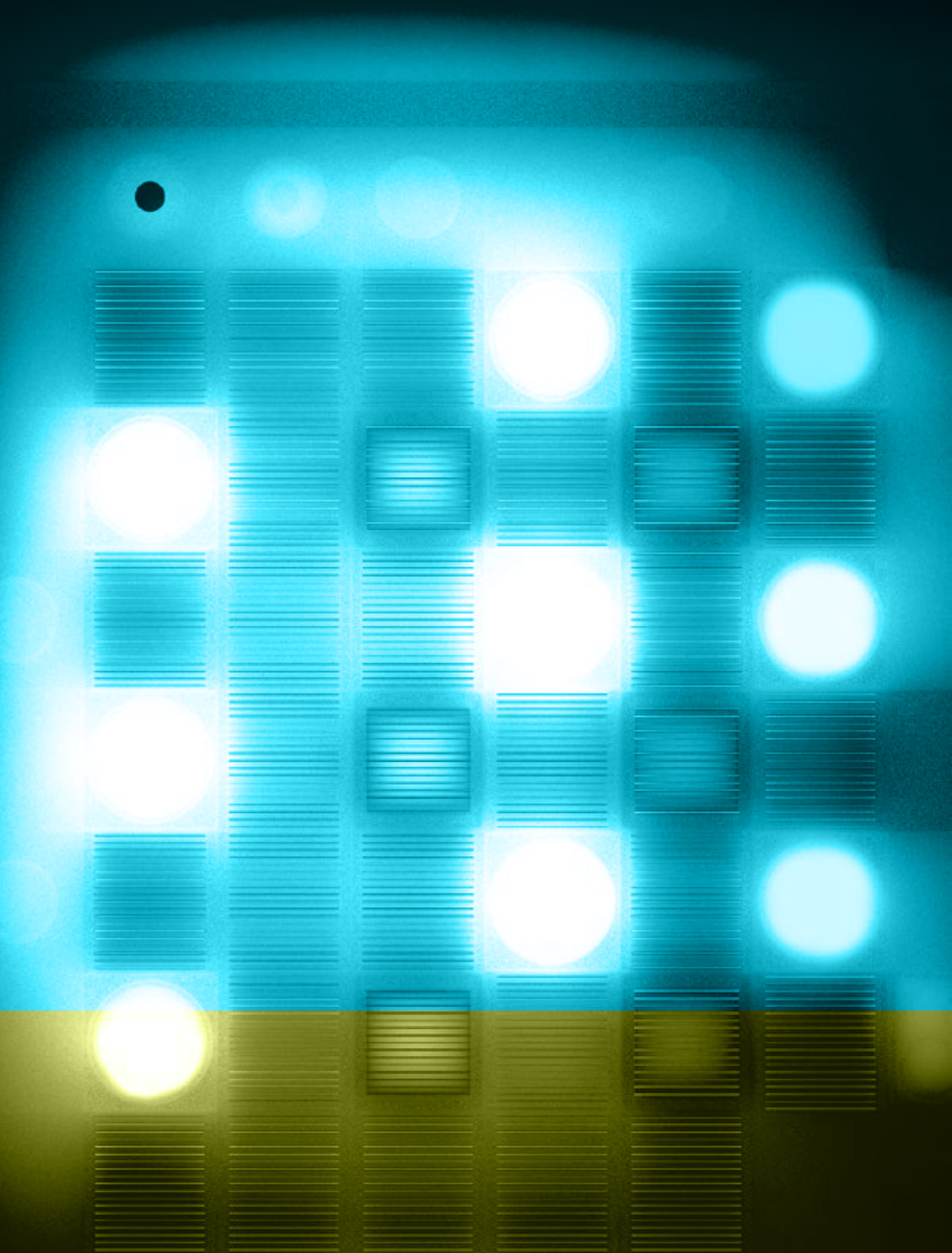


# 2017

INTEGRATED  
ANNUAL  
REPORT

South African Nuclear Energy  
Corporation SOC Limited





Neutron flux distribution in the core of the SAFARI-1 Research Reactor as calculated by the OSCAR-4 code developed by Necsa's Radiation and Reactor Theory group

# 00

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# 01

## General Information



Dawn at Necsa's Pelindaba Site Nestled in the Magaliesberg



## About this Integrated Annual Report

### Significant Frameworks Applied

Complementary national and international frameworks were used to evaluate material matters included in this report. The primary guidance is from the Treasury Guide on the Preparation of the Annual Report for Public Entities, April 2013. This was enhanced with the requirements from The International Integrated Reporting Council's International Integrated Reporting Framework, December 2013. Finally, care was exercised to address all material topics covered in the previous annual report.

Guidance was also taken from the King III Report on Corporate Governance, September 2009 and an assessment of compliance to the King Report is presented in the chapter on Governance. The performance of the Corporation in terms of sustainable development is examined in Chapter 7.

The reporting of Risk Management was informed by Treasury's Public Sector Risk Management Framework as well as the ISO 31000 Standard on Risk Management.

The Annual Financial Statements are prepared in accordance with the South African Statements of Generally Accepted Accounting Practice (SA GAAP), the Companies Act of 2008, as amended, and the Public Finance Management Act (PFMA) of 1999.

### Materiality Determination Process

Material matters for inclusion in this Integrated Annual Report are in large part prescribed by the Treasury Guide on the Preparation of the Annual Report for Public Entities. Within this framework, department heads are expected to contribute significant information concerning their areas of responsibility. Internal reviewers evaluated the report for overall balance and prioritisation of material issues.

### Scope and Reporting Boundary

This Integrated Annual Report covers the operations of the Necsa Group for the financial year beginning 01 April 2016 and ending 31 March 2017. The Necsa

Group - as financial reporting entity - consists of Necsa SOC Ltd and its subsidiaries, most notably NTP Radioisotopes SOC Ltd and Pelchem SOC Ltd. Other subsidiaries, as well as those of NTP Radioisotopes SOC Ltd and Pelchem SOC Ltd are reported on to the extent that they materially affect the Necsa Group. The organisational structure in terms of both Divisions and Programme Clusters is presented on pages 10 and 11.

### Structure of Report

This report has been significantly restructured compared to previous editions. This was necessitated in order to comply with the reporting frameworks discussed while improving the logical flow of information.

### Assurance Statement

The Board Audit and Risk Committee has evaluated the Annual Financial Statements as well as performance information for the year ended 31 March 2017. Additionally, the Committee reviewed the reports of the Group's Internal Audit Department, the Auditor-General's Management report and Management's response thereto, as well as any significant adjustments resulting and has recommended the approval of the Annual Financial Statements to the Board on page 110.

The Auditor-General of South Africa has audited the Financial Statements, performance against predetermined objectives and compliance with legislation of the Necsa Group, see pages 117 to 122.

### Directors' Responsibility and Approval

The Necsa Board of Directors acknowledge their responsibility to ensure the integrity of the 2016/17 Integrated Annual Report. The Board confirms that the report addresses all material issues and fairly presents the performance of the Necsa Group in accordance with the International Integrated Reporting Framework. The Board approved the 2016/17 Integrated Annual Report on page 109.

### Enquiries

Any enquiries regarding this report can be directed to the Chief Financial Officer at +27 12 305 5959 or to [zakes.myeza@necsa.co.za](mailto:zakes.myeza@necsa.co.za)

## Necsa's Profile

### Origins

On 13 August 1944, the United Kingdom first requested South Africa's assistance in obtaining uranium for the Manhattan project. Post World War II, interest in the extraction of uranium oxide continued from the USA and UK for both military and peaceful purposes. This led to the establishment in February 1946 of the "Uranium Research Committee" and in September 1948, the South African Atomic Energy Board (AEB) was constituted. Following international developments in nuclear power and radioisotope applications, construction of the National Nuclear Research Centre, including the SAFARI-1 Research Reactor, started at Pelindaba in 1961.

In 1970, the Uranium Enrichment Corporation (UCOR) was created and tasked to establish a nuclear fuel cycle programme at Valindaba, adjacent to the then Pelindaba site. The ostensible aim was to investigate the feasibility of nuclear explosives for peaceful applications. However, in 1977 the emphasis changed

to a strategic nuclear weapons deterrent capability and in November 1979 the first nuclear explosive device was equipped with highly enriched uranium.

Application of the nuclear fuel cycle technologies to civilian nuclear power generation started with construction of the "Z" Enrichment Plant in 1978. A fuel element manufacturing facility supplying Koeberg Nuclear Power Station started production in 1987.

Meanwhile, the Nuclear Energy Act of 1982 renamed the AEB to NUCOR and combined it with UCOR under the Atomic Energy Corporation (AEC) as controlling body. On 01 July 1985, the NUCOR and UCOR subsidiaries were combined into the AEC. Dismantling of the nuclear deterrent capability started in 1989 while the civilian nuclear fuel cycle services proved uncompetitive post 1994. A drive to industrialise technologies emanating from the nuclear programme was launched. In 1999, the current Nuclear Energy Act transitioned the AEC to the South African Nuclear Energy Corporation – Necsa.



Construction of the SAFARI-1 Research Reactor Started in 1961










## Name and Registration Number

The South African Nuclear Energy Corporation, trading as Necsa, is a State-owned Company (SOC), with registration number 2000/003735/06.

Holding Company:	Department of Energy
Country of Incorporation and Domicile:	South Africa
Physical and Business Address:	Elias Motsoaledi Street Extension (Church Street West) R104 Pelindaba Brits Magisterial District Madibeng Municipality North West Province 0240
Postal Address:	PO Box 582 Pretoria 0001 South Africa
Telephone Number:	+27 12 305 4911
Fax Number:	+27 12 305 3111
E-mail Address:	webmaster@necsa.co.za
Website Address:	www.necsa.co.za
External Auditors:	Auditor-General of South Africa, 300 Middel Street, New Muckleneuk, Pretoria
Bankers:	Nedbank Limited, 135 Rivonia Road, Sandown, Sandton
Company Secretary:	First Corporate Secretaries (Pty) Ltd, 1 Canterbury Crescent, Gallo Manor, Sandton

## Key Quantitative Information

Necsa SOC Ltd operates from its Pelindaba site covering 640 Ha inside its perimeter fence. It distributes products to more than 75 countries, including 50 through NTP SOC Ltd and 25 through Pelchem SOC Ltd.

	Group Employees	Group Revenue	Group Total Assets
2014/15	 1906 (1197 black)	 R1.9bn	 R2.8bn
2015/16	 1857 (1217 black)	 R2.1bn	 *R6.1bn
2016/17	 1912 (1332 black)	 R2.2bn	 *R6.1bn

\* This includes R2.7bn Decommissioning and Decontamination Stage 1 liability with equal receivable contra-provision.

## Abbreviations and Acronyms

<b>AGSA</b>	Auditor-General of South Africa
<b>ALARA</b>	As Low As Reasonably Achievable
<b>ANSTO</b>	Australian Nuclear Science and Technology Organisation
<b>ASME</b>	American Society for Mechanical Engineers
<b>BBBEE</b>	Broad-Based Black Economic Empowerment
<b>BBS</b>	Behaviour-Based Safety
<b>CHIETA</b>	Chemical Industries Education and Training Authority
<b>CTBTO</b>	Comprehensive Nuclear-Test-Ban Treaty Organisation
<b>D&amp;D Stage 1</b>	Decontamination, Decommissioning and Waste Management of Disused Historical Nuclear Facilities
<b>D&amp;D Stage 2</b>	Decontamination, Decommissioning and Waste Management of Operating Nuclear Facilities
<b>DIIR</b>	Disabling Injury Incidence Rate
<b>DoE</b>	Department of Energy
<b>DST</b>	Department of Science and Technology
<b>dti</b>	Department of Trade and Industry
<b>EXCO</b>	Executive Committee
<b>HF</b>	Hydrofluoric Acid
<b>IAEA</b>	International Atomic Energy Agency
<b>IRMC</b>	Internal Risk Management Committee
<b>ISI</b>	International Scientific Indexing
<b>ISO 9001</b>	Quality Management Systems - Requirements
<b>KPI</b>	Key Performance Indicator
<b>LEU</b>	Low Enriched Uranium
<b>Mo-99</b>	Molybdenum Isotope
<b>MTEF</b>	Medium-term Expenditure Framework
<b>Necsa (Company)</b>	South African Nuclear Energy Corporation SOC Limited
<b>Necsa Group</b>	Necsa Company and All Subsidiaries, Associated Entities and Joint Ventures in which it has a Material Ownership Interest
<b>NEHAWU</b>	National Education, Health and Allied Workers Union
<b>NIASA</b>	Nuclear Industry Association of South Africa
<b>NKP</b>	National Key Point
<b>NNR</b>	National Nuclear Regulator
<b>NQF</b>	National Qualifications Framework
<b>NRF</b>	National Research Foundation
<b>NRWDI</b>	National Radioactive Waste Disposal Institute
<b>NSI</b>	National System of Innovation
<b>NTeMBI</b>	Nuclear Technologies in Medicine and the Biosciences Initiative
<b>NuMeRI</b>	Nuclear Medicine Research Infrastructure
<b>NVC</b>	Necsa Visitor Centre
<b>OSCAR</b>	Overall System for the Calculation of Reactors
<b>PFMA</b>	Public Finance Management Act
<b>PSIF</b>	Pelindaba Public Safety Information Forum
<b>R&amp;D</b>	Research and Development
<b>SAFARI-1</b>	South African Fundamental Atomic Research Installation
<b>SHEQ</b>	Safety, Health, Environment and Quality
<b>SNPTC</b>	State Nuclear Power Technology Corporation (China)
<b>SOC</b>	State-owned Company
<b>TIA</b>	Technology Innovation Agency



## Necsa's Strategy

### Strategic Overview

**Our Vision** - To pursue nuclear technology excellence for sustainable social and economic development.

**Our Mission** - To develop, utilise and manage nuclear technology for national and regional socio-economic development through the following principal activities:

- ▶ Applied Research and Development;
- ▶ Commercial application of nuclear and associated technology;
- ▶ Fulfilling the state's nuclear obligations;
- ▶ Contributing to the development of skills in science and technology;
- ▶ Total commitment to health, safety and care for the environment;
- ▶ Developing and empowering our own human resource base; and
- ▶ Satisfying stakeholder expectations.

### Our Values

- ▶ Foundational Values – Integrity, Respect and Accountability;
- ▶ Business Values – Excellence, Innovation and Stakeholder Orientation; and
- ▶ People Values – Trust and People Orientation.

### Current Strategy

Necsa's current strategy is driven by the reality of constrained government funding, challenging commercial operating conditions and its transformation imperatives. In response, wide-ranging austerity measures have been implemented while transformation is a key factor in all staffing decisions.

Commercialisation opportunities for nuclear engineering and manufacturing capabilities through the Pelindaba Enterprises division are receiving high priority. New avenues of growth relating to the proposed Nuclear New Build are being pursued as detailed in Strategy Formulation below.

Necsa's Strategic Outcome Orientated Goals, as reviewed on page 25, are expressed in terms of Performance Indicators measured against targets and reported from page 26.

### Strategy Formulation

External stakeholder engagement with the aim of participating in national nuclear initiatives provides key

impetus to strategy formulation. In association with Necsa, Eskom issued a Request for Information (RFI) on 20 December 2016 for the "Nuclear New Build Programme". The RFI also includes front-end Fuel Cycle Facilities and a Multi-Purpose Research Reactor to be procured by Necsa as mandated by Cabinet. In order to inform future participation in the Nuclear New Build Programme, studies are being performed to evaluate options for establishment of local nuclear fuel cycle facilities.

Internal stakeholder engagement in a formal strategy development process was initiated in May 2016. The process focused on seven impact areas from which Necsa derives most of its value:

- ▶ Industrial Applications;
- ▶ Medical Diagnostics and Therapy;
- ▶ Materials Beneficiation;
- ▶ Nuclear Waste;
- ▶ Non-Proliferation of Nuclear Materials;
- ▶ Nuclear Manufacturing; and
- ▶ Clean Energy.

The resulting document, Necsa Strategic Initiatives (2017-2026) dated 20 February 2017, was reviewed by the Executive Management Committee and approved by the CEO. Ten short-term (2017 to 2019) revenue generating opportunities are prioritised as well as ten medium- to long-term opportunities (2020 to 2023 and beyond).

The document was presented to the Necsa Board of Directors at a strategy workshop on 26 and 27 January 2017. The workshop reviewed Necsa's business model, challenges and opportunities as well as the key turnaround initiatives required to ensure Necsa's sustainability. At the Board meeting of 24 February 2017, the Necsa corporate plan and strategy was formally approved.

### Necsa's Mandates

The South African Nuclear Energy Corporation is listed as a Major Public Entity in PFMA schedule 2. The Company's legislative mandate is contained in Section 13 of the Nuclear Energy Act, No. 46 of 1999, which states that its main functions are to:

- ▶ Undertake and promote research and development in the field of nuclear energy and radiation sciences and technology and, subject to the Safeguards Agreement, to make these generally available;

- ▶ Process source material, special nuclear material and restricted material and to reprocess and enrich source and nuclear material; and
- ▶ Co-operate with any person or institution in matters falling within these functions, subject to the approval of the minister.

Section 14 of the Nuclear Energy Act outlines the ancillary powers and functions of the Corporation. The act further regulates the Corporation's financial accountability, acquisition and possession of nuclear fuel, nuclear and related material as well as the import and export thereof. The Nuclear Energy Act also prescribes measures regarding the management of radioactive waste and the storage of irradiated nuclear fuel.

Additional responsibilities are conferred on Necsa by the Minister of Energy such as those concerning Decommissioning and Decontamination as well as LEU Fuel Conversion.

The South African Nuclear Energy Policy of 2008 directs Necsa to investigate the entire nuclear fuel cycle with the aim of re-establishing viable fuel cycle facilities. In the Integrated Resource Plan (IRP 2010-2030) it is envisaged that Necsa will play an integral role in the Nuclear New Build Programme to generate 9,600 MW of power from nuclear sources by 2029. This was given effect by the November 2016 Cabinet decision which designated Necsa as the Owner, Operator and Procurer for the Nuclear Fuel Cycle and Multi-Purpose Research Reactor.

In addition to these functions, Necsa is responsible for international nuclear obligations such as the Safeguards Agreement and additional protocol with the International Atomic Energy Agency in support of the Nuclear Non-Proliferation Treaty. Necsa is also the competent authority in South Africa in terms of the international conventions on Early Notification of a Nuclear Accident, Assistance in the Case of a Nuclear Accident or Radiological Emergency and Physical Protection of Nuclear Material.

## Business Model

The figure below depicts Necsa's business model which leverages Necsa's knowledge base, legacy infrastructure investment and ongoing R&D in the fulfilment of the State's Nuclear Obligations and

pursuit of Commercial Ventures. Uniquely among the major public entities, Necsa needed to significantly repurpose its strategic legacy investment to the benefit of the new South Africa. This includes core facilities such as the SAFARI-1 Research Reactor being used both for research and radioisotope production. Financial inputs in the form of a government grant and commercial income serve to sustain the company's activities.

In terms of the Integrated Reporting Framework, the above represent the financial, manufactured and intellectual capitals serving as inputs to Necsa's business model.

Activities serving primarily to fulfil Nuclear Obligations are concerned with Nuclear Waste Management, Nuclear Safeguards, Proliferation Prevention as well as Education and Training.

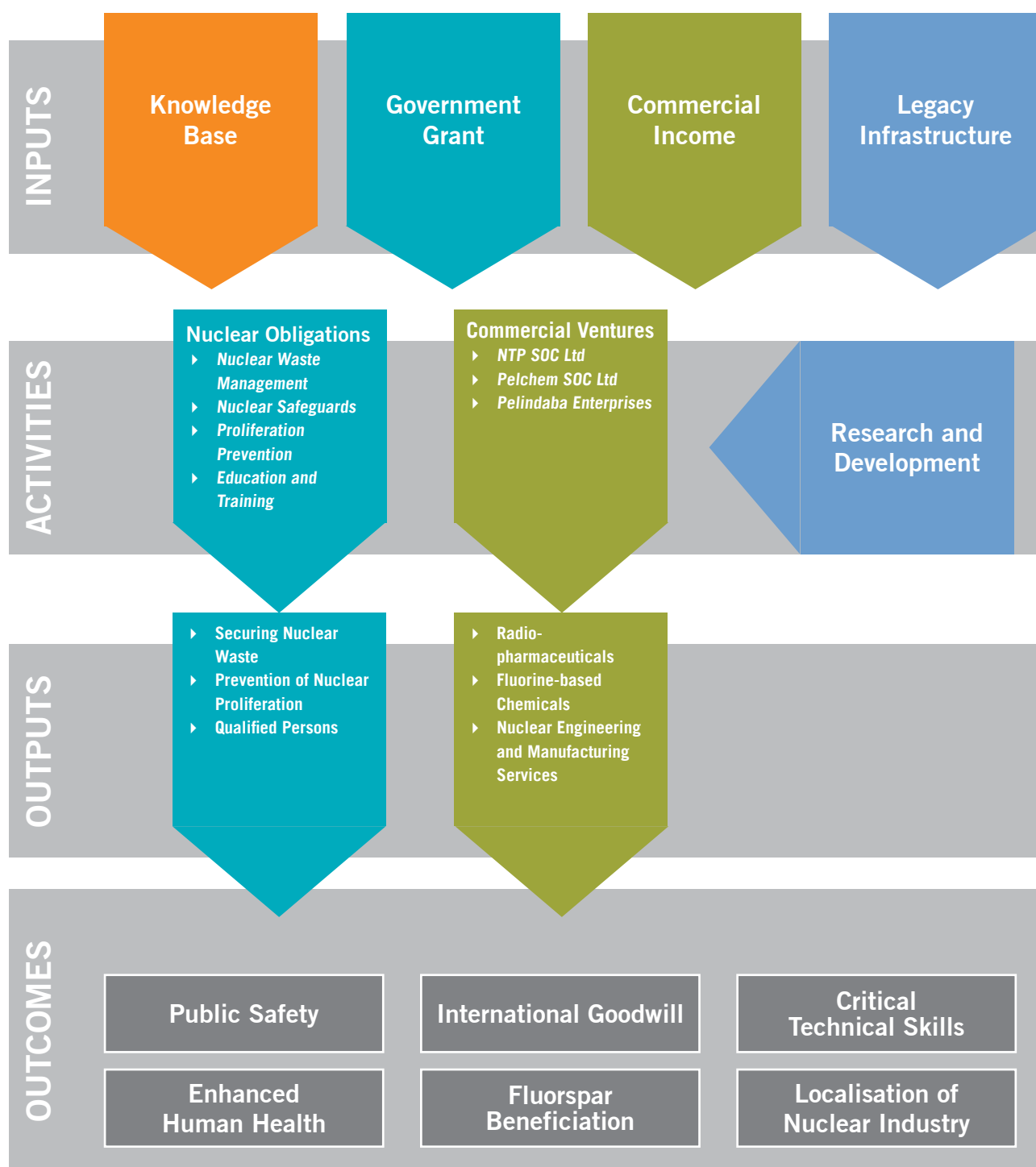
Activities mainly aimed at Commercial Income involve NTP SOC Ltd, Pelchem SOC Ltd and Pelindaba Enterprises. NTP produces a range of radiation-based products and services for healthcare, life sciences and industry while Pelchem supplies fluorine-based products into various industries. Pelindaba Enterprises serves as incubator intended to commercialise nuclear engineering and manufacturing Services.

In terms of the Integrated Reporting Framework, the outcomes effected by this model improves the country's stock of human and intellectual capital, preserves the country's natural capital, the health of its human capital and enables manufactured capitals in industry. The fulfilment of nuclear obligations builds relationship capital in the form of international goodwill.

Opportunities being exploited in this business model include Necsa's position as the only South African entity legally allowed to process nuclear materials as well as NTP's access to an integrated radioisotope supply chain from source material to waste management. Future opportunities relate to the nuclear new build and the growing international market for nuclear decontamination and waste management services.

Risks affecting Necsa's business model include the age of facilities like the SAFARI-1 Research Reactor, declining government grant as well as competitive dynamics in its commercial markets.

## Representation of Necsa's Business Model



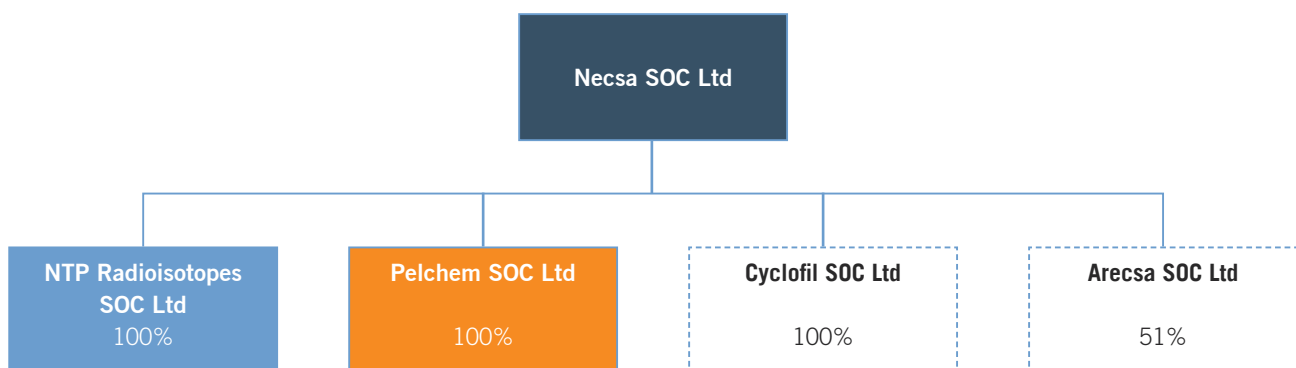
## Organisational Structure

The Necsa Group structure is depicted below followed by a detailed elaboration of the corporate structure of Necsa SOC Ltd. The strategic view of the Group in terms of reporting Programme Clusters is also indicated.

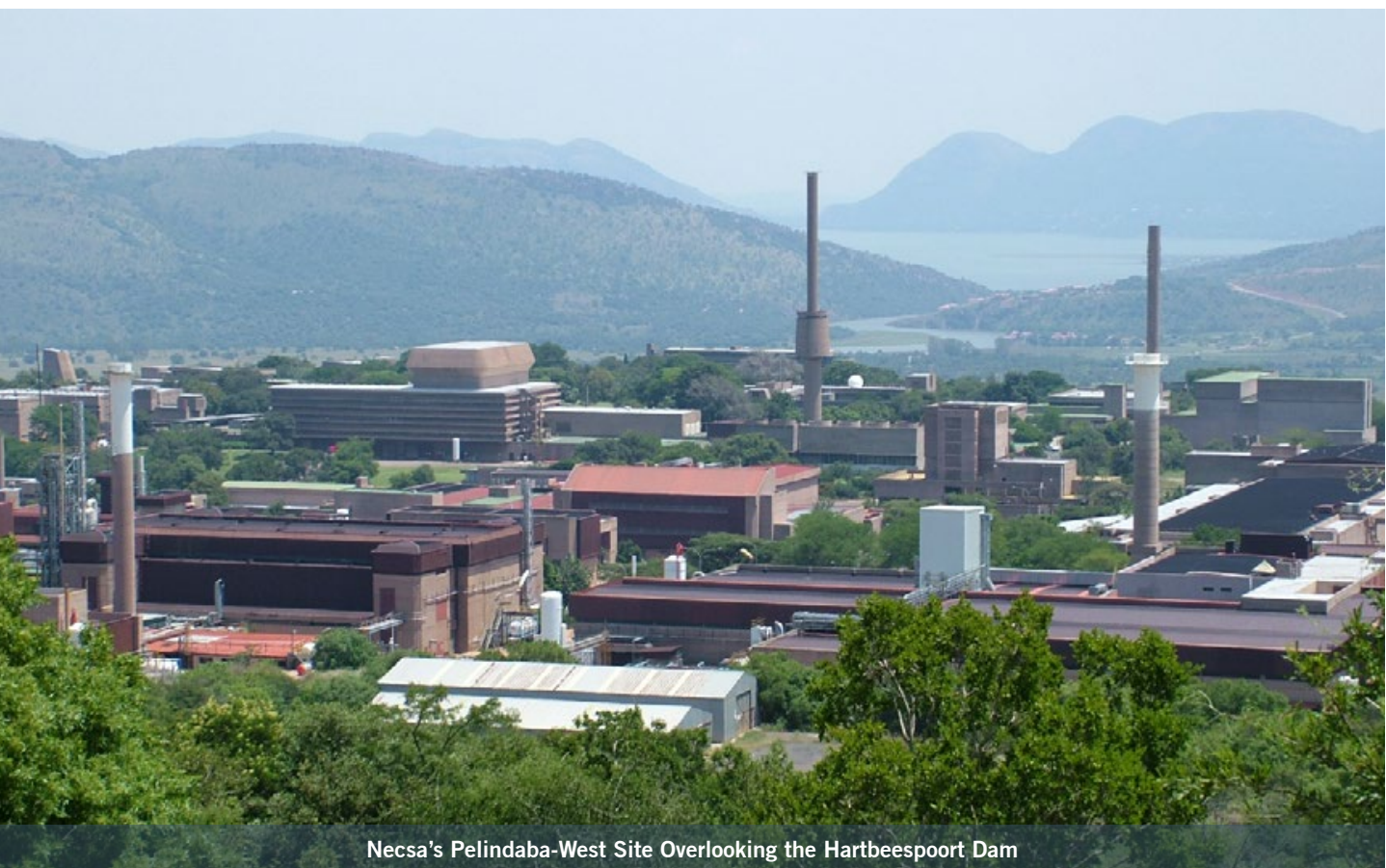
### Necsa Group Structure

The structure of the Necsa Group is depicted below and consists of four subsidiaries of which both Cyclofil SOC Ltd and ARECSA SOC Ltd are dormant. Subsidiaries of NTP Radioisotopes SOC Ltd and Pelchem SOC Ltd are shown on pages 68 and 74 respectively.

### Necsa Group Structure



Subsidiary results are published separately in the addenda entitled: “Necsa Group Subsidiary Results - 2017”



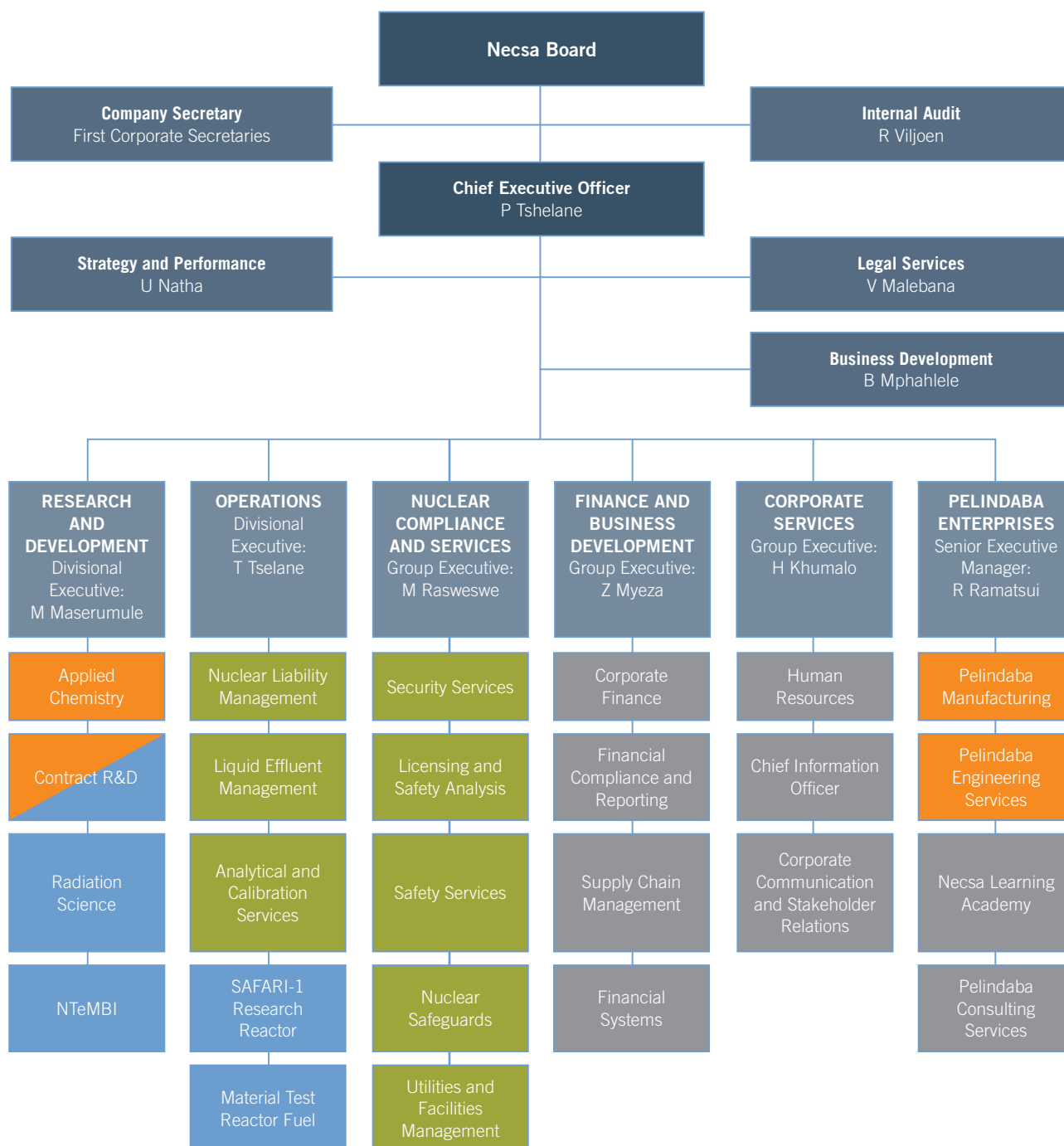
Necsa's Pelindaba-West Site Overlooking the Hartbeespoort Dam



## Necsa's Corporate Organisational Structure

The organisational structure below depicts the effective reporting relationships which existed in the reporting period. Departments are coloured in accordance with the legend at the bottom to indicate which of the four strategic Programme Clusters they belong to.

### Necsa Corporate Structure



### Programme Cluster Legend

<span style="color: orange;">■</span>	Nuclear Energy Programme
<span style="color: blue;">■</span>	Radiation Products and Services Programme
<span style="color: green;">■</span>	Necsa as a Host of Nuclear Programmes
<span style="color: grey;">■</span>	Cross-Cutting Programme

# 02

## Chairperson's Foreword



**Dr KR Kemm**  
Chairperson of the Board

*“Something to be proud of is the highly-skilled artisan training provided by Necsa. No nuclear technology can progress without the valuable input of a cadre of skilled artisans.”*

### Introduction

The Necsa Group is a world-leading nuclear technology organisation which continues to add significant value to South Africa through the environmentally responsible application of a range of nuclear technologies. It therefore gives me great pleasure to present to all our stakeholders the Necsa Integrated Annual Report, for the fiscal year ended 31 March 2017.

### Overview

As Chairman, I have led the Board in further enhancing our corporate governance practices and organisational sustainability, while conducting the Group's business with integrity. The Necsa subsidiaries are governed by independent boards of directors with a disciplined reporting structure, ensuring that suitable governance practices are applied and that the holding company's board is suitably informed.

In December 2016, on the recommendation of the Board, Cabinet announced the reappointment of Mr Phumzile Tshelane as Chief Executive Officer for a further three years. The reappointment of Mr Tshelane has provided a platform of stability and has solidified the strategic direction of Necsa. I am also pleased that we were able to strengthen the Necsa Board with the addition of Dr GJ Davids and Mr MS Sekgota.

The Necsa strategy assesses the return on investment of public funding and has identified the following key impact areas:

- ▶ Industrial Applications;
- ▶ Medical Diagnostics and Therapy;
- ▶ Materials Beneficiation;
- ▶ Nuclear Waste Handling;
- ▶ Non-Proliferation of Nuclear Materials;
- ▶ Nuclear Manufacturing; and
- ▶ Clean Energy.

### Overall Performance

Necsa continued to provide for South Africa's nuclear obligations in terms of international safeguards and nuclear waste management without incident, thereby maintaining the excellent safety record of South Africa's place in the international nuclear industry.

The Group's financial performance was boosted by the NTP subsidiary having an excellent year with net profit 19% ahead of budget. Necsa corporate external sales also increased in comparison with the previous financial year, although still below target. As a world leader in the field of nuclear medicine we are setting ambitious expansion goals to consolidate our dominance even further.

The Pelchem subsidiary recorded a loss, attributable to historic undercapitalisation which in turn compromised plant availability. Certain Pelchem products are also produced at an uncompetitive scale in some markets. However, the products are of extreme strategic value to the country since Pelchem is the only fluorochemical producer in the southern hemisphere. We are currently carrying out an examination of the consolidation and expansion of Pelchem activities.

Necsa continued to carry out valuable scientific investigations and development in support of a range of nuclear applications. Research papers were published internationally and Necsa specialists contributed to international conferences and study groups, thereby enhancing the international image of South Africa.

Something to be proud of is the highly-skilled artisan training provided by Necsa. No nuclear technology can progress without the valuable input of a cadre of skilled artisans. Necsa is acutely aware of this and is concentrating on these activities to provide suitable skills for nuclear power development. Necsa has continued to progress in transformation with black employees now constituting 70% of Necsa Group staff.

### Strategic Relationships

A network of key strategic relationships in the nuclear and related technology domains is of vital importance. Necsa has continued to support the National System of Innovation through initiatives such as its partnership with iThemba LABS and NTeMBI. Involvement was also fostered in strategic international collaborative programmes relating to the application of nuclear and radiation science and technology.

We are extremely proud that Mr Yukiya Amano, International Atomic Energy Agency Director-General has appointed Necsa CEO Phumzile Tshelane to its 20-member Standing Advisory Group on Nuclear Energy. Mr Tshelane's two-year appointment was endorsed by the Departments of Energy and International Relations and Cooperation. This appointment clearly indicates that South Africa's more than 70 years' experience of nuclear technology and wisdom is valued at an international level.

### Challenges

The Board recognises that Necsa has been experiencing increasing pressure on its financial, human and infrastructure resources due to a combination of rising operating costs, a declining government grant in real terms and pressure on its non-grant revenue streams.

### Outlook

Necsa welcomes government's determination to explore the potential of nuclear power as a clean and sustainable source of electricity. According to the Integrated Resource Plan 2010-2013, a total of 9,600 MW of power is to be generated from nuclear sources by 2029. The Nuclear New Build Programme will develop skills, create sustainable jobs, and contribute to dynamic economic growth in South Africa and the wider African continent. Necsa is actively working towards fulfilling its role in nuclear power development, which will contribute to national growth, infrastructure development and job creation at all levels.

We anticipate that global conditions will be fluid. Such a state of affairs provides challenges, but it also provides great opportunities. The Board will continue to urge expansion into available markets while exercising the necessary caution.

### Acknowledgements

Despite significant economic challenges, Necsa has grown stronger as a company, thanks in large part to the dedication of our people, at all levels of the organisation.

On behalf of the Board, I also wish to express our sincere appreciation to Mr Phumzile Tshelane and his Executive Team for their continued stewardship of the Necsa Group this past year.

The Board acknowledges the support and guidance from our Executive Authority, the Department of Energy.

### Conclusion

The South African nuclear industry is on the brink of a new era of development. Necsa remains robust and ready to tackle the demands to be placed on it. Necsa is also moving towards the development and expansion of new opportunities and markets internationally.



**Dr KR Kemm**  
Chairperson of the Board

# 03

## CEO's Overview



**Mr GP Tshelane**  
Chief Executive Officer

*“The Necsa Group, through NTP, is among the top three producers in the world of lifesaving Mo-99 radioisotopes used to diagnose diseases such as cancer.”*

### Introduction - English

During the reporting period, the local manufacturing sector continued to reflect the global economic malaise with specific impacts on Pelindaba Enterprises and Pelchem. This aggravated the severe financial constraints on Necsa due to its comparatively high fixed cost base.

In spite of this, Necsa met or exceeded seven of its twelve key performance indicators. The most noteworthy successes include NTP's net profit, SAFARI-1 operational availability, the very low public radiation dose impact and increase in Black technical staff. Two of the performance indicators missed relate to the financial performance of the Pelchem subsidiary and Necsa corporate. The most troubling underperformance was deterioration in the Disabling Injury Incidence Rate.

Key turnaround initiatives required for Necsa's sustainability have been identified as part of a recent strategic planning process focusing on seven impact areas. With a view to its implementation, the Necsa Executive Management Committee was capacitated with four appointments: Ms Hlengiwe Khumalo as Group Executive-Corporate Services, Ms Mosa Rasweswe as Group Executive-Nuclear Compliance and Services, Mr Ruby Ramatsui as Senior Executive Manager-Pelindaba Enterprises and Mr Ivan Radebe, the new Managing Director of Pelchem.



## Matseno – Setswana

Ka nako ya pegelo ya tirafatso ya kgwebo, bodiredi jwa go ntsha dikuno jwa selegae bo ne jwa tswela go bontsha kwelo tlase ya moruo wa lefatshe le ka moo e amileng kgwebo ya Pelindaba Enterprises le Pelchem. Se se ne sa dira gore maemo a, a boima a madi a fetelele mo go Necsa kantlha ya di tuelo tse di kwa godimo tsa go tsamaisa kgwebo.

Kwa ntle ga se, Necsa e fitlhelletse kgotsa e fitile matshwao a le supa a go lekola tiragatso ya kgwebo gotsa mo a leng some le bobedi. Phitlhelele e kgolo e bonagetse mo pononolo dikuno e ntle e e diragaditsweng ke NTP, le kgonagalo ya go tswetsa pele kgwebo ya SAFARI 1 kwantle le kgaogo, tshwaetso ya seelo se se kwa tlase sa marang a nuclear mmogo le koketsego mo badiring ba setegeniki ba bantsho. Matshwao a tiragatso a le mabedi a asa jeseng diwelang ke tiragatso e e kwa tlase ya dikuno tsa madi ya lekala la Pelchem le Necsa ka kakaretso. Re sa le foo, bodiragatsi jo bo kwa tlase bo bonagetse gape mo maitlhomong a go fedisa ditirafalo tse di kgoreletsang tsa dikgobalo mo badiring ba lekala la Necsa ka kakaretso.

Maiteko a a botlhokwa a go fetola seemo se se kwa tlase sa kgwebo sa Necsa a tlhagisitswe jaaka karolo ya maitlomo a seshweng mo mafapheng a le supa a kgwebo ya Necsa. Ka pono ya go tsenya mo tirisong maiteko a, botsamaisi jwa Necsa bone jwa natlafatsiwa ka tsela e e latelang: Mme Hlengiwe Khumalo jaaka mokhudu thamagala wa Corporate Services; Mme Mosa Rasweswe jaaka Mokudu thamaga wa Nuclear Compliance; Rre Ruby Ramatsui jaaka mookamedi-mogolwane wa Pelindaba Enterprises le Rre Ivan Radebe jaaka mookamedi mogolo wa Pelchem.

## Isingeniso - isiZulu

Phakathi nenkathi yokubika, umkhakha wokukhiqiza wendawo waqhubeka ubonakalisa ukukhathazeka komnotho emhlabeni wonke kanye nemithelela ethile ePelindaba Enterprises nasePelchem. Lokhu kwandisa izinkinga ezinkulu zezezimali ku-Necsa ngenxa yezindleko zayo ezilinganiselwe eziphezulu.

Naphezu kwalokhu, uNecsa wadlula izinkomba zokusebenza esiyisikhombisa kuleziyishumi nambili eziyisihluthulelo. Impumelelo ephawulekayo ihlanganisa inzuzo ye-NTP, ukutholakala kokusebenza kwe-SAFARI-1, umthelela ophansi kakhulu wokushisa imisebe yomphakathi kanye nokwanda kwabasebenzi abamnyama bezobuchwepheshe.

Izinkomba ezimbili zokusebenza ezingabanjwanga zihambisana nokusebenza kwezezimali kumaphiko eNecsa iPelchem neNecsa Corporate. Okukhathaza kakhulu ukwehluleka kokwehla kwezinga lokulimala okukhubazayo kwabasebenzi.

Izinyathelo zokuguqulwa okubalulekile ezidingekayo ekuqinisekiseni kukaNecsa zikhonjwe njengengxenywe yenqubo yamuva yokuhlela amasu egxile ezindaweni eziyisikhombisa zomthelela. Ngenhloso yokuqaliswa kwayo, iKomidi Elilawulayo leNecsa lakhuliswa ngokuqashwa kwabaphathi abane - uNksz Hlengiwe Khumalo njengeQembu Elilawulayo kuMnyango weCorporate Services, uNksz Musa Rasweswe njengeQembu Elilawulayo-kuMnyango weNuclear Compliance and Services, uMnu. Ruby Ramatsui njengoMphathi Omkhulu wePelindaba Enterprises, NoMnu. Ivan Radebe ongumcondisi ophethe iPelchem.

## Inleiding - Afrikaans

Gedurende die rapporteringsperiode het die plaaslike vervaardigingssektor steeds die wêreldwye ekonomiese afswaai gereflekteer met spesifieke impak op Pelindaba Ondernemings en Pelchem. Dit het die reeds stram finansiële beperkings waaronder Necsa gebuk gaan vererger weens die relatiewe hoë vaste koste basis.

Tenspyte daarvan het Necsa sewe van sy twaalf sleutel prestasie aanwysers bereik of oortref. Die mees noemenswaardige suksesse sluit in die netto wins van NTP, SAFARI-1 se operasionele beskikbaarheid, die baie lae radioaktiewe stralingsdosis waaraan die publiek blootgestel is en die toename in Swart tegniese personeel. Twee van die prestasie aanwysers wat nie gehaal is nie, hou verband met die finansiële prestasie van die Pelchem filiaal en Necsa korporatief. Die mees kommerwekkende onderprestasie was die styging in die voorkoms van ongeskiktheidsbeserings (DIIR).

Sleutelinisiatiewe wat geneem moet word vir Necsa se volhoubaarheid is geïdentifiseer as deel van 'n onlangse strategiese beplanningsproses wat fokus op sewe impak areas. Ter implementering daarvan, is vier aanstellings tot die Necsa Uitvoerende Bestuurskomitee gemaak - Me Hlengiwe Khumalo as Groep Uitvoerende Bestuurder-Korporatiewe Dienste, Me Mosa Rasweswe as Groep Uitvoerende Bestuurder – Kernvoldoening en Dienste, Mnr Ruby Ramatsui as Senior Uitvoerende Bestuurder - Pelindaba Ondernemings en Mnr Ivan Radebe as Besturende Direkteur van Pelchem.

## Achievements by Programme Cluster

### Nuclear Energy Programme Cluster

While Pelchem is the Necsa Group custodian of fluorine technology vital to the re-establishment of the Nuclear Fuel Cycle, its operating loss of R35.5m is concerning. This is attributable to unreliable plant as well as declining demand for some of its products. However, there are good prospects to rationalise offerings and exploit new growth opportunities.

The request for information regarding new nuclear power plants, a new research reactor as well as nuclear fuel cycle issued on 27 December 2016 jointly by Eskom and Necsa, is a first step on the long road to growing South Africa's nuclear industry.

### Radiation Products and Services Programme Cluster

The NTP Group profit after tax was R202.6m, substantially above target. It was supported by another excellent performance from the SAFARI-1 Reactor providing 11 more operational days than planned. The Necsa Group, through NTP, is among the top three producers in the world of lifesaving Mo-99 radioisotopes used to diagnose diseases such as cancer. NTP's production capacity was enhanced while strides were made in ensuring a new product pipeline including the GluCAB™ molecular compound. The Nuclear Medicine Research Infrastructure (NuMeRI) project was approved as part of the Department of Science and Technology's South African Research Infrastructure Roadmap launched in October 2016.

Further evidence of Necsa's excellence in the area of Radiation Science was the release by Necsa's Radiation and Reactor Theory group of OSCAR-4 as the official code system for SAFARI-1 Reactor reload and core-follow calculations, also utilised by three international clients.

### Necsa as Host of Nuclear Programmes Cluster

Although marginally short of target, execution of the Decommissioning and Decontamination programme saw a significant improvement on the previous year. Emanating from this work, Necsa's Mobile Hot Cell remains one of the only safe mechanisms in the world for the handling of disused high-activity sealed radioactive sources. During the year, sources from 87 teletherapy units were recovered in Brazil.

However, the increase in the Disabling Incident Injury Rate to 1.1 is unacceptable and is providing further impetus for our efforts to enhance Necsa's Safety Culture.

### Cross-Cutting Programmes Cluster

Although Necsa Corporate Sales continued to grow, it still fell substantially below target mainly due to the Operations Division not achieving budgeted sales and Pelindaba Enterprises Divisions recording an operating loss of R77.9m.

Innovation disclosures and publication of refereed research publications again exceeded targets. This includes work in neutron diffraction for non-destructive investigation of advanced materials and X-ray tomography that resulted in the first known identification of cancer in early hominins.

Technical staff as percentage of total staff fell slightly below target but Black technical staff continued their upward trajectory reaching 58.5% of all technical staff.

Necsa continued to produce a pipeline of skills for South Africa across the spectrum from artisans to graduates to post-doctoral candidates. The Nuclear Skills Development Centre trained 135 apprentices and the first Toolmaker Trade Test Centre in South Africa was accredited at Necsa. As part of an agreement between Necsa and SNPTC of China, 48 South Africans received training in Shanghai from 06 June to 08 July 2016.

International collaboration continued through participation in a variety of IAEA meetings, expert missions and technical co-operation programmes. Necsa engaged at high level in the African Economic Platform hosted by the African Union Foundation in Mauritius in March 2017.

## Outlook

Sluggish economic growth is expected to continue not only negatively impacting commercial revenues but also constraining the support that can be provided by Government. In addition, political and legal challenges to the growth of the South African nuclear industry will need to be navigated.

## Highlights of Future Plans and Projects

The Necsa Group's primary focus going forward is for all businesses and functions to operate sustainably. Specific growth prospects for the near future include:

- ▶ Nuclear New Build Programme in which Necsa will be instrumental in localisation and the nuclear fuel cycle;
- ▶ New research reactor project to replace SAFARI-1;
- ▶ Pelchem's continued progress with product line rationalisation, plant refurbishments and the Ketlaphela project;
- ▶ New NTP production capacity and business initiatives;
- ▶ Demonstration of the Uranium recovery process proven on laboratory scale;
- ▶ Expansion of the NTeMBI network and radiopharmaceutical clinical trials; and
- ▶ Further leveraging Necsa's intellectual property portfolio by the Business Development department.

## Acknowledgements

I wish to express my sincere gratitude to the entire Necsa Group staff for their efforts, the Office of the CEO for unfailing support, members of EXCO for their commitment and the Necsa Board for its sound guidance.

## Conclusion

The South African Nuclear Energy Corporation will continue on its challenging but exciting mission to bring the benefits of nuclear technologies and nuclear power to the people of our country.



**Mr GP Tshelane**  
Chief Executive Officer

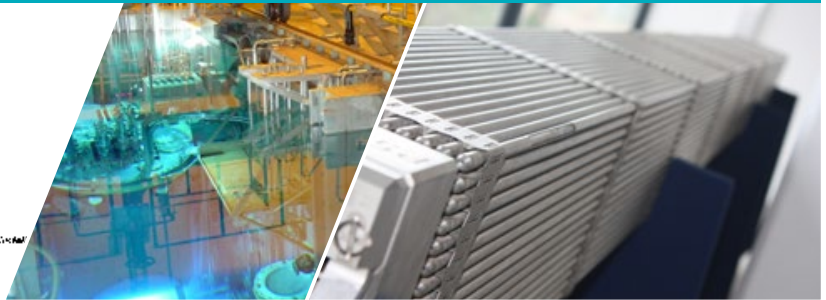
# 04

## Highlights of 2016/17

### Issuing of Nuclear Request for Information



REQUEST FOR INFORMATION  
PROCESSED BY  
ESKOM HOLDINGS SOC. LTD.  
FOR  
THE NUCLEAR ATOM ENERGY RESEARCH AND DEVELOPMENT



On 20 December 2016 Eskom issued, in collaboration with Necsa, a request for information regarding new nuclear power plants, a research reactor as well as nuclear fuel cycle functions. Necsa will play a pivotal role in the localisation of the nuclear build programme based on its extensive experience of the nuclear fuel cycle and operation of the SAFARI-1 Research Reactor.

### Developing Highly Skilled People



Necsa continued to produce a pipeline of skills for industry through training and trade testing, internships, graduate-in-training and study assistance schemes. No fewer than 135 apprentices were trained with 304 trade tests and 296 trade test preparations conducted. The first Toolmaker Trade Test Centre in South Africa was accredited at Necsa in June 2016.



03

### Global Supplier of Disease Detecting Radiopharmaceuticals



Through NTP, the Necsa Group is among the top three producers in the world of critical radioisotopes that are used to diagnose diseases such as cancer. NTP has grown its market share for Mo-99 in the past year through continued investment and by working with its partners to cover the supply gap after the exit of the leading Canadian supplier.

04

### Nuclear Skills Training in China



As part of the South African Civil Nuclear Energy Training Agreement between Necsa and SNPTC of China, 48 South Africans received training at the SPIC Talent Centre in Shanghai from 06 June to 08 July 2016. This included the areas of Engineering Design, Manufacturing Technology, Construction Technology, Commissioning and Start-Up Technology, Project Management and Procurement Technology.

05

### International Safeguarding of Disused Radioactive Sources



Necsa's Mobile Hot Cell remains one of the only safe and reliable mechanisms in the world for the handling of disused high-activity sealed radioactive sources. Following 5 previous missions around the world, Necsa was contracted to recover high-activity sources from 87 teletherapy units in Brazil. These were subsequently dispatched to destinations in the USA and to Germany for recycling.

## Transformation and Representivity

06



Black employees now constitute 70% of Necsa Group staff with black technical staff as percentage of all technical staff amounting to 59%, well in excess of the 55% target set. Two African female Group Executives, an African male Senior Executive Manager and an African male Managing Director were added to the Executive ranks.

## Revealing Hidden Properties with Radiation

07

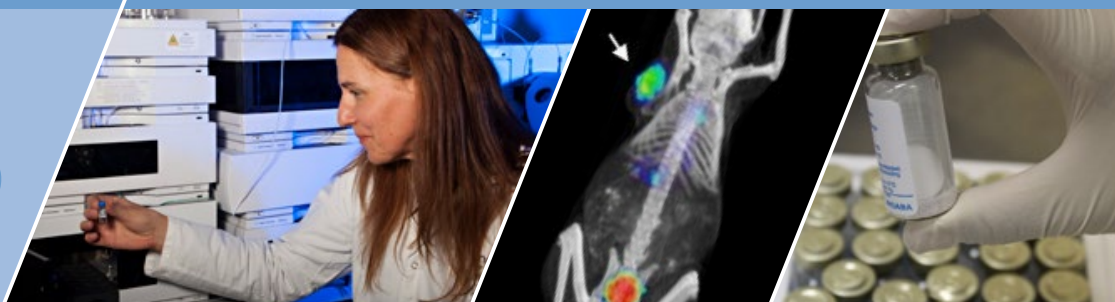


Necsa's Micro Focus X-ray Tomography system was central to producing 3D-results for the first known identification of cancer in early hominins.

The SAFARI-1 Neutron Diffraction beamlines complemented by X-ray Diffraction provide powerful, non-destructive insight into the microstructural properties of materials for advanced manufacturing. This includes residual stresses in weldments and 3D printed titanium alloy components as well as chemical and magnetic phenomena in various chemical systems.

## Development of New Radiopharmaceuticals

08



GluCAB™ is a new molecular compound being developed by Necsa's Radiochemistry group in collaboration with the University of Cape Town. It is intended to identify and treat tumours such as those found in breast and ovarian cancer. As a theranostic, GluCAB™ first identifies cancerous areas before being transported into cancer cells which are then killed by ionising radiation.



## Nuclear Medicine Research Infrastructure Project

09



NuMeRI, the Nuclear Medicine Research Infrastructure project, was approved as part of the Department of Science and Technology's South African Research Infrastructure Roadmap launched in October 2016. NuMeRI's first three-year budget was set at R149m and will be incubated in Necsa.

## OSCAR-4 Reactor Calculation Code

10



After years of development by Necsa's Radiation and Reactor Theory group, the SAFARI-1 Research Reactor has approved the use of OSCAR-4 as the official code for reactor reload and core-follow calculations. The new code system contains features that further promote operational safety and efficiency including predictive isotope reports enabling significantly improved irradiation planning. Three international clients are using the code with McMaster University in Canada as the latest addition.



# 05

## Key Performance Indicators





## Introduction

Performance measurement facilitates accountability by enabling parliament and members of the public to track Necsa's progress. There is effective alignment in terms of Necsa's Strategic Outcome Orientated Goals and Performance Indicators across the Shareholder Compact with the Department of Energy, Corporate Plan and Estimates of Expenditure.

## Statement of Responsibility for Performance Information

The Board is responsible for implementing a system of internal controls to provide reasonable assurance as to the integrity of the performance information, human resources information and the Annual Financial Statements.

The Chief Executive Officer is responsible for the preparation of Necsa's performance information and for the judgements made in this information.

Yours faithfully



**Mr GP Tshelane**  
Chief Executive Officer  
Date: 28 July 2017



**Dr KR Kemm**  
Chairperson of the Board  
Date: 28 July 2017

This Annual Report has been prepared in accordance with the guidelines issued by National Treasury. The Annual Financial Statements have been prepared in accordance with the South African Statements of Generally Accepted Accounting Practice.

The Auditor-General of South Africa has examined the company's Annual Financial Statements and Predetermined Objectives for the year ended 31 March 2017 and their report is presented on pages 117 to 122. All information disclosed in this Annual Report is consistent with the Annual Financial Statements as audited by the Auditor-General.

In our opinion, the Annual Report fairly reflects the operations, performance information, human resources information and the financial affairs of Necsa for the financial year ended 31 March 2017.

## Auditor-General's Report: Predetermined Objectives

The Auditor-General of South Africa currently performs the necessary audit procedures on the performance information to provide reasonable assurance in the form of an audit conclusion. The audit conclusion on the performance against predetermined objectives is included in the report to management, with material findings being reported in the Independent Auditor's Report.

Refer to page 118 for the Independent Auditor's Report on the audit of the annual performance report.

## Overview of Public Entity's Performance

### Service Delivery Environment

Given Necsa's mandates relating to research and development and national nuclear obligations, the company is not directly involved in service delivery to the public.

Prevailing economic conditions affected Necsa significantly, both limiting support from the fiscus as well as commercial revenues. Pelchem suffered declining market demand for  $\text{XeF}_2$  and  $\text{NF}_3$ , the latter having been classified as a greenhouse gas. Pelindaba Enterprises was impacted by continued weakness in the local manufacturing sector although ageing-related replacement of equipment at the Koeberg Nuclear Power Station is providing opportunity. NTP was able to grow its market share by working with partners to cover the supply gap after the exit of the leading Canadian radioisotope supplier.

A Necsa Concerns Register continues to be maintained and captures the concerns raised by stakeholders via channels such as email, Facebook and the Public Safety Information Forum. One such concern from the local community was unhappiness regarding the pom-pom weeds flourishing on the site and spreading to their properties. A service provider has been appointed and this invasive species is expected to be under control by December 2017.

Legal challenges against Necsa were successfully dealt with as reported in the Legal Services section on page 35.

The proposed Nuclear New Build Programme was negatively affected by uncertainty regarding its political support as well as the apparent success of competing renewable energy sources. Favouring nuclear power, though, is the increasing threat posed by global warming.

### Organisational Environment

Significant internal organisational challenges and developments which affected Necsa's performance in the current financial year were most notably the re-appointment of the CEO as well as the one-day strike on 26 July 2016.

The contract of the CEO, Mr Phumzile Tshelane, was extended by a three year period from 01 January 2017 ending a protracted period of uncertainty. Other executive appointments in January and February 2017 were Ms Hlengiwe Khumalo as Group Executive: Corporate Services, Ms Mosa Rasweswe as Group Executive: Nuclear Compliance and Services and Mr Ruby Ramatsui as Senior Executive Manager: Pelindaba Enterprises.

A protected strike by the NEHAWU and Pelindaba Workers' Unions took place on 26 July 2016. This resulted from wage negotiations and led to Necsa's access gates being blocked for most of the day. A wage agreement was signed in the afternoon of the same day.

### Key Policy Developments and Legislative Changes

During the reporting period there were no changes to legislation impacting Necsa.

Government policy on energy is under review in the form of the updated Integrated Energy and Resource Plans gazetted for public comment on 25 November 2016. The period for public comment was extended to 31 March 2017. While the updated draft base case assumes that the first new nuclear reactor would only be required by 2037, Necsa is destined to play an integral role with respect to production of nuclear fuel and procurement of a new research reactor.

## Strategic Outcome Oriented Goals

Although a new Strategic Plan was adopted during the fourth quarter of the financial year, most of 2016/17 was subject to the strategic outcome oriented goals of the previous Strategic Plan, summarised below.

The long-term strategy of the Necsa Group builds on its core research and development mandate to ensure sustainability and growth of the Necsa Group while meeting the nuclear-related needs of South Africa.

The Board of Directors envisioned the following elements in its 2033 vision for the Necsa Group:

- ▶ The Necsa Group is a financially viable and structurally robust organisation by 2033;
- ▶ The organisation's diversified nuclear energy mandate has positioned Necsa as a key player in the energy sector in South Africa and the continent;
- ▶ The organisation has world-class nuclear energy and component manufacturing facilities;
- ▶ While Necsa continues to undertake research projects assigned by the principal stakeholder, the organisation funds its own R&D Programme to enhance nuclear and related research and innovation;
- ▶ Employees view Necsa as a preferred employer and attractive career opportunity enhancing environment;
- ▶ Necsa, as a result of its Skills Pipeline Development Strategy, has ensured an adequate supply of suitably qualified personnel that contribute to the nation's pool of nuclear scientists and engineers;
- ▶ The organisation has adequate capital reserves to fund planned capital expenditure in infrastructure and growth of its operations;
- ▶ Necsa is recognised for its contribution to the growth and development of the South African economy having met all targets set in terms of localisation, job creation and energy security in terms of the overall energy mix; and
- ▶ Necsa has met and exceeded all its institutional obligations.

The Necsa EXCO subsequently defined the following critical success factors for attaining the 2033 vision:

- ▶ Innovation and Growth;
- ▶ Performance Management (Business and Financial);

- ▶ Research and Development;
- ▶ People Development;
- ▶ Stakeholder Management;
- ▶ Strategy Execution and Operational Excellence; and
- ▶ Business Process and Procedures including Security, Safety, Health, Environment and Quality.

Necsa's objectives are grouped into three Strategic Clusters:

### Nuclear Power Cluster

The Nuclear Power Cluster comprises Necsa's nuclear fuel development and production programmes. Projects in support of the South African nuclear power programme will expand Necsa's expertise, technology base and infrastructure to enhance the security of local nuclear fuel supply and enter the global market. The key strategic objectives for this cluster are:

- ▶ To assess the viability of a future industry servicing the front-end nuclear fuel cycle in South Africa and to progress towards the development and demonstration of the required technologies;
- ▶ To prove the viability of Pelindaba Enterprises (Pelindaba Manufacturing; Pelindaba Engineering Services; Pelindaba Consulting Services; and Necsa Learning Academy); and
- ▶ To ensure the retention of competitive commercial fluorine capability through Pelchem's strategy for growth and sustainability.

### Radiation Science and Applications Cluster

This cluster includes radiation science research and products based on the SAFARI-1 Reactor and Necsa's related expertise. The Necsa Group will maintain and expand its global leadership position in the supply of medical radioisotopes through partnerships, expansion of its product portfolio and the eventual replacement of the SAFARI-1 Research Reactor. The key strategic objectives for this cluster include:

- ▶ To maintain full operational capability of SAFARI-1 and implement the reactor's ageing management programme;
- ▶ To expand SAFARI-1 based R&D facilities and outputs;
- ▶ To develop and implement the project to ensure security of supply of LEU, LEU fuel and LEU target plates;

- ▶ To secure core strategic capability through the replacement of SAFARI-1 by a Multi-Purpose Research Reactor before it reaches the end of its operational lifetime; and
- ▶ To grow NTP Group net profit from the 2015/16 forecast of R55.7m to R414.4m by 2019/20.

#### **Necsa as Host of Nuclear Programmes Cluster**

This cluster refers to Necsa's capacity to house nuclear programmes due to its licensed nuclear infrastructure, specialised supporting capabilities and integrated SHEQ management system. The key strategic objectives for this cluster include:

- ▶ To increase Necsa's research, development and innovation outputs;
- ▶ To constantly improve SHEQ management performance;
- ▶ Improving pre-disposal waste management activities; and
- ▶ To maintain infrastructure at a suitable level.

## **Performance Information by Programme Cluster**

Performance against planned indicators and targets, as contracted in the Shareholder Compact – 2016/17 between Necsa and the Minister of Energy, is presented in the prescribed tabular format.

#### **Nuclear Energy Programme Cluster**

The purpose and strategic objectives relating to this programme are described in the preceding section. During the year under review, there were no amendments to the planned targets.



A Natural Nuclear Fusion Reactor Rises over Pelindaba

**Nuclear Energy Programme Cluster: Performance Indicators, Planned Targets and Actual Achievements**

Key Performance Area	Key Performance Indicator	Actual Achievement 2015/2016	Planned Target 2016/2017	Actual Achievement 2016/2017	Deviation from Planned Target 2016/2017	Comment on Deviation
Pelchem Group financials	Net profit after tax	R28.65m	R7.95m	(R35.50m)	(R43.45m)	Target not met - Due to lower HF sales resulting from low availability of ageing HF plant and declining demand for NF <sub>3</sub> and XeF <sub>2</sub> . Cost of production also increased.*

\*Pelchem's short term strategy is to improve operational performance and focus only on commercially viable products. In the longer term sustainability will be pursued by expanding market share based on commercially scaled production plants.

**Radiation Products and Services Programme Cluster**

The purpose and strategic objectives relating to this programme are described in the preceding section. During the year under review, there were no amendments to the planned targets.

**Radiation Products and Services Programme Cluster: Performance Indicators, Planned Targets and Actual Achievements**

Key Performance Area	Key Performance Indicator	Actual Achievement 2015/2016	Planned Target 2016/2017	Actual Achievement 2016/2017	Deviation from Planned Target 2016/2017	Comment on Deviation
NTP Group financials	Net profit after tax	R183.0m	R164.7m	R202.58m	R37.88m	Target exceeded.
SAFARI-1 Operation	Operational availability (days per year)	303 days	287 days	297.9 days	10.9 days	Target exceeded - Due to hours gained by shortening planned outages.*

Establish sustainable supply of LEU fuel and target plates	Achievement of project objectives	Finalisation of business case for sustainable supply of LEU fuel and target plates underway.	Finalisation of business case for sustainable supply of LEU fuel and target plates; and Implementation of the recommendations from the business case	Business case completed; Screening assessment of alternate suppliers updated; Documentation for qualifying second fuel supplier nearing finalisation; Negotiations with routine fuel supplier for 2017 nearing completion; Five year LEU metal supply order concluded.	No material deviations.	Target met.
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\*The SAFARI-1 Operational Availability can be compared to the normal availability of the High Flux Reactor (HFR) in Petten at 275 days/year and ANSTO's Open Pool Australian Lightwater Reactor (OPAL) at 300 days/year.



### Necsa as Host of Nuclear Programmes Cluster

The purpose and strategic objectives relating to this programme are described in the preceding section. During the year under review there were no amendments to the planned targets.

#### Necsa as Host of Nuclear Programmes Cluster: Performance Indicators, Planned Targets and Actual Achievements

Key Performance Area	Key Performance Indicator	Actual Achievement 2015/2016	Planned Target 2016/2017	Actual Achievement 2016/2017	Deviation from Planned Target 2016/2017	Comment on Deviation
D&D programme execution	Execution of Annual Plan of Action as approved by DoE	90%	100%	98.67%	(1.33%)	Target not achieved - Due to no components cleared for scrap due to optimised process / Delays in regulatory approval for Volume Reduction Facility / No complying waste packages from NTP for Vaalputs / Unavailability of ventilation in conversion plant / Time-consuming Area 27 Cylinder washing process / Unavailability of crane for work in Oil Basement / Delays in procurement of water cooled power cable for Smelter / Due to financial constraints, chisels could not be procured for Z-Plant.
Compliance to SHEQ, license and other regulatory requirements	Disabling Injury Incidence Rate (DIIR)	0.78	0.7	1.1	(57%)	Target not achieved - Main causes include vehicle accident near Vaalputs and an incident of permanent hearing loss.*
	Public dose impact (expressed as % of NNR allowable limit)	2.18%	<20%	2.23%	(89%)	Target exceeded.

\*The Necsa Group's Safety Culture will be targeted for further enhancement.

### Cross-Cutting Programmes Cluster

The purpose of this programme is to manage activities of a cross-cutting nature not readily classified into the three preceding clusters. During the year under review, there were no amendments to the planned targets.

#### Cross-Cutting Programmes Cluster: Performance Indicators, Planned Targets and Actual Achievements

Key Performance Area	Key Performance Indicator	Actual Achievement 2015/2016	Planned Target 2016/2017	Actual Achievement 2016/2017	Deviation from Planned Target 2016/2017	Comment on Deviation
Necsa Corporate Financials	External Sales (Including Intra- Group Sales)	R381.96m	R491.8m	R407.0m	(R84.8m)	Target not met - Mainly due to Operations and Pelindaba Enterprises not achieving budgeted sales.
Innovation Value Chain	Innovation Disclosures	13	12	15	3	Target exceeded- Due to greater staff awareness and innovation being an unpredictable process.
Research Outputs	Research Publications	55	28	43	15	Target exceeded.
Staff composition	Technical staff as % of total staff	49.27%	51%	47.83%	(3.17%)	Target not met – Due to, among others, reduced technical staff due to retirements.
	Black technical staff as % of all technical staff	56.02%	55%	58.48%	3.48%	Target exceeded – Due to Employment Equity interventions.

## Summary of Financial Information

### Salient Features of 2016/17

Changes from 2016	Nominal %	Real %
State dependence for operating costs	(3.2%)	(9.3%)
Group sales	7.5%	1.3%
Company sales	4.9%	(1.2%)
Group sales per capita	3.9%	(2.2%)
Company sales per capita	4.7%	(1.4%)
Group expenses	8.6%	2.5%
Company expenses	4.6%	(1.5%)
Group personnel costs	8.2%	2.1%
Company personnel costs	6.8%	0.6%
Group operating expenses (salaries and allowances excluded)	8.8%	2.7%
Company operating expenses (salaries and allowances excluded)	2.6%	(3.5%)

Inflation adjustment used in all calculations is 6.1%

### Value-Added Statement as at 31 March 2017

Group - Values	2017	2016	2015	2014	2013
	R'000	R'000	R'000	R'000	R'000
<b>Income Generated</b>					
Sales and other income	1 781 488	1 881 844	1 512 054	1 289 512	1 264 054
Construction contracts	(11 966)	(21 349)	25 568		
Government grants					
Operating Activities	446 046	436 479	417 421	395 730	393 192
Decommissioning and decontamination	61 691	58 609	57 997	57 934	58 907
LEU Fuel and conversion	8 418	1 087	-	535	503
Security	8 372	8 113	8 206	7 821	8 171
Deferred R&D Safari Grant Used	169	-	-	-	-
SAFARI-1	-	116	3 671	1 609	-
Deferred MTEF Grant Utilised for Activities	766	-	-	-	-
Other grants	37 774	38 411	32 781	59 007	35 520
Income from Investments	318 106	321 834	75 129	42 717	46 728
	<b>2 650 864</b>	<b>2 725 144</b>	<b>2 132 827</b>	<b>1 854 866</b>	<b>1 807 075</b>
<b>Income Distributed</b>					
Employees	838 830	803 457	717 481	629 522	605 406
Providers of Services, Materials and Products	1 554 793	1 394 575	1 322 710	1 063 331	841 780
Training and Development	18 335	15 990	15 031	9 893	6 893
Government	108 974	98 254	47 878	69 092	69 763
Depreciation	81 560	77 965	65 770	74 276	106 142
Retained Income	42 213	327 210	(42 503)	2 116	171 255
Minority Interest Share of Profit	6 159	7 693	6 460	6 636	5 835
	<b>2 650 864</b>	<b>2 725 144</b>	<b>2 132 827</b>	<b>1 854 866</b>	<b>1 807 075</b>

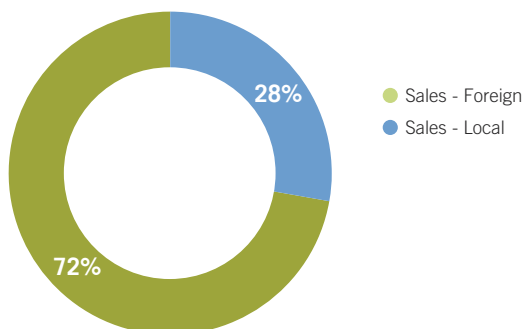
Group - Percentages	2017	2016	2015	2014	2013
	%	%	%	%	%
<b>Income Generated</b>					
Sales and Other Income	67.2%	69.1%	70.9%	69.5%	70.0%
Construction Contracts	(0.5%)	(0.8%)	1.2%	-	-
<b>Government Grants</b>					
Operating Activities	16.8%	16.0%	19.6%	21.3%	21.8%
Decommissioning and Decontamination	2.3%	2.2%	2.7%	3.1%	3.3%
LEU Fuel Conversion	0.3%	-	-	-	-
Security	0.3%	0.3%	0.4%	0.4%	0.5%
SAFARI-1	-	-	0.2%	0.1%	-
Other Grants	1.4%	1.4%	1.5%	3.2%	2.0%
Income from Investments	12.0%	11.8%	3.5%	2.3%	2.6%
	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>Income Distributed</b>					
Employees	31.6%	29.5%	33.6%	33.9%	33.5%
Providers of Services, Materials and Products	58.7%	51.2%	62.0%	57.3%	46.6%
Training and Development	0.7%	0.6%	0.7%	0.5%	0.4%
Government	4.1%	3.6%	2.2%	3.7%	3.9%
Depreciation	3.1%	2.9%	3.1%	4.0%	5.9%
Retained Income	1.6%	12.0%	(2.0%)	0.1%	9.5%
Minority Interest Share of Profit	0.2%	0.3%	0.3%	0.4%	0.3%
	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>



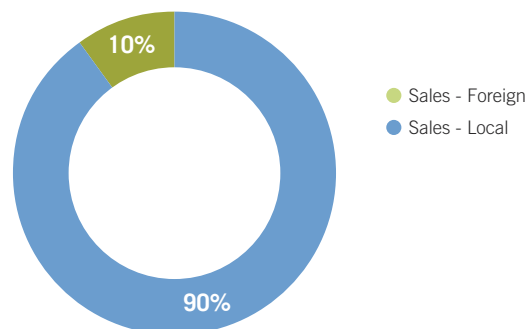
Financial Performance Balanced with Environmental Care at Pelindaba

## Sales

Group 2017

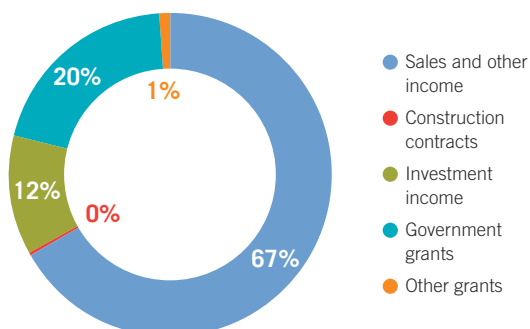


Company 2017

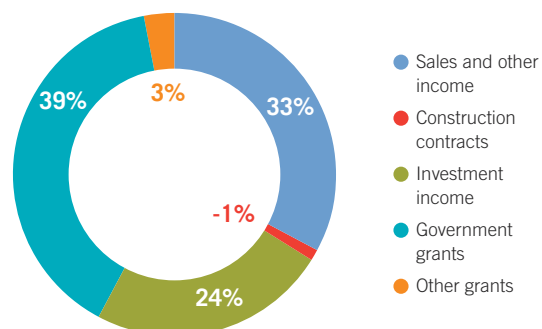


## Income Generated

Group 2017

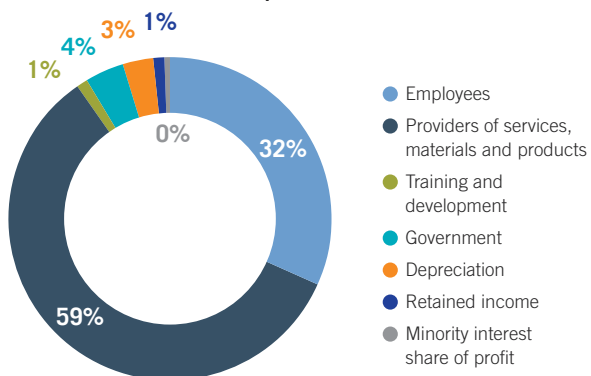


Company 2017

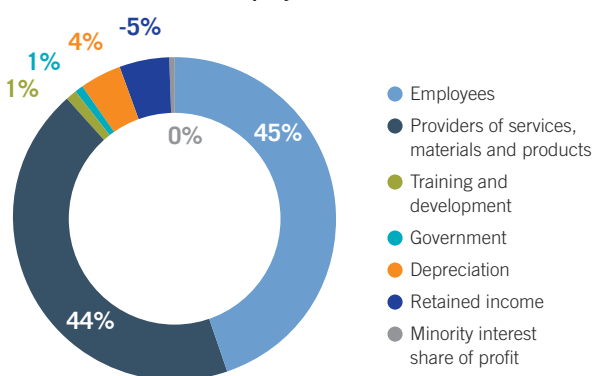


## Income Distributed

Group 2017




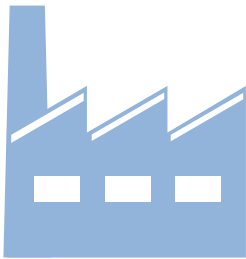


Company 2017





## Capital Investment

### Necsa Group Expenditure on Infrastructure Projects

			
<b>Buildings</b>	<b>Plants</b>	<b>Research Facilities</b>	<b>Site Improvements</b>
<b>Expenditure 2015/2016</b>	<b>Expenditure 2015/2016</b>	<b>Expenditure 2015/2016</b>	<b>Expenditure 2015/2016</b>
<b>R1,549,891</b>	<b>R50,384,775</b>	<b>R5,398,751</b>	<b>R12,203,889</b>
<b>Expenditure 2016/2017</b>	<b>Expenditure 2016/2017</b>	<b>Expenditure 2016/2017</b>	<b>Expenditure 2016/2017</b>
<b>R1,345,847</b>	<b>R39,380,905</b>	<b>R6,932,474</b>	<b>R16,015,449</b>
<hr/>			
<b>Total</b>	<b>{</b> <b>Expenditure 2015/2016</b> <b>R69,537,306</b>		<b>Expenditure 2016/2017</b> <b>R63,674,675</b>

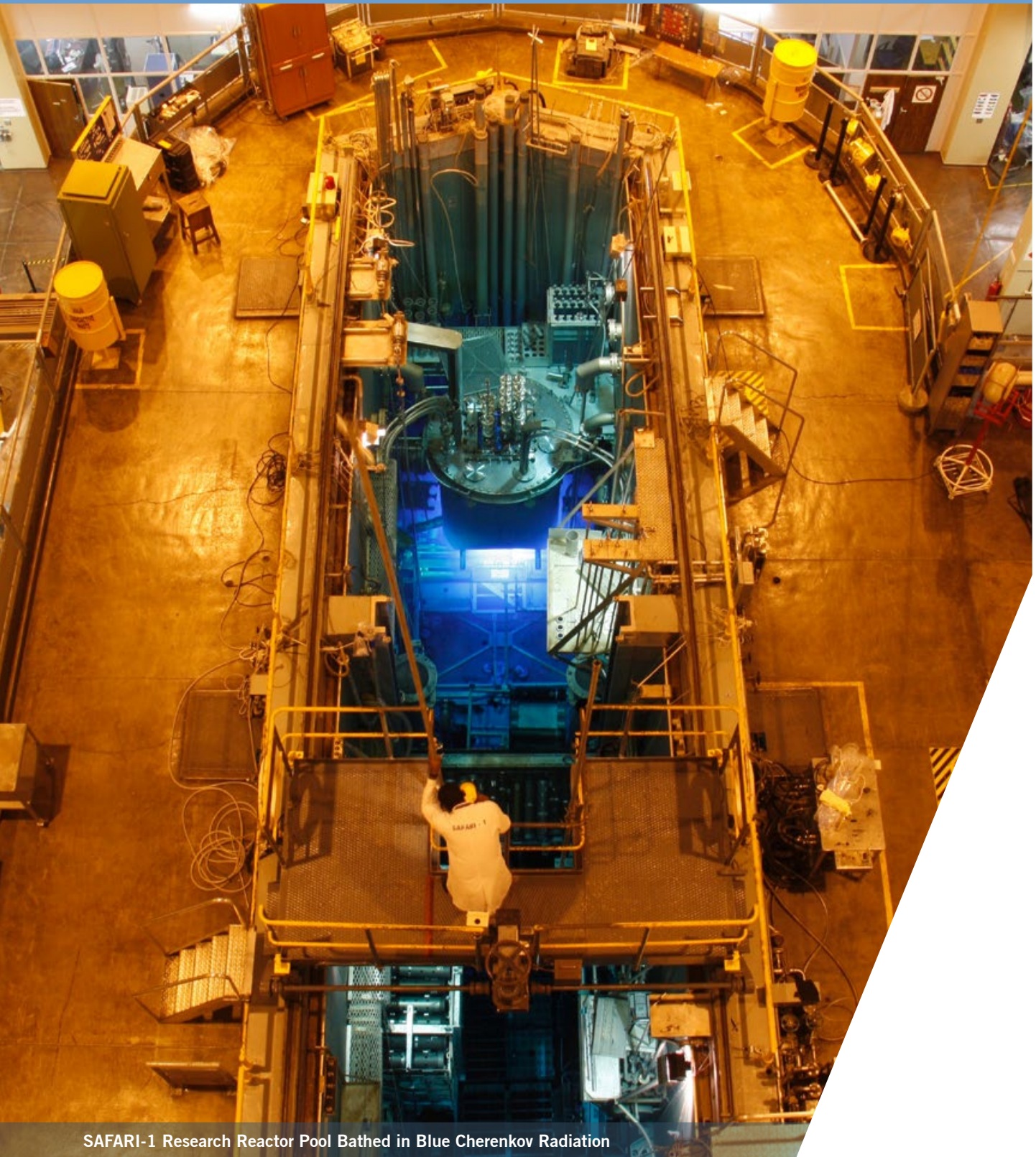
#### Medium-term Expenditure Framework (MTEF) 2015-17: Critical Infrastructure Investment

In 2014, DoE and the National Treasury allocated funding specifically for critical priority investment in Necsa site infrastructure during the 2015 to 2017 MTEF period. The programme was divided into five projects addressing ageing management sub-projects in Analytical and Calibration Services, Liquid Effluent Management Services, Material Test Reactor, Site Security Department and Site Infrastructure.

The programme was planned for the period 01 April 2015 to 31 March 2017 with overall progress on 31 March 2017 reported at 89%. A number of delayed sub-projects are expected to be completed by Dec 2017. The MTEF funding granted to Necsa by the DoE amounted to R166m excluding VAT. This amount was reduced by R55m for overheads and other priorities, and supplemented by R5m from insurance proceeds, resulting in an effective budget of R116m. Actual and committed expenditure to March 2017 amounted to R87.5m.

# 06

## Divisions and Subsidiaries



SAFARI-1 Research Reactor Pool Bathed in Blue Cherenkov Radiation

## Introduction

The functions and performance of the Necsa Group Divisions and Subsidiaries are summarised below with reference to the organisational structures depicted on pages 10 and 11. This is provided at the level of the Departments in each Division and in some instances for the major groups comprising a Department.

## Group Functions

### Company Secretary

During the 2016/17 fiscal year, Company Secretariat services were provided by First Corporate Secretaries (Pty) Ltd. Functions provided include preparing the annual Board schedule of meetings, timeous distribution of correspondence, record keeping, providing appropriate and current legal advice, preparing resolutions for meetings as well as preparing draft Board and Board Committee minutes. In addition, new Board members received induction. The returns required by the Companies Act, complete and accurate, were lodged in time.

### Legal Services

The Necsa Legal Services department is responsible for rendering legal advisory services with respect to contracting and statutory compliance issues while liaising with external parties as required. In addition, the department manages Necsa's litigation matters and submits a quarterly litigation report. Highlights for the 2016/17 fiscal year include the court action won against Earthlife Africa which tried to stop construction and use of the Necsa nuclear waste smelter and the constitutional court bid by former board member Ms M Mokuene dismissed with cost.

### Internal Audit

As part of Necsa's internal control function, Internal Audit evaluates the effectiveness of the Necsa Group's risk management systems and internal control systems including financial, governance and ethics related processes. Assurance and consulting services regarding these matters are provided to the Board Audit and Risk Committee.

The key activities of Internal Audit include the continuous evaluation of risks associated with the integrity of financial and operational information, resource utilisation, asset management as well as

compliance with legal requirements. In addition, consultation services are provided to the Necsa Group for improving performance and applying corporate governance best practices.

Planned and ad-hoc audit projects are carried out in accordance with both an annual plan and a 3-year rolling plan approved by the Audit and Risk Committee. A risk based approach to audit projects is followed and the following audit focus areas are included with the results reported to the Audit and Risk Committee on a regular basis:

- ▶ Systems and Compliance Audit;
- ▶ Corporate Governance and Ethics Related Audit;
- ▶ Risk Based Performance Audit;
- ▶ Predetermined Objectives Audit;
- ▶ Information Technology Audit; and
- ▶ Ad-Hoc Audits and Special Investigations.

### Strategy and Performance

The Strategy and Performance department is responsible for implementation of a coherent strategy to achieve the Necsa Group's business, social and environmental objectives. Performance is evaluated against predetermined objectives and key indicators in accordance with the compact between the Minister of Energy and Necsa. The department supports the Necsa Group in the following areas:

- ▶ Integrated business planning and performance monitoring;
- ▶ Driving the achievement of strategic and operational objectives;
- ▶ Management of Risk and Compliance;
- ▶ Organisational competency in Project Management;
- ▶ Organisational competency for Quality;
- ▶ Occupational Health and Safety;
- ▶ Prefeasibility studies on nuclear fuel facilities; and
- ▶ Ad-hoc matters assigned by the CEO.

The Strategic Planning and Performance Management section is responsible for business planning and reporting performance in terms of predetermined goals and objectives, as reflected under "Performance Information by Programme Cluster" on page 26. All required performance reports were prepared and submitted to the Necsa Board and the Department of Energy.

The Risk and Compliance unit maintains the strategic risk register, based on departmental and divisional risk registers, and presents it to the Audit and Risk Committee. More information on the role of risk management in corporate governance is found on page 90. The Chief Risk Officer resigned in the third quarter of the financial year and is to be replaced.



The Project Management section's project assurance and training roles were put on hold in favour of undertaking pressing projects. A limited advisory service was provided.

Quality Management is leading Necsa's transition to ISO 9001:2015 while revamping its Integrated Management System. Assistance was provided with strategic interventions related to quality system improvements.

Occupational Safety conducts occupational health and safety awareness sessions and is piloting a new hazard identification and risk assessment effort. In order to improve Necsa's compliance with the Occupational Health and Safety Act, a "Framework for Occupational Health and Safety Act Compliance" is being developed.

### Business Development

The Business Development department was established in 2015 in the Office of the CEO to facilitate the identification, protection and exploitation of intellectual property developed and owned by Necsa. This includes technology licensing negotiations and securing funding for further development based on sound business principles.

A funding and technology partnership was negotiated between Necsa, University of Cape Town and BGM Pharma to develop and commercialise a new theranostic called GluCAB™, a potential breakthrough in cancer diagnosis and treatment. License agreements have also been concluded in other areas, including:

- ▶ An exclusive License Agreement with iNkwazi Solutions to market Necsa's 0.5 ton-per-day Plasma Waste Gasification System;
- ▶ An exclusive License Agreement with Thermtron, a South African SMME, for technology development and marketing of Neodymium Tri-Fluoride; and
- ▶ A non-exclusive license agreement with Asia Pacific, a subsidiary of Guangdong Huate Co. Ltd., to investigate and validate the Octafluoropropane (C<sub>3</sub>F<sub>8</sub>) production process developed by Necsa.

A Seed Fund Facility has been established with the Technology Innovation Agency (TIA) to assist Necsa in translating research outputs into fundable ideas for technology development and commercialisation. A number of funding applications have been submitted to TIA across various areas with initial funding of R2.1m secured for the following five new commercial opportunities:

- ▶ A new improved DryKeep® system from the Flosep group for oil drying in transformers and storage tanks;
- ▶ The development of the Cobalt Trifluoride fluorination technology platform;
- ▶ A preconditioning step for Uranium recovery and purification;
- ▶ Ga-Dota-Substance P as a novel pain imaging agent; and
- ▶ A stand-alone Atmospheric Water Generator.

An Intellectual Property (IP) Benefit Sharing Scheme has been established and R100k of benefits was allocated to two IP creators in relation to C<sub>3</sub>F<sub>8</sub>.

The key performance metrics for the department include the number of patents filed, technology development funding secured, license agreements, start-up companies created and new venture creation. Notable success was realised with regards to funding, patents filed and license agreements.

The department is working on a number of projects with significant commercialisation potential. In addition to the ones highlighted above, the following are noteworthy:

- ▶ <sup>195m</sup>Pt-Cisplatin is a chemotherapy drug for various cancers - Partnership with BGM Pharma whereby the company has the right to sell "cold" Cisplatin, which Necsa will radio-label with Pt-195m;
- ▶ <sup>99m</sup>Tc-ECDG is a diagnostic drug used in the detection of lesions in the brain, head and neck - Partnership with BGM Pharma for funding, technology development and commercialisation;
- ▶ <sup>68</sup>Ga UBI and <sup>99m</sup>Tc UBI are used in the diagnosis of opportunistic infections such as TB in HIV infected patients - Partnership for use of the products with the Nuclear Medicine department at Steve Biko Hospital, the Department of Health and the DST;
- ▶ Funding process with the European and Developing Countries Clinical Trials Partnership;
- ▶ <sup>68</sup>Ga/PSMA is a diagnostic for prostate cancer and potentially breast cancer - Partnership in relation to an associated kit with the Nuclear Medicine department at Steve Biko Hospital, NTP and AEC Amersham; and
- ▶ Mining shroud tagging based on sealed radioactive sources improves safety and reduces downtime in the opencast mining environment - Partnerships with potential funders and strategic market vehicles are being explored.

## Research and Development Division

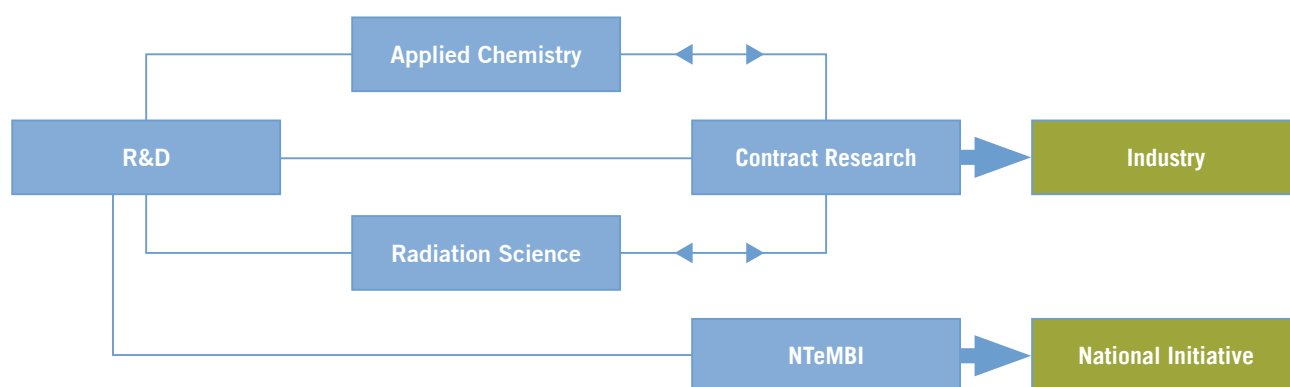
The Necsa Research and Development Division generates knowledge, intellectual property and technological innovations in the field of nuclear and radiation science and technology. This is augmented by contract research and human capital development in collaboration with local and international partners.

Necsa's Research and Development mandate is derived from Sections 13 and 14 of the Nuclear Energy Act of 1999 which include the following responsibilities:

- ▶ Undertake and promote research and development in the field of nuclear energy and radiation sciences and technology;
- ▶ Process nuclear materials, metals, chemicals and related products; and
- ▶ Co-operate with educational, scientific or other institutions with a view to training.

The structure of the Research and Development Division as depicted, gives effect to the division's functions.

### R&D Division's Structure



The two main departments, Applied Chemistry and Radiation Science, house activities related to chemistry and nuclear physics respectively. The Contract Research Department drives contract research with industry and collates expertise from these two departments. The Nuclear Technology in Medicine and Biosciences Initiative (NTeMBI) is a DST programme managed by Necsa which synergises research efforts throughout the country related to nuclear medicine.

Necsa R&D has fostered relationships with local and international universities and science councils to further its primary function of knowledge creation. Closer to home, the R&D departments have strong ties with Necsa's subsidiaries NTP and Pelchem in order to facilitate commercialisation of nuclear related technologies.

Staff training and human capacity building remain at the core of the R&D Division as evidenced by the table below. One PhD and two MSc degrees were awarded

to Necsa staff members during the course of the year. One of Necsa's PhD students received a recognition award from the Operational Research Society of South Africa based on his studies.

### Human Capital Development

Training Involvement	Number of Post-Graduate Students
Formal lectures by Necsa staff: Master's Degree in Applied Radiation Science and Technology (MARST)	14 Honours and 8 M.Sc.
MSONE Students that completed M. Phil	None
Post-graduates supported with research projects at Necsa	36
Own staff enrolled as post-graduates	26
Post-graduates supported at Universities and affiliated to Necsa projects	17



The Key Performance Indicators (KPIs) and achievements of the Research and Development division are summarised in the table below with the full list provided at the end of the Research and Development section.

Output KPA	Indicator KPI	2016/17 Target	2016/17 Output	Notes
Innovation Value Chain	Number of innovation disclosures	12	15	Target exceeded
Research Publications	Number of publications in ISI journals	16	29	Target exceeded
	Number of other peer reviewed publications	12	14	Target exceeded
	Number of substantive scientific reports for contract research projects	17	17	Target reached

## Applied Chemistry

### Nuclear Fuel Cycle

The Nuclear Fuel Cycle (NFC) refers to all processes from uranium mining to fabrication of nuclear fuel as well as the post-reactor processes to manage the spent fuel elements. In Necsa R&D skills development and demonstration of NFC processes are pursued to prepare for possible future localisation.

Research is underway to purify and homogenise uranium feed material related to conversion to  $UF_6$ . A membrane-assisted solvent extraction process is being developed to recover uranium from the historic “unburnts” waste stream and potentially other sources such as fluoride-based waste streams associated with NFC activities.

Under a six-year Advanced Metals Initiative (AMI) contract from DST, the plasma synthesis of kilogram quantities of Zirconium metal, a key material in nuclear fuel assemblies, was demonstrated.

Research also continues into the recovery of historic enriched uranium from various un-irradiated matrices for possible reuse in the production of fuel and target plates for Mo-99 production in the SAFARI-1 Research Reactor.

### Plasma Technology

Plasma gasification technology was further developed for nuclear as well as non-nuclear applications. In the nuclear field, the technology is applicable to the destruction of toxic waste (e.g. decomposed solvent extracting agents) or for the volume reduction of compressible Low Level Nuclear Waste.

In the non-nuclear field this technology is applicable to organic toxic waste destruction (e.g. pesticides) or biomaterial gasification. In selected cases the off-gas could be utilised in the form of heat or synthetic fuels. It is expected that these Waste-to-Energy applications will be further demonstrated through funding from private entities. The first license was issued to a commercial entity for using this technology.

A spheroidisation unit was acquired by the Plasma Technology group through a National Equipment Programme allocation. This unit was successfully commissioned and has already drawn the attention of a number of possible clients. This will create additional commercial applications for metal products of the Advanced Metals Initiative network and in rapid manufacturing.

### Waste Management

Research and Development continued on the processing of High Level Nuclear Waste forms through technologies such as processing (e.g. partitioning) and encapsulation for re-use, storage or disposal.

The selective leaching and initial purification of enriched uranium from the Mo-99 process residue was demonstrated at laboratory level, with the isotopes responsible for most of the total radioactivity being selectively removed. The final purification step, using advanced solvent extraction purification technology to return the enriched uranium for irradiation target plate manufacturing, was demonstrated with simulated material.

This programme is supported by a USA-funded programme not only for the conditioning of the different

Mo-99 nuclear waste streams, but also the safe encapsulation for final disposal. The first two phases of Work Order 2 was successfully completed and published as an open report. It is foreseen that the full Work Order 2 will be completed by mid-2017, followed by the last deliverable, Work Order 3. Negotiations for additional US funding support were successful. These additional work orders will be completed by the end of the 2018 financial year. These work orders are executed in collaboration with the Australian Nuclear Science and Technology Organisation (ANSTO).

### Fluorine Technology

Fluorine related knowledge and know-how have been retained from previous Nuclear Fuel Cycle (NFC) endeavours at Necsa for potential deployment in a revived NFC for a future power reactor fleet. Research and Development focuses on commercial fluorine spin-off products in support of Necsa's Pelchem subsidiary.

Product development through the Fluorochemical Expansion Initiative funded by the DST has reached the phase where the synthesis technology of some products was transferred to Pelchem for pilot and commercial scale production. New products such as components for Li-ion batteries and derivatives of  $\text{CoF}_3$  are under development. A technology package based on direct fluorination to form  $\text{C}_3\text{F}_8$  was sold to an overseas customer.

### Radiochemicals and Radiopharmaceuticals

The Radiochemistry group continued to perform pipeline research to enhance Necsa's status as an internationally competitive radioisotope producer. Besides the development of radiochemicals (precursors to radiopharmaceuticals) emphasis has shifted further down the value chain to the development of new radiopharmaceuticals.

The phase I/II clinical trial on the use of  $^{195\text{m}}\text{Pt}$ -Cisplatin as a companion diagnostic to enhance the treatment of ovarian and cervical cancer is funded by the Technology Innovation Agency (TIA) to the value of R6.75m. The company TCD was appointed as Clinical Research Organisation to handle data collection and regulatory aspects of the trial while the Medicines Control Council will evaluate the clinical trial protocol as a full submission. Interaction with TCD and an oncologist led to significant improvement of the trial protocol which is nearing completion. TIA waived their right of first refusal which means Necsa may attract other investors.

Another molecular compound - GluCAB<sup>TM</sup> - is being developed by Necsa's Radiochemistry group in collaboration with the University of Cape Town and will be brought to market within a few years by BGM pharmaceuticals in a deal valued at R600m. The compound is intended to identify and treat solid mass tumours such as those found in breast and ovarian cancer. As a theranostic, GluCAB<sup>TM</sup> was designed to operate via a two-stage mechanism. The first component of the GluCAB<sup>TM</sup> molecule identifies cancerous areas passively. The second component is actively transported into cancer cells providing therapeutic doses of ionising radiation to kill malignant tumour cells. This provides highly-focused treatment minimising the impact on neighbouring healthy tissue. The term "theranostics" refers to an agent used for diagnosis via imaging followed by therapy. Ethical approval for preclinical studies has been obtained.

$^{68}\text{Ga}$  is a new exciting Positron Emission Tomography imaging radioisotope. However, due to its short 68-minute half-life, shipment to hospitals is highly problematic. The solution is a freeze-dried kit where the  $^{68}\text{Ga}$  is added in the hospital and the preparation is ready for injection after 15 minutes – so called "shake and shoot".  $^{68}\text{Ga}$  can be added to a variety of molecules for different indications such as primary and secondary prostate cancer. The Necsa Radiochemistry group has developed a unique, versatile kit for this purpose which has passed the technical feasibility study. It has a shelf-life of six months and during clinical trials at the Nuclear Medicine Department of the Steve Biko Academic Hospital, more than 150 patients were successfully scanned. Subject to funding, the kit will undergo Good Manufacture Practice compliance certification before the start of full clinical trials.

## Radiation Science

### SAFARI-1 Beam Lines

As a Research Reactor, SAFARI-1 is equipped with a number of beam lines delivering neutrons from its core to scientific instrumentation stations. One such station, unique on the African continent, is the Neutron Powder Diffraction facility which was further upgraded with new double-focused Si monochromators provided by the International Atomic Energy Agency (IAEA) through a Technical Co-operation program. A cryo-furnace, custom-developed by Ice Oxford (UK), was also installed. A number of in-house developments

have improved the research scope of the powder diffraction facility thereby facilitating local and international research collaborations.

Neutron powder diffraction provides powerful insight into the bulk microstructural and stress properties of materials. This capability was used to provide information to a number of researchers on materials important to advanced manufacturing such as quantification studies of heat-treated steels, determination of residual stresses in additive manufactured tool steel, verification of the phase diagram of P91 steel, magnetic phenomena in Cr-Al-Mo alloys, determination of residual stresses in additive manufactured Ti-6Al-4V samples, temperature dependence studies of magnetic phenomena in Cr-Al-Mo alloys and determination of residual stresses in cast ductile iron valves. Based on the new residual stress neutron diffraction instrument, a successful application was made for international collaboration between Necsa, University of the Witwatersrand and ANSTO researchers on residual stress in hard erosion resistant coatings.

The Necsa neutron diffraction facility at SAFARI-1 has been highlighted in IAEA news publications. An expert Necsa delegate attended the DST Plenary Workshop regarding the Country Programme Framework of the IAEA to report on achievements and outcomes of completed and ongoing Necsa beam line projects. A new project on hydrogen fuel cell diagnoses with neutrons has been proposed.

Two young scientists visited the Rutherford Appleton Laboratory Neutron Imaging group for training and collaborative research under the SA-UK Newton initiative of the Department of Science and Technology and the National Research Foundation.

Five project proposals - of which one has been completed - were received from African researchers based on an invitation from the IAEA to access Necsa facilities. This is an important first step towards an IAEA acknowledged African Centre of Excellence in reactor-based neutron science.

The development of instruments for Neutron Radiography and Small Angle Neutron Scattering beam lines remain subject to nuclear regulatory processes.

### X-Ray Tomography

The Micro Focus X-ray Tomography system continued to render excellent research and training support to institutions from the National System of Innovation (NSI) through its three-dimensional imaging capabilities. Utilisation was 100% of available beam time. The utilisation distribution was 6% for commercial clients, 39% for research by general researchers from within the NSI, 39% for research related to PhD studies, 5% for research relating to MSc studies and 11% for 4<sup>th</sup> year training projects. Research fields involved were geology, metallurgy, chemical engineering, material science, conservation, palaeoanthropology and zoology.

Three-dimensional tomography was performed at the Micro Focus X-ray instrument at Necsa that resulted in the first known identification of cancer in early hominins by a team of researchers. This is indicative of the wide-ranging benefits to knowledge generation stemming from the instrumentation and scientific support that Necsa provides to NSI communities.

### Radiation and Reactor Theory

The Radiation and Reactor Theory (RRT) group contributes to the safe and efficient operation of SAFARI-1 as well as other Necsa nuclear facilities through providing calculation support. This involves both core fuel management calculations as well as analyses for safety assessment and licensing in Necsa's projects.

This reporting period marked an important milestone for the OSCAR-4 reactor calculation code development process. After years of development, SAFARI-1 has approved the use of OSCAR-4 instead of OSCAR-3 as the official code for reload and core-follow calculations of the reactor. Operational cycle C1605-1 was the first for which the safety analysis was officially performed by OSCAR-4. The new code system contains features that further promote operational safety and efficiency. A new NTP business support feature has been introduced into OSCAR-4 to predict isotopic yields for upcoming cycles. This is the first time that predictive isotope reports will be provided, promising commercial benefits from significantly improved irradiation management. Support work was also performed for existing and new OSCAR-4 clients. The McMaster Nuclear Reactor (MNR) at McMaster University in Canada is the most recent OSCAR-4 client. Staff from RRT visited the MNR in September 2016 to provide training in the use of OSCAR-4 modalities.

A first version of OSCAR-5, the next generation reactor calculation system for Material Test Reactor and Pressurised Water Reactor analyses, was released and applied within the context of an IAEA collaborative research project focused on research reactor modelling. This system represents an entirely redeveloped reactor modelling platform focussed on high fidelity multi-physics reactor analysis.

Radiation and reactor theory expertise has been shared with collaborators in accelerator science and technology at institutions such as iThemba LABS. A notable collaborative outreach was a ten-day course on the “Theory and Practice of Radiation Shielding, Radiation Dose Rate Calculations and Nuclear Criticality Safety Calculations” presented by Necsa scientists at the University of Namibia from 04 to 15 April 2016. In addition, a set of Master’s level course lectures on computational methods in neutron transport and reactor physics was developed for an eighteen-month long training programme. This programme forms part of the development of Suitably Qualified and Experienced Persons (SQEP) in the area of method and code development for reactor analysis. This supplements an already ongoing SQEP training program in radiation source term, shielding, criticality and reactor analysis.

Radiation and Reactor Theory significantly expanded its use and access to massively parallel high performance computing. In particular, an agreement between Necsa and the Centre for High Performance Computing in Cape Town has provided access to over 1 million CPU hours toward the development of new methods for high-fidelity reactor analysis.

An IAEA Co-ordinated Research Project meeting in Vienna on multi-cycle research reactor depletion benchmarking was attended and Necsa’s work plan for the remainder of the contracted period to 2018 was defined.

### Contract R&D

The Contract Research and Development group identifies and develops a portfolio of R&D-related funding streams. This serves to grow the non-grant income of the Necsa R&D Division while achieving a positive market impact through technology commercialisation and localisation.

Key activities include pursuing leads, developing funding proposals, Technology Readiness Level audits, negotiations, contracting, technology development and project management.

Highlights for the year were the introduction of a Contract R&D life cycle management process for Necsa as well as new local and international Contract R&D initiatives. The group was constrained by limited human resource availability.

### NTeMBI and NuMeRI

The Nuclear Technologies in Medicine and the Biosciences Initiative (NTeMBI) is a national technology platform developed and managed by Necsa and funded by the Department of Science and Technology (DST). Active since mid-2010, there are three potential products in the pipeline. Fifteen projects (14 using radiolabelling) are in progress, of which six have performed pre-clinical trials and three completed human trials. NTeMBI has supported 65 post-graduates and post-doctoral students, of which 32 have been completed their studies (65 % women; 57% historically disadvantaged). In total 42 publications and 89 conference presentations have been produced while one patent was awarded and one is in the process of being filed.

NTeMBI has funded the development of the world first <sup>68</sup>Ga based Positron Emission Tomography (PET) imaging agent distinguishing between infection and inflammation even in immune compromised patients. Based on this success, a European Union funding application to pursue fully-fledged clinical trials worth R100m was submitted together with European collaborators.

The Malaria-Sterile Insect Technique (SIT) project aims to achieve malaria vector control through the release of sterile male mosquitoes. The Malaria-SIT project falls under the NTeMBI steering committee but is financially separate as it is funded by the IAEA. Managed by Necsa’s NTeMBI co-ordinator, the team based at the National Institute for Communicable Diseases (NICD) in Johannesburg consists of four partially seconded NICD employees and five post graduate students. To date the rearing of sterile mass mosquitoes has been proven on laboratory scale. A pilot mass rearing facility is being constructed by Necsa on the NICD site with DST funding. This facility needs to demonstrate raising 50,000 sterile male mosquitoes per week before a field



trial in Jozini (northern KZN) can commence. Funding applications to sustain the team beyond June 2017 have so far proven unsuccessful.

An international review of NTeMBI took place in September 2016. The final report was very positive and advised that NTeMBI should move further down the value chain. A new business plan will pursue this as well as a permanent office with continued funding by the DST.

Emanating from NTeMBI, the Nuclear Medicine Research Infrastructure (NuMeRI) project has been approved as part of DST's South African Research Infrastructure Roadmap launched in October 2016. NuMeRI's first 3-year budget was set at R149m and will be incubated in Necsa. The development of a PET Tuberculosis facility at Tygerberg Hospital and a preclinical imaging facility at Necsa will be prioritised.

## R&D Publications and Reports

### ISI Journal Publications

- ▶ Beaudet, A., Dumoncel, J., De Beer, F.C., Duployer, B., Durrleman, S., Gilissen, E., Hoffman, J., Tenailleau, C., Thackeray, J.F. & Braga, J. (2016). Morphoarchitectural Variation in South African Fossil Cercopithecoid Endocasts. *Journal of Human Evolution* 101 (2016) 65-78. <http://dx.doi.org/10.1016/j.jhevol.2016.09.003>
- ▶ Beaudet, A., Dumoncel, J., Thackeray, J.F., Bruxelles, L., Duployer, B., Tenailleau, C., Bam, L., Hoffman, J., De Beer, F., & Braga, J. (2016). Upper Third Molar Internal Structural Organization and Semicircular Canal Morphology in Plio-Pleistocene South African Cercopithecoids. *Journal of Human Evolution* 95, 104-120, 2016
- ▶ Biira S., Alawad B.A.B., Bissett H., Nel J.T., Ntsoane T.P., Hlatshwayo T.T., Crouse P.L. & Malherbe J.B. (2017). Influence of the Substrate Gas-Inlet Gap on the Growth Rate, Morphology and Microstructure of Zirconium Carbide Films Grown by Chemical Vapour Deposition. *Ceramics International*, 43, 2017, 1354-1361. <http://dx.doi.org/10.1016/j.ceramint.2016.10.092>
- ▶ Biira, S., Crouse, P., Bissett, H., Bilal, B.A.A., Hlatshwayo, T., Nel, J.T. & Malherbe, J. (2016). Optimisation of the Synthesis of ZrC Coatings in a Radio Frequency Induction-Heating Chemical Vapour Deposition System Using Response Surface Methodology. *Thin Solid Films* 624: 61-69. <http://dx.doi.org/10.1016/j.tsf.2017.01.018> AC-AMI-PUB-17003
- ▶ Botes, D., Chifamba, S. & Bokov, P.M. (2016). A Study of the Performance of a Sparse Grid Cross Section Representation Methodology as Applied to MOX Fuel. *Annals of Nuclear Energy*, Volume 99, January 2017, Pages 444-454, ISSN 0306-4549. <http://dx.doi.org/10.1016/j.anucene.2016.09.051>
- ▶ Carpenter, H.W. & Reid, R.G. (2016). The Response of Layered Anisotropic Tubes to Centrifugal Loading. *Composite Structures* 139: 141-150. <http://dx.doi.org/10.1016/j.compstruct.2015.11.071> UBD-ENR-PUB-15001
- ▶ Conradie, E.W., Van der Westhuizen, D.J., Nel, J.T. & Krieg, H.M. (2016). The Separation of Zirconium and Hafnium from (NH<sub>4</sub>)<sub>3</sub>Zr(Hf)F<sub>7</sub> Using Amine-Based Extractants. *Journal of the South African Institute of Mining and Metallurgy* 116: 915-920. <http://dx.doi.org/10.17159/2411-9717/2016/v116n10a4> AC-AMI-PUB-16005
- ▶ Ebenhan, T., Schoeman, I., Roussow, D., Grobler, A., Wagener, J.M., Marjanovic-Painter, B., Kruger, H., Sathekge, M. & Zeevaart, J.R. (2016). Evaluation of a Flexible NOTA-RGD Kit Solution Using Gallium-68 from Different 68Ge/68Ga-Generators: Pharmacokinetics and Biodistribution in Nonhuman Primates and Demonstration of Solitary Pulmonary Nodule Imaging in Humans. *Molecular Imaging and Biology*: 1-14. <http://dx.doi.org/10.1007/s11307-016-1014-1> RC-PETGa68-PUB-16001
- ▶ Ferg, E.E., Billing, D.G. & Venter, A.M. (2017). Thermal Characterization of Tetrabasic Lead Sulphate used in the Lead Acid Battery Technology. *Solid State Sciences* 64 (2017) 13e22. <http://dx.doi.org/10.1016/j.solidstatesciences.2016.11.017>
- ▶ Fourie, M., Meyer, W.C.M.H., Van der Westhuizen, D.J. & Krieg, H.M. (2016). Uranium Recovery from Simulated Molybdenum-99 Production Residue using Non-Dispersive Membrane Based Solvent Extraction. *Hydrometallurgy* 164: 330-333. <http://dx.doi.org/10.1016/j.hydromet.2016.07.001>
- ▶ Kemp, D. & Cilliers, A.C. (2016). High-Temperature Thermal Plasma Treatment of Monazite Followed by Aqueous Digestion. *Journal of the South African Institute of Mining and Metallurgy* 116: 901-906. <http://dx.doi.org/10.17159/2411-9717/2016/v116n10a2> AC-AMI-PUB-16004
- ▶ Lekgoathi, M.D.S. & Kock, L.D. (2016). Thermal Decomposition and Vibrational Spectroscopic Aspects of Pyridinium Hexafluorophosphate (C<sub>5</sub>H<sub>5</sub>NHPF<sub>6</sub>). *Journal of Molecular Structure*

- 1125: 310-314. <http://dx.doi.org/10.1016/j.molstruc.2016.06.078> AC-FEIF214-PUB-15001
- ▶ Lekgoathi, M.D.S. & Kock, L.D. (2016). When Group Theory and Correlation Methods Become Essential in Vibrational Spectroscopy; Examples with Simple Fluorides. *Reviews in Theoretical Science* 4: 1-7. <http://dx.doi.org/10.1166/rits.2016.1064> AC-AHDF-PUB-14002
  - ▶ Marais, D., Venter, A.M., Markgraaff, J. & James, J. (2017). Sample Positioning in Neutron Diffraction Experiments Using a Multi-Material Fiducial Marker. *Nuclear Instruments and Methods in Physics Research A*, 841 (2017) 12–16. <http://dx.doi.org/10.1016/j.nima.2016.10.020>
  - ▶ Nete, M., Purcell, W. & Nel, J.T. (2016). Separation of Niobium and Tantalum Pentafluoride by Selective Precipitation Using p-Phenylenediamine. *The Journal of the Minerals Metals & Materials Society* 68(11): 2817-2823. <http://link.springer.com/article/10.1007/s11837-016-2003-1> AC-AMI-PUB-16002
  - ▶ Odes, E.J., Randolph-Quinney, P.S., Steyn, M., Throckmorton, Z., Smilg, J.S., Zipfel, B., Augustine, T.N., De Beer, F., Hoffman, J.W., Franklin, R.D. & Berger, L.R. (2016). Earliest Hominin Cancer: 1.7-Million-Year-Old Osteosarcoma from Swartkrans Cave, South Africa. *South African Journal of Science* 112: 100-104. <http://dx.doi.org/10.17159/sajs.2016/20150471>
  - ▶ Pan, L., Dumoncel, J., De Beer, F., Hoffman, J., Thackeray, J.F., Duployer, B., Tenailleau, C. & Braga, J. (2016). Further Morphological Evidence on South African Earliest Homo Lower Postcanine Dentition: Enamel Thickness and Enamel Dentine Junction. *J. Hum. Evol.* DOI: 10.1016/j.jhevol.2016.05.003, 2016
  - ▶ Padenko, E., Van Rooyen, L.J., Wetzel, B. & Karger-Kocsis, J. (2016). “Ultralow” Sliding Wear Polytetrafluoroethylene Nanocomposites with Functionalized Graphene. *Journal of Reinforced Plastics and Composites* 35: 892-901. doi:10.1177/0731684416630817 AC-FPCOMP-PUB-16001
  - ▶ Rambapanasi, C., Zeevaart, J.R., Buntting, H., Bester, C., Kotze, D., Hayeshi, R. & Grobler, A. (2016). Bioaccumulation and Subchronic Toxicity of 14 nm Gold Nanoparticles in Rats. *Molecules* 21: 763-775. doi:10.3390/molecules21060763 RC-TRAAU198-PUB-16001
  - ▶ Sathekge, M., Lengana, T., Modiselle, M., Vorster, M., Zeevaart, J.R., Maes, A., Ebenhan, T. & Van de Wiele, C. (2016). <sup>68</sup>Ga-PSMA-HBED-CC PET Imaging in Breast Carcinoma Patients. *European Journal of Nuclear Medicine and Molecular Imaging*: 1-6. <http://dx.doi.org/10.1007/s00259-016-3563-6> RC-NTPPSMA-PUB-16001
  - ▶ Schlünz, E.B., Bokov, P.M. & Van Vuuren, J.H. (2016). A Comparative Study on Multiobjective Metaheuristics for Solving Constrained in-Core Fuel Management Optimisation Problems. Paper published online in *Computers & Operations Research*, <http://www.sciencedirect.com/science/article/pii/S0305054816301332>, 2016
  - ▶ Schlünz, E.B., Bokov, P.M. & Van Vuuren, J.H. (2016). An Optimisation-Based Decision Support System Framework for Multi-Objective In-Core Fuel Management of Nuclear Reactor Cores. *South African Journal of Industrial Engineering*, Vol. 27(3), pp. 201-209, November 2016
  - ▶ Schlünz, E.B., Bokov, P.M. & Van Vuuren, J.H. (2016). A Comparative Study on Multiobjective Metaheuristics for Solving Constrained In-Core Fuel Management Optimisation Problems. *Computers & Operations Research*, Vol. 75, pp. 174-190, November 2016
  - ▶ Sonopo, M.S., Pillay, A., Chibale, K., Marjanovic-Painter, B., Donini, C. & Zeevaart, J.R. (2016). Carbon-14 Radiolabeling and Tissue Distribution Evaluation of MMV390048. *Journal of Labelled Compounds & Radiopharmaceuticals*. <http://dx.doi.org/10.1002/jlcr.3445>
  - ▶ Sonopo, M.S., Venter, K., Winks, S., Marjanovic-Painter, B., Morgans, G. & Zeevaart, J.R. (2016). Carbon-14 Radiolabeling and Tissue Distribution Evaluation of a Potential Anti-TB Compound. *Journal of Labelled Compounds & Radiopharmaceuticals* 59: 264-269. DOI:10.1002/jlcr.3391 RC-TRANATP-PUB-15001
  - ▶ Van der Merwe, R., Cornish, L.A. & Van der Merwe, J.W. (2016). Corrosion Characteristics of Mild Steel Storage Tanks in Fluorine-Containing Acid. *Journal of the South African Institute of Mining and Metallurgy* 116: 921-926. <http://dx.doi.org/10.17159/2411-9717/2016/v116n10a5> AC-CHRNM-PUB-16002
  - ▶ Van Laar, J.H., Barry, J.C., Van der Walt, I.J., Bissett, H. & Crouse, P. (2016). Spheroidisation of Iron Powder in a Microwave Plasma Reactor. *Journal of the South African Institute of Mining and Metallurgy* 116: 941-946. <http://dx.doi.org/10.17159/2411-9717/2016/v116n10a8> AC-UMP-PUB-16001
  - ▶ Van Rooyen, L.J., Bissett, H., Khoathane, C. & Karger-Kocsis, J. (2016). Preparation of PTFE/

Graphene Nanocomposites by Compression Moulding and Free Sintering: A Guideline. Journal of Applied Polymer Science 133: Article ID 43369. <http://dx.doi.org/10.1002/app.43369>

- ▶ Van Rooyen, L.J., Bissett, H., Khoathane, C. & Karger-Kocsis, J. (2016). Gas Barrier Properties of Oxyfluorinated Graphene Filled Polytetrafluoroethylene Nanocomposites. Carbon 109: 30-39. <http://dx.doi.org/10.1016/j.carbon.2016.07.063>

#### Other Peer Reviewed Publications

- ▶ Bam, L.C., Miller, J.A., Becker, M., De Beer, F.C. & Basson, I. (2016). X-Ray Computed Tomography – Determination of Rapid Scanning Parameters for Geometallurgical Analysis of Iron Ore. In: Proceedings of the 3rd International Geometallurgy Conference. AusIMM, Perth, Australia, pp. 209–219
- ▶ Loftus, T., Van Rooyen, J., Van der Merwe, F. & Van der Walt, I.J. (2016). CFD Modelling of the Temperature Profile in a Plasma-Arc Furnace Reactor Quench Probe. ICASETNR-16 AC-PGR-PUB-16002
- ▶ Marais, D., Venter, A.M. & Markgraaff, J. (2016). Data Processing at the South African Nuclear Energy Corporation SOC Ltd (Necsa) Neutron Diffraction Facility. SA Institute of Physics 198 – 203. ISBN: 978-0-620-70714-5
- ▶ Mudau, Z.P., Prinsloo, A.R.E., Sheppard, C.J., Venter, A.M. & Fullerton, E.E. (2016). Néel Temperature Dependence of Cr + 1 at.% Al Thin Films on MgO(110), MgO(100) and Fused Silica. SA Institute of Physics 198 – 203. ISBN: 978-0-620-70714-5
- ▶ Ntsoane, T.P., Theron, C., Venter, A., Topic, M., Härting, M. & Heimann, R. (2016). In-Vitro Investigation of Air Plasma-Sprayed Hydroxyapatite Coatings by Diffraction Techniques. Material Research Forum, Materials Research Proceedings 2 (2016) 485-490
- ▶ Raaths, J.C., Van Heerden, P.R., Marais, D. & Venter, A.M. (2016). Safety Systems at the SAFARI-1 Neutron Diffraction Facility. NOBUGS 2016 Proceedings. <http://dx.doi.org/10.17199/NOBUGS2016.14>
- ▶ Selyshchev, P.A. & Bokov, P.M. (2016). Peculiarity of Propagating Self-Sustained Annealing of Radiation-Induced Interstitial Loops. International Conference on Nonlinear Mathematics and Physics. Book of Abstracts, Vol. Talks, Part 4: Crystals, Metamaterials and Other Condensed Mater, page 81, Seville, Spain, 2016
- ▶ Steyn, P.J., Havenga, J.L., Nel, J.T., Van der Walt, I.J. & Cilliers, A.C. (2015). The Mechanical Engineering Design of a Radio-Frequency Plasma Reactor for the Spheroidisation of Zirconium and Titanium Particles. Nuclear Materials Development Network Conference 2015 S87: 41-57. AC-AMI011-PUB-1500
- ▶ Van der Merwe, R., Cornish, L.A. & Van der Merwe, J.W. (2016). Corrosion Characteristics of Mild Steel Storage Tanks in Fluorine-Containing Acid. Ferrous and base metals development network conference 2016 (Ferrous 2016) AC-CHRNM-PUB-16002
- ▶ Van der Merwe, R., Cornish, L.A. & Van der Merwe, J.W. (2016). Safety Risk Assessment for Corrosion Testing in Hydrofluoric Acid. African Corrosion Journal (AfriCORR 16) 2: 28-36. [www.africorr.org.za](http://www.africorr.org.za) AC-CHRNM-PUB-16001
- ▶ Van der Walt, I.J., Kriek, L., Viljoen, J. & Van der Merwe, F. (2016). Optimizing a Plasma Burner by Implementing Additive Manufacturing in the Spinner Design. ICASETNR-16 AC-PGR-PUB-16003
- ▶ Venter, A.M., Marais, D. & Luzin, V. (2016). Benchmarking Studies of the MPISI Material Science Diffractometer at SAFARI-1. Material Research Forum, Materials Research Proceedings 2 (2016) 413-418

#### Contract Research Reports

- ▶ Lekgoathi, M.D.S. (2015). High Purity LiPF<sub>6</sub>: Its Physical Properties and the Synthesis of PF<sub>5</sub> Gas as a Precursor for LiPF<sub>6</sub> Production (Thesis). AC-FEIF214-DIS-13001
- ▶ Leuner, G.J. (2016). (Confidential report). Report for the Non-Proliferation Council (Received by Mr T Maquebela). UBD-ENR-REP-15002
- ▶ Moolman, D., Le Roux, J.P. & Wagener, J.B. (2017). (Confidential client report). Accepted by H Bester for Pelchem. AC-FEIF205-REP-11001
- ▶ Nel, J.T. (2016). (Confidential client report). Report sent to DST. AC-AMI-REP-16017
- ▶ Pienaar, A.D. (2016). (Confidential client report). Received by Gavin Ball (NTP). AC-NTPXeP3-PRO-16001
- ▶ Pienaar, A.D. (2016). (Confidential client report). Accepted by Gavin Ball for NTP. AC-NTPXeP3-REP-16002
- ▶ Pienaar, A.D. (2017). (Confidential client report). Client: NTP, Gavin Ball. AC-NTPXeP3-REP-17001
- ▶ Stassen, E. (2017). (Confidential client report). Client report for ANL. NWR-UMo01-REP-16008

## Operations Division

### Nuclear Liability Management

The Nuclear Liability Management (NLM) department provides services related to Decommissioning and Decontamination, Care and Maintenance, as well as the management and disposal of nuclear waste.

Decommissioning activities during the financial year focused mainly on the following projects:

- ▶ **Phase 2 Decommissioning of Conversion Facility:** Current pre-decommissioning activities involve cleaning and removing of unattached items.
- ▶ **De-healing of UF<sub>6</sub> Cylinders in Area 27:** The consolidation of the remaining heels of UF<sub>6</sub> into one Type 48Y cylinder was temporarily halted to update documentation to the latest regulatory requirements. Work resumed in May 2016.
- ▶ **Phase 2 Decommissioning of Area 14 Oil Basement:** Cutting of the oil pipes in smaller sections is progressing well. Operational challenges such as ageing infrastructure resulted in project delays.

The NLM Decontamination Facility consists of a Wet Decontamination Section where chemical decontamination techniques are used to recover nuclear materials and a Dry Decontamination Section where nuclear materials are mechanically separated. A total of 305 batches were processed and 99% of the material that was presented for decontamination was cleared from regulatory control.

NLM also takes responsibility for the Care and Maintenance of various facilities, including evaporation pans on the Necsa site. These NNR authorised facilities are regularly inspected and radiologically monitored.

Nuclear waste from various points of origin was collected, transported and safely stored at Necsa during the review period as summarised in the table below.

Type	Origin	Storage Area	Number Received 2016/17
Drums	Facilities on Necsa site and external clients	Pelstore and Area 21	1 884 (Received) 273 (Transported to and disposed of at Vaalputs)
Spent Fuel Elements	SAFARI-1 storage pool	Thabana Pipe Store	0
Spent Sealed Radioactive Sources	Clients throughout SA, specifically the health care sector	Area-24 Disused Source Store	359
Smoke Detectors	Clients throughout SA	Area-24 Disused Source Store	761

Waste characterisation is done on a continuous basis for safeguards and final disposal purposes. A total of 5,957 drums were measured with the IQ3 radiation scanner and 1,966 drums using the BNFL Segmented Drum Scanner. To date, the contents of 6,003 drums have been physically verified and registered on the Waste Tracking System.

Necsa's Mobile Hot Cell (MHC) remains one of the only safe and reliable mechanisms in the world for handling disused high-activity sealed radioactive sources. The MHC was developed by Necsa under contract from the IAEA, and is operated by a Necsa team regarded as world experts. Necsa has already performed 5

successful MHC operations around the world. In the most recent, Necsa was contracted to recover high-activity sources from 87 teletherapy units in Brazil. These were subsequently dispatched to destinations in the USA and to Germany for recycling.

Necsa continues to manage Vaalputs until the National Radioactive Waste Disposal Institute has obtained the requisite nuclear installation license. The National Nuclear Regulator conducted three nuclear installation license compliance inspections, a compliance audit, a physical protection inspection, as well as an emergency preparedness inspection with no non-compliance found. Vaalputs also maintained



its ISO 9001:2008 and ISO 14001:2004 certification status. Results of personnel monitoring, radiological surveillance of facilities, disposal trenches and equipment as well as environmental monitoring results were all within regulatory limits. The Vaalputs Public Safety Information Forum took place on a quarterly basis.

Vaalputs received a total of 753 waste packages in 16 consignments from both Koeberg Nuclear Power Station and Necsa during the 2016/17 financial year as indicated in the table below.

Waste Generator	Concrete Waste Packages	Steel Waste Packages	Number of Consignments
Koeberg	0	480	4
Necsa	66	207	12
<b>TOTAL</b>	<b>66</b>	<b>687</b>	<b>16</b>

Four of the main projects undertaken by NLM are elaborated on below - Liability Assessment, Volume Reduction Facility, Borehole Disposal Concept and Waste Smelter.

The independent Liability Assessment for the operational radiological facilities was completed in March 2017. The report is expected by the end of May 2017.

The construction and cold commissioning of the Volume Reduction Facility (VRF) has been completed successfully. The facility is intended to compact 6 to 7 compressible waste drums (100 litre and 160 litre drums) to be contained in 210 litre metal VRF waste packages. The cold commissioning report and hot commissioning manual were resubmitted to the NNR for approval. Revision 6 of the VRF Safety Analysis Report was resubmitted on 10 February 2017 and the NNR performed an inspection on the readiness of the VRF for hot commissioning on 14 March 2017.

The Borehole Disposal Concept (BDC) was jointly developed by NLM and the IAEA. Various expert missions to implement the concept in Africa and abroad were undertaken in the last few years. The purpose of the concept is to provide a facility for the disposal of disused sealed radioactive sources. NLM has been contracted by the IAEA to integrate the BDC with the Mobile Hot Cell (MHC). All the required MHC modifications were designed and produced. Demonstration of the integration of the BDC and the

MHC is scheduled for August 2017 in South Africa. NLM also participated in a peer review of the Malaysian BDC Safety Case documents at the IAEA in Vienna to determine its suitability for submission to the regulatory authority in Malaysia.

The Waste Smelter had its off-gas system installed, the hydraulic and cooling systems completed and all electrical equipment tested. The crucible linings and flexible water pipes are to be installed before cold commissioning can commence.

### Liquid Effluent Management

Liquid Effluent Management Services (LEMS) receives, treats and disposes of all industrial, low and medium activity radioactive effluents generated on the Pelindaba site. This is done under strict regulation and authorisation from the relevant authorities. The department also provides a comprehensive laundry service at Pelindaba and on an ad-hoc basis to the NNR.

During the current year LEMS have continued to provide uninterrupted services while all effluent releases were in accordance with regulatory limits. Budgetary constraints and unfilled critical vacancies remain concerns with ageing facilities requiring extensive maintenance.

### Liquid Effluent Indicators for 2016/17

Key Performance Area	Target	Actual
Limit Environmental Dose Impact	Annual Dose $\leq$ 150 $\mu$ Sv	6.094 $\mu$ Sv
All Releases to Crocodile River Authorised and within Regulatory Requirements	100% Releases Authorized	100%
Limit Releases to Crocodile River	Annual Releases $\leq$ 250,000 m <sup>3</sup>	60,463 m <sup>3</sup>
Zero Downtime to Customers	100% Plant availability	100% (365 days)

During the year, the industrial effluent pipeline was replaced resulting in re-commissioning of the Industrial Effluent treatment facility. In addition, Medium Term Expenditure Framework funding was utilised to manufacture a replacement "Downcomer" component thereby improving reliability of the Medium Active Evaporator. Upgrading of the Liquid Effluent Control Software and construction of a roof for the Hot Yard are underway.

## Analytical and Calibration Services

Analytical and Calibration Services (ACS) operates laboratories responsible for providing analytical, calibration and radiation protection services to internal and external customers. This is aimed at third-party quality assurance of products and verification of regulatory compliance.

ACS comprises four state-of-the-art laboratories:

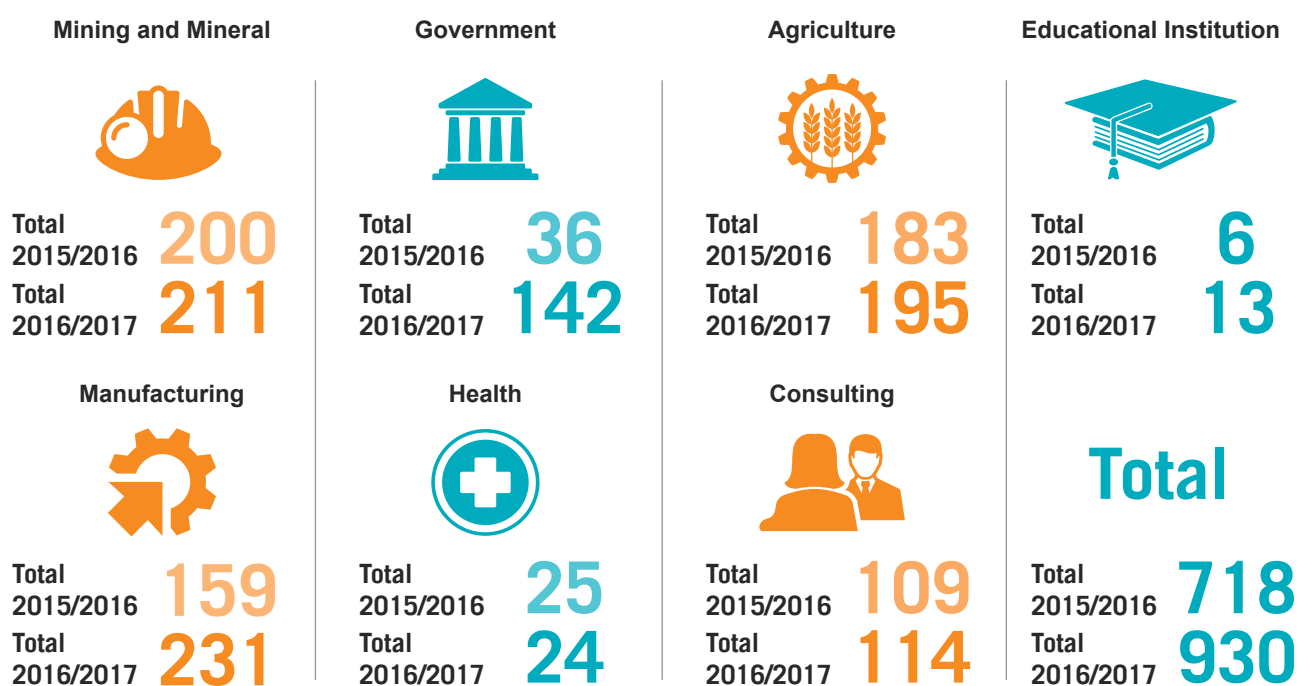
- ▶ **RadioAnalysis Laboratories (RA):** Radiochemical measurement of natural and man-made radionuclides using techniques based on the detection of ionising radiation and neutron activation.
- ▶ **Pelindaba Analytical Laboratories (PAL):** Analysis of chemical composition using instrumentation such as ICP-OES and ICP-MS for elemental, trace and ultra-trace analysis, XRF for elemental analysis, GC and GC-MS for analysis of gas and organic compounds.
- ▶ **Calibration Laboratories (CAL):** Calibration of radiation protection monitoring equipment as well as provision of radiation protection services including surveys, site clearances, inspections and sampling.
- ▶ **Nuclear Forensics Laboratories (NFL):** Provision of temporary storage areas for police nuclear material evidence and the national nuclear forensics database library at Necsa. In addition, regional and international co-operation in nuclear security is fostered.

Highlights with respect to the Nuclear Forensics Laboratories involve partnerships established with the Japanese Atomic Energy Agency (JAEA), USA Department of Energy laboratories and the International Atomic Energy Agency (IAEA). The scope of these partnerships relate to both nuclear forensics infrastructure and human capital development. A National Research Foundation (NRF) grant was secured for nuclear forensics capacity building in conjunction with JAEA. At the regional level, the NFL is lobbying for establishment of an IAEA Southern African Regional Nuclear Forensics Centre of Excellence at Necsa.

All laboratories with the exception of the NFL are accredited in terms of ISO 17025. Validation of relevant methods at NFL has been completed with a view to complete its accreditation in December 2017. PAL has extended the scope of its accreditation with three additional methods. The Nuclear Forensics Laboratories and Calibration Laboratories participated in inter-laboratory comparison studies with results found to be in good agreement with reference standards.

There was growth in customer numbers in most sectors with a significant increase recorded in the government sector. The total number of samples received has increased from 63,917 to 68,834. Throughput of samples and method development in the laboratories decreased compared to the previous financial year due to reduced demand from customers.

### ACS Market Analysis - Customers per Market Segment



**ACS Operational Statistics**

	2015/16	2016/17
Number of Samples Received	63 917	68 834
Number of Analyses Performed	86 170	83 557
Methods Developed and Validated	59	46

A notable project in progress is development of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) Radionuclide Laboratory RL-14. Government, as signatory to the Comprehensive Nuclear Test-Ban Treaty, has mandated Necsa to perform all CTBTO radiological obligations. ACS has taken responsibility for the establishment and operation of the CTBTO Radionuclide Laboratory RL-14 for South Africa. Preparation for certification of the RL-14 Laboratory has been completed. A report has been submitted to the CTBTO and a schedule agreed for the final certification process. A draft Quality Manual was officially submitted to the CTBTO for review on 31 March 2017 to be followed by development of specific operational procedures.

ACS has also embarked on a number of projects to improve capabilities and achieve growth. These are summarised in the table below.

**ACS Main Improvement Projects**

Laboratory	Project Name	Start Date	Target Date	% Complete
Calibration Laboratories	Radon Instrument Calibration Laboratory	May-16	-	20%
	Laboratory Relocation	Apr -15	Aug-17	40%
Nuclear Forensic Laboratories	Commissioning of ICP MS for Analysis of Uranium Isotopes in Water	Aug-15	May-16	100%
Pelindaba Analytical Laboratories	Accredit Additional Trace Elements of SANS 241 for Water Quality	Aug-16	Dec-17	30%
	Accredit Purity Analysis of Lu-177	Nov-16	Nov-17	90%
RadioAnalysis Laboratories	Certification of the RA Laboratory	Sep-15	Dec-17	90%
	Commissioning of Gross Alpha Beta Multi Detector	Sep-15	Apr-16	100%

[www.necsa.co.za/products-and-services](http://www.necsa.co.za/products-and-services)

**Material Test Reactor Fuel**

The primary functions of the Material Test Reactor (MTR) Fuel Department include the supply or sourcing of Target Plates for the production of Molybdenum-99 isotopes by NTP Radioisotopes SOC Ltd and the supply of the SAFARI-1 Research Reactor with Fuel and Control Rod assemblies.

During the 2016/17 financial year, the MTR department manufactured Fuel and Control Rod components in its fuel fabrication plant. This involved manufacturing components such as Combs, End-adaptors, Cadmium housings, Lower members and Aluminium extrusions. Together with Fuel Plates these are assembled into Fuel and Control Rod Assemblies for the SAFARI-1 Reactor. The requirements for supply of Assemblies as well as Target Plates were fully met.

The department also operates a Uranium Metallurgy facility which, during 2016/17, manufactured several Depleted Uranium transport containers used for the safe transportation of Molybdenum-99 isotopes.

The department maintained its ISO 9001:2008 quality management system certification by successfully completing the recertification audit. Non-radiological products were exported and met requirements without any deviations or non-conformances. Projects are reported as part of the MTEF Critical Infrastructure Investment programme.

## SAFARI-1 Research Reactor

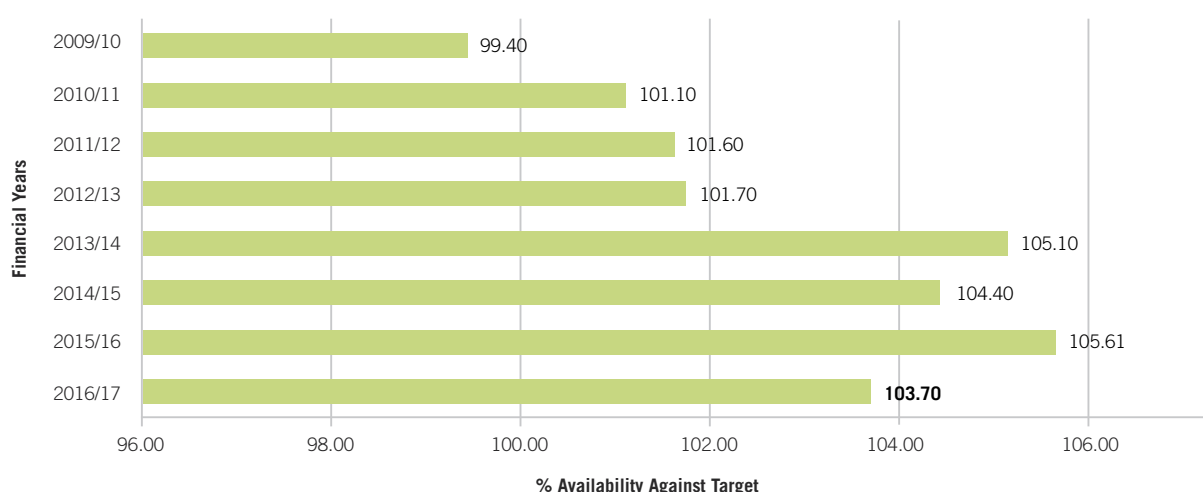
The SAFARI-1 Research Reactor department operates, maintains and upgrades Necsa's Research Reactor in a safe and cost-effective manner for the optimal benefit of customers utilising its irradiation facilities. The reactor was utilised strictly as scheduled and provided all the target irradiation services required by NTP SOC Ltd. SAFARI-1 continues to assist the Radiation Science department with the utilisation of the neutron beam lines and related instrumentation upgrades.

Operational availability of SAFARI-1 Research Reactor for the 2016/17 financial year was 297.89 days against a targeted availability of 287 days, reflecting a 103.79% achievement against target. The average reactor power during the year was 19.64 MW. This excellent operational performance is attributed to an effective reactor maintenance programme, well trained reactor operational personnel as well as the ongoing reactor Ageing Management programme. The total cumulative energy produced by SAFARI-1 up to 31 March 2017 is 3,873,281 MW.h since it was commissioned in 1965.

During the year, the reactor had a number of both unscheduled and planned outages for preventative, corrective as well as routine maintenance. The registered events had no impact on nuclear or operational safety. The impact of unscheduled events on operational availability was reduced through shortening planned outages. SAFARI-1 maintains ISO 9001, ISO 14001 and OHAS 18001 certifications to enhance customer satisfaction, safety culture and environmental management, respectively.

The SAFARI-1 Ageing Management programme is progressing more slowly than anticipated, mainly due to the loss of experienced personnel. The installation and commissioning of most upgraded nuclear instrumentation and radiation monitoring equipment is expected to be completed within the next two years. The main focus of the Ageing Management programme in that period will be characterisation of the SAFARI-1 vessel and biological shield integrity which is vital to life extension of the facility. In addition, independent engineering assessment of all the primary heat exchangers will be undertaken. The implementation of projects related to the Fukushima safety assessment emanating from a directive of the National Nuclear Regulator is gaining momentum.

**Reactor Availability Against Target**





## Nuclear Compliance and Services Division

### Security Services

The objective of the Security Services department is to implement and ensure compliance to security measures at Necsa's Pelindaba site. Security is implemented in a graded approach at each facility based on its IAEA aligned facility categorisation combined with the current Design Basis Threat. In accordance with international best practice, security is achieved through implementation of a number of security layers referred to as defence-in-depth. This can vary all the way up to critical nuclear facilities which are hardened to prevent unauthorised removal of nuclear material or potential sabotage.

As a National Key Point (NKP) in terms of the National Key Points Act, Necsa undergoes a NKP audit on an annual basis. The NKP office of the South African Police Services performs the audit focusing on management of the security operations, administration of the security officers, and the adequacy of the physical protection measures. The annual NKP audit was conducted in August 2016 and Necsa obtained a compliance rating of 98.72% consistent with the high level of compliance maintained in recent years as indicated in the table.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
NKP Compliance Rating	76.04%	90.7%	95.5%	97.72 %	98.13%	98.91%	99.03%	98.98%	98.72%

The Necsa Joint Planning Committee was established in terms of the National Key Points Act and brings together various stakeholders such as the Police, State Security Agency, Necsa Security, Necsa Emergency Services, Madibeng Community and the National Nuclear Regulator. The committee met four times during the 2016/17 financial year.

Necsa recruited previously disadvantaged students on a twelve month Security Learnership Programme in 2014. After completion, the graduates continued to display high levels of competence and work ethic. All the graduates were permanently employed within Necsa Security Services during the 2016/17 financial year.

The most significant security challenge occurred on 26 July 2016 when Necsa experienced strike action by employees demanding salary increases. Roads leading to Necsa on the Elias Motsoaledi road were barricaded and tyres burned by striking employees from early on. Members of the SAPS Public Order Policing Unit were on the scene to control the situation and remove obstructions. A Special National Key Point Joint Planning Committee meeting was held on the day to coordinate the response to the strike action and a resolution was taken that no force would be used. Negotiations between management and labour yielded a resolution and the strike was suspended on the same day.

Security upgrade projects are important in maintaining the desired security posture and strengthening Necsa's physical protection measures by means of technological innovations. The upgrades undertaken during 2016/17 were:

Area of Upgrade	Work Performed
Access Control Systems	Software upgrades and data storage capacity improvements.
Selected Facilities	Hardening, surveillance and redundancy measures.
Control Measures	Updating of procedures and training of security staff.

### Licensing and Safety Analysis

Nuclear Licensing and Safety Analysis aims to maintain effective protection of persons, property and the environment. It is governed by a number of acts including the National Nuclear Regulator and Nuclear Energy Acts of 1999 as well as international treaties, conventions and agreements. A total of 41 Nuclear Installation Licenses are issued and maintained for various nuclear and radiation facilities at Necsa. Each of the licenses is displayed in English, Setswana and Afrikaans at the respective facilities.

The Licensing and Safety Analysis Department at Necsa manages these licenses, supports the facilities with safety analyses and preparation of safety cases as well as liaising with the National Nuclear Regulator (NNR) and various government departments.

Submissions to the NNR include the communication and resolution of operational nuclear safety aspects, regular mandatory reporting as well as requests for NNR authorisation for modifications to existing facilities. Modifications originate from ageing management initiatives and upgrading of some facilities to enhance their production capabilities within strict nuclear safety requirements. Authorisations for new facilities are also facilitated.

During the 2016/17 financial year a total of 1,514 licensing related documents were managed. In all 888 licensing related submissions were made to regulatory authorities of which 857 nuclear licensing related submissions were sent to the NNR. A total of 626 submissions were received from the NNR. Response times to and from the regulator has been reduced from an average of 34 days to an average of 7 days on high priority projects.

#### Necsa Submissions to NNR for 2016/17

Facility	Number of Submissions
Liquid Effluent Management	6
R&D and Laboratories	46
Vaalputs	47
Material Test Reactor Fuel	72
SAFARI-1	75
Necsa Site	79
Nuclear Liabilities Management	170
NTP Radioisotopes	362
<b>TOTAL</b>	<b>857</b>

While the regulatory burden in the nuclear environment is particularly stringent, improvements were driven by managerial interventions. Ongoing improvements relate to developing proactive mechanisms through enhanced data collection and analytics capabilities.

#### Environmental Monitoring Programme

Comprehensive environmental monitoring at Necsa aims to meet the requirements of the Air Quality Act, Nuclear Energy Act, National Environmental Management Act and the National Water Act. Resource usage, waste generation and impacts on the environment are monitored as demonstrated in the following sections.

#### Compliance with Water Permit Requirements

Compliance is measured against water permit no. 1874B. The table reflects the effluent generated during the water year from 01 October 2015 to 30 September 2016. The Pelindaba West Pans (PW 9-14 with a capacity of 14,748 m<sup>3</sup>) and Beva pans (PW A-C and 1-8 with a capacity of 16,054 m<sup>3</sup>) are excluded since they are not receiving effluent.

#### Liquid Effluent Generated – October 2015 to September 2016

Effluent Destination	Volume (m <sup>3</sup> )	Permit Limit (m <sup>3</sup> )	Percentage of Permitted	Percentage Change Year-on-Year
Crocodile River	72,343	250,000	28.94%	-0.33%
PE Pans 1-5	22,000	19,000	115.79%	3.43%
PE Pan 6	9,000	8,500	105.88%	235.84%
PE Pan 9	2,386	15,000	15.91%	-0.23%
PE Pan 7	0	4,500	4.36%	-59.67%
PE Pan 8	196			
<b>Total</b>	<b>105,925</b>	<b>297,000</b>	<b>28.98%</b>	<b>-0.09%</b>

### Compliance with Air Permit Requirements

The total fluoride emissions for the April 2016 to March 2017 period amounted to 964 kg, which was lower by 1,784 kg compared to the previous year's 2,748 kg. The monthly site limit was not exceeded during the year. Total fluoride emissions for the reporting period were 12% of the annual air emission license constraint of 8,187 kg/year.

### Compliance with Environmental Requirements of the Nuclear License

No nuclear occurrence related to the environment was reported to the NNR during the 2016/17 financial year. Radiation dose to the public, as modelled on actual authorised releases, indicates that there was no significant dose impact to people or the environment due to Necsa's activities.

#### Modelled Dose to the Public

	2015 Calendar Year mSv	2016 Calendar Year mSv
Liquid to Crocodile River	0.0023	0.0044
Gaseous Releases	0.0032	0.0012
<b>Total</b>	<b>0.0055</b>	<b>0.0056</b>

The environmental monitoring programme at Vaalputs was in full compliance with sample reporting levels. No environmental nuclear occurrences were registered.

### Safety Services

The Safety Services department is responsible for the following Safety, Health, Environment and Quality (SHEQ) functions at Necsa: Health and Medical Services, Radiation Protection, Conventional Safety Support, Emergency Services and Emergency Preparedness as well as SHEQ Management System Compliance and Auditing.

A highlight for the department was the increase in the number of audits conducted with a view to identify and address potential non-compliances within the Necsa Group. The number of SHEQ audits conducted in this reporting period was 47 compared to 40 in the previous year. This was in addition to the establishment of the safety culture function to strengthen safety culture and awareness on site.

There were 125 Nuclear Occurrences registered with the NNR with an INES (International Nuclear Event Rating Scale) rating of 0, and 1 Nuclear Occurrence with an INES Rating of 1, for the financial year.

The Necsa Group's overall Disabling Injury Incidence Rate (DIIR) deteriorated from 0.78 to 1.1. The main causes for this deterioration include a vehicle accident near Vaalputs and an incident of permanent hearing loss.

#### Safety Performance

Description	2015/16	2016/17	Improvement (+) Deterioration (-)
*Nuclear events:			
INES rating =0	123	125	1.6% (-)
INES rating >0	1	1	0.0% (+)
DIIR	0.78	1.1	41.0% (-)
TIR (Total Injury Rate)	4.21	4.2	0.2% (+)
DIs (Disabling Injuries)	15	22	46.7% (-)
Workdays lost due to Disabling Injuries	651	154	76.3% (+)
Maximum Man-hours Worked Without a Disabling Injury	809,611	107,659	86.7% (-)

\*INES (International Nuclear Event Rating Scale) rating is given to nuclear events with 0 having No Safety Significance and 7 a Major Accident.

**Radiation Doses to Occupationally Exposed Workers**

Description	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 #	Improvement (+) Deterioration (-)
Average cumulative individual dose (mSv per person) for 12 months *	0.65	0.70	0.61	0.72	0.68	0.68	0.58	0.35	0.31	0.28	0.30	7% (-)
Number of persons who received a dose above 4 mSv	53	57	54	72	64	72	53	21	10	6	13	117% (-)

\* Necsa aims to ensure that the average annual effective dose is less than the 4 mSv ALARA objective.

# The dose data in this report may not agree with those presented in other reports covering the same or similar periods. This is because the database is continuously updated. Depending on the date and time of the database enquiry, a report may include projections or updated results.

**Emergency Services and Preparedness**

Necsa and the Madibeng Municipality continue to collaborate on closing out the findings of the National Nuclear Regulator (NNR) related to Necsa's Emergency Planning. The NNR conducted an unannounced inspection following the Necsa site emergency exercise on 28 October 2016 and compliance was found to be 100%. The emergency exercise schedule for 2016 was executed successfully. The NNR conducted emergency preparedness inspections at Necsa Emergency Services on 06 and 07 February 2017 and verified actions implemented as per the Consolidated Corrective Action Plan. The first emergency exercise for 2017 was held on 17 February 2017.

**Emergency Services Call-Outs**

Type of Call	Necsa Site		Public	
	Number of Calls	Number of Patients Transported	Number of Calls	Number of Patients Transported
Fire	16	0	35	0
Vehicle Accidents	2	1	91	69
Ambulance Calls	61	49	156	112
<b>TOTAL</b>	<b>79</b>	<b>50</b>	<b>282</b>	<b>181</b>

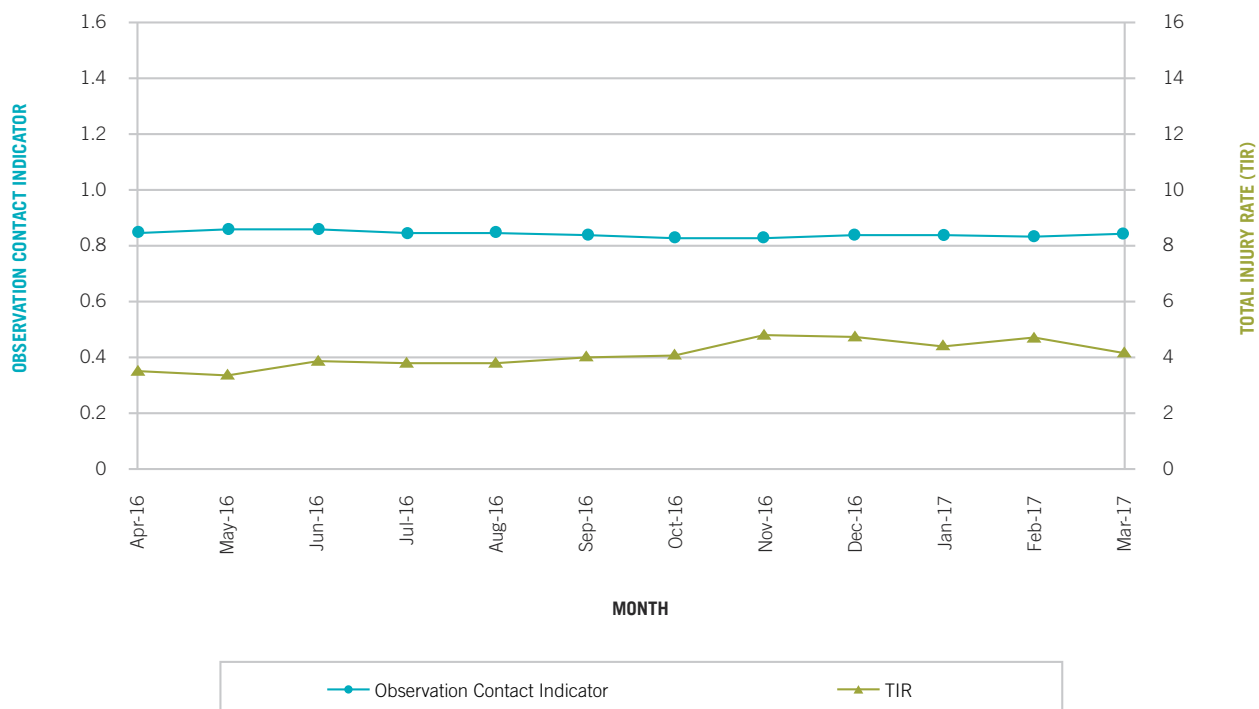
**Safety Culture Enhancement**

The Safety Culture Enhancement unit is responsible for providing guidance, support and implementation assistance related to safety culture aspects at Necsa facilities. The term "Safety Culture" encompasses Conventional Safety Culture, Nuclear Safety Culture as well as Chemical Safety Culture. During the year, various awareness sessions were scheduled with all Necsa groups and subsidiaries where emphasis was placed on the development of departmental Safety Culture Enhancement Plans.

The graph below shows the Behaviour-Based Safety Contact Indicator reflecting the percentage of staff observed as well as the monthly Total Injury Rate.



## Necsa Group Safety Trends



### Nuclear Safeguards

Necsa performs Safeguards and Nuclear Non-Proliferation activities on behalf of the South African Government as delegated by the Department of Energy in terms of the Nuclear Energy Act. This is required by the Nuclear Non-Proliferation Treaty as detailed in the Comprehensive Safeguards Agreement, both entered into with the International Atomic Energy Agency (IAEA) in 1991. Safeguards implementation was further strengthened by the Additional Protocol to the Safeguards Agreement, signed in 2002.

### IQ3 Scanner

The IAEA evaluated the historical uranium imbalance from South Africa's initial declaration and concluded that the anomaly has been resolved. However, South Africa will continue waste drum characterisation using the IQ3 Scanner and accounting of all remaining uranium containing waste from historical activities under IAEA monitoring.

### Integrated Safeguards Approach

The IAEA reduced the number of inspections during the reporting period due to the Integrated Safeguards Approach (ISA) implemented for South Africa on 01 July 2015. A total of 48 inspections were performed at various facilities under the Comprehensive Safeguards Agreement and the Additional Protocol during the reporting period as opposed to a total of 75 inspections performed in 2014/15, the last full year without the ISA. All inspections carried out were conclusive and met the safeguards requirements.

### Member State Support Program

A paper resulting from activities performed under the Member State Support Program was published in the Journal of Radioanalytical and Nuclear Chemistry. The objective of this work was to increase the IAEA's ability to attribute uranium samples, ranging from uranium ore to final products, to a particular origin. Various member states were requested to participate by providing ore

samples for analysis. This enables the IAEA to develop a database containing the characteristics - in particular the trace element content - of uranium materials of known origin.

South Africa participated by organising sampling exercises from uranium producing mines and providing the supporting information. The paper describes the applicability of different characteristics (signatures) in nuclear Safeguards and Forensics for assessment of uranium material origin. The study follows uranium production from ore to a  $U_3O_8$  product.

#### Non-Destructive Assay

The Non-Destructive Assay function of the Nuclear Safeguards department provides support during international and national inspections. The hot commissioning of the High-Activity Active Well Coincidence Counter for measurement of uranium residue canisters at NTP started on 20 March 2017 after approval from the National Nuclear Regulator.

#### Comprehensive Test Ban Treaty Organisation

Necsa is the designated authority for the establishment, operation and maintenance of the Comprehensive Test Ban Treaty Organisation (CTBTO) monitoring station - RN62, near Cape Town. A proposal for infrastructure upgrade was reviewed by CTBTO in October 2016 and Necsa was requested to align the proposal with the allocated project budget and resubmit.

#### Utilities and Facilities Management

The primary functions of the Utilities and Facility Management department are to provide space,

utilities, transport, courier and maintenance services to the Necsa Group and external tenants. The integrity of the buildings and site infrastructure must be maintained and remain in compliance with all regulatory requirements.

**Electricity Bill Reduction** - Since 01 April 2015, Necsa embarked on a process to reduce electricity consumption by 10%. Reductions of 15.5% and 12.7% were achieved for June and July 2016 respectively. Progressive energy savings opportunities implemented in line with the Electricity Supply Agreement with Eskom resulted in significant cost saving of R8m during the 2016/17 financial year.

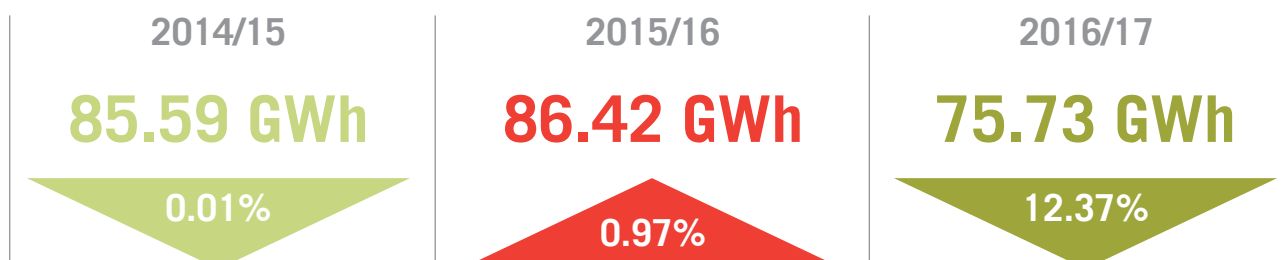
**Fleet Optimisation** – In the period June 2013 to May 2015, the vehicle fleet size was reduced from 133 to 114. As a consequence, the fleet cost reduced by R52,700 per month. The total fleet was reduced further in the 2016/17 financial year to 80 vehicles leading to a saving of approximately R108,000 per month. The Transport and Courier Services unit reviews the fleet on an ongoing basis in line with operational needs.

During the 2016/17 financial year critical maintenance activities were prioritised due to budget limitations. Delays in maintenance and repair are further attributed to lack of spares and lengthy procurement processes.

#### Resource Usage - Energy

The Pelindaba site electricity consumption for the billing period 24 March 2016 to 23 March 2017 was 75.73 GWh. The graphic below reflects the usage over the past 3 financial years.

**Necsa Energy Usage over Past Three Years**



### Resource Usage - Water

The total consumption of all water sources is 80.5% of the permit value. Necsa consumed 224.6% of the Necsa Rand Water permit value but only 12.8% of the River Water permit. The following table reflects the usage for the water year 01 October 2015 to 30 September 2016 as reported to the Department of Water and Sanitation.

Resource	Amount Used (m <sup>3</sup> )	Permitted Amount (m <sup>3</sup> )	Percentage of Permitted Amount	Percentage Change Year-on-Year
Rand Water	898,400	400,000	224.6%	6.7%
River Water	107,578	840,000	12.8%	-51.6%
Borehole	0	9,490	0.0%	0.0%
Total	1,005,978	1,249,490	80.5%	-5.5%

### Condition Assessment of Distribution Transformers

Electricity plays a vital role in the safe and profitable operation of strategic facilities such as NTP, Pelchem and SAFARI-1. Lack of knowledge of the condition of electrical transformers was identified as a major threat to the sustainability of the organisation.

Most of the Necsa electrical distribution transformers were installed between 1960 and 1983. Necsa therefore embarked on a process to assess the condition of the electrical distribution transformers and replace equipment which was at risk. A total of 195 transformers were assessed and a technical report with recommendations submitted to Necsa. All the corrective actions were implemented successfully and the project closed.



Indigenous Quiver Trees Among Namaqualand Granite near the Vaalputs Radioactive Waste Disposal Site

## Finance and Business Development Division

### Corporate Finance

The Corporate Finance department is responsible for the Group's budgets, forecasting, reporting and related administrative functions. In addition, it manages the accounting cycles including Payroll, Accounts Payable, Accounts Receivable, Inventory Control as well as Treasury and Cash Management. The department acts as custodian of Necsa's Property, Plant and Equipment and maintains the Necsa asset register.

The department oversees the overall financial strategy of the Necsa Group with respect to its divisions and to some extent its subsidiaries. This involves strategic Group investment decisions such as Available for Sale Financial Assets, Post-Retirement Medical Aid Liability funding and liaison with financial services providers.

Working closely with both internal and external auditors, assurance is provided that accounts are fairly represented and fraudulent transactions eliminated. Corporate Finance is also involved in the preparation of the Necsa Group's Annual Financial Statements.

### Financial Compliance and Reporting

The department's reporting functions include preparation of Management Accounts for EXCO and

National Treasury and the preparation of Necsa Group's Annual Financial Statements. These are prepared in compliance with Treasury Regulations, SA GAAP, PFMA, Companies Act and other relevant legislation and practices. In addition, a number of projects are registered, tracked and reported by this department.

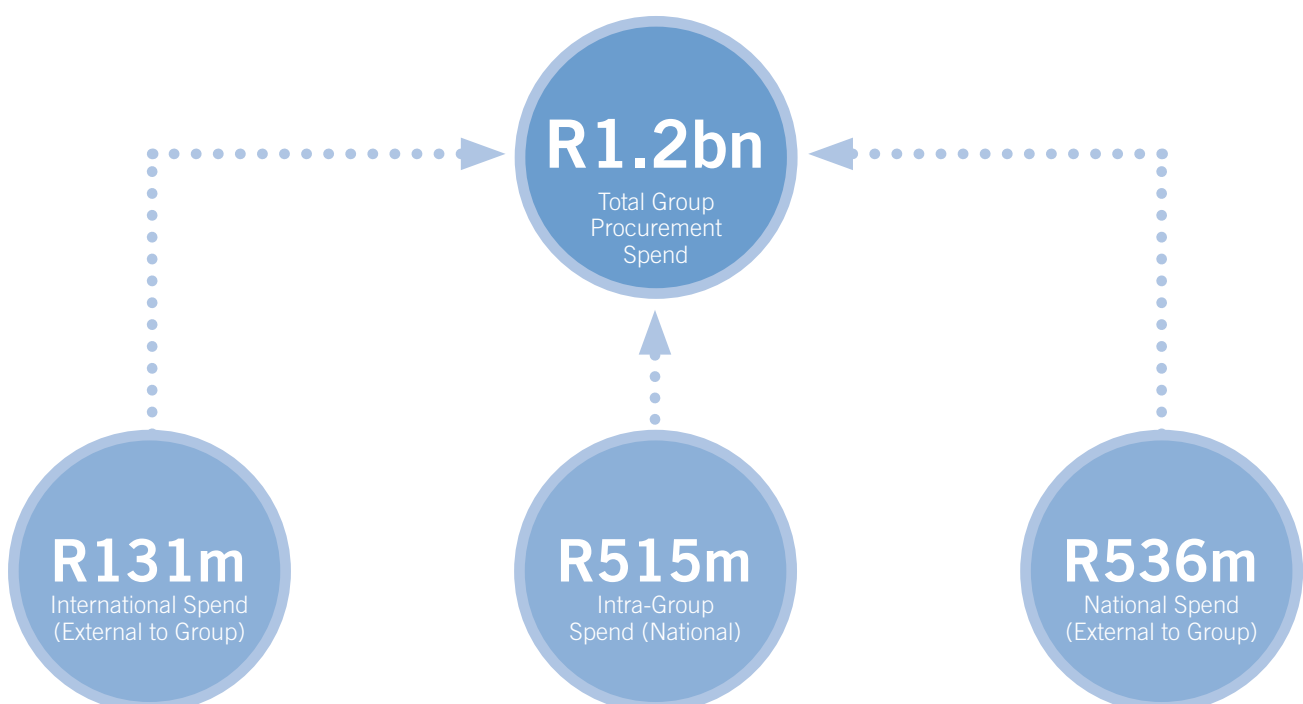
Compliance responsibilities include tracking and reporting of fruitless and wasteful expenditure and providing recommendations for preventing recurrence. A veritable annual highlight is the planning, co-ordination and execution of the year-end reporting and audit by the AGSA leading to the publication of the Necsa Group's Annual Financial Statements, see page 106. Internal and external audit findings are tracked, followed up and reported to the Audit and Risk Committee of the Necsa Board.

Contributions to financial planning include the planning and co-ordination of the company budget as well as preparation of company and Group financials for inclusion in the Corporate Plan.

### Supply Chain Management

The Supply Chain Management (SCM) department develops relevant policies and procedures while also managing compliance with these, legislation and codes of good practice. In addition, SCM provides Contract Management and Enterprise and Supplier Development support.

### Procurement Spend in 2016/17





**Top Ten Suppliers to the Necsa Group (by Payment Value)**

	Supplier	Product / Service Rendered	Value	Percentage of Procurement Spend External to Necsa Group
1	ESKOM	Electricity	R 68,016,882	10.20%
2	ANSTO	Mo-99 Isotopes	R 52,682,249	7.90%
3	NATIONAL NUCLEAR REGULATOR	Nuclear Licensing	R 38,278,184	5.74%
4	CERCA	Fuel and Target Plates	R 30,544,621	4.58%
5	VERGENOEG MINING COMPANY (PTY)	Raw Materials	R 20,790,367	3.12%
6	SASOL OIL FUEL MARKETING (PTY)	Petroleum Products	R 18,806,320	2.82%
7	AON SOUTH AFRICA (PTY) LTD	Insurance Brokers	R 12,781,850	1.92%
8	AUDITOR-GENERAL	Auditing Services	R 11,819,726	1.78%
9	RAND WATER	Local Services	R 11,339,075	1.70%
10	GAMMA - SERVICE RECYCLING GMBH	Logistics	R 10,909,441	1.64%
			<b>R 275,968,714</b>	<b>41.37%</b>

**Broad-Based Black Economic Empowerment Spend**

In compliance with the Broad-Based Black Economic Empowerment Act of 2003, Necsa fosters business relationships with companies that include Black participation in their business structures. Necsa's Policy for Preferential Procurement from BBBEE Companies is based on the dti Codes of Good Practice.

R1m spend) and 10 evaluation points (above R1m spend).

From 01 April 2017, the new Preferential Procurement Regulations allow for reserving procurement budget for 51% black owned companies. The Necsa target is for 30% of the procurable spend to be with suppliers that are more than 51% black owned.

**BBBEE Procurement Spend**

	Value	% National Procurement Spend
Total BBBEE Spend	R918,118,373	87.4%
BBBEE Recognition Spend	R845,766,928	80.5%

Necsa Corporate was assessed as a level 5 contributor with a procurement recognition level of 80%. Areas that can be improved relate to employment equity, skills development and enterprise development.

Both Pelchem SOC Ltd and NTP SOC Ltd were assessed as non-compliant contributors with a procurement recognition value of 0%. Areas that require improvement include employment equity, skills development, enterprise development and socio-economic development.

**Necsa BBBEE Ratings**

The annual BBBEE evaluation was undertaken for each entity within the Necsa Group by an independent rating agency accredited by the South African National Accreditation System. Each entity received a rating while a consolidated scorecard was prepared for the Necsa Group.

The Necsa Group was recorded as a non-compliant contributor with a BBBEE procurement recognition level of 0%. Areas that require improvement relate mainly to employment equity, skills development and enterprise development. The main reasons for the assessed non-compliant contributor level are:

- ▶ Spend in the nuclear industry is dominated by outsourced and specialised suppliers; and
- ▶ Previous preference regulations only allowed BBBEE influence up to 20 evaluation points (below

**Financial Systems**

This department maintains the Enterprise Resource Planning (ERP) and Payroll systems for Necsa and some subsidiaries. This is accomplished through acting as system administrators and first-line user support, overseeing software change control and performing of software quality control. User access control policy and procedures are also managed.

The largest current project is the integration of Necsa's ERP system with the Central Supplier Database of National Treasury.

## Corporate Services Division

### Human Resources

The reader is referred to chapter 9 for comprehensive reporting on Human Resources.

### Chief Information Officer

The Information Technology (IT) function at Necsa is provided through Systems and Information Management in the Office of the Chief Information Officer. The IT function provides the following services to Necsa and to a limited extent also to the subsidiaries Pelchem and NTP:

- ▶ Information and Communication Technologies;
- ▶ Development and maintenance of software applications;
- ▶ Implementation and maintenance of e-mail and internet systems;
- ▶ Telecommunication services including landline and cellular;
- ▶ Support services for IT problems and issues;
- ▶ IT Management and Governance; and
- ▶ Information Security.

### IT Governance

The Information Technology and Information Security Steering Committee exercised its oversight role and deliberated on IT Governance as well as compliance to the King III code of corporate governance.

The Auditor-General conducted the annual audit on General Computer Controls and the report is being awaited.

A total of five IT Disaster Recovery tests were conducted on both on-site and off-site Disaster Recovery Sites. These are used to assess readiness to manage any IT related disasters and outages as well as highlight problem areas for correction. Disaster Recovery Plans are reviewed annually for critical information management systems that could materially impact on the Group's business continuity.

### Information Technology Performance in 2016/17

Metric	Description	Percentage
Average System Availability	Availability of applications and supporting hardware.	99.98%
Average Storage Capacity	Available space on the Necsa storage area network.	29.70%
Average Turnaround Percentage	Percentage of problems resolved within period specified in Service Level Agreement.	90.80%

### IT Projects

The following IT projects were undertaken in the reporting period:

- ▶ Intranet Upgrade: Nucleus, the Necsa intranet, was developed on an outdated version of SharePoint no longer supported by the vendor. Significant progress was made on the implementation of MS SharePoint 2013 but the project was put on hold due to financial constraints.
- ▶ E-mail System Upgrade: Necsa's e-mail system operated on an outdated version of Microsoft Exchange no longer supported by the vendor. The upgrade to Exchange 2016 was successfully completed.
- ▶ Mobile Device Management: Implementation of AirWatch Mobile Device Management was done in line with Necsa's information security requirements.

### Knowledge Management

The Knowledge Management (KM) function at Necsa is provided through the Office of the Chief Information Officer. Its primary purpose is to ensure that knowledge is managed through the processes of knowledge generation, storage, transfer and application in a way that seeks to achieve the organisation's objectives. The KM function works in partnership with stakeholders such as the Human Resources department and line management.

The Necsa Knowledge Management Steering Committee performs an oversight role ensuring that the KM objectives for Necsa are achieved. Good progress was made in the financial year on the implementation of some of the core KM activities in line with the Necsa KM strategy. In particular this involved knowledge loss risk assessments done with priority placed on staff closest to retirement, tacit knowledge capture and development of knowledge retention plans.

## Corporate Communication and Stakeholder Relations

The Corporate Communication and Stakeholder Relations (CCSR) department consists of a Communication and Media Office as well as a Stakeholder Relations Office. The department provides strategic marketing communication and stakeholder engagement support. It offers an internal advisory function in managing reputation and champions programmes to stimulate public awareness about the proposed nuclear energy programme.

CCSR undertakes internal communication via the intranet ("Nucleus"), social media (Facebook, Twitter and LinkedIn), Town Hall Sessions, notice boards, public address system, bulk text message service, auto-dial (emergency communication system) and CEO Communiqués.

External communication is achieved by means of the Necsa website ([www.necsa.co.za](http://www.necsa.co.za)), social media, broadcast (radio and television), online and print media, exhibitions, conferences, site tours, external meetings, campaigns, forums, distribution of bulk text messages, press statements and publications.

### Stakeholder Prioritisation

Level of Influence	High		▶ Business Partners	▶ Government ▶ Media
	Medium		▶ Customers	▶ Employees ▶ Local Community
	Low		▶ Academic Institutions	
		Low	Medium	High
		Level of Interest		

[www.necsa.co.za/visitor-centre](http://www.necsa.co.za/visitor-centre)

### Necsa Visitor Centre

The Necsa Visitor Centre (NVC) promotes public awareness of nuclear technologies and more specifically of Necsa. The NVC hosts programmes such as tailor made presentations, workshops, exhibitions and guided tours. These tours are led by a dedicated team to the benefit of learners and educators. The NVC is also utilised to host international delegations. During the 2016/17 financial year, 25,867 people visited the NVC for participation in a programme or event.

#### Stakeholders Reached through NVC and Exhibitions



### Public Safety Information Forum

The Pelindaba Public Safety Information Forum (PSIF) was established by Necsa as a holder of a nuclear license as required by the National Nuclear Regulatory Act of 1999. Meetings are held on a quarterly basis including members of the community that live within a 5 km radius from the nuclear facility. The PSIF chairperson and deputy chairperson are appointed by the NNR with Necsa providing the secretariat for the meeting. The main objective of the forum is to facilitate interaction with community members and keep stakeholders informed on matters of safety. PSIF meetings took place at the Necsa Visitor Centre on 04 June, 17 September, 12 November 2016 and 04 March 2017.

### Vaalputs Public Safety Information Forum

Members of Necsa attend the Vaalputs Public Safety Information Forum on a quarterly basis. Attendees receive information regarding nuclear technology and specifically the safety aspects of the Vaalputs radioactive waste-disposal facility.

### Events Management

Thirteen events were coordinated in 2016/17:

- ▶ Town Hall session addressed by CEO on 13 April 2016 attended by 800 employees;
- ▶ Farewell function for outgoing Board chairperson Ambassador Seekoe on 19 April;
- ▶ Cell C Take a Girl Child to Work initiative on 26 May 2016 involving 73 girls;
- ▶ Mandela Day at Hofmeyr High School in Atteridgeville on 15 July 2016 where classrooms were cleaned, painted and laboratory chemicals restocked;
- ▶ National Science Week starting Monday, 08 August 2016 at the NVC with an average of 300 learners per day;
- ▶ Women's Day on 25 August 2016 with a 70s theme;
- ▶ Long Service Awards on 23 September 2016 at the NVC where forty six employees received awards for 20, 30 and 40 years' service;
- ▶ National Heritage day on 30 September 2016 where staff was encouraged to celebrate their culture and diversity;
- ▶ Externally sponsored Stakeholder Golf Day at Waterkloof Golf Estate on 03 November 2016 involving sixty players;
- ▶ On-site walk on 23 November 2016 to commemorate Aids Day, Disability Awareness Day as well as Activism Against Abuse;
- ▶ Necsa Pensioners' Day on 16 November 2016 at the NVC;
- ▶ Tracker's Tomorrow's Man Programme on 30 March 2017 where fifteen boy learners from Bokgoni and Edward Phatudi Secondary Schools in Atteridgeville were hosted at the NVC; and
- ▶ Talk by Dr Kelvin Kemm on Nuclear Power: Perceptions, Projections and Reality on the evening of 09 March 2017 at NVC.

### Stakeholder Engagement Initiatives

The following initiatives were undertaken to forge meaningful relations with key stakeholders:

- ▶ Lecture to sixty learners in grades 10 to 12 on nuclear medicine at Sci-Bono Discovery Centre during the week of 16 to 20 May 2016;
- ▶ Delegation of 32 business leaders from the Black Business Council visited Necsa on 02 June 2016 for a presentation on the Nuclear New Build Programme and visits to a number of Necsa facilities;
- ▶ Judging grade 9 and 10 projects at the Science Expo of the Mountain Cambridge School in Hartbeespoort on 09 June 2016;
- ▶ Engagement with various national business associations on possible collaborations around the nuclear new build at Hyatt Regency Hotel on 06 May 2016;
- ▶ Preparations for public meeting on water use license application hosted at the NVC on 15 June 2016;
- ▶ Fifteen second-year Environmental Health students from Botswana Institute of Health Sciences visited Necsa on 29 June 2016;
- ▶ One hundred winners of the Science Olympiad and their facilitators from across SADC countries and a few from Australia visited Necsa on 29 June 2016;
- ▶ Presentation to learners on 30 June 2016 at the Learner Focus Week organised by DoE in Port Elizabeth;
- ▶ Visit by the MEC of Education of the Free State Province, Mr Pule Makgoe, and his delegation to Necsa on 05 July 2016 for engagement on Necsa's skills development capabilities;
- ▶ Visit by NUM and COSATU delegations to Necsa on 11 July 2016 with focus on understanding the nuclear industry's socio-economic benefits and safety aspects;
- ▶ Presentation to the Eastern Cape Executive



Council on 31 August 2016 by the Necsa Chairman and CEOs of Necsa, Eskom and NIASA regarding benefits of the Nuclear New Build;

- ▶ Presentation titled “Demystification of Nuclear” and exhibition at School Energy Day as part of Ministerial Outreach programme on 20 October 2016 in De Aar;
- ▶ Visit to SAFARI-1 Research Reactor for eighteen employees on 05 October 2016;
- ▶ Participation in the Eskom Expo for Young Scientists between 05 and 07 October 2016 at the Birchwood Hotel;
- ▶ Hosting Eskom’s Media Team on 07 October 2016 with visit to SAFARI-1 Reactor;
- ▶ Launch of “Know Your Necsa” campaign on 11 November 2016 with 50 young professionals at the NVC; and
- ▶ Familiarisation visit by Necsa’s new auditing company, KPMG, to Necsa on 24 November 2016.

### Exhibitions

Necsa’s capabilities were promoted through the following exhibitions:

- ▶ Necsa and NTP partnered as Platinum Sponsors of the International Radiation Protection Association congress, 09 to 12 May 2016 in Cape Town where the CEO delivered the keynote address;
- ▶ Gauteng Youth Indaba at Nasrec between 10 and 19 June 2016, commemorating the 40<sup>th</sup> anniversary of June 16, in support of the healthy and responsible living campaign among young people;
- ▶ Necsa reached an estimated 500 people at the African EduWeek exhibition at Gallagher Estate on 29 and 30 June 2016;
- ▶ The Necsa Learning Academy was showcased at the Green Youth Indaba on 29 and 30 June 2016 at the Innovation Hub;
- ▶ Necsa participated in the Northern Cape Career Expo held in Kimberly on 22 and 23 July 2016 which targeted 4000 grade 12 learners each day;
- ▶ Necsa promoted better understanding of nuclear technology at the Government Expo at Church Square in Tshwane on 29 July 2016;
- ▶ Pelchem and Necsa exhibited at the National Science Week at the University of the Western Cape on 06 August 2016;
- ▶ Necsa participated in the Sustainable Energy Focus Week at Sci-Bono Discovery Centre from 05 to 09 September 2016 targeted at grade 4 to 12 learners;
- ▶ Necsa capabilities were showcased at the Women in Energy Business Summit hosted by the Minister of Energy between 06 and 07 September 2016 at the Birchwood Hotel in Boksburg;
- ▶ An exhibition on nuclear energy took place at the Main Government Exhibition Day on 30 September 2016 at the Renbro Centre in Hammanskraal;
- ▶ The IAEA celebrated the hosting of its 60<sup>th</sup> General Conference from 26 to 30 September 2016 in Vienna which was attended by over 1 300 delegates from the IAEA’s 151 Member States. Necsa hosted an exhibition also representing DoE and Eskom;
- ▶ The National Nuclear Regulator hosted an Information Conference at the CSIR between 05 and 07 October 2016. Necsa exhibited products and services while 1500 grade 10 to 12 learners attended;
- ▶ Necsa took part in an exhibition at the Diplomatic Fair hosted by DIRCO at the Union Buildings on 29 October 2016 attended by an estimated 5,000 people;
- ▶ On invitation from the Office of the Deputy President, Necsa participated in the Limpopo Youth Development and Career Expo held at Nkawkawa stadium in Tzaneen on 19 November 2016 attended by more than 3,000 learners and unemployed youth;
- ▶ Necsa hosted the Nuclear Forum at the Sandton Convention Centre on 21 February 2017 where the Minister of Energy gave the keynote address;
- ▶ At the Africa Energy Indaba between 21 and 22 February 2017, also at the Sandton Convention Centre, an exhibition stand was manned by representatives of the Young Nuclear Professionals Society, Nuclear Industry Association and Necsa; and
- ▶ The Nuclear Africa Conference took place at Nt’Shonalanga Valley Resort in Centurion between 29 and 31 March 2017. The conference is organised by Nuclear Africa in collaboration with Necsa which also exhibited and advertised in the conference booklet.

### International Relations and Delegations Hosted

The following international engagements were organised in the year under review:

- ▶ Necsa hosted a group of twenty delegates attending the International Users Meeting of the Radiation Protection Computer Code Analysis and Maintenance Programme for a technical tour on 18 May 2016;
- ▶ Necsa engaged with a delegation from the French companies CEA and AREVA to discuss future participation in the Nuclear New Build on 03 June 2016;
- ▶ The Regional Training Course on Information and Computer Security for Facilities That Handle Nuclear and Other Radioactive Material took place in Cape Town between 07 and 11 November 2016 attended by thirty delegates from across Africa including Necsa;
- ▶ The Austrian Nuclear Society visited Necsa on 08 November 2016 with the aim of promoting scientific and technical acceptance of nuclear technologies;
- ▶ The Ghana Atomic Energy Agency visited Necsa on 25 November 2016 to establish a strategic relationship between South Africa and Ghana;
- ▶ On 30 November 2016 the Department of Science and Technology and Joint Institute for Nuclear Research of Russia visited Necsa in order to promote collaborative research;
- ▶ Anglo American hosted an Open Forum on Energy in Johannesburg between 13 and 14 December 2016. The delegates, consisting of 32 CEOs from across the globe, visited Necsa on 12 December 2016 for a technical tour;
- ▶ The Nuclear New Build was promoted at the African Economic Platform hosted by the African Union Foundation in Mauritius from 19 to 22 March 2017 attended by heads of state, business leaders and academics;
- ▶ The Argentine Minister of Science, Technology and Productive Innovation, Dr Lino Barañao, and his delegation visited Necsa on 03 April 2017 for discussion on strengthening the partnership between Necsa and Argentina; and
- ▶ The State Nuclear Power Technology Corporation of China invited Necsa to participate in an International Master's Program in Nuclear Engineering and Management. Eleven candidates were interviewed at the NVC on 04 April 2017.

### Media and Communications

Necsa uses its internet site at [www.necsa.co.za](http://www.necsa.co.za) as a primary means of electronic engagement with stakeholders as evidenced by the 1,050,874 page views accumulated in the 2016/17 year. The Necsa Visitor Centre appeared in 4,811 Google searches during March 2017 alone. Necsa's Facebook page had 1,502 likes on 30 April 2017, its Twitter account had 187 followers and the company's LinkedIn profile 2,364 followers.

### Media Engagement

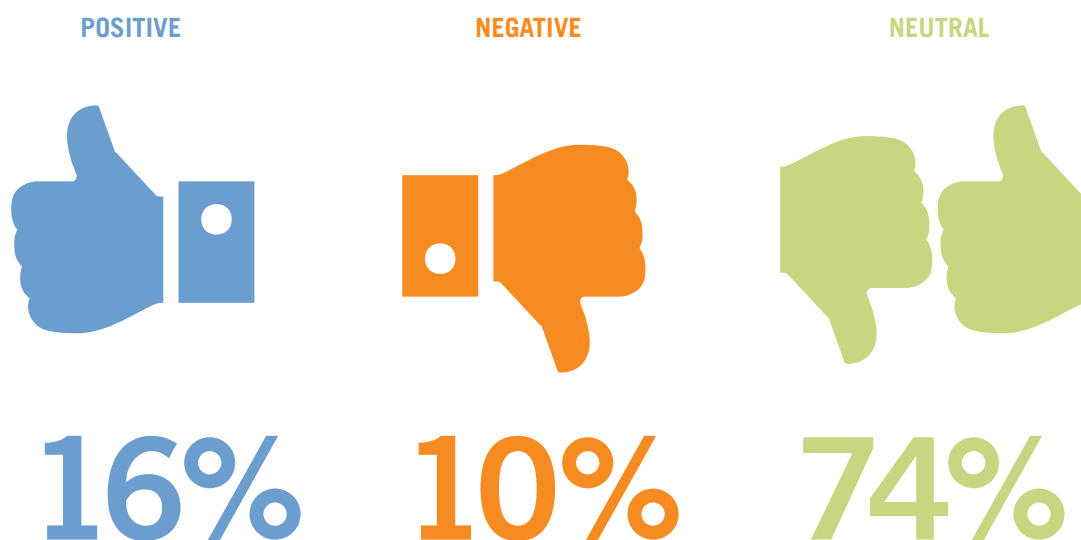
Media creates and shapes public opinion. During the 2016/17 financial year, Necsa had the media interactions listed below, 43% of which were in the form of interviews and 57% as media releases:

- ▶ Enquiry received from Business Day on 23 June 2016 with regards to wage negotiations and talks of a looming strike;
- ▶ Telephonic interview with CEO was arranged on OFM Radio in the Free State province for 04 July 2016;
- ▶ Further questions from Business Day on 22 July 2016 on salary negotiations;
- ▶ CEO was in the Hot Seat interview on 15 September 2016 at WNA Conference;
- ▶ Necsa's Chairman, Kelvin Kemm was on the Big Debate talk show of eTV on 17 September 2016 addressing Renewable Energy versus the Coal/ Nuclear Strategy;
- ▶ Media statement by CEO congratulating SA's Ambassador to the International Atomic Energy Agency, Mr Tebogo Seokolo, on his election as Chair of the IAEA Board on 03 October 2016;
- ▶ Media statement released on 05 October 2016 on the unqualified audit reports received by Necsa in the 2014/15 and 2015/16 annual reports;
- ▶ Media statement released on 11 October 2016 relating to Necsa earnings from international exports;
- ▶ CEO interviewed by PheliFM community radio of Atteridgeville in October 2016;
- ▶ CEO interviewed by Natasha Marx from FDI Spotlight on 13 December 2016;
- ▶ Advertorial for Analytical Services placed in January 2017 issue of the Inside Mining magazine;
- ▶ Opinion editorial by Necsa CEO on Hennops River pollution published on 09 November 2016 in the Pretoria News;

- ▶ Ms Funeka Mtsila interviewed on 06 March 2017 on Radio Umhlobo Wenene show called Ezentlalo Nemfundo regarding Employee Health and Safety in the Nuclear Industry;
- ▶ Media statement on 08 March 2017 on “Necsa Wins Court Case Against Earthlife Africa”;
- ▶ CEO interviewed at SABC, Auckland Park on 25 January 2017 on Russian bid for Nuclear New Build in South Africa;
- ▶ Chairman interviewed on 06 February by Creamer Engineering News relating to the CEO’s appointment to the IAEA Standing Advisory Group on Nuclear Energy;
- ▶ CEO interviewed at African Energy Indaba by Creamer Engineering News on 21 February 2017;
- ▶ Interview with Chairman by The National, United Arab Emirates on 26 February 2017 relating to “SA’s Nuclear Dilemma”;
- ▶ Chairman interviewed by Khanyisani Dlomo of eNCA on 08 March 2017;
- ▶ Channel Africa Radio interview with Chairman on 09 March 2017 – “Necsa Wins over Earthlife Africa”;
- ▶ Business Report article by Chairman on 15 March 2017 – “Let’s Heed Jonas’ Sentiment and Get Cracking”;
- ▶ Mr Brian Mphahlele interviewed by IT Web on 22 March 2017;
- ▶ Various television and radio interviews during the African Union Economic Platform in Mauritius with Chairman and Board member Dr Namane Magau, 19 to 22 March 2017; and
- ▶ Chairman on Algoa FM, Port Elizabeth on 24 March 2017 regarding “Opportunities That Nuclear Has to Offer”.

Necsa monitored the South African print and online market for the 2016/2017 financial year and found sentiment towards the nuclear industry distributed as shown in the graphic below.

#### South African Print and Online Market Sentiment Towards the Nuclear Industry



## Pelindaba Enterprises

### Pelindaba Manufacturing

Pelindaba Manufacturing houses Necsa's fabrication and machining capabilities. Manufacturing is undertaken in conformance with ISO 9001 for general industrial products, ASME VIII for coded non-nuclear grade components, ASME III for coded nuclear grade components and ISO 3834 for welding.

During the 2016/17 financial year, Pelindaba Manufacturing passed audits for ISO 9001 by the South African Bureau of Standards and ASME VIII 'U' Stamp by the American Society for Mechanical Engineers.

The department's two units - Nuclear Manufacturing and Industrial Manufacturing - successfully manufactured a reaction chamber and exported this to Russia. The project entailed manufacturing processes such as boiler making, welding, machining, heat treatment and leak testing. More opportunities from Russia are being hindered by EU and USA sanctions whereby local banks can be penalised for facilitating the transactions.

[www.necsa.co.za/products-and-services](http://www.necsa.co.za/products-and-services).

### Pelindaba Engineering Services

Pelindaba Engineering Services (PES) has expertise in Electrical, Mechanical, Civil, Process, Control and Instrumentation Engineering as well as Configuration Management. These capabilities enable PES to undertake engineering design of facilities and infrastructure while also acting as the Design Authority for Necsa's existing facilities with responsibility for approving design changes. PES maintained its ISO 9001:2008 certification.

The Configuration Management section provides configuration management services to the Necsa Group for projects at SAFARI-1, Material Test Reactor Fuel and NTP. This involves the development and implementation of configuration management processes and systems as well as maintaining the central configuration office for Necsa's technical records.

In the 2016/17 financial year, PES was involved in a number of projects for both internal and external clients such as NTP, Pelchem, Eskom, Rotek Engineering and Sasol. The major projects undertaken included:

- ▶ Necsa buildings' Certificates of Electrical Compliance;

- ▶ Nuclear Waste Smelter electrical and control circuitry;
- ▶ Completion and commissioning of NTP's Hot Cell 19; and
- ▶ Basic Design of HVAC for experimental facility in Building X4.

The Certificate of Compliance (COC) program for certifying existing electrical distribution boards on the Necsa site proceeded well despite financial constraints. Around a further 90 electrical distribution boards were certified in the course of the year. The COC process involves the verification of existing electrical installations, confirmation of the electrical design, updating of drawings and upgrading the electrical installations to comply with statutory requirements.

PES was commissioned to execute the electrical installation construction works for the nuclear waste smelter. This involved outstanding ad hoc activities and interfaces in preparation of the envisaged cold commissioning of the smelter. The control and electrical circuit diagrams of the test smelter were verified and the drawings completed. Remedial work was completed and the test smelter is functional and ready for commissioning.

PES supplies Industrial Isotope Technology (IIT) services to various industries, mostly external to Necsa. The technology is not intrusive, and is particularly valuable for shortening shutdown periods for fault-finding and corrective maintenance. By allowing faster return to service, petrochemical process units gain valuable production time.

The IIT services include:

- ▶ Radiation safety awareness training;
- ▶ Plant inspections to verify that the integrity of radioactive sources used in industry (e.g. density or level gauges) is maintained; and
- ▶ Plant investigations with radio-isotope techniques to diagnose problems or to measure equipment performance. This involves gamma scans (e.g. distillation column density profiles and pipeline blockages), neutron back-scatter scans (e.g. wall thickness anomalies and levels) and radio-isotope tracer studies to obtain a number of parameters.

IIT projects completed in the 2016/17 fiscal year include:

- ▶ Plant inspections for Botash, Kriel Power Station, Kgalagadi Breweries, Debswana, Illovo Sugar Mills, Majuba Power Station and Belgotex Floors; and



- ▶ Plant investigations at four columns of Sasol Synfuels, the C2-Splitter at Sasol Monomers and a Reboiler at Sasol 1.

### Necsa Learning Academy

The Necsa Learning Academy is South Africa's training centre of excellence for nuclear and related skills. It operates centres focused on Skills Development, Trade Testing and Radiation Protection.

#### Technical Skills Training

The Necsa Skills Development Centre continues to support the National Skills Development Strategy through the training of artisans. During 2016/17, 135 apprentices were trained and 56 people attended short courses.

#### Decentralised Trade Test Centre

The Decentralised Trade Test Centre conducted 304 Trade Tests with 296 candidates receiving Trade Test Preparation. The number of candidates benefitting from Gap Training and Pre-assessment was 79 and 155 respectively.

The first Toolmaker Trade Test Centre (TTTC) in South Africa was accredited and commissioned in June 2016 at NLA. The qualification from the TTTC is at NQF level five which is equivalent to a diploma. Mr Sandile Luthuli, from Tshwane Training Institution, became the first candidate in South Africa to successfully complete his trade test for the new Occupational Certificate: Toolmaker at the TTTC.

#### Radiation Protection Training Centre

A total of 150 students were trained in Radiation Protection. Seventy candidates are currently in training as Radiation Protection Officer (RPO) Level 2 which is equivalent to NQF Level 4. Of the seventy, thirty are funded by CHIETA and forty by the National Skills Fund. Fifteen Necsa employees are undergoing RPO Level 1 training - equivalent to NQF level 5 - since 01 February 2014 and are expected to qualify by the end of 2017. To date, one RPO Level 2 and six RPO Level 1 trainees have completed their training.

Short courses in radiation safety were attended by 58 people; 11 from mining, 5 from the tyre industry and 42 working in non-destructive testing. In addition, 20 Industrial Physics students from the Tshwane University of Technology participated in the nuclear industrial training programme.

Two PhD Physics students, one from the University of Pretoria and one from the University of Johannesburg as well as one MSc student from the University of Johannesburg were supervised by Dr RD Mavunda from the Radiation Protection Training Centre. Five peer reviewed papers were published out of this collaborative work with the MSc thesis currently being evaluated.

#### Resource Mobilisation

The National Skills Fund has awarded the Necsa Learning Academy R25.8m to train 72 Apprentices, 40 Radiation Protection Officers and 24 Technicians over the period 01 October 2016 to 31 September 2019.

#### South African Civil Nuclear Energy Training

The energy administration authorities of China and South Africa signed the "Memorandum of Energy Cooperation between the governments of the People's Republic of China and the Republic of South Africa" in August 2010. In support of the memorandum's objectives, the South African Civil Nuclear Energy Training (SACNET) agreement was negotiated in 2015 by the State Nuclear Power Technology Corporation (SNPTC) on behalf of the Chinese government and Necsa on behalf of the South African Government.

The agreement for the SACNET Training Programme started with Phase I-Basic Training for 50 people from South Africa during a four month period in China in 2015. The first leg of Phase II-Specialisation Training Programme took place at Koeberg Nuclear Power Station, Cape Town from 11 to 22 January 2016 and was attended by 49 candidates. This included the speciality areas of Engineering Design, Manufacturing Technology, Construction Technology, Commissioning and Start-Up Technology, Project Management and Procurement Technology. The second leg of Phase II, which was attended by 48 candidates and expanded on the topics, was successfully implemented in China from 06 June to 08 July 2016. The Phase III On-The-Job Training for 16 people from SA to work in Chinese nuclear plants for periods ranging from three to six months is currently being arranged.  
[www.necsa.co.za/skills-training-centre](http://www.necsa.co.za/skills-training-centre).

#### Pelindaba Consulting Services

Pelindaba Consulting Services provides project management services to the Necsa Group.

# NTP Radioisotopes SOC Ltd



**Ms TNM Eboka**  
Group Managing Director  
NTP Radioisotopes

## Group Managing Director Overview

NTP Group is a leading global supplier of radiation-based products, solutions and services for the healthcare, life sciences and industrial sectors. Isotopes like Molybdenum-99 support the practice of nuclear medicine, while radioactive sealed sources are used in applications such as non-destructive testing.

Nuclear technology plays an important role in the South African economy, with nuclear medicine contributing

towards economic growth and improved health outcomes, and also in terms of job creation and social upliftment. The availability of reliable and affordable nuclear medicine stimulates healthy, productive capacity, leading to sustainable economic and social development. NTP supplies local and foreign markets, earning valuable foreign exchange for South Africa.

NTP has enjoyed a period of sustained growth, but the global nuclear map is changing, with potentially far-reaching consequences for nuclear technology markets. The industry faces several critical challenges. These include remaining price-competitive in a market that has yet to achieve full-cost recovery for key medical radioisotopes, and where new technologies may have a significant impact on future regional supply and demand.

Nuclear technology systems will also have to expand to meet the world's ever-growing needs, led by rising incomes and populations in emerging economies, while somehow improving access to nuclear technology products for the world's poorest. This context makes it extremely difficult to put nuclear technology systems onto a more sustainable path, yet this path must be found, by us and by all industry players.

NTP has many unique and valuable assets, which include facilities, skills, expertise, intellectual property and infrastructure. In order to insure that our legacy is not only preserved but that it is passed on to and for future generations, we have developed and invested in strategies and programmes that will ensure our business continues to grow in a way that is organic and sustainable, and which not only meets but which exceeds our stakeholder and customer value propositions.

## NTP Profile

### Origins

NTP Radioisotopes SOC Ltd is a wholly owned subsidiary of Necsa SOC Ltd, and is headquartered at Pelindaba. NTP operated as a division of Necsa from the early 1990s and was incorporated as a limited liability company in October 2003.

Pelindaba has produced small volumes of medical radioisotopes since 1973, initially to supply the South African nuclear medicine market. In the 1990s this scheme was commercialised and the hot cell complex previously used for nuclear fuel testing was converted into radiochemical production facilities. The first export orders for the key medical radioisotope Molybdenum-99 were shipped in 1994.

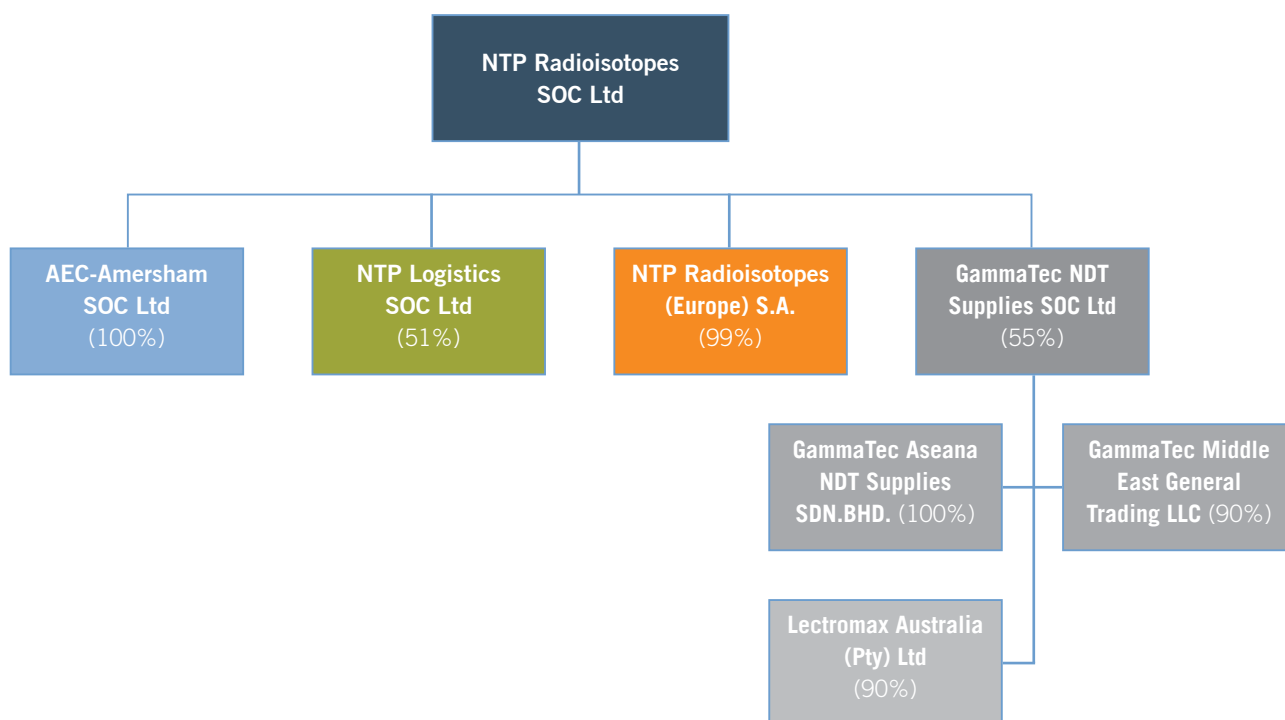
In less than 25 years, NTP has grown to become one of the world's leading suppliers of medical radioisotopes. From just 30 employees in 1992, NTP now boasts over

440 skilled employees, and the company is one of the top three producers of Molybdenum-99.

NTP is a pioneer in the integrated use of medical radioisotopes, making South Africa a hub of nuclear medicine excellence on the African continent. In 1989 NTP began producing and distributing its own high-yield Technetium-99m generators, used by nuclear medicine practitioners. In 2005 the company also began to produce on-site cyclotron-based FDG F-18, which is used for cancer diagnosis. Following the successful conversion of the SAFARI-1 Research Reactor core to low-enriched uranium (LEU) fuel in 2009, NTP became the first large-scale producer to offer commercial all-LEU based Mo-99 and Iodine-131, in which both the fuel and the targets were LEU-based. In 2012, NTP began the first African-based production of the beta-emitter Lutetium-177, which has diagnostic and therapeutic applications. NTP later facilitated the first medical procedure in South Africa using Lu-177 no-carrier added prostate-specific membrane antigen.

## NTP Group Structure

### Group Subsidiary Companies



Subsidiary results are published separately in the addenda entitled: "Necsa Group Subsidiary Results - 2017"

### AEC-Amersham SOC Ltd

AEC-Amersham is the African and Indian Ocean region distributor for NTP radiopharmaceutical products, a range of life science products and service offerings. The company is ISO 9001 certified and complies with all regulatory requirements that enable the company to import and export its products.

### NTP Logistics SOC Ltd

NTP Logistics specialises in the global distribution of hazardous, time sensitive and high value goods offering a full spectrum of land, air and sea solutions. The company is a market leader with experience in national and international regulatory requirements.

NTP Logistics holds an array of permits and licences from the National Nuclear Regulator, Department of Energy, Department of Health and the Department of Transport and is an active member of the World Nuclear Transport Institute. The company maintains ISO 9001 certification with an audit during the 2016/17 year noting a strengthening in management and quality control processes.

### NTP Radioisotopes (Europe) S.A.

NTP Radioisotopes Europe is based in Fleurus, Belgium where it produces and supplies radiation-based products and services. Products are utilised for a wide range of non-destructive testing (NDT) applications ranging from integrity verification on

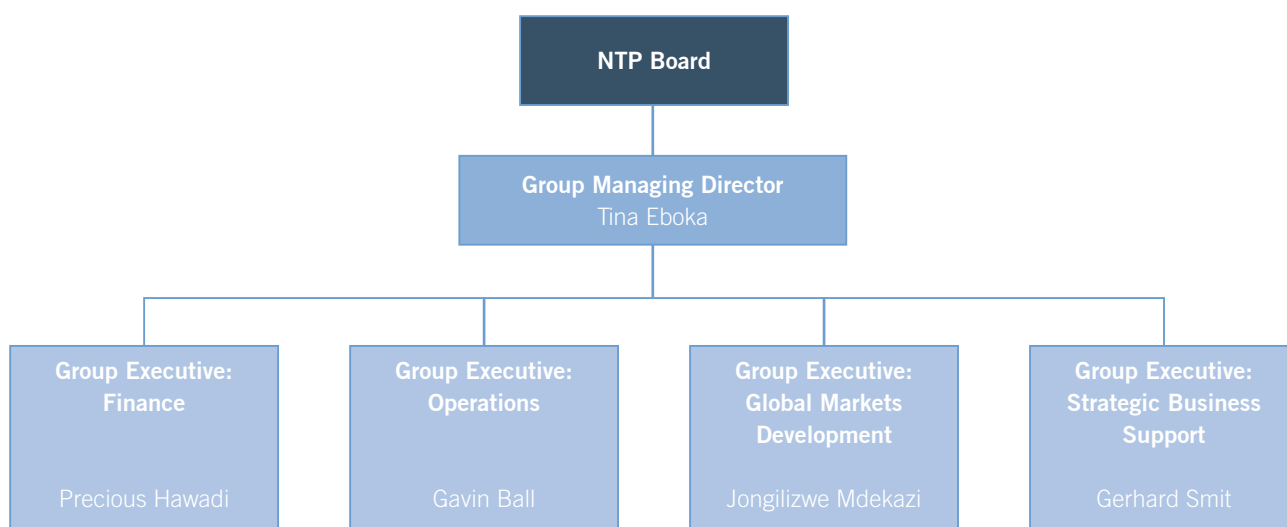
pipelines and components used in the oil and gas sector to aircraft engines and critical components. The company is a manufacturer and distributor of gamma-radiography equipment including sealed radioactive sources containing Iridium-192, Selenium-75 and Cobalt-60 as well as the GammaMat range of NDT projectors and accessories.

### GammaTec NDT Supplies SOC Ltd

GammaTec was established in 1981 and became a subsidiary of the NTP Group of Companies in 2009. GammaTec NDT is a supplier, distributor, manufacturer and turnkey solution provider of non-destructive testing (NDT) equipment, accessories and consumables. Technologies provided include acoustic emission, ultrasonic, phased array, visual inspection, dye penetrant, eddy current, magnetic particle as well as radiography sources such as Iridium-192, Cesium and Selenium. The company is ISO 9001 accredited.

GammaTec exports to over seventy countries with a focus on Africa, the Middle East, Southeast Asia and Australasia, with subsidiary operations in Dubai and Kuala Lumpur. GammaTec's equity associate, Oserix SA, based in Belgium, services the gamma radiation isotopes market in Europe, North Africa and the Americas. This association has allowed GammaTec to manufacture the Dual 120 portable projectors for gamma-radiographic applications in South Africa.

## NTP Internal Structure



### Governance

NTP's performance is driven by engaged and accountable leadership across our executive structures, focusing on the business imperatives of efficiency, accountability and sustainability.

NTP's Board of Directors is chaired by Dr Namane Magau and provides strategic leadership, performance oversight, and good governance. The non-executive NTP Board members are Nala Mhlono, Dr Nozipho Nyakale, Mashukudu James Maboja, Albert Jordaan, Thabo Tselane, Brian Mphahlele, and Dr Nozi Mjoli. They are joined by NTP executives Tina Eboka (Group Managing Director) and Precious Hawadi (Group Executive: Finance).

### NTP Growth Strategy: Nuclear Medicine in Africa

NTP is consistently exploring opportunities to grow its market share and footprint across the world while at the same time strengthening its financial and future sustainability through investment in South Africa and Africa.

There are currently some seventeen nuclear medicine centres in sub-Saharan Africa, excluding South Africa. These centres serve a population of over 377 million people. As the demand for nuclear medicine and medical radioisotopes grows on the continent, NTP is identifying and responding to the market's unique needs and requirements, and partnering with local organisations and individual medical practitioners to develop appropriate strategies and solutions.

Over the next five years, NTP will grow its African business, focusing on three key regions: west, east, and southern Africa. Working with in-country nuclear medicine centres and doctors, NTP will accelerate market growth and make nuclear medicine technology more accessible to more patients in Africa. Together with NTP group subsidiary companies AEC-Amersham (radiopharmaceuticals) and NTP Logistics, NTP is able to offer a unique value proposition to African nuclear medicine centres and practitioners.

### Highlights/Challenges for 2016/17

#### Highlights

- ▶ NTP has grown its market share in the past year through continued investment in infrastructure, increased production and by working with its partners to cover the supply gap after the exit of

the leading Canadian supplier from the Mo-99 and I-131 markets;

- ▶ NTP Group MD Tina Eboka was elected as vice-chair of the OECD's High-Level Group on Medical Radioisotopes. This is the first time an isotope producer has been appointed to the executive;
- ▶ After the successful repair and commissioning of hot cell 19, NTP once again has two production lines;
- ▶ Following NNR approval, the first hot commissioning run of the uranium residue facility was successfully performed;
- ▶ Various successful production runs and the first validation run of Lu-177 were performed with no carrier added;
- ▶ Four shipments of Lu-177 from these test runs were dispatched to Argentina and Brazil with positive feedback from customers;
- ▶ The Package Design Safety Report for the TSI B(U) transport container was submitted to the Belgian Nuclear Regulator and the certification of the packages subsequently approved;
- ▶ Facility gaseous discharge doses for the year amounted to 1.13 µSv, well below the licensed limit; and
- ▶ NTP successfully completed its ISO 9001 transition audit and received ISO 9001:2015 certification in early 2017.

#### Challenges

- ▶ A project for implementing an Enterprise Resource Planning system was suspended mainly due to financial considerations.

### Human Resources

NTP operates in an environment that requires a strong foundation of skilled and qualified staff. Its goal is to ensure that unique and invaluable skills are preserved and passed on to future generations. NTP is an employer of choice for medical radioisotope experts, recruiting and retaining the best skills and continuously improving the available skills within the industry.

#### Human Resource Development

Statutory training spend for the period under review was R215k, while R4.1m was spent on soft and core skills development, which is 2.67% of the total payroll.

- ▶ NTP Radioisotope's internship programme placed a total of 31 interns within the company during the financial year of whom six were retained after completion. A bursary scheme was initiated during



the period under review to create an opportunity for academically deserving students to gain access to education, while at the same time creating a talent pipeline for NTP.

- ▶ AEC-Amersham has training, mentoring and coaching systems in place to enhance the skill levels of employees.
- ▶ Training and development at NTP Logistics during the period under review included Aircraft Dangerous Goods, Radiation and Hazchem Goods and ISO 9001 Quality Management.
- ▶ GammaTec supported training of employees on all levels ranging from Adult Basic Education and Training (ABET) to Management/Supervisory Certificates. A Learnership Programme assisted ten unemployed black learners in obtaining full time employment.

### Change and Transformation Programmes

NTP has performed extensive work to ensure integrated and sustainable Employment Equity Act compliance and consultation across the business. During 2016/17 financial year, 92% of all appointments on post level C4 (skilled technical and academically qualified workers) and higher at NTP were Black people (African, Coloured, Indian and Asians).

### Remuneration and Rewards

In order to attract and retain the best talent, new remuneration and benefit structures were developed and implemented based on principles of equity, equality and consistency. The short-term incentive scheme was reviewed, all job sizes verified and internal and legal remuneration parity fully implemented. NTP's remuneration model is benchmarked against major companies to ensure competitiveness.

### Employee Relations

NTP strives to achieve good working relationships with organised labour and more broadly a stable labour environment for all. In this reporting period wage negotiations were completed without incident and a collective agreement signed. Although there was an increase in the number of grievances lodged (8) and disciplinary hearings (10) held during the reporting period, measures were in place to ensure that these were resolved within a reasonable time. During the period under review, 240 counselling sessions were held as part of the Employee Assistance Programme.

### Socio-Economic Development

During the reporting period a decision was taken to focus the Socio Economic Development Programme on ongoing needs of employees and their families with respect to education as a key enabler for sustainable economic growth. A study loan repayment assistance programme was introduced for employees and their dependants for which a total of nine employees qualified (6 Africans, 2 Coloured and 1 White) at a total costs of R375k.

### Sustainability

NTP's sustainability is intimately linked to its ability to operate safely, comply with a multitude of regulatory requirements, and deliver sound financial performance.

### Regulatory Compliance

Regulatory compliance requirements for nuclear and/or radiation facilities as well as radiopharmaceutical and medical products continue to increase both nationally and internationally. NTP is currently fully compliant with some 50 different regulatory licenses relevant to the production and distribution chains.

As valued stakeholders to NTP, frequent interactions with all regulatory authorities are maintained. Through a process of mutual understanding and support, the highest levels of regulatory control and adherence are ensured for both NTP and its affiliate companies. All reports required for the period under review were submitted to the Department of Health, the National Nuclear Regulator, and the Department of Energy.

Regular audits are conducted by DEKRA with respect to NTP's ISO 9001:2015 certification, and by the South African Medicines Control Council, the Department of Energy, the National Nuclear Regulator, the Department of Health's Radiation Control directorate, the United States Food and Drug Administration, the International Atomic Energy Agency and NTP's customers. NTP has retained all its necessary licences and certifications, allowing for continued, safe, reliable and sustainable production of quality products.

### Safety

Employee radiation doses have reduced steadily since 2010. This is attributed to the continued enhancement of the on-the-job radiation protection programme and a well-entrenched As Low As Reasonably Achievable (ALARA) programme. However, this reduction has now stabilised with a marginal increase in the 2016/17

financial year due to increased production output. Gaseous releases from the NTP production facilities remain well within authorised levels with the total release remaining within annual limits.

NTP has a Behaviour-Based Safety (BBS) programme in place to improve safety culture. The safety committee holds regular safety awareness presentations. Four Disabling Injuries and four Injuries on Duty were registered during 2016/17, resulting in a Total Injury Rate of 2.31 at the end of March 2017. The Disabling Injury Incident Rate at the end of the financial year stood at 1.16 and the total number of Disabling Injury free hours worked since January 2017 was 166,186 hours.

### NTP Safety Trends



### Summary Financial Information

During the 2016/17 financial year, NTP reported increased sales and grew its profit. This was achieved through improved production of the radiochemical Molybdenum-99, and through cost savings. NTP Group achieved total sales of R1.364bn in 2016/17, posting a profit after tax of R202.58m which was R37.88m more than its target of R164.7m.

[www.ntp.co.za](http://www.ntp.co.za)

# Pelchem SOC Ltd



**Mr IM Radebe**  
Group Managing Director  
Pelchem

## Group Managing Director Overview

Pelchem is entering a new phase as it prepares to execute its expansion and growth strategy to position itself as one of the leading fluorochemical producers globally. The organisation faced a difficult year largely due to operational difficulties because of aged and unreliable plants. The operational difficulties constrained the organisation's ability to meet market demand and that impacted negatively on financial performance.

Fluorochemicals have versatile properties making it essential in applications ranging from production of toothpaste and ingredients of aviation fuel to its use in plastics for storing agrochemicals. We see great opportunity to unlock value for the organisation in the fluorochemicals sector with an anticipated compound annual growth rate of 4%.

I am very excited to lead Pelchem in reaching its goals.

## Pelchem Profile

Pelchem SOC Ltd is a wholly owned subsidiary of Necsa SOC Ltd located at Pelindaba. The company originated as a commercialisation vehicle for fluorine expertise developed for the nuclear fuel cycle at Necsa. Pelchem was designed as a fluorochemical hub to add value to South African mined fluorspar of which the country has the largest reserves in the world. With over thirty years' experience, Pelchem is the only producer of fluorochemicals in the southern hemisphere with a portfolio of over fourteen products exported to more than twenty-seven countries. In Southern Africa, Pelchem is a critical supplier of Hydrofluoric Acid (HF) to the petrochemical industry for the production of fuel.

Other products include Fluorine gas and gas mixtures, Xenon Difluoride and speciality Perfluorocarbons and Fluoromonomers for diverse markets such as electronics, cosmetics, pharmaceuticals, steel finishing and mining. Pelchem's production facilities are operated with its own proprietary technologies protected by patent, trade secret or trade mark.

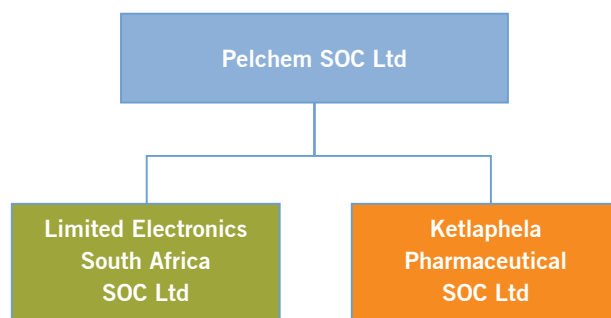
Pelchem's strategy is transitioning under the new leadership of Mr Radebe (appointed November 2016) to focus on expansion and growth. The company envisions expanding on its position as global supplier of commodity and specialty chemicals through growth based on its unique fluorine technology and

capabilities. The main elements of Pelchem's vision are:

- ▶ Being the preferred supplier of both commodity and specialty chemicals;
- ▶ Delivering on our promises, safely and in an environmentally responsible manner;
- ▶ Driving growth through excellence, innovation, performance and customer focus; and
- ▶ Delivering world class products and services reliably.

### Pelchem Group Structure

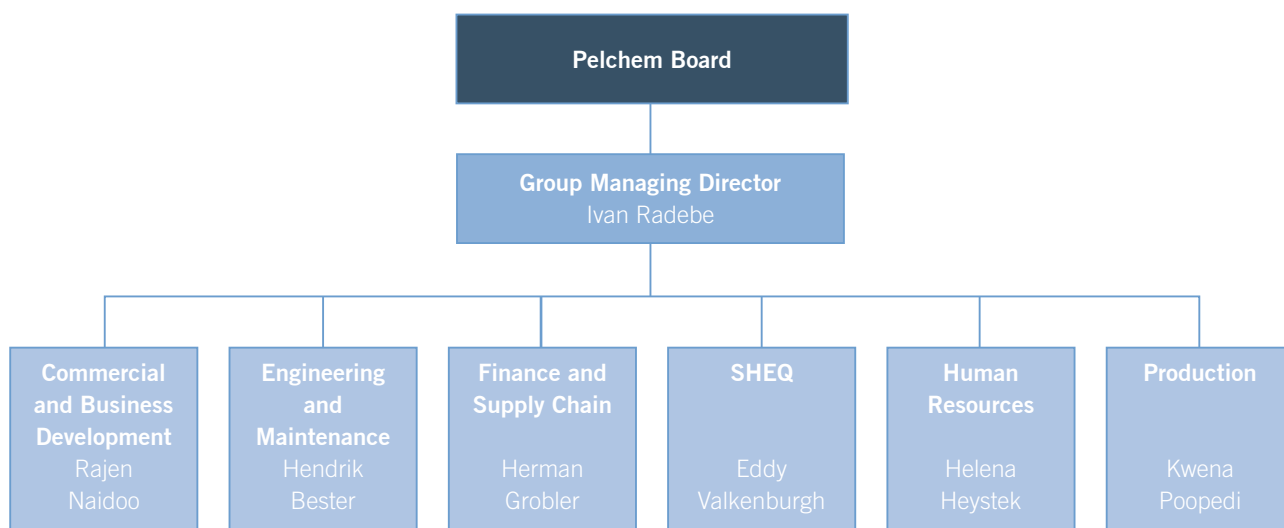
The Pelchem Group includes two subsidiaries. Limited Electronics South Africa SOC Limited (LESA) is a wholly owned subsidiary of Pelchem used primarily for global sales of  $\text{NF}_3$  to the semiconductor industry. A new pharmaceutical subsidiary, Ketlaphela SOC Limited, was created to manufacture and supply the local health market with active pharmaceutical ingredients for antiretroviral medicines. Pelchem has a 100% shareholding in Ketlaphela.



Subsidiary results are published separately in the addenda entitled: "Necsa Group Subsidiary Results - 2017"

### Pelchem Internal Structure

Pelchem's organisational structure is depicted in the diagram below. The Managing Director reports to the Board of Directors of which the majority are non-executive members. The structure aims to effectively integrate sustainability concerns with decision-making in an ethical environment. The production division is responsible for eight facilities.



## Governance

Pelchem's Board of Directors is chaired by Mr Mashukudu Maboja and provides strategic leadership, performance oversight, and good governance. The non-executive Pelchem Board members are Dr Nozibele Mjoli, Mr Fabrizio Dionisio and Mr Fadl Hendricks. They are joined by Pelchem Managing Director, Mr Ivan Radebe.

## Highlights/Challenges for 2016/17

### Highlights

- ▶ Pelchem's new Managing Director, appointed in November 2016, is a seasoned executive. Mr Radebe was recently Managing Director of NTP Radioisotopes (Europe) SA in Belgium. Prior to joining NTP Radioisotopes (Europe) SA, he held senior positions in the energy and government sectors including General Electric, Department of Public Works and Eskom.
- ▶ Pelchem produced and supplied its first Molybdenum Hexafluoride ( $\text{MoF}_6$ ) used as feedstock for selectively increasing the proportion of  $^{100}\text{Mo}$  isotope. Material enriched in  $^{100}\text{Mo}$  is incorporated into targets for studies on accelerator based production of the well-known radioisotope Technetium-99m which is used for early cancer detection.

### Challenges

- ▶ Nitrogen Trifluoride ( $\text{NF}_3$ ) has been classified as a greenhouse gas, suppressing demand and resulting in collapse of the market.
- ▶ Aging infrastructure, especially of the main Hydrofluoric Acid plant, has impacted on production resulting in loss of sales.

## Human Resources

### Personnel and Transformation

Pelchem is pleased to announce the appointment of a Black male as Managing Director and a Black female in a senior position as Marketing Specialist. The total Black staff complement of Pelchem at the end of this financial year was 64.3% and the female component was 16.5%. The company had only a 3% staff turnover.

### Training and Development

Pelchem's goal is to be a preferred employer in its industry. To that end the company has embarked on an internship program for engineers, artisans and

operators both for Pelchem and the wider market. In addition, Pelchem has offered bursaries to nine employees of which four are females. During the year the NQF levels of five process controllers were enhanced.

## Sustainability

Pelchem continued to deliver on its pledge of being a responsible corporate citizen in the social, environmental and financial domains.

### Social Responsibility

Pelchem adopted the Meerhof School for disabled children as its Corporate Social Investment support project. Pelchem staff also continued to support various learning initiatives such as the National Science Week and school visits to the Necsa Visitor Centre.

### Environmental Responsibility

There was 99% compliance with regard to atmospheric emissions during the review period. ISO 9001 certification was successfully retained for both LESA and Pelchem. An ISO 14001 SABS Stage 2 certification audit took place on 25 and 28 November 2016. All findings were satisfactorily closed out and a positive recommendation for certification was presented to the SABS Certification Board.

### Health and Safety

Health and Safety at Pelchem is managed through the Necsa Safety, Health and Environment policies and with the aid of a Behaviour-Based Safety programme known as PEARL (Pelchem Eliminating Accidents and Risks of Life). The Disabling Injury Incidence Rate (DIIR) decreased to 1.20 from 1.22 in the previous reporting period. However, the Total Injury Rate (TIR) in the same period was 13.48 against a target of 6.0. Pelchem has since launched a Safety Culture improvement programme in an effort to eliminate all injuries. This includes the adoption of non-negotiable behaviours.

## Summary Financial Information

Pelchem achieved a revenue of R199.8m in 2016/17 and posted a net loss of R35.5m. The company is striving to grow the market share of its existing products as well as working towards a long term expansion and growth strategy.

[www.pelchem.com](http://www.pelchem.com)



# 07

## Sustainability Report



Strict Controls at Necsa's Nuclear Facilities Result in a Pristine Natural Environment at Pelindaba

## Introduction

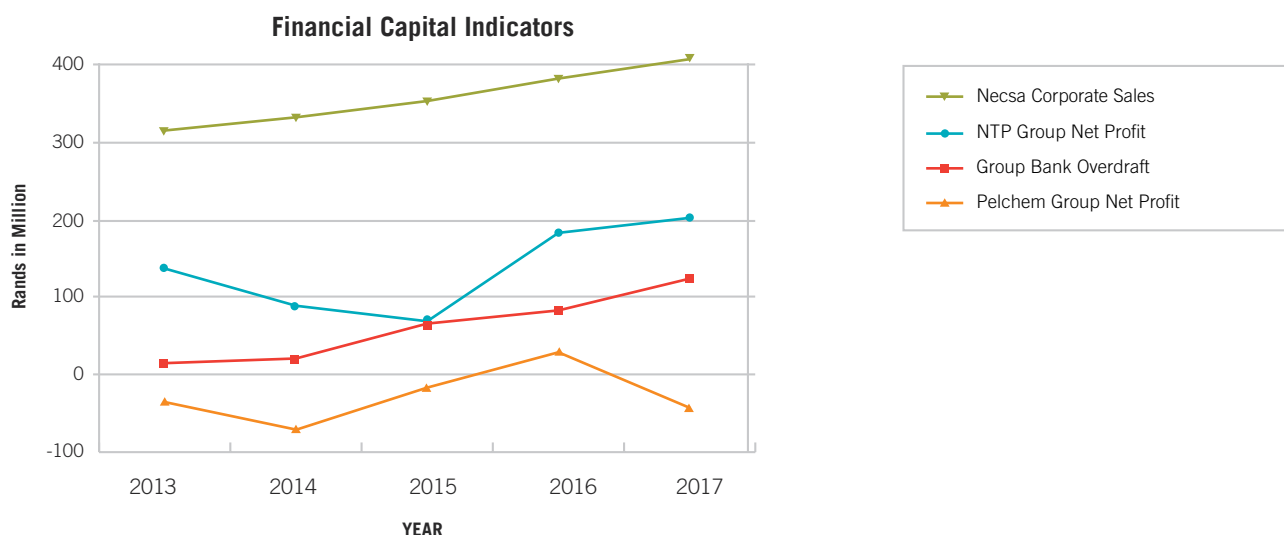
The Necsa Group is committed to the goal of sustainable development to ensure that opportunities available to future generations are not compromised. To this end, the company's Economic, Social and Environmental Impacts are considered below.

In each of the three domains, sustainability is examined in terms of the relevant capitals at the core of the International Integrated Reporting Framework and relevant performance indicators presented.

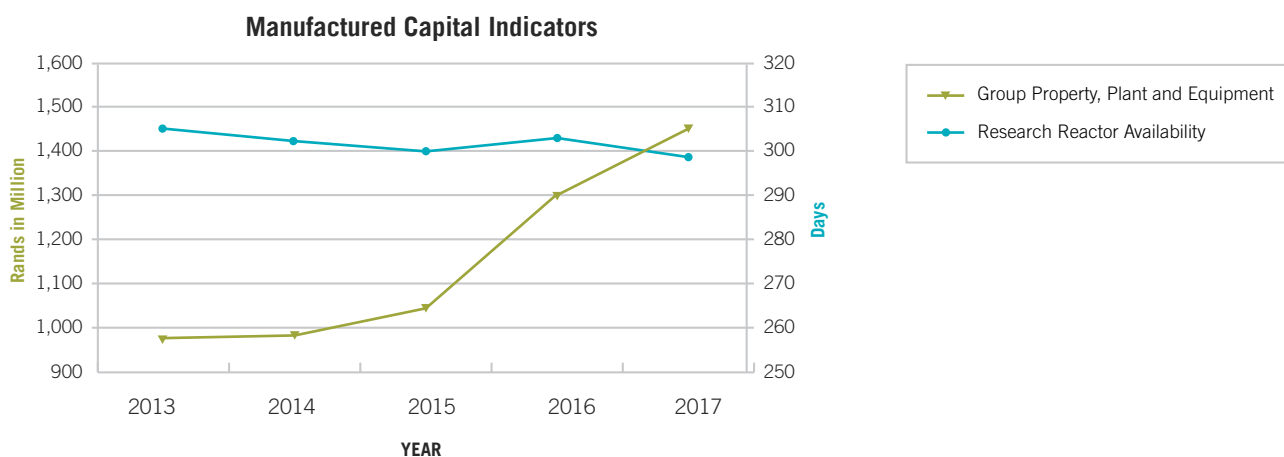
## Economic Sustainability

The following Integrated Reporting Capitals are directly linked to Economic Sustainability:

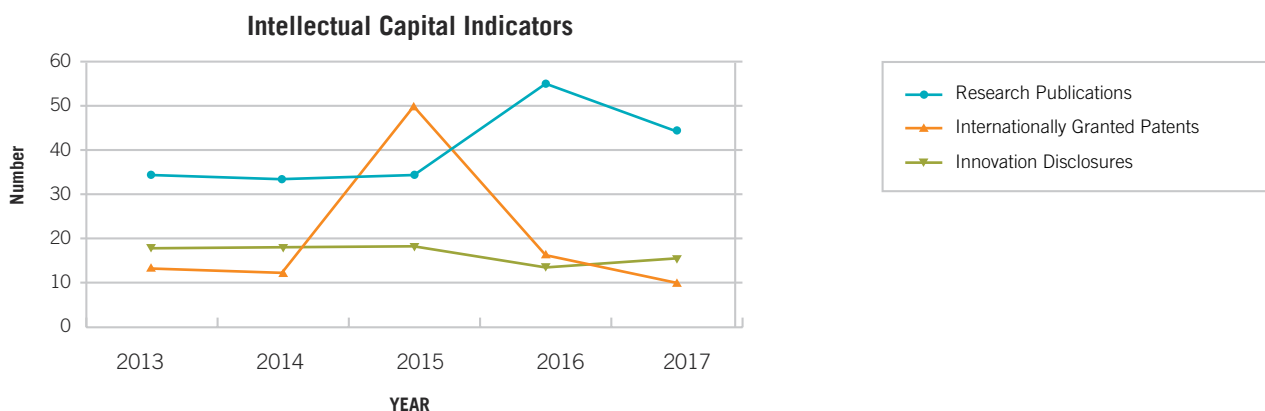
- ▶ Necsa's **Financial Capital** includes operational and capital grants from government, revenues from commercial ventures as well as debt financing. Necsa manages its Financial Capital through its Finance and Business Development division, its two commercial subsidiaries NTP and Pelchem, as well as the Pelindaba Enterprises division as incubator of new business ventures. In addition, a Business Development department resides in the Office of the CEO.



- ▶ Necsa's **Manufactured Capital** includes its buildings, infrastructure, plant and equipment used in its operations. It is managed jointly by the Utilities and Facilities, Security Services and Corporate Finance departments as well as the respective facility operating units.



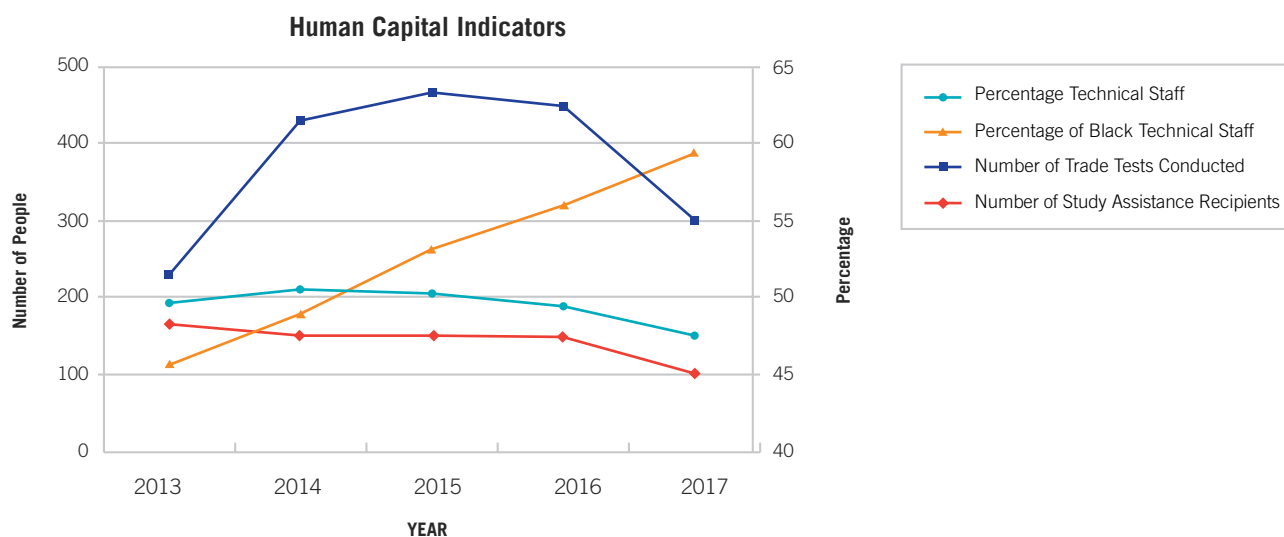
- ▶ Necsa's **Intellectual Capital** includes the organisation's stock of intellectual property, as well as the tacit knowledge embedded in systems and processes. Necsa manages its Intellectual capital through the Intellectual Property office in the Business Development department and the Knowledge Management unit. The Research and Development division generates new intellectual property.



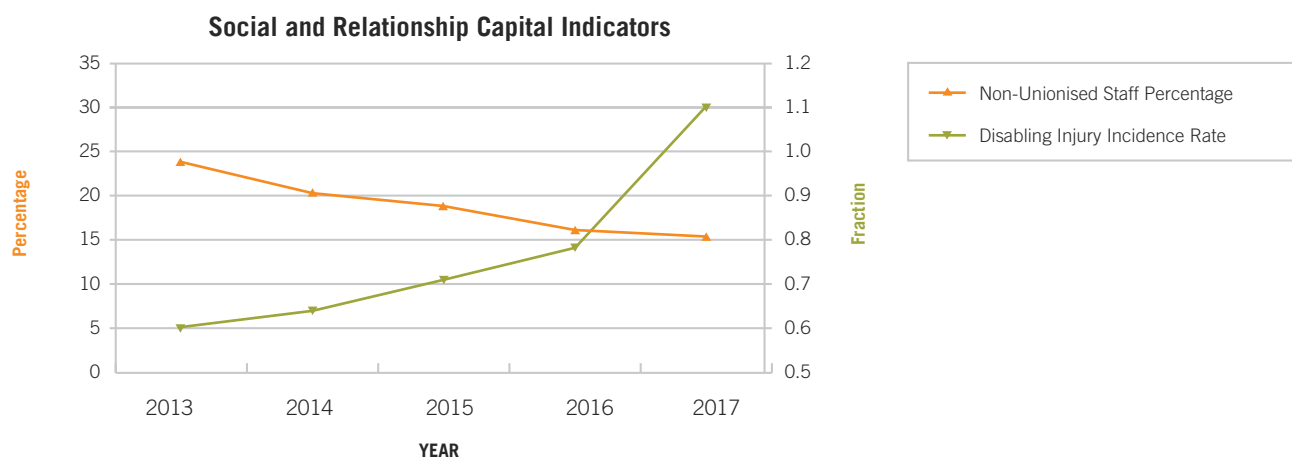
## Social Sustainability

Social Sustainability can be analysed in terms of **Human as well as Social and Relationship Capitals**:

- ▶ Necsa's **Human Capital** includes the vast educational qualifications of its staff and their nuclear industry experience as well as their motivation to innovate and collaborate. The Human Resources department in collaboration with the Necsa Learning Academy are dedicated to managing this capital.



- ▶ Necsa's **Social and Relationship Capital** includes its relationships with key stakeholders such as government, National Nuclear Regulator, media, customers and business partners. In addition, the social networks among its employees and the community around the Pelindaba site contributes to individual and collective well-being. Necsa manages this capital by means of its Corporate Communications and Stakeholder Relations department in collaboration with the departments taking responsibility for the indicators below.



## Environmental Sustainability

The **Natural Capital** from the Integrated Reporting Framework can be analysed to examine Environmental Sustainability:

- ▶ Necsa's **Natural Capital** includes the abiotic factors on and around the Pelindaba site such as the land, air, aquifers, rivers and water bodies as well as attendant vegetation and animal life. Necsa's Environmental Management group takes responsibility for environmental monitoring on the Pelindaba site and has a veterinarian on call to attend to fauna in need. The Nuclear Liability Management department performs ongoing Decommissioning and Decontamination while the Utilities and Facilities department manages water and electricity consumption. The Central Scrap Recovery unit manages redundant materials in compliance with safety and security requirements and utilises certified waste and paper recycling contractors.

### Natural Capital Indicators

	2013	2014	2015	2016	2017
Execution of Annual Decommissioning and Decontamination Plan	110%	104%	106%	90%	99%
Public Dose Impact as % of Allowable Limit	3.8%	3.9%	2.5%	2.2%	2.2%
Percentage of Permitted Effluent Released to Crocodile River	54%	58%	77%	43%	29%
Percentage of Permitted Fluoride Emissions	22%	25%	25%	34%	12%
Annual Electricity Usage	100 GW.h	86 GW.h	86 GW.h	86 GW.h	76 GW.h
Annual Water Usage	883 k.m <sup>3</sup>	907 k.m <sup>3</sup>	977 k.m <sup>3</sup>	1,064 k.m <sup>3</sup>	1,006 k.m <sup>3</sup>



# 08

## Governance





## Introduction

Corporate Governance comprises the processes and systems by which Necsa is directed, controlled and held to account by its stakeholders. The objective is to ensure that the organisation's leadership act with transparency and in the best interests of these stakeholders.

Necsa is a wholly-owned state entity with its enabling legislation contained in the Nuclear Energy Act, No. 46 of 1999. Additional legislative requirements on Governance emanate from the Companies Act and Public Finance Management Act. Beyond the legal requirements, governance is further informed by the Code of Governance Principles for South Africa as recommended in the King III Report.

Decisions relating to Governance are escalated or delegated as appropriate in a multi-tier hierarchy described in the sections below. The Governance hierarchy includes:

1. Portfolio Committees representing Parliament;
2. Department of Energy as Executive Authority;
3. Board of Directors as Accounting Authority appointed by the Minister of Energy in accordance with the Nuclear Energy Act;
4. Chief Executive Officer as Accounting Officer and only Executive Director of the Board appointed by the Minister of Energy in accordance with the Nuclear Energy Act;
5. Executive Management Committee; and
6. Risk Management and Internal Controls including mechanisms for addressing integrity and ethical issues.

## Portfolio Committees

No engagements with the Standing Committee on Public Accounts (SCOPA) took place in 2016/17.

The Parliamentary Committee on Energy exercises oversight over Necsa's performance. Representatives of Necsa appeared before the Committee on the following dates:

- ▶ 11 October 2016: Briefing by the Department of Energy on the nuclear new build;
- ▶ 12 October 2016: Briefing by the AGSA on the audit outcomes of the DoE and its entities; and
- ▶ 25 October 2016: Briefing by Necsa on its annual reports for 2014/15 and 2015/16.

## Executive Authority - DoE

The Treasury publication "Parent Departments and their Associated Public Entities as at 24 February 2017" designates Necsa's Executive Authority as the National Department of Energy (DoE). The PFMA gives authority and prescripts to the DoE's oversight powers.

The Department of Energy appoints Necsa's Board with the appropriate mix of executive and non-executive directors having the necessary skills to guide the company.

The Necsa Corporate Plan and Quarterly Reports were submitted to the Department of Energy as required. The Medium Term Expenditure Framework submission was made on 15 July 2016. However, the draft Annual Financial Statements for 2015/16 due by 31 May 2016 was only submitted on 25 July 2016 due to complexities in the accounting treatment of Decommissioning and Decontamination liabilities.

Additional information and clarification on a number of issues were requested by the DoE Nuclear Branch and the State Owned-Entities Oversight Unit.

## Accounting Authority - Necsa Board

### Introduction

The Necsa Board of Directors is the Accounting Authority as defined in terms of the Public Finance Management Act, No. 1 of 1999 (PFMA). The Board is appointed by the Minister of Energy (the Shareholder) in terms of Section 16 of the Nuclear Energy Act. Due regard is given to the ratio between independent and non-independent members to ensure objectivity in decision-making.

The Board is appointed for a renewable period of three years and undergoes a Necsa-specific induction process within six months of appointment. No appraisals of the Board or its committees were conducted due to the majority of members being appointed on 24 March 2016 not allowing for an adequate review period.

### Role of Board

As Accounting Authority, the Board is responsible for the application of corporate governance principles and the performance of the company. To this end, the Board reviews risk policy, annual budgets, business plans as well as corporate strategy.

## Board Charter

The Nuclear Energy Act serves directly as the Necsa Board's Charter - In terms of Section 16 of the act, "the Board must ensure that the goals of this act are actively pursued, and must exercise general control over the performance of the Corporation's functions."

The functions of Necsa are delineated in the act under Section 13 on the Main Functions of Corporation and Section 14 on Ancillary powers and functions

of Corporation. These relate to nuclear research and development, processing of nuclear materials, control of nuclear waste and compliance with the republic's international nuclear obligations.

## Composition of Board

The Necsa Board consists of a chairperson, one executive and eight non-executive directors. No alternate members were appointed.

## Necsa Board Members



**Dr KR Kemm**  
Chairperson



**Mr GP Tshelane**  
Chief Executive Officer



**Dr NT Magau**  
Non-Executive Director  
(Chairperson of Social and  
Ethics Committee)



**Dr GJ Davids**  
Non-Executive Director  
(Chairperson of Research  
and Development  
Committee)



**Ms P Bosman**  
Non-Executive Director  
(Chairperson of Audit and  
Risk Committee)



**Dr ENN Ngcobo**  
Non-Executive Director



**Mr MPK Tshivhase**  
Non-Executive Director  
(Chairperson of Investment  
and Finance Committee)



**Mr ZC Ngidi**  
Non-Executive Director



**Ms RP Mosia**  
Non-Executive Director



**Mr MS Sekgota**  
Non-Executive Director

**Details of Board Members for the Period 01 April 2016 to 31 March 2017**

Executive Members						
Name	Age on 31 Mar 2017	Directorship on Other Boards	Date of Appointment	Term	Date of Resignation/ Expiry of Term	Qualifications
Mr GP Tshelane	54	► Nuclear Industry Association of South Africa (NIASA)	Appointed as CEO with effect from 1 September 2012	2	Re- appointed 2 <sup>nd</sup> Term CEO with effect from 1 January 2017 – 31 December 2019	► BSc Honours (Nuclear Physics) – University of Witwatersrand;
Chief Executive Officer		► KINGS International Advisory Board				► BSc (Maths and Physics) – University of Witwatersrand;
						► Executive Development Programme;
						► Certificate in Project Management;
						► Finance for Non-financial Managers – University of Witwatersrand.

Independent Non-Executive Members						
Name	Age on 31 Mar 2017	Directorship on Other Boards	Date of Appointment	Term	Date of Resignation/ Expiry of Term	Qualifications
Dr KR Kemm  Chairperson	67	<ul style="list-style-type: none"><li>▶ Supreme Chess Trust</li><li>▶ Stratek Business Strategy Consultants</li><li>▶ Silver Protea Nuclear Consortium Pty (Ltd)</li><li>▶ Board of Advisors: Committee for a Constructive Tomorrow, Washington DC.</li><li>▶ Board of Advisors: Go nuclear, Colorado USA</li><li>▶ Board of Advisors: Environmentalists for Nuclear, Paris France</li></ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"><li>▶ BSc ( Physics and Mathematics), University of KwaZulu-Natal;</li><li>▶ BSc (Hons Physics), University of KwaZulu-Natal</li><li>▶ MSc (Nuclear Physics), University of KwaZulu-Natal</li><li>▶ PhD (Nuclear Physics), University of KwaZulu-Natal.</li></ul>
Dr NT Magau  Chairperson of Social and Ethics Committee	64	<ul style="list-style-type: none"><li>▶ Advisory Council member of the University of Cape Town Business School</li><li>▶ Advisory member of the UP School of Management</li><li>▶ NTP Radioisotopes Board</li><li>▶ Trustee of Bertha Gxowa Foundation</li><li>▶ Dept of Water Izakhiwo Infundo Trust</li></ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"><li>▶ D Ed, Harvard University;</li><li>▶ M Ed, Rand Afrikaans University;</li><li>▶ B Ed, University of South Africa;</li><li>▶ BA, University of the North.</li></ul>

Independent Non-Executive Members						
Name	Age on 31 Mar 17	Directorship on Other Boards	Date of Appointment	Term	Date of Resignation/Expiry of Term	Qualifications
Dr GJ Davids Chairperson of Research and Development Committee	57	<ul style="list-style-type: none"> <li>Khayelisha District Hospital Board</li> </ul>	07 December 2016	1	Appointed for three year term to expire 06 December 2019	<ul style="list-style-type: none"> <li>BA Public Administration, University of Western Cape;</li> <li>BA (Hon) Development Administration, Stellenbosch University;</li> <li>Master's Degree Public Administration, Stellenbosch University;</li> <li>PHD, University of Western Cape;</li> <li>Certificate in Finance and Economics, IAP-France;</li> <li>PMD, Harvard Business School;</li> <li>GNP, Harvard Business School.</li> </ul>
Mr MPK Tshivhase Chairperson of Investment and Finance Committee	54	<ul style="list-style-type: none"> <li>Deputy Chairperson of the Council of UNIVEN</li> <li>ANC Provincial Executive Committee</li> </ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"> <li>BLuris Diploma, University of Zululand;</li> <li>BA Law, LLB, University of Limpopo.</li> </ul>
Dr ENN Ngcobo Official of the Department of Energy	60	<ul style="list-style-type: none"> <li>None</li> </ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"> <li>MSc (Eng.), Technical University of Sofia, Bulgaria;</li> <li>BSc (Science), University of Zululand, RSA;</li> <li>PhD (Doctor of Philosophy), Cambridge University, UK.</li> </ul>
Mr ZC Ngidi	56	<ul style="list-style-type: none"> <li>Ngidi and Co Inc.</li> <li>Ngidi Consulting</li> <li>Board member of South African Post Office and Chair of Ethics Committee of SAPO</li> </ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"> <li>BA Law, LLB, UKZN Westville;</li> <li>Various courses on the following: Tax Competency, MBA, Financial Management, Marketing, Business law, Economics, Human Resources Management.</li> </ul>
Ms P Bosman Chairperson of Audit and Risk Committee	43	<ul style="list-style-type: none"> <li>Executive Chairman Lumoka Strat (Pty) Ltd</li> <li>Eastern Cape Development Board</li> <li>KwaZulu-Natal Sharks Board</li> </ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"> <li>Chartered Accountant;</li> <li>Bachelor of Commerce, UKZN;</li> <li>BCompt Honours, University of South Africa;</li> <li>Postgraduate Diploma in Auditing, University of South Africa.</li> </ul>
Ms RP Mosia	49	<ul style="list-style-type: none"> <li>The Bridge of Hope Wines</li> <li>Lemaj Investment</li> <li>Ekuseni Distribution</li> </ul>	24 March 2016	1	Appointed for three year term to expire 23 March 2019	<ul style="list-style-type: none"> <li>BCom Accounting, University of the North;</li> <li>Business Administration, Wits Graduate School of Business;</li> <li>Criminal Justice in Auditing, UJ;</li> <li>BCTA (Bridging Certified Theory in Accounting), UJ;</li> <li>Master in Business Leadership (MBL);</li> <li>PG Higher Dip In Tax Law, University of Cape Town.</li> </ul>
Mr MS Sekgota	38		07 December 2016	1	Appointed for three year term to expire 06 December 2019	<ul style="list-style-type: none"> <li>B Com Honours (Strategic Marketing);</li> <li>B Com Business Management.</li> </ul>

Dr XH Mkhwanazi left the Board due to being unable to attend 75% of Board meetings.

## Meetings of the Board

The Nuclear Energy Act (Section 18) requires that the Board meet at least four times per annum to discuss and review the Strategy and Business Plan. Special Board meetings are convened, when necessary, to deliberate on issues that require Board resolutions between scheduled meetings. Members of management are periodically invited to make presentations on issues of particular interest to the Board.

The Board held seven (7) meetings during the review period.

### Attendance of Board Members for the period 01 April 2016 to 31 March 2017

Name	Board Meeting Dates						
	26 Apr 2016 (Special Meeting- Board Induction)	27 May 2016	16 Sep 2016	30 Nov 2016	26 -27 Jan 2017	24 Feb 2017	27 Mar 2017 (Necsa AGM)
Dr KR Kemm	Present	Present	Present	Present	Present	Present	Present
Mr GP Tshelane	Present	Present	Present	Present	Present	Present	Apology
Dr NT Magau	Present	Present	Present	Present	Present	Present	Present
Dr GJ Davids	Not applicable	Not applicable	Not applicable	Not applicable	Present	Present	Present
Mr MPK Tshivhase	Present	Present	Present	Present	Present	Apology	Present
Dr ENN Ngcobo	Present	Present	Present	Present	Present	Present	Present
Mr ZC Ngidi	Present	Present	Present	Apology	Apology	Present	Present
Ms P Bosman	Present	Present	Apology	Present	Present	Present	Present
Mrs RP Mosia	Present	Present	Present	Present	Present	Present	Present
Mr MS Sekgota	Not applicable	Not applicable	Not applicable	Not applicable	Present	Present	Present

## Committees of the Board

In accordance with Section 19 of the Nuclear Energy Act, the Necsa Board is assisted by committees, whose mandate it is to assist the Board in performing its functions. These committees play an important role in ensuring high standards of governance. External advisors are invited to attend Board and/or committee meetings on an ad hoc basis, when the need arises. The following four committees were active in the financial year under review:

- ▶ Audit and Risk Committee
- ▶ Social and Ethics Committee
- ▶ Research and Development Committee
- ▶ Investment and Finance Committee

The Terms of Reference of all four committees were reviewed and adopted in April 2016.

### Audit and Risk Committee

The Audit and Risk Committee comprises four Non-executive Directors and one co-opted member. A Non-executive Director, who is not the Chairman of the Board, chairs the Committee.

The Committee has adopted formal Terms of Reference and is satisfied that it has complied with its responsibilities as set out therein.

The Audit and Risk Committee assists the Board in overseeing:

- ▶ The quality and integrity of the Group's financial statements and the disclosure thereof;
- ▶ The scope and effectiveness of the external audit function; and
- ▶ The effectiveness of the Company's internal controls and internal audit function.



The Committee convened six (6) times during the year with membership and meeting attendance being as follows:

Name	Meetings of the Audit and Risk Committee					
	04 May 2016 (Special)	27 May 2016	15 Jul 2016 (Special)	16 Sep 2016	21 Nov 2016	17 Feb 2017
Ms P Bosman Committee Chairperson	Present	Present	Present	Apology	Present	Present
Mr GP Tshelane	Present	Present	Present	Apology	Present	Present
Mr ZC Ngidi	Apology	Present	Apology	Present	Present	Present
Mrs RP Mosia	Present	Present	Present	Present	Present	Present
Mr NA Mhlongo Co-opted Member	Apology	Apology	Present	Present	Present	Present
Mr MS Sekgota	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Present
Dr KR Kemm (Board Chairperson)	Present	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

### Social and Ethics Committee

The Social and Ethics Committee comprises four Non-executive Directors. A Non-executive Director, who is not the Chairman of the Board, chairs the Committee.

This Committee was formally constituted in line with the provisions of regulation 43(5) read with section 72(4)-(10) of the Companies Act, Act 71 of 2008. The Committee has adopted formal Terms of Reference in line with the aforementioned regulation.

The Committee's responsibilities include:

- ▶ Monitoring the Company's activities with regard to social and economic development, good corporate citizenship, the environment, health and public safety, consumer relationships and labour relations;
- ▶ Drawing matters within the Committee's mandate to the attention of the Board as the occasion requires; and
- ▶ Reporting to the shareholders at the Company's annual general meeting on matters falling within its mandate.

The Committee holds sufficient scheduled meetings to discharge its duties as set out in its Terms of Reference, but subject to a minimum of three meetings per year. The Committee convened four (4) times during the period under review with meeting attendance being as follows:

Name	Meetings of the Social and Ethics Committee			
	20 Jun 2016	21 Oct 2016 (Special)	20 Nov 2016	16 Feb 2017
Dr NT Magau Committee Chairperson	Present	Present	Present	Present
Mr GP Tshelane	Present	Present	Present	Present
Dr ENN Ngcobo	Present	Present	Present	Present
Ms P Bosman	Apology	Present	Apology	Apology
Dr GJ Davids	Not Applicable	Not Applicable	Not Applicable	Present
Mr ZC Ngidi	Not Applicable	Not Applicable	Present	Present
Mr MPK Tshivhase	Not Applicable	Present	Not Applicable	Not Applicable

## Research and Development Committee

The Research and Development Committee comprises three Non-executive Directors and two co-opted members. A Non-executive Director, who is not the Chairman of the Board, chairs the Committee.

The Committee's Terms of Reference assigns it the following responsibilities:

- ▶ Make recommendations concerning:
  - Policy and implementation of Research, Development and Technology;
  - Research and Development initiatives proposed by Management;
  - Implementation of best practices;
  - Potential opportunities in nuclear research and development;
  - Capacity development and annual research budget;
  - External collaboration; and
  - Strategic management of Intellectual Property
- ▶ Monitoring:
  - Management of Research, Development and Nuclear Technology; and
  - Progress in collaboration with other organisations.

The Committee met three (3) times during the period under review with meeting attendance being as follows:

Name	Meetings of the Research and Development Committee		
	20 Jun 2016	22 Nov 2016	16 Feb 2017
Mr MPK Tshivhase Acting Committee Chairperson (Apr 2016 –Jan 2017)	Present	Apology	Present
Dr GJ Davids Committee Chairperson (Feb 2017)	Not applicable	Not applicable	Present
Mr GP Tshelane	Present	Present	Present
Dr ENN Ngcobo	Present	Present	Present
Dr Z Vilakazi Co-opted Member	Present	Present	Apology
Dr M Sathekge Co-opted Member	Apology	Apology	Apology

## Investment and Finance Committee

The Investment and Finance Committee comprises five Non-executive Directors. A Non-executive Director, who is not the Chairman of the Board, chairs the Committee.

The responsibilities of this Committee include:

- ▶ Investment policies;
- ▶ Reviewing the viability of business opportunities and/or cases;
- ▶ Reviewing the Necsa Group financial performance;
- ▶ Procedures to monitor compliance with investment policies by officers, employees and Necsa's Investment Board's agents;
- ▶ Approval of investment transactions;
- ▶ Monitoring the effectiveness of the investment policies;
- ▶ Considering and recommending approval by the Necsa Board of the Necsa Group Corporate Plan; and
- ▶ Such other matters as may be delegated to the Committee by the Board.

The Committee met three (3) times during the period under review as follows:

Name	Meetings of the Investment and Finance Committee		
	26 May 2016	28 Sep 2016 (special)	17 Feb 2017
Mr MPK Tshivhase Committee Chairperson	Present	Present	Present
Mr GP Tshelane	Present	Apology	Present
Dr NT Magau	Present	Present	Apology
Mr ZC Ngidi	Apology	Apology	Present
Mrs RP Mosia	Present	Not applicable	Present
Mr MS Sekgota	Not applicable	Not applicable	Present

## Remuneration of Board Members

### Remuneration of Non-Executive Board Members for the period 01 April 2016 to 31 March 2017

Name	Fees	Running Cost	Travel Cost	Company Contribution SDL	Company Contribution COIDA	Total
Dr KR Kemm	R 254,565	R 11,878	0	R 2,326	R 1,391	R 270,160
Dr NT Magau	R 198,150	0	0	R 1,969	R 1,759	R 201,878
Dr GJ Davids	R 94,661	0	0	R 934	R 308	R 95,903
Mr MPK Tshivhase	R 219,906	R 35,453	0	R 2,546	R 2,207	R 260,112
Dr ENN Ngcobo	0	R 5,188	0	R 42	R 51	R 5,280
Mr ZC Ngidi	R 175,997	0	0	R 1,631	R 1,500	R 179,128
Ms P Bosman	R 208,584	0	0	R 2,075	R 1,862	R 212,521
Ms RP Mosia	R 148,869	0	0	R 1,362	R 1,335	R 151,566
Mr SM Sekgota	R 80,118	0	0	R 791	R 308	R 81,216

The remuneration of Necsa's Non-executive Directors is determined and reviewed annually by the Minister of Energy in terms of the Nuclear Energy Act, No. 46 of 1999. In making her determination in this respect, the Minister also takes into account the relevant National Treasury Regulations and/or Framework on Remuneration of Non-executive Directors of state-owned entities.

## Executive Management Committee - EXCO

In terms of Sections 22 and 23 of the Nuclear Energy Act, the CEO must ensure that the functions of the Corporation in terms of the act are carried out, report accordingly to the Board and furnish the minister with an annual plan of action. As Accounting Officer of the Board, the CEO accounts for the Corporation's finances.

The CEO is assisted by the Executive Management Committee (EXCO) for which Terms of Reference have been approved by the Board. The contract period for the CEO is three years while Divisional and Group Executives are contracted for five years with a one month notice of termination period.

EXCO advises the CEO on matters including implementation of policies, procedures and annual budgets. It ensures proper governance through the implementation of Corporate strategy and plans and the appointment of senior officials reporting directly to Divisional and Group Executives.

EXCO reports to the Board on Group performance, makes recommendations via EXCO committees aligned to the four Board Committees and recommends the integrated annual report for approval by the Board.

## Composition of EXCO

The Executive Management Committee is chaired by the CEO. It is further composed of Divisional and Group Executives, as well as the heads of Internal Audit, Strategy and Performance, Business Development, the Company Secretariat and Pelindaba Enterprises.

## Necsa EXCO Members



**Mr GP Tshelane**

Chief Executive Officer



**Mr ZG Myeza**

Group Executive  
Finance and Business  
Development



**Mr MU Ramatsui**

Senior Executive Manager  
Pelindaba Enterprises



**Mr TJ Tselane**

Divisional Executive  
Operations



**Ms MA Rasweswe**

Group Executive  
Nuclear Compliance and  
Services



**Dr MS Maserumule**

Divisional Executive  
Research and  
Development



**Ms HNB Khumalo**

Group Executive  
Corporate Services



**Mr U Natha**

Acting Executive Manager  
Strategy and Performance



**Mr BM Mphahlele**

Executive Manager  
Business Development



**Mr VMG Malebana**

Chief Legal Adviser



**Mr HJ Viljoen**

Chief Audit Officer

**Standing EXCO Members for the 2016/17 Financial Year**

Name	Capacity	Appointed to the Committee
Mr Phumzile Tshelane	CEO	September 2012 to date
Mr Zakes Myeza	Group Executive: Finance and Business Development	April 2014 to date
Mr Ruby Ramatsui	Senior Executive Manager: Pelindaba Enterprises	January 2017 to date
Mr Thabo Tselane	Divisional Executive: Operations	April 2014 to date
Ms Mosa Rasweswe	Group Executive: Nuclear Compliance	January 2017 to date
Dr Motodi Maserumule	Divisional Executive: R&D	April 2014 to date
Ms Hlengiwe Khumalo	Group Executive: Corporate Services	February 2017 to date
Mr Umesh Natha	Acting Executive Manager: Strategy and Performance	January 2017 to date
Mr Brian Mphahlele	Executive Manager: Business Development	November 2015 to date
Mr Vusi Malebana	Chief Legal Adviser	April 2013 to date
Mr Rico Viljoen	Chief Audit Officer	October 2013 to date

**Meetings of EXCO**

The Executive Management Committee is mandated to hold sufficient meetings to discharge all its obligations subject to a minimum of one meeting per month. During the 2016/17 financial year the Committee met fortnightly, alternating between a Strategic and Performance focus.

**Risk Management**

Enterprise-wide Risk Management has as principal objective increasing the likelihood of Necsa achieving its objectives by optimally balancing risk and reward. The methodology and processes described below are aimed at ensuring that significant business risks are systematically identified, assessed and reduced to acceptable levels.

**Risk Methodology**

Group Risk Management follows the Risk Management Framework of ISO 31000, the Committee of Sponsoring Organisations (COSO) of the Treadway Commission, the National Treasury Risk Management Framework and King III, to ensure alignment with best practice.

The Necsa Group Risk Management Policy and Strategy was compiled in alignment with the forgoing and approved by the Board in March 2015. The strategy outlines roles and responsibilities for risk identification, assessment and management as well as the overall risk management process. As a nuclear organisation operating a Research Reactor, sustainability risks relating to safety, security, regulatory compliance and commercial success of subsidiaries are prioritised.

Current, imminent and envisaged risks that may threaten the long-term sustainability of the Group are considered.

Necsa's risk tolerance is set at a risk rating level of  $\geq 16$  (i.e. those risks with high impact and high likelihood of occurrence). The company's risk appetite has been defined as "No risk may remain in the very high (unacceptable) category ( $16 \leq \text{rating} \leq 25$ ) for longer than two consecutive quarters before being managed into a more acceptable (lower) risk category (rating  $\leq 15$ )".

**Risk Management Assurance**

Assurance for the Risk Management Process is provided through a series of interrelated processes which include Divisional Risk Champions, the Group's Internal Risk Management Committee (IRMC), Internal Audit, the Audit and Risk Committees of EXCO and the Board, and ultimately the Board of Directors.

The IRMC assists the Executive Management Committee (EXCO) and the Board with implementation of the Risk Management Policy and Strategy by developing processes for risk identification and control. These processes involve Risk Champions updating Divisional Risk Registers at Management Committee meetings for amalgamation into the Necsa Group Strategic Risk Register. The IRMC meets on a quarterly basis to review the Necsa Group Strategic Risk Register and progress with risk responses. Internal Audit conducts a risk-based audit and assesses the effectiveness of the risk management processes for assurance to both EXCO and the Board.

The Chief Risk Officer resigned in December 2016 and a permanent replacement is to be appointed.



## Strategic Group Risks

The top ten risks currently faced by the Group are reviewed below.

### Group Sustainability Risks

#### Liquidity Risk

The inability of Necsa to meet its obligations when they fall due results from ineffective cash management within the financial constraints faced by Necsa. Mitigation actions include guidelines circulated to line management, information sessions, monthly forecasts and appropriate delegations of spending authority. Complete Management Accounts are provided monthly to EXCO and MTEF ring-fenced funds as well as additional bank overdrafts are to be accessed if approved. Residual risk rating remains at 25.

#### Pelindaba Enterprises Sales Targets

The risk of Pelindaba Enterprises not achieving its sales targets impacts on its viability. In mitigation, a market research study was completed. This information is being used to compile a business model and plan. More competitive pricing is required in quotes which necessitates finding a solution to the high overhead cost structures. The capacity of the project management office needs to be strengthened and a productivity improvement programme implemented. Residual risk rating is at 25.

#### Pelchem Business Sustainability

Pelchem's business strategy for growth and sustainability aims to implement appropriately scaled production infrastructure. The residual risk level is at 25.

#### NTP Waste Storage Space

Declining waste storage space may compromise NTP's ability to operate its production plant and reliably supply products to customers. Mitigation actions include packaging of Uranium residue and a medium to long-term storage facility for Uranium residue. Residual risk level remains at 25.

#### Going Concern Status

Necsa's Going Concern Status is crucial to its financial sustainability as it determines its ability to fund operations and strategic initiatives. To this end savings on variable costs are being pursued, costs savings are negotiated with suppliers and commercial focus to grow revenue is encouraged. Additional grant funding for R&D is being sought, borrowing from DBSA and IDC

for capital projects is being pursued, Pelchem's Board is being engaged and long-term Cabinet commitment for Stage 2 Decommissioning and Decontamination funding is to be secured. The residual risk rating stands at 20.

#### NTP Dependence on One Dissolver Hot Cell

Dependence on a single unit for Mo-99 radiochemical production threatens sustained and reliable supply of products to customers. This is being mitigated by the refurbishment of Cell 19 for which the last hot commissioning run was conducted on 28 March 2017. The residual risk level is assessed at 20.

#### NTP Reliance on One Major Product

Lack of product diversification makes NTP's business excessively vulnerable to changes in the market for Mo-99. The product range is to be broadened with introduction of Lu-177. In addition, iThemba LABS investment is to be explored as well as a Radiopharmaceutical Market Growth Strategy. Residual risk rating stands at 20.

#### Pelchem's Ageing Plant and Equipment

Downtime and increasing maintenance costs at Pelchem can be attributed to ageing infrastructure and equipment. An ageing management plan is being developed and implemented. Approval for an Industrial Development Corporation loan from National Treasury is awaited. The residual risk level is assessed at 20.

### Group Security of Supply Risks

#### Security of Supply of LEU Target Plates

Low Enriched Uranium (LEU) target plates are essential as irradiation targets in the production of Mo-99 in SAFARI-1 for NTP. Security of target plate supply is being ameliorated through recommendations from the formulated strategy including the current assessment of potential suppliers. The residual risk level is at 20.

#### Security of Supply of LEU Fuel Plates

Low Enriched Uranium (LEU) fuel plates are essential in the manufacturing of fuel elements and control rods for SAFARI-1. The security of supply risk is being addressed through a number of strategic interventions including diversifying suppliers by establishing partnerships and collaborations. The residual risk level is assessed at 20.

## Internal Controls

While Necsa does not have a centralised “Internal Control Unit”, components thereof reside with the Finance and Business Development Division, Corporate Services Division, Legal Services Department, Risk Management Department as well as the Internal Audit Department.

### Internal Audit and Audit Committees

Refer to Internal Audit department on page 35 as well as the Board Audit and Risk Committee on page 85.

### Compliance with Laws and Regulations

Necsa is compelled to not only comply with relevant conventional legislation but also extensive nuclear specific legal requirements. A number of organisational structures contribute to ensuring Necsa’s legal compliance. Many of these reside in the Nuclear Compliance and Services division including departments dedicated to nuclear licensing, nuclear safeguards and safety services. The latter is the custodian of Necsa’s Safety, Health, Environment and Quality management system with a strong focus on compliance. Legal advisory services are provided by the Necsa Legal Services department and legal registers are utilised to identify applicable statutory provisions.

### Fraud and Corruption

The Necsa Group Fraud Prevention Plan forms part of the overall Necsa Corporate Plan approved by the relevant governance structures. It aims to minimise possible losses by improving fraud prevention, detection and responses. The response to suspected fraud involves a streamlined investigation process including an initial investigation by line management or appointed external organisation, Necsa Security Services, Internal Audit Department, Legal Department as well as Executive Management Committee. The Fraud Prevention Plan lists objectives and activities for the financial years 2016/17 to 2019/20 and in more detail for 2016/17.

During this financial year, the KPMG Ethics and Fraud Hotline service was retained by Necsa which provided

a variety of communication mediums for whistle blowers to make confidential disclosures.

### Minimising Conflict of Interest

A number of processes are in place to attempt to minimise conflict of interest in supply chain management.

A workflow process on the Necsa intranet allows for Declaration of Business Courtesies while another workflow, completion of which is annually enforced, calls for Declaration of Business Interest by employees. At every Bid Adjudication Committee meeting, a conflict of interest declaration form is circulated for signature.

The Vetting and Investigations unit in the Security Services department performs top secret vetting of Bid Adjudication Committee members and screen companies and their directors involved in significant tenders. Where conflict of interest is identified, disciplinary proceedings are initiated and criminal charges pursued if appropriate.

### Code of Conduct

The Necsa Code of Ethics was adopted in February 2014 and provides guidance for consistent behaviour in situations where the integrity of staff may be put to the test. Three categories of values are described, being the Foundational Values of Integrity, Respect and Accountability, the Business Values of Excellence, Innovation and Stakeholder Orientation as well as the People Values of Trust and People Orientation. In its Guiding Principles, the Code of Ethics commits Necsa to legal compliance, fraud prevention, information security and avoiding conflicts of interest.

### Health, Safety and Environmental Issues

The reader is referred to page 95 for information on Employee Health, to page 52 for Safety related information and page 51 where Environmental Management is addressed.

### Company Secretary

The functions and status of the Company Secretariat are discussed on page 35.

## King III Compliance

This Integrated Annual Report has been assessed against the 73 disclosure requirements of the King III report. Eight partial or non-compliances were identified as listed in the table.

### KING III Reporting Checklist

Chapter 1: Ethical Leadership and Corporate Citizenship		
Para. 49, practice note on ethics management	As part of its sustainability reporting, the board reports on the company's ethics performance.	Not disclosed.
Chapter 2: Boards and Directors		
Board Chairman		
Para. 39	If the chairman is a non-executive director but is not independent, this should be disclosed in the integrated report, together with the justifications for the appointment.	Not assessed.
Board Composition		
Para. 76	Every year, non-executive directors classified as "independent" should undergo an evaluation of their independence.	Not assessed.
Reporting		
Para. 88	The following aspects regarding directors should be disclosed:	
	- The education, qualifications and experience of the directors; and	Partially fulfilled - Experience not detailed in integrated report.
	- Actual or potential political connections or exposure.	Not disclosed.
Chapter 9: Integrated Reporting and Disclosure		
Sustainability Disclosure		
Para. 11-13	The company should report on the positive and negative impact the company's operations had on its stakeholders. It is important for sustainability disclosure to highlight the company's plans to improve the positives and eradicate or mitigate the negatives in the financial year ahead.	Partially fulfilled - The sustainability report does not extend to plans.
Assurance of Sustainability Information		
Para. 20	In obtaining assurance (of sustainability information), the company should disclose the scope of the assurance to be provided.	Not addressed.
Summarised Integrated Report		
Para. 41	The company should prepare a summarised integrated report in addition to the complete integrated report.	Not fulfilled. Chapters 2, 3 and 4 serve as summary in respectively containing Chairperson's Foreword, CEO's Overview and Highlights.

## Audit and Risk Committee Report

Refer to page 110 in the Financial Report for the report of the Audit and Risk Committee.

# 09

## Human Resources



Members of Necsa's Human Resources Management Team



## Introduction

The primary mandate of the Human Resources department is to provide strategic Human Resources support to Necsa Group.

The greatest Human Resources challenge faced by the organisation is the declining government grant coupled with an escalating salary bill. Development of a high performance culture to raise productivity is therefore essential. Furthermore, Necsa's ageing workforce calls for a talent management framework to attract, retain and develop a younger workforce while advancing transformation.

For the year under review, the following high level HR priorities were embarked on:

- ▶ Implementation of the Leadership Development Framework;
- ▶ Intervention programmes to implement recommendations of the culture survey conducted in 2014;
- ▶ Programmes facilitating effective implementation of talent management; and
- ▶ Programmes to embed a performance management culture in the organisation.

Necsa's integrated approach to workforce planning is aligned to the organisation's overall planning cycle in the form of the Medium Term Expenditure Framework. Workforce planning therefore forms part of strategic planning by informing capacity requirements for the execution of the strategic priorities.

The employee performance management framework aims to link individuals and group achievements with overall strategic objectives. The performance management framework attempts to ensure a fair, equitable and transparent process. It includes clarification of performance expectations, agreement on resource requirements, focused training and development, early identification of performance problems and appropriate recognition for high performance.

Apart from being a business imperative due to the nature of its operations, Necsa's approach to employee wellness is motivated by the direct correlation between productivity and the well-being of employees. Accordingly, Necsa has adopted an integrated Employee Wellness programme

involving continuous medical surveillance of workers potentially occupationally exposed to radiation, noise and chemicals. Necsa maintains a comprehensive occupational hygiene monitoring programme to meet the requirements of the Occupational Health and Safety Act, Act 85 of 1993.

Necsa Employee Assistance Services supports management in addressing productivity issues and also assists employees in resolving personal or work related problems while providing emotional assistance.

Health and wellness events have been organised to good effect. These include a Corporate Wellness Day to increase awareness of lifestyle conditions such as diabetes, hypertension and cholesterol. World AIDS day was observed with an HIV testing and counselling campaign and extended into a condom and reproductive health awareness week. A mental health awareness campaign was also undertaken.

It is Necsa's policy to provide for the wellbeing of its employees through the provision of cost effective Medical Scheme benefits. Employees are obliged, in terms of their conditions of service, to become members of either Discovery Health or Fedhealth Medical Scheme or alternatively to remain dependants of their spouses' medical schemes.

To ensure alignment of its Human Resources policies to legislation and its operational requirements, Necsa has put in place a process for regular policy review. During the current year about twenty five Human Resources policies and procedures were reviewed and amended.

Necsa Group's staff complement inclusive of contract workers as at 31 March 2017 was 1,912. Of this, 1,717 were permanent employees while 195 were contract workers.

The table below reflects the breakdown of staff by occupational categories as at 31 March 2017. The percentage of Technical staff relative to total staff was 47.8% while Black Technical staff as a percentage of total technical staff was 58.5%. This steady increase in the percentage of Black technical staff relative to total technical staff represents a significant achievement against the target of 49%.



**Necsa Group Staff Composition for the Year Ended 31 March 2017**

Job Category	Total	Black	White	Female
Management (Non-Technical)	49	36	13	21
Management (Technical)	90	45	45	17
Engineers	48	28	20	11
Scientists	104	59	45	31
Professionals (Technologists/Technical Officers/Radiation Protection Officers)	65	22	43	11
Other Professionals	56	40	16	30
Supervisors (Non-Technical)	36	22	14	11
Supervisors (Technical)	51	18	33	1
Operators (Non-Technical)	93	73	20	6
Operators (Technical)	122	104	18	3
Artisans	99	47	52	5
Technicians	153	119	34	68
Skilled: Technical (Information Technology)	21	16	5	6
Skilled: Technical (Technical Officer)	37	11	26	3
Skilled: Technical (Radiation Protection Officer)	35	19	16	12
Other Skilled	318	203	115	177
Semi-Skilled	283	247	36	105
Unskilled	57	56	1	36
Contract Staff (Technical)	53	31	22	13
Contract Staff (Non-Technical)	142	136	6	94
<b>Grand Total</b>	<b>1,912</b>	<b>1,332</b>	<b>580</b>	<b>661</b>

## Staff Financial Statistics

### Remuneration

Necsa recognizes that remuneration is a strategic issue that has a direct impact on operational expenditure, company culture, individual behaviour and ultimately the performance, profitability and sustainability of the business.

It is Necsa's aim to maintain fair and competitive remuneration consistent with sector practices and all necessary regulations and the Collective Agreement governing employees. To that end, Necsa's total remuneration packages are referenced to the external market's guaranteed package figures based on the rates for the specific jobs and grades being surveyed using reputable survey houses.

Annual remuneration increases for employees falling within the Bargaining Unit are determined through a collective bargaining process after obtaining a mandate from the Social and Ethics Committee.

Necsa pays executive management as well as all other employees a guaranteed package based on the total cost to company principle.

Necsa compares the remuneration of its executive management with the median of the South African remuneration market. The Necsa Board's Social and Ethics Committee, details of which are reported in the Governance chapter, oversees the principles for remuneration of executive employees. Implementation is managed through the Human Resources Department and Finance and Business Development Division.

Adjustments to the remuneration of Executive Directors are recommended by the Social and Ethics Committee and are approved by the Board of Directors.

Remuneration of Executives and Executive Directors is disclosed under Note 39 to the Financial Statements and that of Non-Executive Directors in the chapter on Governance.

**Three Most Highly Remunerated Non-Executive Employees**

Name	Organisation	Remuneration
Mr AB Myoli	Necsa	R2.389m
Mr PA Louw	NTP	R2.336m
Mr BJ Steynberg	NTP	R1.852m

**Personnel Cost by Division**

Division	Total Expenditure for the Entity (R'000)	Personnel Expenditure (R'000)	Personnel Expenditure as Percentage of Total	Number of Employees	Average Personnel Cost per Employee (R'000)
Group Functions	48,777	28,362	58.1%	29	978
Research and Development	155,023	90,986	58.7%	130	699
Corporate Services	87,633	47,396	54.1%	85	557
Finance and Business Development	65,054	42,549	65.4%	91	467
Nuclear Compliance Services	434,193	186,476	42.9%	502	371
Pelindaba Enterprises	192,891	102,502	53.1%	217	472
Operations	536,720	167,031	31.1%	363	460
NTP	963,414	173,863	18.0%	331	525
Pelchem	88,810	60,428	68.0%	164	368
<b>TOTAL</b>	<b>2,572,515</b>	<b>899,593</b>	<b>35.0%</b>	<b>1,912</b>	<b>470</b>

**Personnel Cost by Salary Band**

Job Category	Personnel Expenditure (R'000)	Personnel Expenditure as Percentage of Total (R'000)	Number of Employees	Average Personnel Cost per Employee (R'000)
Top Management	26,271	2.92%	11	2,388
Senior Management	51,528	5.73%	43	1,198
Professional Qualified	297,215	33.04%	366	812
Skilled	390,429	43.40%	957	408
Semi-skilled	84,382	9.38%	283	298
Unskilled	10,332	1.15%	57	181
Contract	39,435	4.38%	195	202
<b>TOTAL</b>	<b>899,593</b>	<b>100.00%</b>	<b>1,912</b>	<b>470</b>

**Performance Rewards**

While Necsa does not have performance rewards in the form of bonuses, it does use performance management for determining annual general cost of living adjustment for its Executives and Senior Management employees. The table below reflects the amount of salary adjustment granted to Executives and Senior Management based on their performance.

Job Category	Performance Related Salary Adjustment (R'000)	Personnel Expenditure (R'000)	Performance Rewards as Percentage of Job Category Total (R'000)
Top Management	361	26,243	1.4%
Senior Management	2,507	51,340	4.9%
<b>TOTAL</b>	<b>2,868</b>	<b>77,583</b>	<b>3.7%</b>

## Training Costs

Division/ Unit	Personnel Expenditure (R'000)	Training Expenditure (R'000)	Training Expenditure as Percentage of Personnel Cost	Number of Employees Trained	Average Training Cost per Employee (R)
Finance and Business Development	42,549	101	0.237%	91	1,110
Office of the CEO	28,362	686	2.419%	29	23,655
Pelindaba Enterprises	102,502	2,795	2.727%	217	12,880
Corporate Services*	47,396	8,062	17.010%	85	94,847
Research and Development	90,986	295	0.324%	130	2,269
Nuclear Compliance and Services	186,476	1,032	0.553%	502	2,056
Operations	167,031	962	0.576%	363	2,650
NTP	173,863	955	0.549%	331	2,885
Pelchem	60,428	620	1.026%	164	3,780
<b>Total</b>	<b>899,593</b>	<b>15,508</b>	<b>1.724%</b>	<b>1,912</b>	<b>8,111</b>

\* Training expenditure includes cost of Necsa-wide staff development.

## Retirement Fund

As part of its employee value proposition, Necsa has in place a defined contribution provident fund called Momentum FundsAtWork Umbrella Provident Fund administered by Momentum. The Necsa Retirement Fund offers three investment options: the Necsa Mapped Lifestage Portfolios, Momentum Lifestages Portfolios and Necsa Individual Portfolios for which investment information is provided in the tables below.

The Necsa Mapped Lifestage Portfolios provided the option for members to continue investing on a similar basis as in the former Necsa Standalone Retirement fund while the Necsa Individual Portfolios allow members to design their own investment portfolios on the Momentum platform.

The Momentum Lifestages Portfolios is the default and switches automatically from more aggressive investment portfolios for those far from retirement to more conservative and ultimately defensive portfolios as members approach retirement age.

Coupled to the Retirement Fund are other benefits such as Disability Risk and Death Benefits. The Death-in-Service Benefit under the Retirement Fund is insured based on an age related scale. The total benefit available on an employee's death will amount to the insured lump sum in accordance with age group plus the total accumulated credit in the fund.

The Medical Disability Benefit in the Retirement Fund becomes available upon a member being declared medically disabled. There is a three-month waiting period after which a member receives 75% of his/her monthly pensionable salary applicable on the last day of active service plus increases (if any) from the insurer. The maximum monthly benefit is equal to: 75% of first R66,000 plus 60% of next R74,000 plus 50% of salary above R140,000. Medical Disability cover is provided to Retirement Fund members up to the age of 65.

**Market Value of Necsa Individual Portfolios as at 31 March 2017**

<b>Necsa Mapped Lifestage Portfolios</b>	<b>Market Value</b>	<b>% Portfolio</b>
7 years to retirement (CPI+5%)	R 6,319,160	0.51%
6 years to retirement (CPI+4.5%)	R 888,044	0.07%
<b>Momentum Lifestages Portfolios</b>		
Momentum MoM Enhanced Factor 7 (Targets CPI+7% over seven year rolling period)	R 881,223,490	70.97%
Momentum MoM Enhanced Factor 6 (Targets CPI+6% over six year rolling period)	R 87,404,897	7.04%
Momentum MoM Enhanced Factor 5 (Targets CPI+5% over five year rolling period)	R 165,913,093	13.36%
Momentum MoM Enhanced Factor 4 (Targets CPI+4% over four year rolling period)	R 5,807,213	0.47%
Momentum MoM Enhanced Factor 3 (Targets CPI+3% over three year rolling period)	R 82,206,657	6.62%
<b>Necsa Individual Portfolios</b>		
Momentum Multi Manager Local Money Market	R 6,046,752	0.49%
Other	R 5,904,815	0.47%
<b>Total Market Value of the Portfolios</b>	<b>R 1,241,714,121</b>	<b>100%</b>

**Portfolios Investment Net Returns for the Year Ended 31 March 2017**

<b>Necsa Mapped Lifestage Portfolios</b>	<b>One Year Return</b>
7 years to retirement (CPI+5%)	3.59%
6 years to retirement (CPI+4.5%)	1.25%
<b>Momentum Lifestages Portfolios</b>	
Momentum MoM Enhanced Factor 7 (Targets CPI+7% over seven year rolling period)	3.15%
Momentum MoM Enhanced Factor 6 (Targets CPI+6% over six year rolling period)	3.34%
Momentum MoM Enhanced Factor 5 (Targets CPI+5% over five year rolling period)	3.59%
Momentum MoM Enhanced Factor 4 (Targets CPI+4% over four year rolling period)	Not Available
Momentum MoM Enhanced Factor 3 (Targets CPI+3% over three year rolling period)	4.02%
<b>Necsa Individual Portfolios</b>	
Momentum Multi Manager Local Money Market	9.07%

## Staff Social Statistics

### Employment and Vacancies

The organisation had a total of 141 vacancies as at 31 March 2017. Of these, six were at Senior Management level, while Top Management was operating at full strength. At the time of reporting, the process of filling all vacancies at Senior Management and Management levels had commenced.

Job Category	2016/17 Approved Posts	2016/17 Number of Employees	2016/17 Vacancies	Percentage Posts Vacant
Top Management	11	11	0	0.0%
Senior Management	49	43	6	12.2%
Professional Qualified	436	366	70	16.1%
Skilled	975	957	18	1.8%
Semi-skilled	318	283	35	11.0%
Unskilled	69	57	12	17.4%
<b>Subtotal</b>	<b>1,858</b>	<b>1,717</b>	<b>141</b>	<b>7.6%</b>
Contract	N/A	195	N/A	N/A

### Employment Changes

As seen in the tables below, a total of 86 employees left the organisation through a combination of normal retirement, resignations, dismissals and deaths during the financial year. Of this figure, 39 were members of the designated group. The overall staff turnover rate for the year was very low, at about 5%.

A total of 112 appointments were made some of which were internal promotions. Ninety-nine of the appointments, two of which were to Executive level, were employees from the designated group.

### Changes in Employment over the Financial Year

Job Category	Designated Group		Total Employees	
	Appointments	Exits	Appointments	Exits
Management	8	4	8	12
Engineers	4	1	5	1
Scientists	4	1	4	4
Other Professionals	6	6	8	15
Supervisors	1	1	2	8
Operators	10	1	11	4
Artisans	3	1	5	5
Technicians	14	4	15	6
Skilled	20	8	24	17
Semi-Skilled	19	9	20	11
Unskilled	10	3	10	3
<b>Total</b>	<b>99</b>	<b>39</b>	<b>112</b>	<b>86</b>



**Staff Turnover in Critical Skills Categories**

Job Category	2016/17 %	2015/16 %	2014/15 %	2013/14 %	2012/13 %
Management	0.62	0.12	0.42	4.93	9.2
Engineering and Science	0.26	0.65	0.77	9.90	17.9
Technical	0.31	0.30	4.02	19.0	14.8

**Reasons for Staff Leaving**

Reason	Number	Percentage of Total Staff Who Left
Death	4	4.7%
Resignation	38	44.1%
Dismissal	1	1.2%
Retirement	42	48.8%
Ill health	1	1.2%
<b>Total</b>	<b>86</b>	<b>100%</b>

**Labour Relations****Misconduct and Disciplinary Action**

Nature of Disciplinary Action	Number
Verbal Warning	5
Written Warning	0
Final Written Warning	0
Dismissal	4

**Disciplinary Hearings, Grievances and Sick Leave**

Description	2016/17	2015/16	2014/15	2013/14	2012/13
Disciplinary Action	4	27	34	46	39
Grievances Registered	48	40	24	14	8
Sick Leave (days per person per month)	0.63	0.69	0.64	0.65	0.71

**Labour Union Membership**

Union	2016/17		2015/16		2014/15		2013/14		2012/13	
	Number	Percentage of Total	Number	Percentage of Total	Number	Percentage of Total	Number	Percentage of Total	Number	Percentage of Total
Pelindaba Workers Union	326	26.2%	341	27.5%	369	29.2%	390	31.5%	493	30.1%
Solidarity	81	6.5%	92	7.4%	114	9.0%	124	10.0%	172	10.5%
National Education, Health and Allied Workers Union (NEHAWU)	647	52.0%	606	48.9%	544	43.1%	469	37.9%	582	35.6%
Sub-total	1,054	84.7%	1,039	83.9%	1,027	81.3%	983	79.5%	1,247	76.2%
Non-unionised	191	15.3%	199	16.1%	236	18.7%	254	20.5%	390	23.8%
<b>Total*</b>	<b>1,245</b>	<b>100%</b>	<b>1,238</b>	<b>100%</b>	<b>1,263</b>	<b>100%</b>	<b>1,237</b>	<b>100%</b>	<b>1,637</b>	<b>100%</b>

\* Excluding Directors, contract staff and staff of subsidiaries

## Employment Equity

In developing Necsa's employment equity plans, the Economically Active Population (EAP) analysis was used to determine the degree of underrepresentation of the designated groups in the workforce profile and set numerical targets for an equitable workforce.

As seen from the tables below, male representation relative to staff compliment is 67% indicating underrepresentation of females. Although Black people constitute 57% of Senior Management, white males remained over-represented at this level in comparison with their EAP. The very low staff turnover and overall growth rate reported above are major impediments to achieving the employment equity targets.

### Necsa Group's Employment Equity Performance against Numerical Goals as at 31 March 2017

Job Category	FEMALE							
	African		Coloured		Indian		White	
	Current	Target 34,9%	Current	Target 5%	Current	Target 1.5%	Current	Target 4.6%
Top Management	3	4	0	1	0	0	0	1
Senior Management	6	15	0	2	0	1	1	1
Professional Qualified	35	112	3	16	8	5	42	14
Skilled	199	304	5	44	3	13	103	40
Semi-skilled	80	136	8	20	1	6	17	17
Unskilled	37	28	0	4	0	1	0	3
<b>TOTAL</b>	<b>360</b>	<b>499</b>	<b>16</b>	<b>87</b>	<b>12</b>	<b>26</b>	<b>163</b>	<b>76</b>

Job Category	MALE							
	African		Coloured		Indian		White	
	Current	Target 40%	Current	Target 5.6%	Current	Target 1.9%	Current	Target 6,2%
Top Management	8	4	0	1	0	0	0	1
Senior Management	14	17	2	2	2	1	17	3
Professional Qualified	99	129	5	18	9	6	121	20
Skilled	307	348	24	49	4	17	226	54
Semi-skilled	252	156	8	22	1	7	23	24
Unskilled	42	32	0	5	0	2	2	5
<b>TOTAL</b>	<b>722</b>	<b>687</b>	<b>39</b>	<b>96</b>	<b>16</b>	<b>32</b>	<b>389</b>	<b>106</b>

Notes:

- ▶ Shortfall against Necsa Group targets as at March 2017 indicated in red
- ▶ Calculations of shortfall do not include temporary staff

The representation of disabled people is improving. However, out of a total of 1,717 employees, only 27 are people with disabilities. Efforts made to improve the situation include identification of vacant positions that can be targeted specifically for people with disabilities and awareness campaigns to encourage members of staff with disabilities to disclose their status.

### Necsa Group Disability Status

	2017	2016
Target Percentage	2%	2%
Total Entire Number of Staff	1,717	1,887
Number of Disabled Staff	27	25
Current Percentage Disabled	1.6%	1%
Target Number for Disabled Staff	34	38
<b>Shortfall from Target</b>	<b>-7</b>	<b>-13</b>

**Targets for Black Technical Staff 2013–2017**

Description	Actual		Targets			
	31 March 2017	31 March 2016	2013/14	2014/15	2015/16	2016/17
Technical Staff as Percentage of Total Staff	47.83%	49.27%	50%	52%	49%	51%
Black Technical Staff as Percentage of All Technical Staff	58.48%	56.02%	47%	49%	49%	55%

**Staff Development****Necsa Study Assistance Scheme**

During the 2016/17 financial year, a total amount of R1,377,984 was spent on the Study Assistance Scheme to assist Necsa staff in obtaining qualifications at various institutions of higher learning. Overall a total of 102 employees participated in the Study Assistance Scheme.

The table below reflects the breakdown of employees who benefited from the programme in terms of race and gender.

Discipline	Black		Coloured		Indian		White	
	♂	♀	♂	♀	♂	♀	♂	♀
BA Degree	4	1	0	0	0	0	2	0
BCom	2	3	0	0	0	0	0	0
BTech Degree	7	10	0	0	0	0	1	2
LLB	1	2	0	0	0	0	0	0
MTech	1		0	0	0	0	0	0
Masters	3	2	0	1	0	0	2	0
MBA	1	1	0	0	0	0	0	0
MSc	0	5	0	0	0	0	1	1
National Diploma	20	14	3	0	0	0	1	2
PhD	7	1	0	0	0	0	1	0
<b>Total</b>	<b>46</b>	<b>39</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>5</b>

**Graduate-in-Training Scheme**

The Graduate-in-Training Scheme was developed to help ensure a sustainable talent pipeline for Necsa. In the year under review, a total of five participants were taken onto the programme as reflected below.

Discipline	Black		Coloured		Indian		White	
	♂	♀	♂	♀	♂	♀	♂	♀
BSc Chemical Eng	2	0	0	0	0	0	0	0
BSc Chemistry	0	1	0	0	0	0	0	0
Honours in Chemistry	0	1	0	0	0	0	0	0
Honours in Mechanical Eng	1	0	0	0	0	0	0	0
<b>Total</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Necsa Internship Programme

As part of its contribution towards the National Human Capital Development Strategy, Necsa trains interns funded by the Chemical Industries Education and Training Authority (CHIETA). For the year under review, 69 young Black graduates were appointed on contract to provide them the opportunity to gain workplace experience in various fields as detailed below.

Discipline	Black		Coloured		Indian		White	
	♂	♀	♂	♀	♂	♀	♂	♀
N6 Financial Management	1	0	0	0	0	0	0	0
BCom Supply Chain Management	0	1	0	0	0	0	0	0
BSc Statistics and Applied Mathematics	1	0	0	0	0	0	0	0
BSc in Physics and Electronics	1	3	0	0	0	0	0	0
BTech Science	0	1	0	0	0	0	0	0
BTech in Internal Audit	0	1	0	0	0	0	0	0
BTech in Logistics	1	0	0	0	0	0	0	0
BTech in Communication Sciences	0	1	0	0	0	0	0	0
BTech in Administration in HR	1	0	0	0	0	0	0	0
BSc in Analytical Chemistry	3	1	0	0	0	0	0	0
Degree in Business Administration	0	2	0	0	0	0	0	0
Degree in Arts in Media Studies	0	1	0	0	0	0	0	0
ND Administrative Assistant	2	4	0	0	0	0	0	0
ND Analytical Chemistry	6	3	0	0	0	0	0	0
ND in Chemical Engineering	3	0	0	0	0	0	0	0
ND Business	1	0	0	0	0	0	0	0
ND in Internal Audit	0	2	0	0	0	0	0	0
ND Labour Relations	1	0	0	0	0	0	0	0
ND Media and Graphic Design	1	0	0	0	0	0	0	0
ND In Marketing	0	2	0	0	0	0	0	0
ND In Information Technology	6	3	0	0	0	0	0	0
ND Safety Management	0	1	0	0	0	0	0	0
ND Logistics	1	2	0	0	0	0	0	0
ND Industrial Physics	6	3	0	0	0	0	0	0
ND In Human Resource	1	1	0	0	0	0	0	0
N6 Human Resources	1	0	0	0	0	0	0	0
<b>Total</b>	<b>37</b>	<b>32</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



Student Group at the Necsa Visitor Centre



# 10

## Financial Report



Members of Necsa's Financial Reporting Team

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## Level of Assurance

These Annual Financial Statements have been audited in compliance with the applicable requirements of the Companies Act 71 of 2008.

## Prepared by

**Mororiseng Nyathi - CA(SA)**

**Manager: Financial Compliance**

## Supervised by

**Zakes Myeza - MBA, BCom**

**Chief Financial Officer**

## Published

31 July 2017

## General Information

### COUNTRY OF INCORPORATION AND DOMICILE

South Africa

### NATURE OF BUSINESS AND PRINCIPAL ACTIVITIES

The South African Nuclear Energy Corporation SOC Limited is responsible for managing certain institutional obligations defined in the Nuclear Energy Act, No. 46 of 1999

### DIRECTORS

Dr KR Kemm (Chairperson)  
Mr GP Tshelane (Necsa CEO)  
Dr NT Magau  
Mrs RP Mosia  
Dr ENN Ngcobo  
Ms P Bosman  
Mr ZC Ngidi  
Mr MPK Tshivhase  
Mr MS Sekgota  
Dr GJ Davids

### REGISTERED OFFICE

Elias Motsoaledi Street Extension (Church Street West)  
R104 Pelindaba  
Brits Magisterial District  
Madibeng Municipality  
North West Province  
0240

### BUSINESS ADDRESS

Elias Motsoaledi Street Extension (Church Street West)  
R104 Pelindaba  
Brits Magisterial District  
Madibeng Municipality  
North West Province  
0240

### POSTAL ADDRESS

PO Box 582  
Pretoria  
0001

### SHAREHOLDER AUDITOR

Department of Energy  
Auditor-General of South Africa  
Registered Auditors

### SECRETARY

First Corporate Secretaries (Pty) Ltd

### COMPANY REGISTRATION NUMBER

2000/003735/06

## Directors' Responsibilities and Approval

The directors are required in terms of the Companies Act 71 of 2008 and the Public Finance Management Act No.1 of 1999 (PFMA) to maintain adequate accounting records and are responsible for the content and integrity of the Annual Financial Statements (AFS) and related financial information included in this report. It is their responsibility to ensure that the Annual Financial Statements fairly present the state of affairs of the Group and company as at the end of the financial year and the results of its operations and cash flows for the period then ended, in conformity with South African Statements of Generally Accepted Accounting Practice. The external auditor is engaged to express an independent opinion on the Financial Statements.

The Annual Financial Statements are prepared in accordance with South African Statements of Generally Accepted Accounting Practice and are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgements and estimates.

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

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

The directors have reviewed the Group and company's cash flow forecast for the year to 31 March 2018 and, in light of this review and the current financial position, they are satisfied that the Group and company have access to adequate resources to continue in operational existence for the foreseeable future.

The external auditor is responsible for independently auditing and reporting on the Group and company's Financial Statements. The Financial Statements have been examined by the Group's external auditor and their report is presented on pages 117 to 122.

The Annual Financial Statements set out on pages 123 to 211, which have been prepared on the going concern basis, were approved by the directors on 28 July 2017 and were signed on their behalf by



**Dr KR Kemm**  
Chairperson of the Board



**Mr GP Tshelane**  
Chief Executive Officer

**Date: 28 July 2017**

## Report of the Audit and Risk Committee

We are pleased to present our report for the financial year ended 31 March 2017.

### Audit and Risk Committee Terms of Reference

The Audit and Risk Committee reports that it has adopted formal terms of reference that have been approved by the Board of Directors. The Committee has conducted its affairs in compliance with its terms of reference and has discharged its responsibilities contained therein. The terms of reference are available on request.

### Audit and Risk Committee Members, Meeting Attendance and Qualifications

The Committee is independent and consists of four independent, Non-Executive Directors. It meets at least four times per year as per its terms of reference. Attendance of meetings, dates of appointments as well as qualifications of the members are included in the governance report.

### Roles and Responsibilities

#### Statutory Duties

The Committee's role and responsibilities include statutory duties as per the Companies Act, PFMA and further responsibilities assigned to it by the Board of Directors.

#### External Auditor Appointments and Independence

The Committee has satisfied itself that the external auditor was independent of the Group, as set out in the Companies Act, which includes consideration of conflicts of interest as prescribed by the Public Auditors Act (PAA). Requisite assurance was sought and provided by the external auditor that internal governance processes within the audit firm support and demonstrate its claims to independence.

The Committee, in consultation with executive management, agreed to the engagement letter, audit plan and budgeted audit fees for the 2017 financial year.

### Financial Statements and the Accounting Practices

The Committee has evaluated the Annual Financial Statements of the company and the Group for the year ended 31 March 2017 and based on the information provided to the Committee, considers that the Annual Financial Statements comply, in all material respects with the requirements of the Companies Act and the PFMA, and South African Statements of the Generally Accepted Accounting Practice. The Committee concurs that the adoption of the going concern premise in the preparation of the Annual Financial Statements is appropriate. The Committee has recommended the adoption of the Annual Financial Statements and the Integrated Annual Report by the Board of Directors.

The Audit and Risk Committee has:

- ▶ Reviewed and discussed with the Auditor-General and Accounting Authority the audited Annual Financial Statements;
- ▶ Reviewed the Auditor-General's management letter and management responses;
- ▶ Reviewed changes in accounting policies and practices;
- ▶ Reviewed significant adjustments resulting from the audit; and
- ▶ Reviewed and discussed with the Accounting Authority, performance information submitted to the Auditor-General.

### Internal Financial Controls

The Committee is satisfied that internal controls and systems have been put in place and that these controls have functioned effectively during the period under review. The Committee has overseen a process by which internal audit has performed audits according to a risk based audit plan where the effectiveness of the risk management and internal controls were evaluated. The findings of these evaluations formed the basis for the Committee's recommendations in this regard to the Board of Directors, in order for the Board of Directors to report thereon. The Audit and Risk Committee is satisfied, based on the information and explanations given by management and the Internal



Audit Department as well as through discussion with the Auditor-General on the result of their audits that an adequate system of internal control is being maintained to:

- ▶ Reduce the entity's risk to an acceptable level;
- ▶ Meet the business objectives of the organisation;
- ▶ Review changes in accounting policies and practices;
- ▶ Ensure the organisation's assets are adequately safeguarded; and
- ▶ Ensure that the transactions undertaken are recorded in the organisation's records accurately and timely.

### Going Concern

The Committee has reviewed management's assessment of the going concern status of the Group and has made recommendation to the Board of Directors that the Group is a going concern.

### Internal Audit

The Committee is responsible for ensuring that the Group's Internal Audit is independent and has the necessary resources, standing and authority within the Group to enable it to discharge its duties. Furthermore, the Committee oversees co-operation between the internal and external auditors and serves as a link between the Board of Directors and these functions. The Committee considered and approved the internal audit charter. The internal audit function's annual audit plan and three year strategic plan were approved by the Committee.

The internal audit function reports administratively to the Chief Executive Officer and functionally to this Committee and is responsible for reviewing and providing assurance on the adequacy of the internal control environment across all of the Group's operations. The Internal Audit Manager has direct access to the Committee, primarily through its Chairperson.

From the various reports of the internal auditors, it was noted that no matters were reported that indicate any material deficiencies in the systems of internal control. Risks that have been identified through various processes have been addressed.

### Expertise and Experience of Chief Financial Officer and Finance Function

The Committee has satisfied itself that the Chief Financial Officer has appropriate expertise and experience. The Committee has considered, and has satisfied itself of the appropriateness of the expertise and the adequacy of resources of the finance function and experience of the senior members of management responsible for the financial function.

### Governance of Risk

The Committee oversees the implementation of the policy and plan for risk management taking place by means of risk management systems and processes. The Committee is satisfied that appropriate and effective systems are in place for risk management.

### Auditor-General

The Committee accepts the audit opinion of the Auditor-General on the Annual Financial Statements and recommends that the audited Annual Financial Statements be accepted and read together with the report of the Auditor-General.

On behalf of the Audit Committee:



**Ms P Bosman**  
**Chairperson - Audit and Risk Committee**  
**Pelindaba**  
**21 July 2017**

## Group Secretary's Certification

### Declaration by the Group Secretary in Respect of Section 88(2)(e) of the Companies Act

In terms of Section 88(2)(e) of the Companies Act, No 71 of 2008, as amended, I certify that the Group has lodged with the Commissioner all such returns as are required of a stated owned company in terms of the Companies Act and that all such returns are true, correct and up to date.



**Mr T Sithole**

**First Corporate Secretaries (Pty) Ltd**

**Company Secretary**

**Date: 28 July 2017**

## Directors' Report

The directors have pleasure in submitting their report on the Annual Financial Statements of The South African Nuclear Energy Corporation SOC Limited and its Group Companies for the year ended 31 March 2017.

### Incorporation

The company was incorporated on 24 February 2000 as a Schedule 2 Public Entity in terms of the PFMA and obtained its certificate to commence business on the same day.

### Review of Financial Results and Activities

Necsa derives its mandate from the Nuclear Energy Act and the Minister of Energy (the minister) to manage and operate certain of the republic's nuclear and related objectives.

Necsa has been assigned the responsibility for managing certain institutional obligations of the republic as defined in the act. The main functions of the Company are:

- ▶ To undertake and promote research and development in the field of nuclear energy and radiation sciences and technology and subject to the Safeguards Agreement, to make these generally available;
- ▶ To process source material, special nuclear material and restricted material and to process and enrich source material and nuclear material; and
- ▶ To co-operate with any person or institution in matters falling within these functions subject to the approval of the minister.

Ancillary powers and functions may be granted to the Group:

- ▶ In connection with its main functions;
- ▶ In order to create and utilise viable business opportunities in commerce and industry; and
- ▶ In order to undertake the development and/or exploitation of nuclear technology or nuclear related technology.

With regard to its nuclear related activities Necsa is governed by Nuclear Installations Licences (NILs) issued by the National Nuclear Regulator (NNR) in terms of the Nuclear Regulator Act 47 of 1999.

The subsidiaries in turn, have a mandate from Necsa to operate the companies in a self-sustainable manner and to remain competitive in the industries within which they operate.

Full details of the financial position, results of operations and cash flows of the Group are set out in these Consolidated Annual Financial Statements.

### Dividends

No dividends were declared or paid to the shareholder during the period under review.

### Directorate

The directors in office at the date of this report are as follows:

Directors	Designation	Appointment Date
Dr KR Kemm (Chairperson)	Non-executive	24 March 2016
Mr GP Tshelane (Necsa CEO)	Executive	01 September 2012
Ms P Bosman	Non-executive	24 March 2016
Dr NT Magau	Non-executive	24 March 2016
Mrs RP Mosia	Non-executive	24 March 2016
Dr ENN Ngcobo	Non-executive	24 March 2016
Mr ZC Ngidi	Non-executive	24 March 2016
Mr MPK Tshivhase	Non-executive	24 March 2016
Mr MS Sekgota	Non-executive	07 December 2016
Dr GJ Davids	Non-executive	07 December 2016

## Directors' Report (continued)

### Directors' Interests in Contracts

During the financial year, no contracts were entered into which directors or officers of the Group had an interest and which significantly affected the business of the Group.

### Interests in Subsidiaries

Name of Company	Nature of Business	Issued Share Capital		Effective Percentage		Number of Shares		Profit/(Loss) after Taxation	
		2017 R	2016 R	2017 %	2016 %	2017	2016	2017 R'000	2016 R'000
ARECSA Human Capital SOC Ltd <sup>5</sup>	Non-operating	1 000	1 000	51	51	510	510	98	80
Cyclofil SOC Ltd <sup>5</sup>	Dormant	1	1	100	100	1	1	-	-
NTP Radioisotopes SOC Ltd <sup>5</sup>	Marketing and distribution of radiopharmaceuticals	220	220	100	100	220	220	184 001	121 873
NTP Logistics SOC Ltd <sup>1</sup>	Logistics	100	100	51	51	51	51	10 107	7 487
NTP Radioisotopes Europe SA <sup>1</sup>	Supply isotopes and accessories for the radiographic non-destructive testing market	726 137	726 137	100	100	4 734	4 734	(20 714)	(30 000)
AEC Amersham SOC Ltd <sup>1</sup>	Marketing of radiopharmaceutical products	4 000	4 000	100	100	4 000	4 000	5 338	4 816
Pharmatopes SOC Ltd <sup>3</sup>	Dormant	1 000	1 000	100	100	1 000	1 000	-	-
Gammatec NDT Supplies SOC Ltd <sup>1</sup>	Non destructive testing equipment and accessories	300	300	55	55	165	165	3 368	3 400
Gammatec Aseana NDT Supplies SDN.BHD <sup>4</sup>	Non-destructive testing equipment, accessories and consumables	860 074	860 074	55	55	275 000	275 000	312	1 560
Gamma Film Industries SOC Ltd <sup>4</sup>	Dormant	100	100	55	55	55	55	-	-
Gammatec Middle East General Trading Liability Co <sup>4</sup>	Non-destructive testing equipment, accessories and consumables	414 270	414 270	41.81	41.81	125	125	(2 975)	(738)
Pelchem SOC Ltd <sup>5</sup>	Fluorochemical products	770 310	770 310	100	100	770 310	77 0310	(36 993)	28 648
Fluoro Pack SOC Ltd <sup>2</sup>	Dormant	100	100	100	100	100	100	-	-
Fluorochem SOC Ltd <sup>2</sup>	Dormant	100	100	100	100	100	100	-	-
Ketlaphela SOC Ltd <sup>2</sup>	Dormant (Formerly Fluoropharm)	4 000	4 000	100	100	4 000	4 000	-	-
Limited Electronics South Africa SOC Ltd <sup>2</sup>	Manufacturing and distribution of Nitrogen Tri-Fluoride	1 000	1 000	100	100	1 000	1 000	7 195	3 123
Lectromax <sup>1</sup>	Dormant (Being deregistered)	-	-	-	-	-	-	-	-

<sup>1</sup> Subsidiary of NTP Radioisotopes SOC Ltd

<sup>2</sup> Subsidiary of Pelchem SOC Ltd

<sup>3</sup> Subsidiary of AEC Amersham SOC Ltd

<sup>4</sup> Subsidiary of Gammatec NDT Supplies SOC Ltd

<sup>5</sup> Subsidiary of Necsa SOC Limited

Details of the Group's investment in subsidiaries are set out in Note 7. Subsidiary results are published separately in the addenda entitled: "Necsa Group Subsidiary Results - 2017"

## Interest in Associates

Name of Company	Nature of Business	Issued Share Capital		Effective Percentage		Number of Shares	
		2017 R	2016 R	2017 %	2016 %	2017	2016
Business Venture Exploration Investments No. 33 (Pty) Ltd <sup>2</sup>	Dormant	3 840	3 840	41.61	41.61	1 598	1 598
Gamwave (Pty) Ltd (formerly Cyclotope) <sup>3</sup>	Radiation of food sources	100	100	40	40	40	40
Oserix <sup>1</sup>	Supply isotopes and accessories for the radiographic non-destructive testing market	582	582	13.75	13.75	80	80
Element 42 <sup>3</sup>	Dormant	-	-	50	50	-	-

<sup>1</sup> Associate of Gammatec NDT Supplies SOC Ltd

<sup>2</sup> Associate of Necsa SOC Limited

<sup>3</sup> Associate of NTP Radioisotopes SOC Ltd

Details of the Group's investment in associates are set out in Note 8.

## Shareholder

The Company's sole shareholder is the State, represented by the Minister of Energy.

## Events after the Reporting Period

The directors are not aware of any material event which occurred after the reporting date and up to the date of this report, which would require adjustment to or disclosure in the financial statements.

## Going Concern

The Annual Financial Statements have been prepared on the basis of accounting policies applicable to a going concern. According to the Conceptual Framework of Financial Reporting, the financial statements are prepared using the underlying assumption that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business.

The ability of the Group to continue as a going concern is dependent on grant funding from government. Funding for the 2017/18 financial year has been approved; and as per the Medium Term Expenditure Framework (MTEF) of the National Government

funding has also been allocated for the 2018/19 and 2019/20 financial years.

In considering whether the Group and the Company are going concerns the following is noted:

Necsa is established in terms of the Nuclear Energy Act (the act) and is the successor in title to the Atomic Energy Corporation which has been in existence since 1950. Its main functions and ancillary powers and functions are prescribed by the act. The act prescribes how Necsa will be funded; it specifically states that, amongst other sources of funding, Necsa will be funded and provided with capital from money appropriated by Parliament and income derived from the sale or other commercial exploitation of its products.

Further, the act requires that Necsa must in respect of each financial year submit a statement of estimated income and expenditure for approval to the Minister of Energy (the minister) and the minister may approve the statement with the agreement of the Minister of Finance. The act also states that Necsa may not be placed under judicial management or in liquidation except if authorised by an act of Parliament. The Group's intellectual property and its main operations are considered strategic to the republic, hence



## Directors' Report (continued)

the direct involvement of government to ensure its continued existence.

Since its establishment and to date the Group's statement of estimated income and expenditure has been approved by the Minister of Energy with the concurrence of the Minister of Finance and the approved funding has been received by the Group. Grant funding for the current year amounted to R599m and funding for the 2017/18 year of R664m has been approved; and the Medium Term Expenditure Framework tabled in Parliament during November 2016 has allocated R702m for 2018/19 and R742m for 2019/20.

The Group exports a substantial portion of its commercial products and as result of the deteriorating global economic environment in recent years it has not been achieving its revenue targets. Consequently expenditure and cash flows have been managed prudently. Although the Group has adequate cash resources, Necsa, the Company, has experienced short term cash shortages. This is so because the Company's operations (commercial, research and development and State mandated obligations) are integrated resulting in interdependencies and cross subsidisation. The minister, and the National Treasury are aware of these constraints and discussions are ongoing. These short term shortages are funded from an overdraft facility of R120m. It is also noted that a subsidiary NTP has significant available cash resources of R518m.

In March 2016, Senior Counsel confirmed that Necsa, and not the Department of Energy, is liable to Decommission and Decontaminate (D&D) strategic nuclear facilities currently in operation (Stage 2) and, in terms of Accounting Standards, Necsa has had to recognise this liability in its financial statements, although the D&D process (and the resulting cash flows) may only commence in 2030 or later. Although Senior Counsel's opinion is that the State has an obligation to fund these liabilities, Accounting Standards dictate that such obligation cannot yet be recognised as an asset without Cabinet approval and discussions are underway to obtain such approval. The recognition of this liability has negatively impacted the Equity of the Company and the Group in the amount of R255m in the 2015/16 financial year and a further charge of

R44m in the current financial year. The recognition of this liability will have no impact on the Company's and the Group's future cash flows until 2030. Refer to Note 44 for further discussion on the Company's D&D obligations.

Despite this significant negative impact to Equity, the Group and the Company are still solvent; and once Cabinet approves funding, solvency will be enhanced.

On the basis of the Group's current financial position, the forecasted financial performance and cash flows for the foreseeable future, the grant funding approved for the 2016/17 financial year, the funding allocated for the 2017/18 and 2018/19 financial years, the State's obligations in terms of the act and the ongoing discussions with the State, it is considered that the Group has access to adequate resources to continue in operational existence for the foreseeable future.

### Auditors

Auditor-General of South Africa continued in office as auditors for the company and its subsidiaries for 2017.

### Secretary

The company secretary is First Corporate Secretaries (Pty) Ltd.

#### Postal address

PO Box 216  
Gallo Manor  
2052

#### Business address

1 Canterbury Crescent  
Gallo Manor  
Sandton  
2052

### Compliance with Legislation

The directors believe the Group has complied, in all material respects, with the provisions of the Companies Act, PFMA and the Nuclear Energy Act and other applicable legislation during the year under review.

## Independent Auditor's Report

### Report on the audit of the consolidated and separate financial statements

#### Opinion

1. I have audited the consolidated and separate financial statements of the South African Nuclear Energy Corporation SOC Limited (Necsa) and its subsidiaries (the group and company) set out on pages 123 to 211 which comprise the consolidated and separate statement of financial position as at 31 March 2017, and the consolidated and separate statement of other comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, as well as the notes to the consolidated and separate financial statements, including a summary of significant accounting policies.
2. In my opinion the consolidated and separate financial statements present fairly, in all material respects, the consolidated and separate financial position of the South African Nuclear Energy Corporation SOC Limited as at 31 March 2017, and their financial performance and cash flows for the year then ended in accordance with the South African Statements of Generally Accepted Accounting Practice (SA Statements of GAAP) and the requirements of the Public Finance Management Act of South Africa, (Act No.1 of 1999) (PFMA) and the Companies Act of South Africa, (Act No.71 of 2008) (Companies Act).

#### Basis for opinion

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

#### Emphasis of matter

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

#### Restatement of corresponding figures

7. As disclosed in Note 40 to the consolidated and separate financial statements, the corresponding figures for the year ended 31 March 2016 have been restated as a result of an error in the consolidated financial statements of the group at, and for the year ended, 31 March 2017.

#### Responsibilities of the board of directors, which constitutes the accounting authority for the financial statements

8. The board of directors, which constitutes the accounting authority, is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with the SA Statements of GAAP and the requirements of the PFMA and the Companies Act and for such internal control as the accounting authority determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

## Independent Auditor's Report (continued)

9. In preparing the consolidated and separate financial statements, the board of directors, which constitutes the accounting authority, is responsible for assessing the South African Nuclear Energy Corporation SOC Limited and its subsidiaries' ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless there is an intention by the board of directors, which constitutes the accounting authority either to liquidate the group and/or company or to cease operations, or has no realistic alternative but to do so.

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

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

## Report on the audit of the annual performance report

### Introduction and scope

12. In accordance with the Public Audit Act of South Africa, 2004 (Act No. 25 of 2004) (PAA) and the general notice issued in terms thereof I have a responsibility to report material findings on the reported performance information against predetermined objectives for selected objectives presented in the performance information by programme cluster ("annual performance report"). I performed procedures to identify findings but not to gather evidence to express assurance.
13. My procedures address the reported performance information, which must be based on the approved performance planning documents of the company. I have not evaluated the completeness and appropriateness of the performance indicators included in the planning documents. My procedures also did not extend to any disclosures or assertions relating to planned performance strategies and information in respect of future periods that may be included as part of the reported performance information. Accordingly, my findings do not extend to these matters.
14. I evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected objectives presented in the annual performance report of the company for the year ended 31 March 2017:

Objectives	Pages in the annual performance report
Objective 1 – Pelchem Group financials: Net profit after tax	27
Objective 2 – NTP Group financials: Net profit after tax	27
Objective 3 – SAFARI-1 Operation: Operational availability (days per year)	27
Objective 4 – D&D programme execution: Execution of Annual Plan of Action as approved by DoE	28
Objective 5 – Compliance to SHEQ, license and other regulatory requirements:	28
▶ Disabling Injury Incidence Rate (DIIR)	
▶ Public dose impact (expressed as % of NNR allowable limit)	
Objective 6 – Necsa Corporate Financials: External sales (including Intra Group Sales)	29

15. I performed procedures to determine whether the reported performance information was properly presented and whether performance was consistent with the approved performance planning documents. I performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.
16. I did not identify any material findings on the usefulness and reliability of the reported performance information for the following objectives:
- ▶ Objective 1 – Pelchem Group financials: Net profit after tax
  - ▶ Objective 2 – NTP Group financials: Net profit after tax
  - ▶ Objective 3 – SAFARI-1 Operation: Operational availability (days per year)
  - ▶ Objective 4 – D&D programme execution: Execution of Annual Plan of Action as approved by DoE
  - ▶ Objective 5 – Compliance to SHEQ, license and other regulatory requirements:
    - Disabling Injury Incidence Rate (DIIR)
    - Public dose impact (expressed as % of NNR allowable limit)
  - ▶ Objective 6 – Necsa Corporate Financials: External sales (including Intra Group Sales)

#### Other matter

Although I identified no material findings on the usefulness and reliability of the reported performance information for the selected objectives, I draw attention to the following matter:

#### Achievement of planned targets

Refer to the annual performance report on pages 26 to 29 for information on the achievement of planned targets for the year and explanations provided for the under/over-achievement of a significant number of targets.

## Independent Auditor's Report (continued)

### Report on audit of compliance with legislation

#### Introduction and scope

17. In accordance with the PAA and the general notice issued in terms thereof I have a responsibility to report material findings on the compliance of the group and company with specific matters in key legislation. I performed procedures to identify findings but not to gather evidence to express assurance.
18. The material finding in respect of the compliance criteria for the applicable subject matters is as follows:

#### Annual financial statements, performance and annual report

19. The financial statements of the group and company submitted for auditing were not prepared in accordance with the prescribed financial reporting framework as required by section 55(1)(a) of the PFMA and section 29(1)(a) of the Companies Act.

Material misstatements of current assets and revenue identified by the auditors in the submitted financial statements of the group and company were corrected, resulting in the financial statements receiving an unqualified audit opinion.

#### Other information

20. The Necsa SOC Limited and its subsidiaries' accounting authority is responsible for the other information. The other information comprises the information included in the annual report which includes the director's report, the audit committee's report and the company secretary's certificate as required by the Companies Act. The other information does not include the consolidated and separate financial statements, the auditor's report thereon and those selected objectives presented in the annual performance report that have been specifically reported on in the auditor's report.
21. My opinion on the financial statements and findings on the reported performance information and compliance with legislation do not cover the other information and I do not express an audit opinion or any form of assurance conclusion thereon.
22. In connection with my audit, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements and the selected objectives presented in the annual performance report, or my knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work I have performed on the other information obtained prior to the date of this auditor's report, I conclude that there is a material misstatement of this other information, I am required to report that fact. I have nothing to report in this regard.

#### Internal control deficiencies

23. I considered internal control relevant to my audit of the consolidated and separate financial statements, reported performance information and compliance with applicable legislation; however, my objective was not to express any form of assurance thereon. The matters reported below are limited to the significant internal control deficiencies that resulted in the findings on compliance with legislation included in this report.



## Financial and performance management

### 24. Daily and monthly processing and reconciling of transactions

Transactions on contract revenue were not appropriately processed and reconciled resulting in material misstatements to current assets and revenue which was subsequently corrected by management.

*Auditor-General*

Pretoria

31 July 2017



AUDITOR - GENERAL  
SOUTH AFRICA

*Auditing to build public confidence*

## Annexure – Auditor-General's responsibility for the audit

1. As part of an audit in accordance with the ISAs, I exercise professional judgement and maintain professional scepticism throughout my audit of the consolidated and separate financial statements, and the procedures performed on reported performance information for selected objectives and on the group's and company's compliance with respect to the selected subject matters.

### Financial statements

2. In addition to my responsibility for the audit of the consolidated and separate financial statements as described in the auditor's report, I also:
  - ▶ identify and assess the risks of material misstatement of the consolidated and separate financial statements whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
  - ▶ obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the group's and company's internal control.
  - ▶ evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the board of directors, which constitutes the board of directors, which constitutes the accounting authority.
  - ▶ conclude on the appropriateness of the board of directors, which constitutes the board of directors, which constitutes the accounting authority's use of the going concern basis of accounting in the preparation of the financial statements. I also conclude, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the South African Nuclear Energy Corporation SOC Limited and its subsidiaries ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify the opinion on the financial statements. My conclusions are based on the information available to me at the date of the auditor's report. However, future events or conditions may cause a group and/or the company to cease to continue as a going concern.
  - ▶ evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
  - ▶ obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

### Communication with those charged with governance

3. I communicate with the board of directors, which constitutes the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.
4. I also confirm to the accounting authority that I have complied with relevant ethical requirements regarding independence, and communicate all relationships and other matters that may reasonably be thought to have a bearing on my independence and here applicable, related safeguards.

# Consolidated Statement of Financial Position

as at 31 March 2017

Assets	Note(s)	Group		Company	
		2017 R '000	2016 R '000	2017 R '000	2016 R '000
Non-Current Assets					
Investment property	3	18 027	17 190	63 212	61 377
Property, plant and equipment	4	1 348 288	1 298 751	1 027 060	1 004 001
Goodwill	5	11 357	11 357	-	-
Intangible assets	6	10 284	10 860	-	-
Investments in subsidiaries	7	-	-	262 702	262 702
Investments in associates	8	2 405	2 405	2	2
Other financial assets	10	254 937	317 523	254 897	311 988
Deferred tax	11	30 283	26 565	-	-
Decommissioning & Decontamination Stage 1	44	2 727 063	2 789 448	2 727 063	2 789 448
Decommissioning & Decontamination Stage 2	44	152 941	195 312	152 941	195 312
Vaalputs After Care	45	4 142	4 519	4 142	4 519
		4 559 727	4 673 930	4 492 019	4 629 349
Current Assets					
Inventories	12	238 065	231 886	22 765	39 491
Loans to group companies	9	3 310	3 310	756	3 879
Other financial assets	10	15 887	14 987	15 887	14 987
Current tax receivable		10 733	10 005	-	-
Trade and other receivables	13	197 209	309 091	147 700	186 241
Prepayments	43	7 901	121 109	78	55 808
Cash and cash equivalents	14	1 065 283	781 511	466 785	263 066
		1 538 388	1 471 899	653 971	563 472
Non-current assets held for sale and assets of disposal groups	15	-	307	-	-
Total Assets		6 098 115	6 146 136	5 145 990	5 192 821

## Consolidated Statement of Financial Position (continued)

as at 31 March 2017

### Equity and Liabilities

Equity and Liabilities		Group		Company	
		Note(s)	2017 R '000	2016 R '000	2017 R '000
Equity					
Equity Attributable to Equity Holders of Parent					
Share capital	16	2 205	2 205	2 205	2 205
Reserves		545 593	493 625	483 212	454 804
Accumulated Earnings / (loss)		503 964	511 051	(396 489)	(287 717)
		1 051 762	1 006 881	88 928	169 292
Non-controlling interest		52 583	48 113	-	-
		1 104 345	1 054 994	89 928	169 292
Liabilities					
Non-Current Liabilities					
Other financial liabilities	17	12 975	14 486	-	-
Finance lease liabilities	18	3 549	5 543	2 690	3 126
Retirement benefit obligation	19	371 953	386 972	346 471	361 156
Deferred income	20	453 558	479 387	453 558	479 387
Provisions	21	228 393	205 769	381 845	313 888
Decommissioning & Decontamination Stage 1	44	2 727 063	2 789 448	2 727 063	2 789 448
Decommissioning & Decontamination Stage 2	44	449 951	450 308	449 951	450 308
Vaalputs After Care liabilities	45	76 792	75 080	76 792	75 080
Investment contributions for future liabilities	46	35 653	33 049	35 653	33 049
		4 359 887	4 440 042	4 474 023	4 505 442
Current Liabilities					
Other financial liabilities	17	7 693	24 777	756	-
Current tax payable		1 100	2 529	-	-
Finance lease liabilities	18	1 756	2 659	1 058	1 961
Operating lease liability		15	16	-	-
Trade and other payables	22	188 185	272 170	127 082	139 612
Retirement benefit obligation	19	23 808	22 234	22 652	21 972
Deferred income	20	140 804	110 593	140 804	110 593
Provisions	21	138 921	98 420	45 894	44 200
Amounts received in advance		1 331	31 036	142 946	139 749
Deposits received		6 549	2 669	-	-
Bank overdraft	14	123 721	82 734	101 847	60 000
		633 883	649 837	583 039	518 087
Liabilities of disposal groups	15	-	1 263	-	-
Total Liabilities		4 993 770	5 091 142	5 057 062	5 023 529
Total Equity and Liabilities		6 098 115	6 146 136	5 145 990	5 192 821

# Consolidated Statement of Comprehensive Income

for the year ended 31 March 2017

		Group		Company	
	Note(s)	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Continuing operations</b>					
Revenue	27	2 174 089	2 065 384	936 866	924 350
Cost of sales	12	(962 783)	(723 683)	(236 160)	(146 739)
<b>Gross profit</b>		<b>1 211 306</b>	<b>1 341 701</b>	<b>700 706</b>	<b>777 611</b>
Other income		87 529	184 382	16 669	50 045
Other operating expenses		(1 169 034)	(1 143 211)	(791 530)	(796 067)
Government Grant Income (Decommissioning & Decontamination Stage 1)		264 857	2 570 919	264 857	2 570 919
Acceptance of D&D Stage 1		(264 858)	(2 570 919)	(264 857)	(2 570 919)
Administration and management fees		(127 283)	(154 492)	(126 790)	(120 108)
<b>Operating profit (loss)</b>	28	<b>2 517</b>	<b>228 380</b>	<b>(200 945)</b>	<b>(88 519)</b>
Investment income	29	318 106	308 871	313 920	270 396
Fair value adjustments	30	2 919	1 187	5 883	(1 580)
Finance costs	31	(256 067)	(292 992)	(243 647)	(266 500)
<b>Profit (loss) before taxation</b>		<b>67 475</b>	<b>245 446</b>	<b>(124 789)</b>	<b>(86 203)</b>
Taxation	32	(96 603)	(81 799)	-	-
<b>(Loss) profit from continuing operations</b>		<b>(29 128)</b>	<b>163 647</b>	<b>(124 789)</b>	<b>(86 203)</b>
<b>Discontinued operations</b>					
Profit (loss) from discontinued operations	15	201	(2 944)	-	-
<b>(Loss) profit for the year</b>		<b>(28 927)</b>	<b>160 703</b>	<b>(124 789)</b>	<b>(86 203)</b>
<b>Other comprehensive income</b>					
Remeasurements on net defined benefit liability/asset		19 191	(11 765)	16 647	10 061
Gains on property revaluation		28 891	166 992	27 020	166 586
Exchange differences on translating foreign operations		21 689	8 359	-	-
Available-for-sale financial assets adjustments		1 388	(10 051)	1 388	(10 046)
<b>Other comprehensive income for the year net of taxation</b>	33	<b>71 159</b>	<b>153 535</b>	<b>45 055</b>	<b>166 601</b>
<b>Total comprehensive income (loss) for the year</b>		<b>42 232</b>	<b>314 238</b>	<b>(79 734)</b>	<b>80 398</b>
<b>(Loss) profit attributable to:</b>					
Owners of the parent		(35 086)	153 010	(124 789)	(86 203)
Non-controlling interest		6 159	7 693	-	-
		<b>(28 927)</b>	<b>160 703</b>	<b>(124 789)</b>	<b>(86 203)</b>
<b>Total comprehensive income (loss) attributable to:</b>					
Owners of the parent		36 073	306 545	(79 734)	80 398
Non-controlling interest		6 159	7 693	-	-
		<b>42 232</b>	<b>314 238</b>	<b>(79 734)</b>	<b>80 398</b>



## Consolidated Statement of Changes in Equity

for the year ended 31 March 2017

	Share capital R '000	Foreign currency translation reserve R '000	Revaluation reserve R '000	Fair value adjustment assets-available-for-sale reserve R '000	Total reserves R '000	Accumulated Earnings / (loss) R '000	Total attributable to equity holders of the group / company R '000	Non-controlling interest R '000	Total equity R '000
<b>Group</b>									
Opening balance as previously reported	2 205	1 316	312 573	14 493	328 382	349 023	679 610	42 140	721 750
Prior period error	-	(57)	-	-	(57)	1 786	1 729	(1 729)	-
<b>Balance at 01 April 2015 as restated</b>	<b>2 205</b>	<b>1 259</b>	<b>312 573</b>	<b>14 493</b>	<b>328 325</b>	<b>350 809</b>	<b>681 339</b>	<b>40 411</b>	<b>721 750</b>
Total comprehensive income for the year	-	8 359	166 992	(10 051)	165 300	141 245	306 545	7 693	314 238
Transfer between reserves	-	-	-	-	-	6 803	6 803	-	6 803
Dividends received/(paid)	-	-	-	-	-	(769)	(769)	-	(769)
Prior period error - (Note 40)	-	-	-	-	-	12 963	12 963	9	12 972
<b>Total changes</b>	<b>-</b>	<b>8 359</b>	<b>166 992</b>	<b>(10 051)</b>	<b>165 300</b>	<b>160 242</b>	<b>632 087</b>	<b>7 702</b>	<b>954 027</b>
<b>Balance at 01 April 2016</b>	<b>2 205</b>	<b>9 618</b>	<b>479 565</b>	<b>4 442</b>	<b>493 625</b>	<b>511 051</b>	<b>1 006 881</b>	<b>48 113</b>	<b>1 054 994</b>
Other comprehensive income	-	21 689	28 891	1 388	51 968	(15 895)	36 073	6 159	42 232
Other 3 Dividends received/(paid)	-	-	-	-	-	(630)	(630)	-	(630)
Discontinued Operations (Note 15)	-	-	-	-	-	233	233	-	233
Realisation of at acquisition	-	-	-	-	-	9 205	9 205	(1 670)	7 535
Non-controlling interest on de-registration of subsidiary	-	-	-	-	-	-	-	(19)	(19)
<b>Total changes</b>	<b>-</b>	<b>21 689</b>	<b>28 891</b>	<b>1 388</b>	<b>51 968</b>	<b>(7 087)</b>	<b>44 881</b>	<b>4 470</b>	<b>49 351</b>
<b>Balance at 31 March 2017</b>	<b>2 205</b>	<b>31 307</b>	<b>508 456</b>	<b>5 830</b>	<b>545 593</b>	<b>503 964</b>	<b>1 051 762</b>	<b>52 583</b>	<b>1 104 345</b>
Note(s)	16	33	25 & 33	33		33			

	Share capital R '000	Foreign currency translation reserve R '000	Revaluation reserve R '000	Fair value adjustment assets-available-for-sale reserve R '000	Total reserves R '000	Accumulated Earnings / (loss) R '000	Total attributable to equity holders of the group / company R '000	Non-controlling interest R '000	Total equity R '000
<b>Company</b>									
<b>Balance at 01 April 2015</b>	<b>2 205</b>	<b>-</b>	<b>283 799</b>	<b>14 465</b>	<b>298 264</b>	<b>(211 575)</b>	<b>88 894</b>	<b>-</b>	<b>88 894</b>
Total comprehensive income for the year	-	-	166 586	(10 046)	156 540	(76 142)	80 398	-	80 398
<b>Total comprehensive income for the year</b>	<b>-</b>	<b>-</b>	<b>166 586</b>	<b>(10 046)</b>	<b>156 540</b>	<b>(76 142)</b>	<b>80 398</b>	<b>-</b>	<b>80 398</b>
<b>Balance at 01 April 2016</b>	<b>2 205</b>	<b>-</b>	<b>450 385</b>	<b>4 419</b>	<b>454 804</b>	<b>(287 717)</b>	<b>169 292</b>	<b>-</b>	<b>169 292</b>
Other comprehensive income	-	-	27 020	1 388	28 408	(108 142)	(79 734)	-	(79 734)
<b>Total comprehensive income for the year</b>	<b>-</b>	<b>-</b>	<b>27 020</b>	<b>1 388</b>	<b>28 408</b>	<b>(108 142)</b>	<b>(79 734)</b>	<b>-</b>	<b>(79 734)</b>
Other 3	-	-	-	-	-	(630)	(630)	-	(630)
<b>Total contributions by and distributions to owners of company recognised directly in equity</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(630)</b>	<b>(630)</b>	<b>-</b>	<b>(630)</b>
<b>Balance at 31 March 2017</b>	<b>2 205</b>	<b>-</b>	<b>477 405</b>	<b>5 807</b>	<b>483 212</b>	<b>(396 489)</b>	<b>88 928</b>	<b>-</b>	<b>88 928</b>
Note(s)	16	33	25 & 33	33		33			

## Consolidated Statement of Cash Flows

for the year ended 31 March 2017

	Note(s)	Group		Company	
		2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Cash flows from operating activities</b>					
Cash receipts from customers		2 362 306	2 226 432	992 076	984 020
Cash paid to suppliers and employees		(2 076 500)	(1 705 852)	(962 486)	(711 040)
Cash generated from operations	34	285 806	520 580	29 590	272 980
Interest income		114 784	89 554	50 371	41 759
Finance costs		(19 061)	(31 413)	(6 642)	(3 828)
Dividends received/(paid)		233	(769)	-	-
Tax paid	35	(102 559)	(98 801)	-	-
<b>Net cash from operating activities</b>		<b>279 203</b>	<b>479 151</b>	<b>73 319</b>	<b>310 911</b>
<b>Cash flows from investing activities</b>					
Purchase of property, plant and equipment	4	(104 730)	(143 595)	(56 175)	(76 749)
Proceeds from sale of property, plant and equipment	4	2 506	10 690	-	-
Purchase of other intangible assets	6	(162)	(307)	-	-
Proceeds/(payments) of related party loans		-	-	3 123	(490)
Sale of financial assets		105 228	13 963	105 228	13 963
Purchase of financial assets		(25 606)	(255 555)	(31 100)	(250 057)
Dividends received		852	769	61 074	10 088
<b>Net cash from investing activities</b>		<b>(21 912)</b>	<b>(374 035)</b>	<b>82 150</b>	<b>(303 245)</b>
<b>Cash flows from financing activities</b>					
Movement from other financial liabilities		(18 595)	-	756	-
Movement in investment contributions for future liabilities		2 604	-	2 604	-
Movement in deferred Grant Income		4 382	(27 447)	4 382	(27 447)
Movement in Grant for Stage 2		-	15 014	-	15 014
Proceeds from shareholders loan		-	151	-	-
Finance lease payments		(2 897)	(16)	(1 339)	-
<b>Net cash from financing activities</b>		<b>(14 506)</b>	<b>(12 449)</b>	<b>6 403</b>	<b>(12 433)</b>
<b>Total cash movement for the year</b>		<b>242 785</b>	<b>92 667</b>	<b>161 872</b>	<b>(4 767)</b>
Cash at the beginning of the year		698 777	606 110	203 066	207 833
<b>Total cash at end of the year</b>	14	<b>941 562</b>	<b>698 777</b>	<b>364 938</b>	<b>203 066</b>

## Accounting Policies

### 1. Basis of preparation

#### Statement of compliance

The Annual Financial Statements have been prepared in accordance with South African Statements of Generally Accepted Accounting Practice and the Companies Act, Act 71 of 2008. The financial statements have been prepared on the historical cost basis except for certain properties and financial instruments that are measured at revalued amounts or fair values, as explained in the accounting policies below. Historical cost is generally based on the fair value of the consideration given in exchange for assets. These accounting policies are consistent with the previous period.

The principal accounting policies are set out below.

#### 1.1 Consolidation

##### Basis of consolidation

The consolidated Annual Financial Statements incorporate the Annual Financial Statements of the company and all entities which are controlled by the company.

Control is achieved where the Company has the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities. Assets and liabilities of subsidiaries acquired or disposed of during the year are included in the consolidated statement of financial position from the effective date of acquisition and up to the effective date of disposal, as appropriate.

Income and expenses of subsidiaries acquired or disposed of during the year are included in the consolidated statement of comprehensive income from the effective date of acquisition and up to the effective date of disposal, as appropriate.

Total comprehensive income of subsidiaries is attributed to the owners of the Company and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

Where necessary, adjustments are made to the Annual Financial Statements of subsidiaries to bring their accounting policies in line with those of the Group. All intergroup balances, income and expenses are eliminated in full on consolidation.

Non-controlling interests in the net assets of consolidated subsidiaries are identified and recognised separately from the Group's interest therein, and are recognised within equity.

Changes in the Group's ownership interests in subsidiaries that do not result in the Group losing control over the subsidiaries are accounted for as equity transactions. The carrying amounts of the Group's interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognised directly in equity and attributed to owners of the Company.

When the Group loses control of a subsidiary, the profit or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest and (ii) the previous carrying amount of the assets (including goodwill), and liabilities of the subsidiary and any non-controlling interests. When assets of the subsidiary are carried at revalued amounts or fair values and the related cumulative gain or loss has been recognised in other comprehensive income and accumulated in equity, the amounts previously recognised in other comprehensive income and accumulated in equity are accounted for as if the Company had directly disposed of the relevant assets (i.e. reclassified to profit or loss or transferred directly to retained earnings as specified by applicable IFRSs). The fair value of any investment retained in the former subsidiary at the date when control is lost is regarded as the fair value on initial recognition for subsequent accounting under IAS 39 Financial Instruments: Recognition and Measurement or, when applicable, the cost on initial recognition of an investment in an associate or a jointly controlled entity. Where a subsidiary is disposed of and a non-controlling shareholding is retained, the remaining investment is measured to fair value with the adjustment to fair value recognised in profit or loss as part of the gain or loss on disposal of the controlling interest.

##### Business combinations

Acquisitions of businesses are accounted for using the acquisition method. The consideration transferred

## Accounting Policies (continued)

in a business combination is measured at fair value, which is calculated as the sum of the acquisition-date fair values of the assets transferred by the Group, liabilities incurred by the Group to the former owners of the acquiree and the equity interests issued by the Group in exchange for control of the acquiree. Acquisition-related costs are generally recognised in profit or loss as incurred.

At the acquisition date, the identifiable assets acquired and the liabilities assumed, including acquired contingent liabilities are recognised at their fair value at the acquisition date, except that:

- ▶ deferred tax assets or liabilities and liabilities or assets related to employee benefit arrangements are recognised and measured in accordance with *IAS 12 Income Taxes* and *IAS 19 Employee Benefits* respectively;
- ▶ liabilities or equity instruments related to share-based payment arrangements of the acquiree or share-based payment arrangements of the Group entered into to replace share-based payment arrangements of the acquiree are measured in accordance with *IFRS 2 Share-based Payment* at the acquisition date; and
- ▶ assets (or disposal groups) that are classified as held for sale in accordance with *IFRS 5 Non-current Assets Held for Sale and Discontinued Operations* are measured in accordance with that Standard.

Goodwill is measured as the excess of the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree, and the fair value of the acquirer's previously held equity interest in the acquiree (if any) over the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed. If, after reassessment, the net of the acquisition-date amounts of the identifiable assets acquired and liabilities assumed exceeds the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree and the fair value of the acquirer's previously held interest in the acquiree (if any), the excess is recognised immediately in profit or loss as a bargain purchase gain.

Non-controlling interests that are present ownership interests and entitle their holders to a proportionate share of the entity's net assets in the event of liquidation

may be initially measured either at fair value or at the non-controlling interests' proportionate share of the recognised amounts of the acquiree's identifiable net assets. The choice of measurement basis is made on a transaction-by-transaction basis. Other types of non-controlling interests are measured at fair value.

When the consideration transferred by the Group in a business combination includes assets or liabilities resulting from a contingent consideration arrangement, the contingent consideration is measured at its acquisition-date fair value and included as part of the consideration transferred in a business combination. Changes in the fair value of the contingent consideration that qualify as measurement period adjustments are adjusted retrospectively, with corresponding adjustments against goodwill. Measurement period adjustments are adjustments that arise from additional information obtained during the 'measurement period' (which cannot exceed one year from the acquisition date) about facts and circumstances that existed at the acquisition date.

The subsequent accounting for changes in the fair value of the contingent consideration that do not qualify as measurement period adjustments depends on how the contingent consideration is classified. A contingent consideration that is classified as equity is not re-measured at subsequent reporting dates and its subsequent settlement is accounted for within equity. A contingent consideration that is classified as an asset or a liability is re-measured at subsequent reporting dates in accordance with IAS 39, or IAS 37 Provisions, Contingent Liabilities and Contingent Assets, as appropriate, with the corresponding gain or loss being recognised in profit or loss.

When a business combination is achieved in stages, the Group's previously held equity interest in the acquiree is re-measured to fair value at the acquisition date (i.e. the date when the Group obtains control) and the resulting gain or loss, if any, is recognised in profit or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognised in other comprehensive income are reclassified to profit or loss where such treatment would be appropriate if that interest were disposed of.



If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period (see above), or additional assets or liabilities are recognised, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognised at that date.

### **Investment in associates**

An associate is an entity over which the Group has significant influence and which is neither a subsidiary nor a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

The results and assets and liabilities of associates are incorporated in these consolidated financial statements using the equity method of accounting, except when the investment is classified as held for sale, in which case it is accounted for in accordance with IFRS 5 Non-current Assets Held for Sale and Discontinued Operations. Under the equity method, an investment in an associate is initially recognised in the consolidated statement of financial position at cost and adjusted thereafter to recognise the Group's share of the profit or loss and other comprehensive income of the associate. When the Group's share of losses of an associate exceeds the Group's interest in that associate (which includes any long-term interests that, in substance, form part of the Group's net investment in the associate), the Group discontinues recognising its share of further losses. Additional losses are classified as liabilities when recognised, only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate.

Any excess of the cost of acquisition over the Group's share of the net fair value of the identifiable assets, liabilities and contingent liabilities of an associate recognised at the date of acquisition is recognised as goodwill, which is included within the carrying amount of the investment. Any excess of the Group's share of the net fair value of the identifiable assets, liabilities and contingent liabilities over the cost of acquisition,

after reassessment, is recognised immediately in profit or loss.

The requirements of IAS 39 are applied to determine whether it is necessary to recognise any impairment loss with respect to the Group's investment in an associate. When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment in accordance with IAS 36 Impairment of Assets as a single asset by comparing its recoverable amount (higher of value in use and fair value less costs to sell) with its carrying amount. Any impairment loss recognised forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognised in accordance with IAS 36 to the extent that the recoverable amount of the investment subsequently increases.

When a Group entity transacts with its associate, profits and losses resulting from the transactions with the associate are recognised in the Group's consolidated financial statements only to the extent of interests in the associate that are not related to the Group.

When the Group reduces its level of significant influence or loses significant influence, the Group proportionately reclassifies the related items which were previously accumulated in equity through other comprehensive income to profit or loss as a reclassification adjustment. In such cases, if an investment remains, that investment is measured to fair value, with the fair value adjustment being recognised in profit or loss as part of the gain or loss on disposal.

### **1.2 Significant judgements and sources of estimation uncertainty**

In preparing the Annual Financial Statements, management is required to make estimates and assumptions that affect the amounts presented in the Annual Financial Statements and related disclosures. Use of available information and the application of judgement is inherent in the formation of estimates. Actual results in the future could differ from these estimates which may be material to the Annual Financial Statements. The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised if the

## Accounting Policies (continued)

revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods. Significant judgements include:

### **Trade receivables, Held to maturity investments and Loans and receivables**

The Group assesses its trade receivables, held to maturity investments and loans and receivables for impairment at the end of each reporting period. In determining whether an impairment loss should be recorded in profit or loss, the Group makes judgements as to whether there is observable data indicating a measurable decrease in the estimated future cash flows from a financial asset.

The impairment for trade receivables, held-to-maturity investments and loans and receivables is calculated on a portfolio basis, based on historical loss ratios, adjusted for national and industry-specific economic conditions and other indicators present at the reporting date that correlate with defaults on the portfolio. These annual loss ratios are applied to loan balances in the portfolio and scaled to the estimated loss emergence period.

### **Available-for-sale financial assets**

The Group follows the guidance of IAS 39 to determine when an available-for-sale financial asset is impaired. This determination requires significant judgement. In making this judgement, the Group evaluates, among other factors, the duration and extent to which the fair value of an investment is less than its cost; and the financial health of and near-term business outlook for the investee, including factors such as industry and sector performance, changes in technology and operational and financing cash flow.

### **Allowance for slow moving, damaged and obsolete inventory**

An allowance is made to write inventory down to the lower of cost or net realisable value. Management have made estimates of the selling price and direct cost to sell on certain inventory items. The write down is included in the operating profit note.

### **Fair value estimation**

The fair value of financial instruments traded in active markets (such as trading and available-for-sale

securities) is based on quoted market prices at the end of the reporting period. The quoted market price used for financial assets held by the Group is the current bid price.

The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques. The Group uses a variety of methods and makes assumptions that are based on market conditions existing at the end of each reporting period. Other techniques, such as estimated discounted cash flows, are used to determine fair value for the remaining financial instruments. The fair value of forward foreign exchange contracts is determined using quoted forward exchange rates at the end of the reporting period.

The carrying value less impairment provision of trade receivables and payables are assumed to approximate their fair values. The fair value of financial liabilities for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to the Group for similar financial instruments. The assumption is based on the management expectation that outstanding balances will be collected or paid within twelve months, therefore the time value of money will not have an impact as it is considered to be immaterial.

### **Impairment testing**

The recoverable amounts of cash-generating units and individual assets have been determined based on the higher of value-in-use calculations and fair values less costs to sell. These calculations require the use of estimates and assumptions. It is reasonably possible that an assumption may change which may then impact estimations and may then require a material adjustment to the carrying value of goodwill and tangible assets.

The Group reviews and tests the carrying value of assets when events or changes in circumstances suggest that the carrying amount may not be recoverable. In addition, goodwill is tested on an annual basis for impairment. Assets are grouped at the lowest level for which identifiable cash flows are largely independent of cash flows of other assets and liabilities. If there are indications that impairment may have occurred, estimates are prepared of expected future cash flows

for each group of assets. Expected future cash flows used to determine the value in use of goodwill and tangible assets are inherently uncertain and could materially change over time.

### Provisions

Provisions are estimated by management based on the available information. Additional disclosure of these estimates are included in Note 21 - Provisions.

### Taxation

Judgement is required in determining the provision for income taxes due to the complexity of legislation. There are many transactions and calculations for which the ultimate tax determination is uncertain during the ordinary course of business. The Group recognises liabilities for anticipated tax audit issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact the income tax and deferred tax provisions in the period in which such determination is made.

The Group recognises the net future tax benefit related to deferred income tax assets to the extent that it is probable that the deductible temporary differences will reverse in the foreseeable future. Assessing the recoverability of deferred income tax assets requires the Group to make significant estimates related to expectations of future taxable income. Estimates of future taxable income are based on forecast cash flows from operations and the application of existing tax laws in each jurisdiction. To the extent that future cash flows and taxable income differ significantly from estimates, the ability of the Group to realise the net deferred tax assets recorded at the end of the reporting period could be impacted.

### Property, Plant and Equipment

The useful lives of assets are based on management's estimation. Management considers the following factors to determine the optimum useful life expectation for each of the individual items of property, plant and equipment:

- ▶ Expected usage of the asset. Usage is assessed by reference to the assets expected capacity or physical output;
- ▶ Expected physical wear and tear, which depends

on operational factors such as the number of shifts for which the asset is to be used and the repair and maintenance programme, and the care and maintenance of the asset while idle;

- ▶ Technical or commercial obsolescence arising from changes or improvement in production or from a change in the market demand for the product or service output of the asset; and
- ▶ Exit policy of the Company.

The estimation of residual value of assets is also based on management's judgement that the assets will be sold and what its condition will be like at the end of its useful life. For assets that incorporate both a tangible and intangible portion, management uses judgement to assess which element is more significant to determine whether it should be treated as property, plant and equipment or intangible assets.

### Post retirement benefit obligation

Judgement is required when recognizing and measuring the retirement benefit obligation of the Group and the Company. The obligation is valued by an independent actuary at each reporting date. The actuarial valuation method is used to value the obligation and the projected unit credit method is used. Future benefit values are projected using specific actuarial assumptions and the liability to in-service members is accrued over the expected working lifetime.

### 1.3 Investment property

Investment properties are properties held to earn rentals and/or for capital appreciation (including property under construction for such purposes).

Investment property is recognised as an asset when, and only when, it is probable that the future economic benefits that are associated with the investment property will flow to the enterprise, and the cost of the investment property can be measured reliably.

Investment property is initially recognised at cost. Transaction costs are included in the initial measurement.

Costs include costs incurred initially and costs incurred subsequently to add to, or to replace a part of, or service a property. If a replacement part is recognised

## Accounting Policies (continued)

in the carrying amount of the investment property, the carrying amount of the replaced part is derecognised.

### Fair value

Subsequent to initial measurement investment property is measured at fair value.

A gain or loss arising from a change in fair value is included in net profit or loss of the period in which it arises.

An investment property is derecognised upon disposal or when the investment property is permanently withdrawn from use and no future economic benefits are expected from the disposal. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in profit or loss in the period in which the property is derecognised.

### 1.4 Property, plant and equipment

The cost of an item of property, plant and equipment is recognised as an asset when:

- ▶ it is probable that future economic benefits associated with the item will flow to the company; and
- ▶ the cost of the item can be measured reliably.

Property, plant and equipment is initially measured at cost.

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised.

The initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located is also included in the cost of property, plant and equipment, where the entity is obliged to incur such expenditure, and where the obligation arises as a result of acquiring the asset or using it for purposes other than the production of inventories.

Plant and equipment is stated at cost less accumulated depreciation and any impairment losses.

Land and buildings is carried at revalued amount, being the fair value at the date of revaluation less any subsequent accumulated depreciation and subsequent accumulated impairment losses.

Revaluations are performed with sufficient regularity such that the carrying amount does not differ materially from that which would be determined using fair value as the end of the reporting period.

The frequency of revaluations depends upon the changes in fair values of the items of property, plant and equipment being revalued. Some items of property, plant and equipment experience significant and volatile changes in fair value, thus necessitating annual revaluation. Such frequent revaluations are unnecessary for items of property, plant and equipment with only insignificant changes in fair value. Instead, it may be necessary to revalue the item every three to five years.

When an item of property, plant and equipment is revalued, any accumulated depreciation at the date of the revaluation is eliminated against the gross carrying amount of the asset and the net amount restated to the revalued amount of the asset.

Any increase in an asset's carrying amount, as a result of a revaluation, is recognised to other comprehensive income and accumulated in the revaluation surplus in equity. The increase is recognised in profit or loss to the extent that it reverses a revaluation decrease of the same asset previously recognised in profit or loss.

Any increase in an asset's carrying amount, as a result of a revaluation, is recognised in profit or loss in the current period. The decrease is recognised in other comprehensive income to the extent of any credit balance existing in the revaluation surplus in respect of that asset. The decrease recognised in other comprehensive income reduces the amount accumulated in the revaluation surplus in equity.

The revaluation surplus in equity related to a specific item of property, plant and equipment is transferred directly to retained earnings when the asset is derecognised.

Property, plant and equipment is depreciated on the straight line basis over their expected useful lives to their estimated residual value.

The useful lives of items of property, plant and equipment have been assessed as follows:

Item	Range of useful lives
Land	indefinite
Buildings	10 - 50 years
Plant	5 - 50 years
Furniture and fixtures	2 - 22 years
Motor vehicles and transport containers	2 - 26 years
Office equipment	2 - 22 years
IT equipment	2 - 22 years
Research facilities	2 - 22 years
Leasehold improvements	2 - 10 years
Machinery and equipment	2 - 22 years
Component spares	2 - 10 years

The residual value, useful life and depreciation method of each asset are reviewed at the end of each reporting period. If the expectations differ from previous estimates, the change is accounted for as a change in accounting estimate.

The depreciation charge for each period is recognised in profit or loss unless it is included in the carrying amount of another asset.

An item of property, plant and equipment is derecognised upon disposal or when no future economic benefits are expected to arise from the continued use of the asset.

The gain or loss arising from the derecognition of an item of property, plant and equipment is included in profit or loss when the item is derecognised. The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

## 1.5 Intangible assets

An intangible asset is recognised when:

- ▶ it is probable that the expected future economic benefits that are attributable to the asset will flow to

the entity; and

- ▶ the cost of the asset can be measured reliably.

Intangible assets are initially recognised at cost.

### Internally generated intangible assets - research and development expenditure

Expenditure on research (or on the research phase of an internal project) is recognised as an expense when it is incurred.

An intangible asset arising from development (or from the development phase of an internal project) is recognised when all of the following have been demonstrated:

- ▶ the technical feasibility of completing the intangible asset so that it will be available for use or sale;
- ▶ the intention to complete the intangible asset and use or sell it;
- ▶ the ability to use or sell the intangible asset;
- ▶ it will generate probable future economic benefits;
- ▶ how the intangible asset will generate probable future economic benefits;
- ▶ the availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset; and
- ▶ the ability to measure reliably the expenditure attributable to the intangible asset during its development.

The amount initially recognised for internally-generated intangible assets is the sum of the expenditure incurred from the date when the intangible asset first meets the recognition criteria listed above. Where no internally-generated intangible asset can be recognised, development expenditure is recognised in profit or loss in the period in which it is incurred.

Subsequent to initial recognition, internally-generated intangible assets are reported at cost less accumulated amortisation and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

An intangible asset is regarded as having an indefinite useful life when, based on all relevant factors, there is no foreseeable limit to the period over which the asset is expected to generate net cash inflows. Amortisation is not provided for these intangible assets, but they are



## Accounting Policies (continued)

tested for impairment annually and whenever there is an indication that the asset may be impaired. For all other intangible assets amortisation is provided on a straight-line basis over their useful life.

The amortisation period and the amortisation method for intangible assets are reviewed at the end of each reporting period.

Re-assessing the useful life of an intangible asset with a finite useful life after it was classified as indefinite is an indicator that the asset may be impaired. As a result the asset is tested for impairment and the remaining carrying amount is amortised over its useful life.

Internally generated brands, mastheads, publishing titles, customer lists and items similar in substance are not recognised as intangible assets.

Amortisation is provided to write down the intangible assets, on a straight line basis, to their residual values as follows:

Item	Useful lives
Patents, trademarks and other rights	2-8 years
Computer software	3 years

### 1.6 Investments in subsidiaries

#### Company financial statements

In the company's separate Annual Financial Statements, investments in subsidiaries are carried at cost less any accumulated impairment.

The cost of an investment in a subsidiary is the aggregate of:

- ▶ the fair value, at the date of exchange, of assets given, liabilities incurred or assumed, and equity instruments issued by the company; plus
- ▶ any costs directly attributable to the purchase of the subsidiary.

### 1.7 Investments in associates

#### Company Annual Financial Statements

An investment in an associate is carried at cost less any accumulated impairment.

### 1.8 Financial instruments

#### Classification

The Group classifies financial assets and financial liabilities into the following categories:

- ▶ Financial assets at fair value through profit or loss - held for trading;
- ▶ Held-to-maturity investments;
- ▶ Loans and receivables;
- ▶ Available-for-sale financial assets;
- ▶ Financial liabilities at fair value through profit or loss - held for trading; and
- ▶ Financial liabilities measured at amortised cost.

Classification depends on the purpose for which the financial instruments were obtained / incurred and takes place at initial recognition. Classification is re-assessed on an annual basis, except for derivatives and financial assets designated at fair value through profit or loss, which may not be classified out of the fair value through profit or loss category.

#### Initial recognition and measurement

Financial instruments are recognised initially when the Group becomes a party to the contractual provisions of the instruments.

The Group classifies financial instruments, or their component parts, on initial recognition as a financial asset, a financial liability or an equity instrument in accordance with the substance of the contractual arrangement.

Financial instruments are measured initially at fair value, except for equity investments for which a fair value is not determinable, which are measured at cost and are classified as available-for-sale financial assets.

For financial instruments which are not at fair value through profit or loss, transaction costs are included in the initial measurement of the instrument.

Transaction costs on financial instruments at fair value through profit or loss are recognised in profit or loss.

Regular purchases and sales of investments are recognised on trade-date, i.e. the date on which the Group commits to purchase or sell the asset.

**Subsequent measurement**

Financial instruments at fair value through profit or loss are subsequently measured at fair value, with gains and losses arising from changes in fair value being included in profit or loss for the period.

Net gains or losses on the financial instruments at fair value through profit or loss exclude dividends and interest.

Dividend income is recognised in profit or loss as part of other income when the Group's right to receive payment is established.

Loans and receivables are subsequently measured at amortised cost, using the effective interest method, less accumulated impairment losses.

Held-to-maturity investments are subsequently measured at amortised cost, using the effective interest method, less accumulated impairment losses.

Available-for-sale financial assets are subsequently measured at fair value. This excludes equity investments for which a fair value is not determinable, which are measured at cost less accumulated impairment losses.

Gains and losses arising from changes in fair value are recognised in other comprehensive income and accumulated in equity until the asset is disposed of or determined to be impaired. Interest on available-for-sale financial assets calculated using the effective interest method is recognised in profit or loss as part of other income. Dividends received on available-for-sale equity instruments are recognised in profit or loss as part of other income when the Group's right to receive payment is established.

Changes in fair value of available-for-sale financial assets denominated in a foreign currency are analysed between translation differences resulting from changes in amortised cost and other changes in the carrying amount. Translation differences on monetary items are recognised in profit or loss, while translation differences on non-monetary items are recognised in other comprehensive income and accumulated in equity.

Financial liabilities at amortised cost are subsequently measured at amortised cost, using the effective interest method.

**Fair value determination**

The fair values of quoted investments are based on current bid prices. If the market for a financial asset is not active (and for unlisted securities), the Group establishes fair value by using valuation techniques. These include the use of recent arm's length transactions, reference to other instruments that are substantially the same, discounted cash flow analysis, and option pricing models making maximum use of market inputs and relying as little as possible on entity-specific inputs.

**Impairment of financial assets**

At each reporting date, the Group assesses all financial assets, other than those at fair value through profit or loss, to determine whether there is objective evidence that a financial asset or Group of financial assets has been impaired.

Financial assets are considered to be impaired when there is objective evidence that, as a result of one or more events that occurred after the initial recognition of the financial asset, the estimated future cash flows of the investment have been affected.

For amounts due to the Group, significant financial difficulties of the debtor, probability that the debtor will enter bankruptcy and default of payments are all considered indicators of impairment.

In the case of equity securities classified as available-for-sale, a significant or prolonged decline in the fair value of the security below its cost is considered an indicator of impairment. For all other financial assets, objective evidence of impairment could include:

- ▶ significant financial difficulty of the issuer or counterparty; or
- ▶ breach of contract, such as a default or delinquency in interest or principal payments; or
- ▶ it becoming probable that the borrower will enter bankruptcy or financial re-organisation; or
- ▶ the disappearance of an active market for that financial asset because of financial difficulties.

## Accounting Policies (continued)

For financial assets carried at amortised cost, the amount of the impairment loss recognised is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate.

For financial assets carried at cost, the amount of the impairment loss is measured as the difference between the asset's carrying amount and the present value of the estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment loss may not be reversed in subsequent periods.

The carrying amount of the financial asset is reduced by the impairment loss directly for all financial assets with the exception of trade receivables, where the carrying amount is reduced through the use of an allowance account. When a trade receivable is considered uncollectible, it is written off against the allowance account. Subsequent recoveries of amounts previously written off are credited against the allowance account. Changes in the carrying amount of the allowance account are recognised in profit or loss.

When an available-for-sale financial asset is considered to be impaired, cumulative gains or losses previously recognised in other comprehensive income are reclassified to profit or loss in the period.

For financial assets measured at amortised cost, if, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, the previously recognised impairment loss is reversed through profit or loss to the extent that the carrying amount of the investment at the date the impairment is reversed does not exceed what the amortised cost would have been had the impairment not been recognised.

In respect of available-for-sale equity securities, impairment losses previously recognised in profit or loss are not reversed through profit or loss. Any increase in fair value subsequent to an impairment loss is recognised in other comprehensive income and accumulated under the heading of investments revaluation reserve. In respect of available-for-sale debt securities, impairment

losses are subsequently reversed through profit or loss if an increase in the fair value of the investment can be objectively related to an event occurring after the recognition of the impairment loss.

The group derecognises a financial asset only when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If the group neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, the group recognises its retained interest in the asset and an associated liability for amounts it may have to pay. If the group retains substantially all the risks and rewards of ownership of a transferred financial asset, the group continues to recognise the financial asset and also recognises a collateralised borrowing for the proceeds received.

On derecognition of a financial asset in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognised in other comprehensive income and accumulated in equity is recognised in profit or loss.

On derecognition of a financial asset other than in its entirety (e.g. when the group retains an option to repurchase part of a transferred asset or retains a residual interest that does not result in the retention of substantially all the risks and rewards of ownership and the group retains control), the group allocates the previous carrying amount of the financial asset between the part it continues to recognise under continuing involvement, and the part it no longer recognises on the basis of the relative fair values of those parts on the date of the transfer. The difference between the carrying amount allocated to the part that is no longer recognised and the sum of the consideration received for the part no longer recognised and any cumulative gain or loss allocated to it that had been recognised in other comprehensive income is recognised in profit or loss. A cumulative gain or loss that had been recognised in other comprehensive income is allocated between the part that continues to be recognised and the part that is no longer recognised on the basis of the relative fair values of those parts.

**Financial instruments designated as at fair value through profit or loss**

These are financial assets held for trading. A financial asset is classified in this category if acquired principally for the purpose of selling in the short term. Assets in this category are classified as current assets if they are either held for trading or are expected to be realised within 12 months of the statement of financial position date.

Gains or losses arising from changes in the fair value of the 'financial assets at fair value through profit or loss' category, are presented in the statement of comprehensive income in the period in which they arise. Dividend income from financial assets at fair value through profit or loss is recognised in the statement of comprehensive income as part of other income when the Group's right to receive payment is established.

**Financial instruments designated as available-for-sale**

Available-for-sale financial assets are non-derivatives that are either designated in this category or not classified in any of the other categories. They are included in non-current assets unless management intends to dispose of the investment within 12 months of the statement of financial position date.

Changes in the fair value of monetary securities classified as available-for-sale and non-monetary securities classified as available-for-sale are recognised in comprehensive income.

When securities classified as available-for-sale are sold or impaired, the accumulated fair value adjustments recognised in other comprehensive income are included in the statement of comprehensive income as 'gains and losses from investment securities'. Interest on available-for-sale securities calculated using the effective interest method is recognised in the statement of comprehensive income. Dividends on available-for-sale equity instruments are recognised in the statement of comprehensive income when the company's right to receive payments is established.

**Loans to (from) group companies**

These include loans to and from holding companies, fellow subsidiaries, subsidiaries, joint ventures and associates and are recognised initially at fair value plus direct transaction costs.

Loans to Group companies are classified as loans and receivables.

Loans from Group companies are classified as financial liabilities measured at amortised cost.

**Loans to shareholders, directors, managers and employees**

These financial assets are classified as loans and receivables.

**Trade and other receivables**

Trade receivables are measured at initial recognition at fair value, and are subsequently measured at amortised cost using the effective interest rate method. Appropriate allowances for estimated irrecoverable amounts are recognised in profit or loss when there is objective evidence that the asset is impaired. Significant financial difficulties of the debtor, probability that the debtor will enter bankruptcy or financial reorganisation, and default or delinquency in payments (more than 30 days overdue) are considered indicators that the trade receivable is impaired. The allowance recognised is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the effective interest rate computed at initial recognition.

The carrying amount of the asset is reduced through the use of an allowance account, and the amount of the loss is recognised in profit or loss within operating expenses. When a trade receivable is uncollectible, it is written off against the allowance account for trade receivables. Subsequent recoveries of amounts previously written off are credited against operating expenses in profit or loss.

Trade and other receivables (excluding prepayments, deposits and VAT receivable) are classified as loans and receivables.

**Trade and other payables**

Trade payables are initially measured at fair value, and are subsequently measured at amortised cost, using the effective interest rate method.

**Cash and cash equivalents**

Cash and cash equivalents comprise cash on hand and demand deposits, and other short-term highly liquid

## Accounting Policies (continued)

investments that are readily convertible to a known amount of cash and are subject to an insignificant risk of changes in value. These are initially recognised at fair value and subsequently treated as loans and receivables.

### Bank overdraft and borrowings

Bank overdrafts and borrowings are initially measured at fair value, and are subsequently measured at amortised cost, using the effective interest rate method. Any difference between the proceeds (net of transaction costs) and the settlement or redemption of borrowings is recognised over the term of the borrowings in accordance with the Group's accounting policy for borrowing costs.

### Derivatives

Derivative financial instruments, which are not designated as hedging instruments, consisting of foreign exchange contracts and interest rate swaps, are initially measured at fair value on the contract date, and are re-measured to fair value at subsequent reporting dates.

Derivatives embedded in other financial instruments or other non-financial host contracts are treated as separate derivatives when their risks and characteristics are not closely related to those of the host contract and the host contract is not carried at fair value with unrealised gains or losses reported in profit or loss.

Changes in the fair value of derivative financial instruments are recognised in profit or loss as they arise.

Derivatives are classified as financial assets at fair value through profit or loss - held for trading.

## 1.9 Tax

### Current tax assets and liabilities

Current tax for current and prior periods is, to the extent unpaid, recognised as a liability. If the amount already paid in respect of current and prior periods exceeds the amount due for those periods, the excess is recognised as an asset.

Current tax liabilities (assets) for the current and prior periods are measured at the amount expected to be

paid to (recovered from) the tax authorities, using the tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

The tax currently payable is based on taxable profit for the year. Taxable profit differs from profit as reported in the consolidated statement of comprehensive income because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. The Group's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

### Deferred tax assets and liabilities

A deferred tax liability is recognised for all taxable temporary differences, except to the extent that the deferred tax liability arises from:

- ▶ the initial recognition of goodwill; or
- ▶ the initial recognition of an asset or liability in a transaction which:
  - is not a business combination; and
  - at the time of the transaction, affects neither accounting profit nor taxable profit (tax loss).

A deferred tax liability is recognised for all taxable temporary differences associated with investments in subsidiaries, branches and associates, and interests in joint ventures, except to the extent that both of the following conditions are satisfied:

- ▶ the parent, investor or venturer is able to control the timing of the reversal of the temporary difference; and
- ▶ it is probable that the temporary difference will not reverse in the foreseeable future.

A deferred tax asset is recognised for all deductible temporary differences to the extent that it is probable that taxable profit will be available against which the deductible temporary difference can be utilised, unless the deferred tax asset arises from the initial recognition of an asset or liability in a transaction that:

- ▶ is not a business combination; and
- ▶ at the time of the transaction, affects neither accounting profit nor taxable profit (tax loss).

A deferred tax asset is recognised for all deductible temporary differences arising from investments in



subsidiaries, branches and associates, and interests in joint ventures, to the extent that it is probable that:

- ▶ the temporary difference will reverse in the foreseeable future; and
- ▶ taxable profit will be available against which the temporary difference can be utilised.

A deferred tax asset is recognised for the carry forward of unused tax losses and unused Dividends Withholding Tax credits to the extent that it is probable that future taxable profit will be available against which the unused tax losses and unused Dividends Withholding Tax credits can be utilised.

The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realised or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

### 1.10 Leases

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

#### Finance leases - lessor

The Group recognises finance lease receivables in the statement of financial position.

Finance income is recognised based on a pattern reflecting a constant periodic rate of return on the Group's net investment in the finance lease.

#### Finance leases – lessee

Finance leases are recognised as assets and liabilities in the statement of financial position at amounts equal to the fair value of the leased property or, if lower, the present value of the minimum lease payments. The corresponding liability to the lessor is included in the statement of financial position as a finance lease obligation.

The assets are depreciated over the useful life on a straight line basis consistent with the property, plant and equipment within the group.

The discount rate used in calculating the present value of the minimum lease payments is the interest rate implicit in the lease.

The lease payments are apportioned between the finance charge and reduction of the outstanding liability. The finance charge is allocated to each period during the lease term so as to produce a constant periodic rate on the remaining balance of the liability.

#### Operating leases - lessor

Operating lease income is recognised as an income on a straight-line basis over the lease term.

Initial direct costs incurred in negotiating and arranging operating leases are added to the carrying amount of the leased asset and recognised as an expense over the lease term on the same basis as the lease income.

Income for leases is disclosed under revenue in profit or loss.

#### Operating leases – lessee

Operating lease payments are recognised as an expense on a straight-line basis over the lease term except when another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. The difference between the amounts recognised as an expense and the contractual payments is recognised as an operating lease asset. This liability is not discounted.

In the event that lease incentives are received to enter into operating leases, such incentives are recognised as a liability. The aggregate benefit of incentives is recognised as a reduction of rental expense on a

## Accounting Policies (continued)

straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

Any contingent rents are expensed in the period they are incurred.

### 1.11 Inventories

Inventories are measured at the lower of cost and net realisable value.

Net realisable value represents the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

The cost of inventories comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.

The cost of inventories of items that are not ordinarily interchangeable and goods or services produced and segregated for specific projects is assigned using specific identification of the individual costs.

The cost of inventories is assigned using the weighted average cost formula. The same cost formula is used for all inventories having a similar nature and use to the entity.

When inventories are sold, the carrying amount of those inventories are recognised as an expense in the period in which the related revenue is recognised. The amount of any write-down of inventories to net realisable value and all losses of inventories are recognised as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realisable value, are recognised as a reduction in the amount of inventories recognised as an expense in the period in which the reversal occurs.

### 1.12 Non-current assets held for sale

Non-current assets and disposal groups are classified as held for sale if their carrying amount will be recovered through a sale transaction rather than through continuing use. This condition is regarded as

met only when the sale is highly probable and the asset (or disposal group) is available for immediate sale in its present condition. Management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification.

In the statement of comprehensive income, income and expenses from discontinued operations are reported separately from income and expenses from continuing operations, down to the level of profit after taxes, even when the Group retains a non-controlling interest in the subsidiary after the sale. The resulting profit or loss (after taxes) is reported separately in the statement of comprehensive income as part of comprehensive income.

Non-current assets held for sale (or disposal group) are measured at the lower of its previous carrying amount and fair value less costs to sell.

A non-current asset is not depreciated (or amortised) while it is classified as held for sale, or while it is part of a disposal group classified as held for sale.

Interest and other expenses attributable to the liabilities of a disposal group classified as held for sale are recognised in profit or loss.

Any gain or loss on the remeasurement on a non-current asset classified as held for sale that does not meet the definition of a discontinued operation is included in profit or loss from continuing operations.

Any impairment loss is recognised for any initial or subsequent write-down of the asset to fair value less cost to sell.

A gain shall be recognised for any subsequent increase in fair value less costs to sell of the asset, but not in excess of the cumulative impairment loss that has been recognised previously.

### 1.13 Impairment of tangible and intangible assets other than goodwill

The Group assesses at each end of the reporting period whether there is any indication that an asset 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).

Irrespective of whether there is any indication of impairment, the Group also:

- ▶ tests intangible assets with an indefinite useful life or intangible assets not yet available for use annually for impairment by comparing its carrying amount with its recoverable amount. This impairment test is performed during the annual period and at the same time every period; and
- ▶ tests goodwill acquired in a business combination annually for impairment.

If it is not possible to estimate the recoverable amount of the individual asset, the recoverable amount of the cash-generating unit to which the asset belongs is determined.

The recoverable amount of an asset or a cash-generating unit is the higher of its fair value less costs to sell and its value in use.

In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount.

An impairment loss of assets carried at cost less any accumulated depreciation or amortisation is recognised immediately in profit or loss. Any impairment loss of a revalued asset is treated as a revaluation decrease. Goodwill acquired in a business combination is, from the acquisition date, allocated to each of the cash-generating units, or groups of cash-generating units, that are expected to benefit from the synergies of the combination.

An impairment loss is recognised for cash-generating units if the recoverable amount of the unit is less than the carrying amount of the units. The impairment loss is allocated to reduce the carrying amount of the assets of the unit in the following order:

- ▶ first, to reduce the carrying amount of any goodwill allocated to the cash-generating unit; and
- ▶ then, to the other assets of the unit, pro rata on the basis of the carrying amount of each asset in the unit.

The carrying amount of an asset included in a cash generating unit may not be reduced below the highest of (1) Its fair value less cost to sell; (2) Its value in use or (3) zero.

An entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for assets other than goodwill may no longer exist or may have decreased. If any such indication exists, the recoverable amounts of those assets are estimated.

The increased carrying amount of an asset other than goodwill attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation other than goodwill is recognised immediately in profit or loss. Any reversal of an impairment loss of a revalued asset is treated as a revaluation increase.

#### 1.14 Share capital and equity

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities.

Ordinary shares are classified as equity and measured at cost.

#### 1.15 Employee benefits

##### Short-term employee benefits

The cost of short-term employee benefits, those payable within 12 months after the service is rendered, such as paid vacation leave and sick leave, bonuses, and non-monetary benefits such as medical care, are recognised in the period in which the service is rendered and are not discounted.

## Accounting Policies (continued)

The expected cost of compensated absences is recognised as an expense as the employees render services that increase their entitlement or, in the case of non-accumulating absences, when the absence occurs. The expected cost of profit sharing and bonus payments is recognised as an expense when there is a legal or constructive obligation to make such payments as a result of past performance.

### Defined contribution plans

The companies operate a provident fund on behalf of its employees. The schemes are generally funded through payments to insurance companies or trustee-administered funds, determined by periodic actuarial calculations. A defined contribution plan is a plan under which the company pays fixed contributions into a separate entity. The company has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefit relating to employee service in the current and prior periods.

Payments to defined contribution retirement benefit plans are charged as an expense as they fall due. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in the future payments is available.

### Defined benefit plans

Some Group companies provide post-retirement healthcare benefits to their retirees. The entitlement to these benefits is usually conditional on the employee remaining in service up to retirement age and the completion of a minimum service period. For defined benefit plans the cost of providing the benefits is determined using the projected unit credit method.

Actuarial valuations are conducted on an annual basis by independent actuaries.

Consideration is given to any event that could impact the funds up to the end of the reporting period where the interim valuation is performed at an earlier date.

Past service costs are recognised immediately to the extent that the benefits are already vested, and are otherwise amortised on a straight line basis over the average period until the amended benefits become vested.

Actuarial gains and losses are recognised in the year in which they arise, in other comprehensive income.

Gains or losses on the curtailment or settlement of a defined benefit plan are recognised when the Group is demonstrably committed to curtailment or settlement.

When it is virtually certain that another party will reimburse some or all of the expenditure required to settle a defined benefit obligation, the right to reimbursement is recognised as a separate asset. The asset is measured at fair value. In all other respects, the asset is treated in the same way as plan assets. In profit or loss, the expense relating to a defined benefit plan is presented as the net of the amount recognised for a reimbursement.

The amount recognised in the statement of financial position represents the present value of the defined benefit obligation as adjusted for unrecognised actuarial gains and losses and unrecognised past service costs, and reduces by the fair value of plan assets.

Any asset is limited to unrecognised actuarial losses and past service costs, plus the present value of available refunds and reduction in future contributions to the plan.

## 1.16 Provisions and contingencies

Provisions are recognised when:

- ▶ the Group has a present obligation as a result of a past event;
- ▶ it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation; and
- ▶ a reliable estimate can be made of the obligation.

The amount recognised as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material).

Where some or all of the expenditure required to settle a provision is expected to be reimbursed by another party, the reimbursement shall be recognised when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement shall be treated as a separate asset. The amount recognised for the reimbursement shall not exceed the amount of the provision.

Provisions are not recognised for future operating losses.

### **Onerous contracts**

If an entity has a contract that is onerous, the present obligation under the contract shall be recognised and measured as a provision.

An onerous contract is considered to exist where the Group has a contract under which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received from the contract.

### **Restructurings**

A constructive obligation to restructure arises only when an entity:

- ▶ has a detailed formal plan for the restructuring, identifying at least:
  - the business or part of a business concerned;
  - the principal locations affected;
  - the location, function, and approximate number of employees who will be compensated for terminating their services;
  - the expenditures that will be undertaken; and
  - when the plan will be implemented; and
- ▶ has raised a valid expectation in those affected that it will carry out the restructuring by starting to implement that plan or announcing its main features to those affected by it.

The measurement of a restructuring provision includes only the direct expenditures arising from the restructuring, which are those amounts that are both necessarily entailed by the restructuring and not associated with the ongoing activities of the entity. The effect of the time value of money is only considered if material.

### **Contingent assets and liabilities**

After their initial recognition contingent liabilities recognised in business combinations that are recognised separately are subsequently measured at the higher of:

- ▶ the amount that would be recognised as a provision; and
- ▶ the amount initially recognised less cumulative amortisation.

Contingent assets and contingent liabilities are not recognised. Contingencies are disclosed in Note 37.

### **1.17 Government grants and deferred grant income**

Government grants are recognised when there is reasonable assurance that:

- ▶ the Group will comply with the conditions attaching to them; and
- ▶ the grants will be received.

Government grants are recognised as income over the periods necessary to match them with the related costs that they are intended to compensate.

Specifically, government grants whose primary condition is that the Group should purchase, construct or otherwise acquire non-current assets are recognised as deferred revenue in the consolidated statement of financial position and transferred to profit or loss on a systematic and rational basis over the useful lives of the related assets.

A government grant that becomes receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the entity with no future related costs is recognised as income of the period in which it becomes receivable.

Government grants related to assets, including non-monetary grants at fair value, are presented in the statement of financial position by setting up the grant as deferred income.

Grants related to income are presented as a credit in the profit or loss (separately).



## Accounting Policies (continued)

Repayment of a grant related to income is applied first against any unamortised deferred credit set up in respect of the grant. To the extent that the repayment exceeds any such deferred credit, or where no deferred credit exists, the repayment is recognised immediately as an expense.

Repayment of a grant related to an asset is recorded by reducing the deferred income balance by the amount repayable. The cumulative additional depreciation that would have been recognised to date as an expense in the absence of the grant is recognised immediately as an expense.

### 1.18 Revenue

Revenue is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and other similar allowances.

Revenue from the sale of goods is recognised when all the following conditions have been satisfied:

- ▶ the Group has transferred to the buyer the significant risks and rewards of ownership of the goods;
- ▶ the Group retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- ▶ the amount of revenue can be measured reliably;
- ▶ it is probable that the economic benefits associated with the transaction will flow to the Group; and
- ▶ the costs incurred or to be incurred in respect of the transaction can be measured reliably.

When the outcome of a transaction involving the rendering of services can be estimated reliably, revenue associated with the transaction is recognised by reference to the stage of completion of the transaction at the end of the reporting period. The outcome of a transaction can be estimated reliably when all the following conditions are satisfied:

- ▶ the amount of revenue can be measured reliably;
- ▶ it is probable that the economic benefits associated with the transaction will flow to the Group;
- ▶ the stage of completion of the transaction at the end of the reporting period can be measured reliably; and

- ▶ the costs incurred for the transaction and the costs to complete the transaction can be measured reliably.

When the outcome of the transaction involving the rendering of services cannot be estimated reliably, revenue is recognised only to the extent of the expenses recognised that are recoverable.

Service revenue is recognised by reference to the stage of completion of the transaction at the end of the reporting period. Stage of completion is determined by services performed to date as a percentage of total services to be performed.

Contract revenue comprises:

- ▶ the initial amount of revenue agreed in the contract; and
- ▶ variations in contract work, claims and incentive payments:
  - to the extent that it is probable that they will result in revenue; and
  - they are capable of being reliably measured.

Interest income from a financial asset is recognised when it is probable that the economic benefits will flow to the Group and the amount of income can be measured reliably. Interest income is accrued on a time basis, by reference to the principal outstanding and at the effective interest rate applicable, which is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount on initial recognition.

Royalties are recognised on the accrual basis in accordance with the substance of the relevant agreements.

Dividends are recognised, in profit or loss, when the company's right to receive payment has been established.

Service fees included in the price of a product are recognised as revenue over the period during which the service is performed.

The company has applied the principles stipulated in Circular 09/2006. The application of this circular

is to consider the impact in accounting for extended payment terms to trade debtors and creditors. Where extended payment terms are granted, whether explicitly or implicitly, the effect of the time value of money should be taken into account wherever this is material, irrespective of other factors such as the cash selling prices of the goods.

### 1.19 Turnover

Turnover comprises of sales to customers and service rendered to customers. Turnover is stated at the invoice amount and is exclusive of value added taxation.

### 1.20 Cost of sales

When inventories are sold, the carrying amount of those inventories is recognised as an expense in the period in which the related revenue is recognised. The amount of any write-down of inventories to net realisable value and all losses of inventories are recognised as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realisable value, is recognised as a reduction in the amount of inventories recognised as an expense in the period in which the reversal occurs.

The related cost of providing services recognised as revenue in the current period is included in cost of sales.

Contract costs comprise:

- ▶ costs that relate directly to the specific contract;
- ▶ costs that are attributable to contract activity in general and can be allocated to the contract; and
- ▶ such other costs as are specifically chargeable to the customer under the terms of the contract.

### 1.21 Translation of foreign currencies

#### Functional and presentation currency

Items included in the Annual Financial Statements of each of the Group entities are measured using the currency of the primary economic environment in which the entity operates (functional currency).

The consolidated Annual Financial Statements are presented in Rand which is the Group functional and presentation currency.

#### Foreign currency transactions

In preparing the financial statements of each individual Group entity, transactions in currencies other than the entity's functional currency (foreign currencies) are recognised at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Non-monetary items carried at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Non-monetary items that are measured in terms of historical cost in a foreign currency are not retranslated.

Exchange differences on monetary items are recognised in profit or loss in the period in which they arise except for:

- ▶ exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings;
- ▶ exchange differences on transactions entered into in order to hedge certain foreign currency risks; and
- ▶ exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur (therefore forming part of the net investment in the foreign operation), which are recognised initially in other comprehensive income and reclassified from equity to profit or loss on repayment of the monetary items.

Exchange differences arising on the settlement of monetary items or on translating monetary items at rates different from those at which they were translated on initial recognition during the period or in previous Annual Financial Statements are recognised in profit or loss in the period in which they arise.

When a gain or loss on a non-monetary item is recognised to other comprehensive income and accumulated in equity, any exchange component of that gain or loss is recognised to other comprehensive income and accumulated in equity. When a gain or loss on a non-monetary item is recognised in profit or loss, any exchange component of that gain or loss is recognised in profit or loss.

## Accounting Policies (continued)

### Investments in subsidiaries, joint ventures and associates

For the purposes of presenting consolidated financial statements, the assets and liabilities of the Group's foreign operations are translated into currency units using exchange rates prevailing at the end of each reporting period. Income and expense items are translated at the average exchange rates for the period, unless exchange rates fluctuate significantly during that period, in which case the exchange rates at the dates of the transactions are used. Exchange differences arising, if any, are recognised in other comprehensive income and accumulated in equity (attributed to non-controlling interests as appropriate).

On the disposal of a foreign operation (i.e. a disposal of the Group's entire interest in a foreign operation, or a disposal involving loss of control over a subsidiary that includes a foreign operation, a disposal involving loss of joint control over a jointly controlled entity that includes a foreign operation, or a disposal involving loss of significant influence over an associate that includes a foreign operation), all of the exchange differences accumulated in equity in respect of that operation attributable to the owners of the Company are reclassified to profit or loss.

In the case of a partial disposal that does not result in the Group losing control over a subsidiary that includes a foreign operation, the proportionate share of accumulated exchange differences are re-attributed to non-controlling interests and are not recognised in profit or loss. For all other partial disposals (i.e. reductions in the Group's ownership interest in associates or jointly controlled entities that do not result in the Group losing significant influence or joint control), the proportionate share of the accumulated exchange differences is reclassified to profit or loss.

Goodwill and fair value adjustments on identifiable assets and liabilities acquired arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the rate of exchange prevailing at the end of each reporting period. Exchange differences arising are recognised in equity.

### 1.22 Related Parties

The Group operates in an economic environment currently dominated by entities directly or indirectly owned by the South African Government. As a result of the constitutional independence of all three spheres of government in South Africa, only parties within the national sphere of government are considered to be related parties.

Key management is defined as being individuals with the authority and responsibility for planning, directing and controlling the activities of the entity. All individuals from the level of Chief Executive Officer up to the Board of Directors are regarded as key management.

Close family members of key management personnel are considered to be those family members who may be expected to influence or be influenced by key management individuals or other parties related to the entity.

### 1.23 Fruitless and wasteful, irregular and unauthorised expenditure

Fruitless and wasteful expenditure in terms of the Public Finance Management Act means expenditure which was made in vain and would have been avoided had reasonable care been exercised are recorded in the notes to the financial statements.

Irregular expenditure is recorded in the notes to the financial statements. The amount recorded in the notes are equal to the value of the irregular expenditure incurred unless it is impracticable to determine the value thereof.

Unauthorised expenditure, when confirmed, must be recorded in the Statement of Financial Position. The amount recorded must be equal to the overspending within the division or the expenditure incurred that was not in accordance with the purpose of the division.

### 1.24 Investment Contribution for future liability

Where some or all of the expenditure required to settle a future liability is expected to be reimbursed by another party or ring fenced by the company itself, the amount shall be recognised when it will be received or

ring-fenced. The reimbursement shall be treated as a separate asset and liability.

### 1.25 Rounding

Unless otherwise stated all financial figures have been rounded off to the nearest one thousand rands (R'000).

## 2. New Standards and Interpretations

Since the withdrawal of Statements of GAAP in 2012, the Accounting Standards Board (ASB) has been deliberating on what the most appropriate reporting framework should be for entities that applied Statements of GAAP. During this time, the Board agreed as an interim measure, after consultation with its constituents, that Government Business Enterprises (GBEs) should retain the status quo regarding the reporting frameworks applied in preparing their financial statements. This meant that those GBEs that applied Statements of GAAP in previous reporting periods would continue to do so, while those that applied IFRSs in previous reporting periods, would continue to apply IFRSs.

The Board approved Exposure Draft (ED) 130 as a final Directive at its meeting in July 2015. This Directive on The Selection of an Appropriate Reporting Framework by Public Entities (Directive 12) outlines a set of criteria that entities are required to consider in determining what reporting framework they should apply.

The directive provides that entities are only allowed to apply IFRSs if they meet one of the following criteria:

- (a) The entity is a financial institution, as defined in the Financial Services Board Act, Act No. 97 of 1990, or undertakes activities similar to a financial institution, including the provision of loans and credit in accordance with the National Credit Act, Act No. 34 of 2005;
- (b) The entity has ordinary shares or potential ordinary shares that are publicly traded on capital markets;
- (c) Its operations are such that they are:
  - (i) commercial in nature; and

- (ii) only an insignificant portion of the entity's funding is acquired through government grants or other forms of financial assistance from government. Entities assess, holistically, the nature of the funding received, how it is used, and its level of dependency on that funding.

If entities do not meet any of these criteria, then they should apply Standards of GRAP.

The directive is effective for financial years commencing on or after 01 April 2018 so as to provide entities sufficient time to prepare for any change in reporting framework, with earlier application permitted.

Necsa and its subsidiaries have obtained approval to use IFRS from Board of Directors. The project on the adoption of IFRS is underway and below are all new standards and interpretation notes identified, for compliance with IFRS with effect from 01 April 2018:

### Section 1 - New and revised IFRSs for 2016 annual financial statements and beyond

This section provides a high level summary of the new and revised IFRSs that are effective for 2016 and beyond. Specifically, this section covers the following:

#### Section 1A: Amendments to IFRSs that are mandatorily effective for annual periods beginning on or after 01 January 2016

The following amendments to IFRSs became mandatorily effective in the current year. All these amendments to IFRSs generally require full retrospective application (i.e. comparative amounts have to be restated), with some amendments requiring prospective application.

Below is a list of the amendments to IFRSs that are mandatorily effective for their 2016/17 financial year\*:

- ▶ Amendments to IFRS 10, IFRS 12 and IAS 28 Investment Entities: Applying the Consolidation Exception;
- ▶ Amendments to IFRS 11 Accounting for Acquisitions of Interests in Joint Operations;
- ▶ Amendments to IAS 1 Disclosure Initiative;

\*IFRS 14 Regulatory Deferral Accounts is also effective for an entity's first IFRS financial statements for annual periods beginning on or after 01 January 2016, however, it is not applicable to International GAAP Holdings Limited as the Group is not a first-time adopter of IFRSs.

## Accounting Policies (continued)

- ▶ Amendments to IAS 16 and IAS 38 Clarification of Acceptable Methods of Depreciation and Amortisation;
- ▶ Amendments to IAS 16 and IAS 41 Agriculture: Bearer Plants;
- ▶ Amendments to IAS 27 Equity Method in Separate Financial Statements; and
- ▶ Amendments to IFRSs Annual Improvements to IFRSs 2012-2014 Cycle:
  - IFRS 5 - Non-current Assets Held for Sale and Discontinued Operations;
  - IFRS 7 - Financial Instruments: Disclosures (with consequential amendments to IFRS 1);
  - IAS 19 - Employee Benefits; and
  - IAS 34 - Interim Financial Reporting.
- ▶ IFRS 14 Regulatory Deferral Accounts (Effective for first annual IFRS financial statements with annual periods beginning on or after 01 January 2016).
- IAS 18 Revenue;
- IAS 11 Construction Contracts;
- IFRIC 13 Customer Loyalty Programmes;
- IFRIC 15 Agreements for the Construction of Real Estate;
- IFRIC 18 Transfers of Assets from Customers; and
- SIC 31 Revenue-Barter Transactions Involving Advertising Services.
- ▶ IFRS 16 Leases (Effective for annual periods beginning on or after 01 January 2019) IFRS 16 provides a comprehensive model for the identification of lease arrangements and their treatment in the financial statements of both lessees and lessors. It will supersede the following lease Standard and Interpretations upon its effective date:
  - IAS 17 Leases;
  - IFRIC 4 Determining whether an Arrangement contains a Lease;
  - SIC-15 Operating Leases - Incentives; and
  - SIC-27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease.
- ▶ Amendments to IFRS 2 Classification and Measurement of Share-based Payment Transactions;
- ▶ Amendments to IFRS 10 and IAS 28 Sale or Contribution of Assets between an Investor and its Associate or Joint Venture;
- ▶ Amendments to IAS 7 Disclosure Initiative; and
- ▶ Amendments to IAS 12 Recognition of Deferred Tax Assets for Unrealised Losses.

### Section 1B: New and revised IFRSs that are not mandatorily effective (but allow early application) for the year ending 31 December 2016

A list of new and revised IFRSs that are not yet mandatorily effective (but allow early application) for the year ending 31 December 2016 follows:

- ▶ IFRS 9 Financial Instruments;
- ▶ IFRS 15 Revenue from Contracts with Customers and the related Clarifications; (Effective for annual periods beginning on or after 01 January 2018). IFRS 15 establishes a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers. It will supersede the following revenue standards and interpretations upon its effective date:



## Notes to the Annual Financial Statements

### for the Year Ended 31 March 2017

### 3. Investment property

	2017			2016		
	Valuation R '000	Accumulated depreciation R '000	Carrying value R '000	Valuation R '000	Accumulated depreciation R '000	Carrying value R '000
<b>Group</b>						
Investment property	18 027	-	18 027	17 190	-	17 190

	2017			2016		
	Valuation R '000	Accumulated depreciation R '000	Carrying value R '000	Valuation R '000	Accumulated depreciation R '000	Carrying value R '000
<b>Company</b>						
Investment property	63 212	-	63 212	61 377	-	61 377

#### Reconciliation of investment property - Group - 2017

	Opening balance R '000	Transfers to Property, plant and equipment R '000	Other changes, movements R '000	Fair value adjustments R '000	Total R '000
Investment property	17 190	(1 297)	(784)	2 918	18 027

#### Reconciliation of investment property - Group - 2016

	Opening balance R '000	Transfers to Property, plant and equipment R '000	Other changes, movements R '000	Fair value adjustments R '000	Total R '000
Investment property	15 467	1 801	(1 265)	1 187	17 190

#### Reconciliation of investment property - Company - 2017

	Opening balance R '000	Transfers to Property, plant and equipment R '000	Other changes, movements R '000	Fair value adjustments R '000	Total R '000
Investment property	61 377	(1 297)	(2 751)	5 883	63 212

#### Reconciliation of investment property - Company - 2016

	Opening balance R '000	Transfers to Property, plant and equipment R '000	Other changes, movements R '000	Fair value adjustments R '000	Total R '000
Investment property	64 313	1 801	(3 157)	(1 580)	61 377

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

### 3. Investment property (continued)

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Fair value of investment properties	18 027	17 190	63 212	61 377

A register containing the information required by Regulation 25(3) of the Companies Regulations, 2011 is available for inspection at the registered office of the company.

#### Details of valuation

The effective date of the revaluations was 31 March 2017. Revaluations were performed by an independent valuer, Mr M Fitchet from Knight Frank. Mr M Fitchet is a registered professional valuer in terms of section 19 of the Property Valuers Act, 2000.

Knight Frank is not a related party to the Group and is independent.

The Investment (or Income) Approach to Valuation has been applied in terms of IFRS13. The valuation is made on the basis that the property's Highest and Best Use would be for a mixed use industrial park providing facilities management for security, fire & safety as well as existing steam and compressed air services to tenants, including Necsa.

Gross rentals range from R12/m<sup>2</sup> for yard area to between R25-R32/m<sup>2</sup> for workshop/warehouse and R38-R40/m<sup>2</sup> for offices.

Special assumptions used are that the property is not a National Key Point and is therefore capable of occupation and lease to third parties.

#### Amounts recognised in profit and loss for the year

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Rental income from investment property	2 022	8 215	16 766	17 385
Direct operating expenses from rental generating property	(3 309)	(4 091)	(10 913)	(10 174)
	<b>(1 287)</b>	<b>4 124</b>	<b>5 853</b>	<b>7 211</b>

#### 4. Property, plant and equipment

	2017			2016		
	Cost / Valuation R '000	Accumulated depreciation R '000	Carrying value R '000	Cost / Valuation R '000	Accumulated depreciation R '000	Carrying value R '000
<b>Group</b>						
Component spares	24 286	(18 480)	5 806	25 489	(17 710)	7 779
Finance lease assets	29 751	(23 444)	6 307	27 348	(21 404)	5 944
Furniture and fixtures	19 151	(13 120)	6 031	19 362	(11 206)	8 156
IT equipment	88 534	(66 740)	21 794	80 731	(61 672)	19 059
Land and buildings	840 874	(87 130)	753 744	768 459	(34 803)	733 656
Leasehold improvements	195	(93)	102	195	(78)	117
Machinery and equipment	399 059	(244 177)	154 882	379 636	(219 408)	160 228
Motor vehicles and transport containers	59 036	(34 987)	24 049	57 607	(32 073)	25 534
Office equipment	17 214	(14 272)	2 942	17 323	(14 106)	3 217
Plant	546 108	(199 662)	346 446	497 053	(181 984)	315 069
Research facilities	32 714	(6 529)	26 185	25 781	(5 789)	19 992
<b>Total</b>	<b>2 056 922</b>	<b>(708 634)</b>	<b>1 348 288</b>	<b>1 898 984</b>	<b>(600 233)</b>	<b>1 298 751</b>

	2017			2016		
	Cost / Valuation R '000	Accumulated depreciation R '000	Carrying value R '000	Cost / Valuation R '000	Accumulated depreciation R '000	Carrying value R '000
<b>Company</b>						
Finance lease assets	29 751	(23 420)	6 331	27 348	(21 380)	5 968
Furniture and fixtures	14 066	(9 704)	4 362	14 006	(7 846)	6 160
IT equipment	65 180	(52 760)	12 420	63 393	(48 763)	14 630
Land and buildings	760 789	(81 619)	679 170	689 630	(28 625)	661 005
Machinery and equipment	312 933	(191 627)	121 306	295 612	(172 937)	122 675
Motor vehicles and transport containers	24 147	(17 244)	6 903	24 076	(15 462)	8 614
Office equipment	10 590	(8 076)	2 514	10 116	(7 202)	2 914
Plant	201 176	(33 307)	167 869	193 060	(31 017)	162 043
Research facilities	32 714	(6 529)	26 185	25 781	(5 789)	19 992
<b>Total</b>	<b>1 451 346</b>	<b>(424 286)</b>	<b>1 027 060</b>	<b>1 343 022</b>	<b>(339 021)</b>	<b>1 004 001</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 4. Property, plant and equipment (continued)

##### Reconciliation of property, plant and equipment - Group - 2017

	Opening balance R '000	Additions R '000	Disposals R '000	Transfers from Investment Property R '000	Revalua- tions R '000	Foreign exchange movements R '000	Other changes, movements R '000	Depreciation R '000	Impair- ment reversals/ (loss) R '000	Total R '000
Component spares	7 779	1 979	-	-	-	-	(3 263)	(689)	-	5 806
Finance lease assets	5 944	2 733	-	-	-	-	(330)	(2 040)	-	6 307
Furniture and fixtures	8 156	7 182	(53)	-	-	(25)	(4 869)	(4 343)	(17)	6 031
IT equipment	19 059	3 481	(96)	-	-	(6)	4 727	(5 371)	-	21 794
Land and buildings	733 656	15 976	-	1 297	31 098	-	714	(28 997)	-	753 744
Leasehold improvements	117	-	-	-	-	-	(15)	-	-	102
Machinery and equipment	160 228	19 303	(11)	-	-	-	(3 848)	(20 790)	-	154 882
Motor vehicles and transport containers	25 534	2 838	(523)	-	-	(15)	(26)	(3 782)	23	24 049
Office equipment	3 217	283	(1)	-	-	-	473	(1 030)	-	2 942
Plant	315 069	44 023	(357)	-	-	(35)	2 860	(13 778)	(1 338)	346 446
Research facilities	19 992	6 932	-	-	-	-	1	(740)	-	26 185
	<b>1 298 751</b>	<b>104 730</b>	<b>(1 041)</b>	<b>1 297</b>	<b>31 098</b>	<b>(81)</b>	<b>(3 576)</b>	<b>(81 560)</b>	<b>(1 330)</b>	<b>1 348 288</b>

## Reconciliation of property, plant and equipment - Group - 2016

	Opening balance R '000	Additions R '000	Disposals R '000	Transfers from Investment Property R '000	Revalua- tions R '000	Foreign exchange movements R '000	Other changes, movements R '000	Depreciation R '000	Impair- ment reversals/ (loss) R '000	Total R '000
Component spares	-	-	-	-	-	-	-	-	7 779	7 779
Finance lease assets	7 335	1 495	-	-	-	-	-	(2 862)	-	5 944
Furniture and fixtures	9 259	2 935	(1 368)	-	-	6	-	(2 700)	24	8 156
IT equipment	21 132	3 625	(12)	-	-	8	-	(6 098)	404	19 059
Land and buildings	575 133	23 630	(4 762)	(1 801)	167 086	-	3 156	(28 844)	58	733 656
Leasehold improvements	59	58	-	-	-	-	-	-	-	117
Machinery and equipment	148 496	33 263	(3 337)	-	-	-	-	(18 754)	560	160 228
Motor vehicles and transport containers	22 352	5 016	(152)	-	-	18	-	(5 179)	3 479	25 534
Office equipment	4 751	347	(905)	-	-	-	-	(1 010)	34	3 217
Plant	238 322	68 822	(154)	-	-	52	(2 044)	(19 331)	29 378	315 069
Research facilities	15 304	5 399	-	-	-	-	-	(711)	-	19 992
	<b>1 042 143</b>	<b>144 590</b>	<b>(10 690)</b>	<b>(1 801)</b>	<b>167 086</b>	<b>84</b>	<b>1 112</b>	<b>(85 489)</b>	<b>41 716</b>	<b>1 298 751</b>



## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 4. Property, plant and equipment (continued)

##### Reconciliation of property, plant and equipment - Company - 2017

	Opening balance R '000	Additions R '000	Disposals R '000	Transfers from Investment Property R '000	Revaluations R '000	Other changes, movements R '000	Depreciation R '000	Total R '000
Finance lease assets	5 968	2 733	-	-	-	(330)	(2 040)	6 331
Furniture and fixtures	6 160	70	(1)	-	-	(1)	(1 866)	4 362
IT equipment	14 630	2 802	(71)	-	-	-	(4 941)	12 420
Land and buildings	661 005	15 976	-	1 297	27 020	2 749	(28 877)	679 170
Machinery and equipment	122 675	19 293	(11)	-	-	(1)	(20 650)	121 306
Motor vehicles and transport containers	8 614	72	-	-	-	-	(1 783)	6 903
Office equipment	2 914	181	(1)	-	-	330	(910)	2 514
Plant	162 043	8 116	-	-	-	-	(2 290)	167 869
Research facilities	19 992	6 932	-	-	-	1	(740)	26 185
	<b>1 004 001</b>	<b>56 175</b>	<b>(84)</b>	<b>1 297</b>	<b>27 020</b>	<b>2 748</b>	<b>(64 097)</b>	<b>1 027 060</b>

##### Reconciliation of property, plant and equipment - Company - 2016

	Opening balance R '000	Additions R '000	Disposals R '000	Transfers from Investment Property R '000	Revaluations R '000	Other changes, movements R '000	Depreciation R '000	Total R '000
Finance lease assets	7 335	1 495	-	-	-	-	(2 862)	5 968
Furniture and fixtures	7 116	212	-	-	-	-	(1 168)	6 160
IT equipment	18 511	1 833	(12)	-	-	-	(5 702)	14 630
Land and buildings	500 884	20 805	-	(1 801)	166 586	3 156	(28 625)	661 005
Machinery and equipment	107 886	33 263	-	-	-	-	(18 474)	122 675
Motor vehicles and transport containers	8 841	1 726	-	-	-	-	(1 953)	8 614
Office equipment	3 665	133	(5)	-	-	-	(879)	2 914
Plant	151 226	13 109	-	-	-	-	(2 292)	162 043
Research facilities	15 304	5 399	-	-	-	-	(711)	19 992
	<b>820 768</b>	<b>77 975</b>	<b>(17)</b>	<b>(1 801)</b>	<b>166 586</b>	<b>3 156</b>	<b>(62 666)</b>	<b>1 004 001</b>

### Pledged as security

Vehicles and electronic office equipment held under finance leases have been pledged as security (refer to Note 18).

### Details of properties

Land and buildings consist of the following properties:

**Necsa:** Farm 567, Weldaba; Erf 1150, 1153, 1155 and 1156 Albertinia; Erf 4473 and 4474 Riverdale; Erf 1115, 1224, 1916, 1917, 1919, 1921, 1922, 1924, 1926, 1928 and 1929 Springbok; Farm 369 and 380 Vaalputs. The properties was revalued as at 31 March 2017 by an independent valuer.

**Gammatec NDT:** Portion 91 of Farm 601 Klipplaatdrif, Vereeniging. The property is encumbered as disclosed in note of Gammatec NDT AFS. The property was revalued as at 31 April 2017 by an independent valuer.

**AEC Amersham:** Erf 176, 100 Indianapolis Street, Kyalami. The property was revalued as at 31 March 2017 by an independent valuer.

The estimation of the useful lives of property, plant and equipment is based on historic performance as well as expectations about future use and therefore requires a significant degree of judgement to be applied by management. These depreciation rates represent management's current best estimate of the useful lives of the assets.

There are no idle assets held. There are assets fully depreciated but still in use to the value of R9 389 (2016: R9 377) on the Company's asset register.

Transfer of property, plant and equipment not only relates to investment property, but also include transfers to other asset classes.

The revaluation reserve may not be distributed to shareholders.

A register containing the information required by Regulation 25(3) of the Companies Regulations, 2011 is available for inspection at the registered office of the Company.

### Revaluations

The effective date of the revaluation on properties is 31 March 2017. Valuations were performed by an independent valuer, Mr M Fitchet from Knight Frank. Mr M Fitchet is a registered professional valuer in terms of section 19 of the Property Valuers Act, 2000. Knight Frank is not a related party to the Group and is independent.

The Investment (or Income) Approach to Valuation has been applied in terms of IFRS13. The valuation is made on the basis that the property's Highest and Best Use would be for a mixed use industrial park providing facilities management for security, fire & safety as well as existing steam and compressed air services to tenants, including Necsa.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 4. Property, plant and equipment (continued)

Gross rentals range from R12/m<sup>2</sup> for yard area to between R25-R32/m<sup>2</sup> for workshop/warehouse and R38-R40/m<sup>2</sup> for offices.

Special assumptions used are that the property is not a National Key Point and is therefore capable of occupation and lease to third parties.

#### 5. Goodwill

	2017			2016		
	Cost R '000	Accumulated impairment R '000	Carrying value R '000	Cost R '000	Accumulated impairment R '000	Carrying value R '000
<b>Group</b>						
Goodwill	14 587	(3 230)	11 357	14 587	(3 230)	11 357

Goodwill is initially measured at cost, which represents the excess of the purchase price over the net fair value of the identifiable assets, liabilities and contingent liabilities when the subsidiary was acquired.

Goodwill arose on the acquisition of the following subsidiaries:

A 55% shareholding in Gammatec NDT Supplies SOC Limited was acquired on 01 October 2009 by NTP Radioisotopes SOC Limited. The Gammatec Group of companies consists of six companies located in South Africa, Malaysia, the Middle East, Australia and New Zealand.

A 100% shareholding in Pharmatopes SOC Limited was acquired on 01 January 2009 by AEC Amersham SOC Limited.

## 6. Intangible assets

	2017			2016		
	Cost R '000	Accumulated impairment R '000	Carrying value R '000	Cost R '000	Accumulated impairment R '000	Carrying value R '000
<b>Group</b>						
Computer software	2 117	(1 154)	963	1 998	(990)	1 008
Intangible assets under development	8 847	-	8 847	8 847	-	8 847
Patents, trademarks and other rights	2 039	(1 565)	474	2 396	(1 391)	1 005
<b>Total</b>	<b>13 003</b>	<b>(2 719)</b>	<b>10 284</b>	<b>13 241</b>	<b>(2 381)</b>	<b>10 860</b>

### Reconciliation of intangible assets - Group - 2017

	Opening balance R '000	Additions R '000	Other changes, movements R '000	Amortisation R '000	Total R '000
Computer software	1 008	162	-	(207)	963
Intangible assets under development	8 847	-	-	-	8 847
Patents, trademarks and other rights	1 005	-	(531)	-	474
	<b>10 860</b>	<b>162</b>	<b>(531)</b>	<b>(207)</b>	<b>10 284</b>

### Reconciliation of intangible assets - Group - 2016

	Opening balance R '000	Additions R '000	Disposals R '000	Transfers R '000	Foreign exchange movements R '000	Amortisation R '000	Total R '000
Computer software	1 177	46	(16)	(2)	5	(202)	1 008
Intangible assets under development	8 847	-	-	-	-	-	8 847
Patents, trademarks and other rights	922	261	-	-	-	(178)	1 005
	<b>10 946</b>	<b>307</b>	<b>(16)</b>	<b>(2)</b>	<b>5</b>	<b>(380)</b>	<b>10 860</b>

### Other information

There are no significant intangible assets controlled by the entity but not recognised as assets because they did not meet the recognition criteria in this standard or because they were acquired or generated before the version of IAS 38 Intangible Assets issued in 1998 was effective.

Intangible assets comprise computer software and intellectual property generated internally by a subsidiary of the Company, which is used in the purification of Fluorine.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 7. Investments in subsidiaries

The carrying amounts of subsidiaries are shown net of impairment losses.

The directors' value of the investment in subsidiaries is equal to its carrying value.

Name of company	Held by	% holding 2017	% holding 2016	Carrying amount 2017 R'000	Carrying amount 2016 R'000
Pelchem SOC Limited	Necsa	100%	100%	42 001	42 001
NTP Radioisotopes SOC Limited	Necsa	100%	100%	220 700	220 700
Cyclofil SOC Limited	Necsa	100%	100%	-	-
Areca SOC Limited	Necsa	51%	51%	1	1
				<b>262 702</b>	<b>262 702</b>

#### 8. Investments in associates

The following table lists all of the associates in the Group:

Name of company	% holding 2017	% holding 2016	Carrying amount 2017 R '000	Carrying amount 2016 R '000	Fair value 2017 R '000	Fair value 2016 R '000
Business Venture International No.33 (Pty) Ltd	41.67%	41.67%	2	2	2	2
Gamwave (formerly Cyclotope, a subsidiary)	40.00%	40.00%	-	-	-	-
Oserix	13.75%	13.75%	2 403	2 403	2 403	2 403
Element 42	50.00%	50.00%	-	-	-	-
			<b>2 405</b>	<b>2 405</b>	<b>2 405</b>	<b>2 405</b>

The carrying amounts of Associates are shown net of impairment losses.

The directors' value of the investment in associates is equal to its carrying value.



## Summary of the group's interest in associates

	2017 R '000	2016 R '000
Total assets	67 872	46 986
Total liabilities	52 263	42 133
Revenue	95 284	57 595
Profit or loss	(3 709)	(1 621)

## 9. Loans to/(from) group companies

## Subsidiaries

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Pelchem SOC Limited</b>				
The loan is unsecured, bears no interest and has no fixed terms of repayment	-	-	350	-
<b>NTP Radioisotopes SOC Limited</b>				
The loan is unsecured, bears no interest and has no fixed terms of repayment	-	-	406	3 879
	-	-	<b>756</b>	<b>3 879</b>

## Associates

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Gamwave</b>				
The loan is unsecured, bears no interest and has no fixed terms of repayment	3 310	3 310	-	-

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 9. Loans to/(from) group companies (continued)

##### Credit quality of loans to group companies

The credit quality of loans to Group companies that are neither past due nor impaired, can be assessed by reference to historical information about counterparty default rates, as external credit ratings are not available. Loans to Associates are considered medium high quality as no defaults occurred in the past. The loan to NTP Radioisotopes SOC Limited is considered high quality as no defaults occurred in the past, and NTP Radioisotopes SOC Limited has a strong financial position. The credit quality of the loan to Pelchem SOC Limited is considered medium to low due to the fact that Pelchem SOC Limited has an accumulated loss at year end and predicts a loss for the ensuing financial year.

##### Fair value of loans to and from group companies

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Loans to group companies	3 310	3 310	756	3 879

The maximum exposure to credit risk at the reporting date is the fair value of each class of loan mentioned above. The Group does not hold any collateral as security.

#### 10. Other financial assets

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>At fair value through profit or loss - designated</b>				
Foreign-exchange contract asset	7	10 520	-	5 018
<b>Available-for-sale</b>				
Listed shares	1 303	1 568	1 270	1 535
Unit trusts	221 502	275 195	221 502	275 195
	<b>222 805</b>	<b>276 763</b>	<b>222 772</b>	<b>276 730</b>
<b>Loans and receivables</b>				
Retention fees receivable	17 560	16 660	17 560	16 660
Government Grant receivables Stage 2	30 452	28 567	30 452	28 567
	<b>48 012</b>	<b>45 227</b>	<b>48 012</b>	<b>45 227</b>
<b>Total other financial assets</b>	<b>270 824</b>	<b>332 510</b>	<b>270 784</b>	<b>326 975</b>

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Non-current assets</b>				
Designated as at FV through profit (loss) (FV through income)	7	10 520	-	5 018
Available-for-sale	222 805	276 763	222 772	276 730
Loans and receivables	32 125	30 240	32 125	30 240
	<b>254 937</b>	<b>317 523</b>	<b>254 897</b>	<b>311 988</b>
<b>Current assets</b>				
Loans and receivables	15 887	14 987	15 887	14 987
	<b>270 824</b>	<b>332 510</b>	<b>270 784</b>	<b>326 975</b>

#### Fair value information

Financial assets at fair value through profit or loss are recognised at fair value, which is therefore equal to their carrying amounts.

The following classes of financial assets at fair value through profit or loss are measured to fair value using quoted market prices:

- ▶ Listed shares
- ▶ Unit trusts

Fair values are determined annually as at the end of the reporting period.

#### Fair value hierarchy of financial assets at fair value through profit or loss

For financial assets recognised at fair value, disclosure is required of a fair value hierarchy which reflects the significance of the inputs used to make the measurements.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Level 1</b>				
Sanlam - Ordinary shares	86	88	53	54
Old Mutual - Ordinary shares	1 217	1 480	1 217	1 480
Unit Trusts - Collective Investment Schemes	221 502	275 195	221 502	275 195
	<b>222 805</b>	<b>276 763</b>	<b>222 772</b>	<b>276 729</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 11. Deferred tax

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Deferred tax asset</b>				
Property, plant and equipment	(17 901)	(18 075)	-	-
Provisions, allowances and PRMA liability	44 964	41 219	-	-
Fair value and IFRS adjustments	3 484	3 514	-	-
Prepayments	(264)	(93)	-	-
	<b>30 283</b>	<b>26 565</b>	-	-
<b>Reconciliation of deferred tax asset</b>				
At beginning of year	26 565	13 898	-	-
Charged to the income statement	4 741	12 667	-	-
Taxable / (deductible) temporary difference movement on tangible fixed assets	(1 023)	-	-	-
	<b>30 283</b>	<b>26 565</b>	-	-
<b>Deferred tax liability</b>				
<b>Reconciliation of deferred tax (liability)</b>				
At beginning of year	-	(15)	-	-
Charged to income statement	-	15	-	-
	-	-	-	-

The deferred tax assets and the deferred tax liability relate to income tax in the same jurisdiction, and the law allows net settlement. Therefore, they have been offset in the statement of financial position as follows:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Deferred tax asset	30 283	26 565	-	-

## 12. Inventories

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Raw materials	29 884	27 229	-	-
Work in progress	(3 342)	19 989	(8 808)	10 089
Finished goods	13 073	20 158	-	1 915
Life science products and equipment	5 965	7 339	-	-
Production supplies	20 623	21 203	-	-
Goods in transit	27 778	32 673	-	-
Consumables	165 325	124 098	33 267	28 918
	259 306	252 689	24 459	40 922
Inventories (write-downs)	(21 241)	(20 803)	(1 694)	(1 431)
	<b>238 065</b>	<b>231 886</b>	<b>22 765</b>	<b>39 491</b>
Carrying value of inventories carried at fair value less costs	238 065	231 886	22 765	39 491
<p>During the financial year end 31 March 2017 R962 783 (2016: R723 683) was recognised as an expense for the Company and R236 160 (2016: R146 739) for the Group.</p>				
<b>Impaired amount of categories of inventory</b>				
Raw materials	4 696	3 014	-	-
Finished goods	10 292	8 379	1 694	1 431
Production supplies	6 253	5 965	-	-
Consumables	-	3 445	-	-
	<b>21 241</b>	<b>20 803</b>	<b>1 694</b>	<b>1 431</b>

## 13. Trade and other receivables

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Financial Instruments</b>				
Trade receivables	77 032	240 176	83 461	65 576
Other receivables	75 259	46 284	64 059	120 665
<b>Non-financial instruments</b>				
VAT	44 918	22 631	-	-
	<b>197 209</b>	<b>309 091</b>	<b>147 700</b>	<b>186 241</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 13. Trade and other receivables (continued)

##### Trade and other receivables pledged as security

No trade and other receivables have been pledged as security.

##### Credit quality of trade and other receivables

Customer credit risk is managed by each business unit subject to the Group's established policy, procedures and control relating to customer credit risk management. Credit quality of a customer is assessed based on an extensive credit rating scorecard and individual credit limits are defined in accordance with this assessment. Outstanding customer receivables are regularly monitored and any shipments to major customers are generally covered by letters of credit or other forms of credit insurance.

At 31 March 2017, the Company had 259 customers (2016: 242 customers) that owed the Company R146 670 (2016: R112 957) and the Group had 546 customers (2016: 529 customers) that owed the Group R464 320 (2016: R212 853). There were 10 customers (2016: 7 customers) that owed the Company and 21 customers (2016: 24 customers) that owed the Group more than R1m each. These customers comprise 92% (2016: 87%) of total trade receivables for the Company and 69.7% (2016: 69.7%) for the Group.

##### Fair value of trade and other receivables

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Trade and other receivables	197 209	309 091	147 700	186 241

Fair value of trade and other receivables has been determined using unobservable inputs (level 3).

Debtors have been reviewed on an individual basis and where extended payment terms were granted the effect of the time value of money have been taken into account. This was done to determine the finance portion granted. The carrying value of trade and other receivables is reduced by an interest charge of R2 461 (2016: R1 445) to discount the carrying value to amortised cost for the Company and an interest charge of R5 570 (2016: R5 927) for the Group.

##### Trade and other receivables past due but not impaired

Trade and other receivables which are past due are assessed for impairment on an ongoing basis. At 31 March 2017, R83 306 (2016: R21 406) were past due but not impaired for the Company and R195 448 (2016: R147 689) were past due but not impaired for the Group. The ageing of these amounts are less than 1 year outstanding.

##### Trade and other receivables impaired

As of 31 March 2017, trade and other receivables of R60 858 (2016: R46 167) were past due and provided for possible impairment by the Company and R49 605 (2016: R21 297) were past due and provided for possible impairment by the Group. These amounts were fully provided for due to the uncertainty of its recoverability.



### Reconciliation of provision for impairment of trade and other receivables

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Opening balance	21 297	20 444	46 167	15 604
Provision for impairment	78 096	18 096	60 858	46 167
Amounts written off as uncollectible	(679)	(858)	(616)	-
Unused amounts reversed	(49 109)	(16 385)	(45 551)	(15 604)
	<b>49 605</b>	<b>21 297</b>	<b>60 858</b>	<b>46 167</b>

The creation and release of provision for impaired receivables have been included in operating expenses in profit or loss.

The maximum exposure to credit risk at the reporting date is the fair value of each class of loan mentioned above. The Group does not hold any collateral as security.

The credit period on sales of goods is 30 days from date of statement. Interest on overdue accounts is charged based on management discretion. It is the policy of the Group to provide fully for receivables that are identified on an individual basis as unrecoverable. The other classes within trade and other receivables do not contain impaired assets.

## 14. Cash and cash equivalents

Cash and cash equivalents consist of:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Cash on hand	68	106	53	62
Bank balances	450 633	213 558	389 347	130 783
Short-term deposits	614 582	566 604	77 385	130 978
Other cash and cash equivalents	-	1 243	-	1 243
Bank overdraft	(123 721)	(82 734)	(101 847)	(60 000)
	<b>941 562</b>	<b>698 777</b>	<b>364 938</b>	<b>203 066</b>
Current assets	1 065 283	781 511	466 785	263 066
Current liabilities	(123 721)	(82 734)	(101 847)	(60 000)
	<b>941 562</b>	<b>698 777</b>	<b>364 938</b>	<b>203 066</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 14. Cash and cash equivalents (continued)

Of the R364 938 cash in Necsa as per 2017, R(53 702) relates to general Necsa activities, while R374 812 relates to ring-fenced activities and R43 828 are cash held on behalf of third parties.

The Government of South Africa is irrevocably bound as surety and co-principal debtor to Absa Bank (2016: Absa) with regard to the repayment of capital and payment of interest and any other charges in terms of the general short-term banking facility of Necsa to the amount of R20m.

The R20m undrawn facility is available for future operating activities and to settle capital commitments, with no restriction to this.

#### Details of facilities

The bank overdraft is secured, Necsa has signed suretyship for the R20m overdraft facility. The overdraft facility is reviewed once a year by Nedbank. There is no set repayment terms of the overdraft and interest is charged at prime less 1.5%. There is no restrictions on the realisability of any of the cash and cash equivalents. The credit quality of cash at bank and short term deposits, excluding cash on hand that are neither past due nor impaired can be assessed by reference to external credit ratings (if available) or historical information about counterparty default rates:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Overnight loan facility	120 000	60 000	120 000	60 000
Asset based financing	8 000	8 000	8 000	8 000
Bills of exchange	100	100	-	-
CFC	2 000	1 500	-	-
Commitments regarding guarantees (foreign)	-	73	-	-
Commitments regarding guarantees (local)	11 300	12 300	-	-
Corporate credit card	300	300	-	-
FEC's	86 515	85 235	30 000	30 000
Fleet management service	145	145	-	-
Forex cancellation limit	750	750	-	-
Forex settlement limit	7 000	7 000	-	-
General short term banking facility	75 200	37 200	15 000	15 000
Guarantees by bank	11 300	11 300	-	-
Letter of credit	45 000	450	-	-
Medium term loan	967	1 100	-	-
Overdraft	15 600	13 600	-	-
Vehicle and asset finance	6 890	6 890	-	-

## 15. Discontinued operations or disposal groups or non-current assets held for sale

The Board of Lectromax and the Board of Gammatec NDT Supplies SOC Ltd resolved to discontinue all direct operations of Lectromax Australia (Pty) Ltd during the prior financial year. The assets and liabilities as at 31 March 2016 are set out below. The decision was made to discontinue operations due to lack of return and suitable profitable trading activities.

In the 2017 financial year, the property, plant and equipment has been sold at a loss on sale of R71 671 and this has been recorded and included in the Loss from Discontinued Operations in the Consolidated Statement of Comprehensive Income.

All the trade receivables has been settled by the relevant customers during the current financial year. The loan from the shareholders and trade payables were settled or forgiveness provided.

Deregistration of Lectromax Australia (Pty) Ltd was submitted on 28 March 2017.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Profit and loss</b>				
Revenue	-	15 080	-	-
Cost of sales	-	(15 125)	-	-
Gross profit	-	(45)	-	-
	613	(412)	-	-
Operating expenses	(400)	(1 552)	-	-
Operating profit/ (loss)	213	(2 009)	-	-
Other income/ (expenses)	(2)	(183)	-	-
Finance costs	(10)	(752)	-	-
<b>Profit/(Loss) from discontinued operations</b>	<b>201</b>	<b>(2 944)</b>	<b>-</b>	<b>-</b>
<b>Assets and liabilities</b>				
<b>Assets of disposal groups</b>				
Trade and other receivables	-	307	-	-
<b>Liabilities of disposal groups</b>				
Loans from group companies	-	652	-	-
Other liabilities	-	611	-	-
	-	<b>1 263</b>	-	-
<b>Equity</b>				
Non-controlling interest	(1 676)	-	-	-

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 16. Share capital

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Authorised</b>				
500 000 000 Ordinary shares of R1 each	500 000	500 000	500 000	500 000
There were no changes in authorised share capital.				
<b>Reconciliation of number of shares issued:</b>				
Reported as at 01 April 2017	2 205	2 205	2 205	2 205
<b>Issued</b>				
Ordinary	2 205	2 205	2 205	2 205

#### 17. Other financial liabilities

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>At fair value through profit / (loss)</b>				
Cash Flow Hedge	-	15 058	-	-
Foreign exchange contract	5 474	-	756	-
	<b>5 474</b>	<b>15 058</b>	<b>756</b>	<b>-</b>
<b>Held at amortised cost</b>				
<b>Standard Bank - Australia Investment</b>				
The loan is unsecured, bears a fixed interest rate of 11.50% and is repayable in equal monthly instalments of R42 000. The amount is restricted to R2 500.	633	1 033	-	-
<b>First National Bank - Mortgage</b>				
The loan is secured by a first mortgage bond registered over land and buildings Portion 91 of Farm 601, Klipplaatdrif, Vereeniging (Note 4). Interest is charged at prime rate minus 1%. The bond is repayable in equal monthly instalments of R146.	9 280	10 391	-	-
Less: Short term portion	(2 219)	(2 219)	-	-
<b>IDC Loan</b>	<b>7 500</b>	<b>15 000</b>	<b>-</b>	<b>-</b>

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Pelchem has obtained from the IDC in the prior financial year, a R30m loan in terms of their job fund program. The Minister of Energy approved the borrowing from IDC on the 12 April 2013. The loan was fully utilised by 31 March 2014. These funds were used as working capital. The R30m is repayable over 4 years starting 01 April 2014 at an interest rate of 5%. NTP Radioisotopes SOC Ltd have signed suretyship for the R30m should Pelchem not be in a position repay the loan.				
	<b>15 194</b>	<b>24 205</b>	-	-
	<b>20 668</b>	<b>39 263</b>	<b>756</b>	-
<b>Non-current liabilities</b>				
At amortised cost	12 975	14 486	-	-
<b>Current liabilities</b>				
Fair value through profit or loss	5 474	15 058	756	-
At amortised cost	2 219	9 719	-	-
	<b>7 693</b>	<b>24 777</b>	<b>756</b>	-
	<b>20 668</b>	<b>39 263</b>	<b>756</b>	-

## 18. Finance lease liabilities

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Minimum lease payments due</b>				
- within one year	3 409	5 073	2 027	3 283
- in second to fifth year inclusive	2 605	4 176	2 319	2 503
	6 014	9 249	4 346	5 786
less: future finance charges	(709)	(1 047)	(598)	(699)
<b>Present value of minimum lease payments</b>	<b>5 305</b>	<b>8 202</b>	<b>3 748</b>	<b>5 087</b>
<b>Present value of minimum lease payments due</b>				
- within one year	1 756	2 659	1 058	1 961
- in second to fifth year inclusive	3 549	5 543	2 690	3 126
	<b>5 305</b>	<b>8 202</b>	<b>3 748</b>	<b>5 087</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 18. Finance lease liabilities (continued)

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Non-current liabilities	3 549	5 543	2 690	3 126
Current liabilities	1 756	2 659	1 058	1 961
	<b>5 305</b>	<b>8 202</b>	<b>3 748</b>	<b>5 087</b>

The average lease term was 2 to 5 years (2016: 2 to 5 years) and the average effective borrowing rate was 9,5% (2016: 10,5%)

Interest rates are linked to prime at the contract date. All leases have fixed repayments and no arrangements have been entered into for contingent rent.

The Group's obligations under finance leases are secured by the lessor's charge over the leased assets (refer to Note 4). The Lessor will at all times remain the owner of the vehicle and the vehicle may only be utilised for the rental period or any extended period. The pledging agreement does not impede the use or control over the assets.

#### 19. Retirement benefits

##### Provident fund benefits

The Company and its two major subsidiaries, NTP Radioisotopes and Pelchem, operates a provident fund scheme which is governed by the Pensions Fund Act No. 24 of 1956. The scheme is generally funded through payments to insurance companies or trustee administered funds, determined by periodic actuarial calculations. The Company has defined contribution plans established in 1994. These contribution plans are compulsory for every permanent employee employed in accordance with the conditions of employment, primarily by means of monthly contributions to the Necsa Retirement Fund. A defined contribution plan is a provident fund under which the Company pays fixed contributions into a separate entity. The Company has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee services in the current and prior periods. The contributions are recognised as an expense when they are due. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in the future payments is available.

The Necsa Retirement Fund is revalued by an independent actuary on an annual basis. The last actuarial valuation was performed in April 2017 for the period ending 31 March 2017. The conclusion made in the latest actuarial valuation was that the fund is currently in a good financial position and should remain so, based on the contribution rates payable in terms of the rules of the fund, until the next actuarial valuation.

##### Post retirement medical aid

The Company provides post-retirement health care benefits to employees who were employed on or before 30 September 2004. The entitlement to post-retirement health care benefits is further based on the employee remaining in service up to retirement age and completing a minimum service period. The expected costs of these benefits are accrued over the period of employment, using an accounting methodology similar to that for defined



benefit pension plans. Independent qualified actuaries carry out valuations of these obligations. All actuarial gains and losses are recognised immediately in the statement of comprehensive income. The actuarial valuation method used to value the obligations is the projected unit credit method. Future benefit values are projected using specific actuarial assumptions and the liability to in service members is accrued over the expected working lifetime. These obligations are funded over a 25-year period. The valuation is done every year. Management has embarked on a strategy to effectively manage its future commitments by initiating a plan that consists of settling the present value of the future commitments of a small targeted employee base and purchasing an inflation linked annuity for the remainder.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Carrying value</b>				
Present value of the defined benefit obligation	399 769	412 026	353 519	366 364
Fair value of plan assets	(32 547)	(35 163)	(12 935)	(15 579)
Past service cost not recognised	28 539	32 343	28 539	32 343
	<b>395 761</b>	<b>409 206</b>	<b>369 123</b>	<b>383 128</b>
Non-current liabilities	(371 953)	(386 972)	(346 471)	(361 156)
Current liabilities	(23 808)	(22 234)	(22 652)	(21 972)
	<b>(395 761)</b>	<b>(409 206)</b>	<b>(369 123)</b>	<b>(383 128)</b>
<b>Reconciliation of net liability recognised in the statement of financial position</b>				
Opening balance	409 206	419 800	383 128	393 572
Current service cost	5 050	5 489	3 777	3 941
Expected return on plan asset	(5 052)	(3 986)	(3 099)	(2 414)
Interest cost	40 403	34 015	35 838	30 254
Actuarial gains recognised in profit and loss	(19 797)	(13 062)	(17 415)	(10 061)
Expected employer benefit payments	(23 977)	(22 726)	(23 055)	(22 315)
Benefits payments from plan asset	23 543	23 063	23 055	22 315
Past service cost recognised	(3 804)	(3 804)	(3 804)	(3 804)
Employer prefunding contributions	(29 811)	(29 583)	(29 302)	(28 360)
<b>Total non-current portion of net liability recognised</b>	<b>395 761</b>	<b>409 206</b>	<b>369 123</b>	<b>383 128</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 19. Retirement benefits (continued)

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Reconciliation of present value of obligations in excess of plan assets</b>				
Opening balance	376 793	384 257	350 785	357 425
Current service cost	5 050	5 489	3 777	3 941
Interest cost	40 403	34 015	35 838	30 254
Expected return on plan assets	(5 052)	(3 986)	(3 099)	(2 414)
Actuarial gains	(19 797)	(13 062)	(17 415)	(10 061)
Expected employer benefit payments	(23 543)	(23 063)	(23 055)	(22 315)
Expected benefit payments from plan assets	23 977	22 726	23 055	22 315
Employer prefunding contributions	(29 811)	(29 583)	(29 302)	(28 360)
	<b>368 020</b>	<b>376 793</b>	<b>340 584</b>	<b>350 785</b>

#### Expense recognised in the statement of comprehensive income

Current service cost	5 050	5 489	3 777	3 941
Past service cost	(3 804)	(3 804)	(3 804)	(3 804)
Interest cost	40 403	34 015	35 838	30 254
Actuarial gains	(19 797)	(13 062)	(17 415)	(10 061)
	<b>21 852</b>	<b>22 638</b>	<b>18 396</b>	<b>20 330</b>

#### Reconciliation of plan assets

Opening balance	35 334	33 331	15 579	13 899
Return on plan assets	5 052	3 986	3 099	2 414
Employer benefit payments	(23 543)	(23 063)	(23 055)	(22 315)
Employer prefunding contributions	29 811	28 909	29 302	28 360
Experience adjustment	(13 936)	(7 829)	(11 990)	(6 779)
	<b>32 718</b>	<b>35 334</b>	<b>12 935</b>	<b>15 579</b>

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Key assumptions used</b>				
Assumptions used on the last valuation on 31 March 2017				
CPI Inflation	7.40%	8.10%	7.40%	8.10%
Discount rates per annum	9.90%	10.10%	9.90%	10.10%
Expected retirement age	65.00%	65.00%	65.00%	65.00%
Expected return on plan assets	9.90%	10.10%	9.90%	10.10%
Withdrawal assumption	0% - 15% (Males)	0% - 15% (Males)	0% - 15% (Males)	0% - 15% (Males)
	0% - 15% (Females)	0% - 15% (Females)	0% - 15% (Females)	0% - 15% (Females)
Post-retirement assumption	PA (90) ultimate rated down 2 years	PA (90) ultimate rated down 2 years	PA (90) ultimate rated down 2 years	PA (90) ultimate rated down 2 years

The expected rate of return on plan assets of 9,90% (2016: 10,10%) per annum is based on the expected return on cash (discount rate 9,90%).

An estimated R 29 811 (2016: R 29 583) will be contributed to the retirement fund in the next financial year. Any actuarial gains and losses are recognised immediately in profit and loss.

The plan assets consist of an annuity insurance policy with the following components:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Market value growth account	10 880	12 851	433	389
Value of guaranteed account	20 105	20 690	9 438	12 690
Cash account	127	323	109	274
	<b>31 112</b>	<b>33 864</b>	<b>9 980</b>	<b>13 353</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 20. Deferred income

Government grants for future expenditure:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Non-current liabilities	453 558	479 387	453 558	479 387
Current liabilities	140 804	110 593	140 804	110 593
	<b>594 362</b>	<b>589 980</b>	<b>594 362</b>	<b>589 980</b>
At 01 April 2016	589 980	617 427	589 980	617 427
Received during the year	493 578	580 097	493 578	580 097
Released to the statement of comprehensive income	(525 462)	(542 815)	(525 462)	(542 815)
*Other movements	36 266	(64 729)	36 266	(64 729)
<b>At 31 March 2017</b>	<b>594 362</b>	<b>589 980</b>	<b>594 362</b>	<b>589 980</b>

\*Other movements represent the utilisation of other grants that were received in the previous year, but utilised in the current year. These other grants are mainly from the government and relate to capital expenditures.

#### 21. Provisions

##### Reconciliation of provisions - Group - 2017

	Opening balance R '000	Additions R '000	Utilised during the year R '000	Reversed during the year R '000	Change in discount factor R '000	Total R '000
Decontamination and waste disposal	205 100	71 972	(49 656)	1 058	(2 426)	226 048
Legal proceedings	-	33 232	-	-	-	33 232
Employee benefit accruals	96 296	79 565	(71 848)	-	-	104 013
Provision for loss on contracts	697	(697)	-	-	-	-
Provision for gratuities	669	-	-	-	-	669
After-reactor management cycle	1 427	3 012	(1 087)	-	-	3 352
	<b>304 189</b>	<b>187 084</b>	<b>(122 591)</b>	<b>1 058</b>	<b>(2 426)</b>	<b>367 314</b>

**Reconciliation of provisions - Group - 2016**

	Opening balance R '000	Additions R '000	Utilised during the year R '000	Change in discount factor R '000	Total R '000
Decontamination and waste disposal	130 508	100 887	(24 251)	(2 044)	205 100
Employee benefit accruals	74 550	74 624	(52 878)	-	96 296
Provision for loss on contracts	281	416	-	-	697
Provision for gratuities	669	-	-	-	669
After-reactor management cycle	7 455	74	(6 102)	-	1 427
	<b>213 463</b>	<b>176 001</b>	<b>(83 231)</b>	<b>(2 044)</b>	<b>304 189</b>

**Reconciliation of provisions - Company - 2017**

	Opening balance R '000	Additions R '000	Utilised during the year R '000	Total R '000
Decontamination and waste disposal	313 888	66 281	-	380 169
Employee benefit accruals	43 503	29 905	(27 514)	45 894
Provision for loss on contracts	697	(697)	-	-
After-reactor management cycle	-	1 676	-	1 676
	<b>358 088</b>	<b>97 165</b>	<b>(27 514)</b>	<b>427 739</b>

**Reconciliation of provisions - Company - 2016**

	Opening balance R '000	Additions R '000	Utilised during the year R '000	Total R '000
Decontamination and waste disposal	269 800	44 088	-	313 888
Employee benefit accruals	42 281	33 168	(31 946)	43 503
Provision for loss on contracts	281	416	-	697
	<b>312 362</b>	<b>77 672</b>	<b>(31 946)</b>	<b>358 088</b>
Non-current liabilities	228 393	205 769	381 845	313 888
Current liabilities	138 921	98 420	45 894	44 200
	<b>367 314</b>	<b>304 189</b>	<b>427 739</b>	<b>358 088</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 21. Provisions (continued)

##### Provision for decontamination and waste disposal

Provision is made for the decontamination of purely commercial plants and disposal of the resulting waste. The annual transfer is based on the latest available cost information. The Company was awarded a license from the National Nuclear Regulator to transport the waste to Vaalputs on 15 March 2011. The assessment methodology provides an estimate of the total cost associated with the decommissioning of commercial plants currently existing at Necsa to the point where they can be reused or released from regulatory control, and the total cost to manage (treat, condition, store and/or dispose) all the existing and future waste created by these activities. In order to estimate the cost and scheduling of the various decommissioning and waste management activities the following assumptions were made:

- i) In view of the fact that the Necsa site will remain a licensed site for the foreseeable future, the decommissioning of facilities to the point of release from regulatory control is not necessarily regarded as the required endpoint, as that may depend on the potential future re-use of the nuclear facility.
- ii) Only liabilities associated with existing facilities identified during the assessment cycle, and future facilities identified as essential for the discharge of these liabilities are included in the assessment.
- iii) The following costs are included in the assessment: The cost to decommission all facilities to the point where they can be released from regulatory control (the cost excludes future demolishing cost of buildings). Rehabilitation of the site was not included in the assessment, except in cases where this was considered to be the most viable option to achieve release from regulatory control.

A potential benefit (cost decrease) may be achieved as a result of technological progress in the fields of decommissioning and waste management. There are, however, many uncertainties that may impact the accuracy of cost estimates for discharging nuclear liabilities, mainly due to the long time periods over which the cost estimates must be done. Some of these uncertainties are listed below:

- ▶ Non-technical aspects, such as socio-political factors and changes in laws or regulations in nuclear safety and waste management, are difficult to quantify in terms of impact on cost estimates.
- ▶ Decommissioning cost for many projects occur some years in the future. The life time of some processes may also be extended resulting in the postponement of decommissioning activities and cost.
- ▶ Future developments in the nuclear industry (up scaling or down scaling) may result in the re-use of contaminated or previously decommissioned facilities.

##### Accrual for employee benefits

The cost of leave days due to employees as well as thirteenth cheques payable has been accrued for. The accrual will be realised during the following year.

##### General

It is envisaged that, based on the current information available, any additional liability in excess of the amounts provided will not have a material adverse effect on the Group's financial position, liquidity or cash flow.

The effect of time value of money has been omitted when calculating provisions where the effect was immaterial.

Investment contributions for future liabilities, previously lumped into provisions, have been disclosed separately on the face of the balance sheet and therefore prior year provision figures have changed.



## 22. Trade and other payables

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Financial Instruments</b>				
Trade payables	85 313	120 889	53 036	49 821
Funds held on behalf of NRWDI	(2)	11 186	(1)	11 155
Accrued expenses	43 237	83 702	19 837	41 696
Other payables	19 159	38 968	31 866	36 672
<b>Non-financial liabilities</b>				
VAT	40 478	17 425	22 346	268
	<b>188 185</b>	<b>272 170</b>	<b>127 084</b>	<b>139 612</b>
<b>Fair value of trade and other payables</b>				
Trade and other payables	188 185	272 170	127 084	139 612

Trade creditors have been reviewed on an individual basis and where extended payment terms were applicable the effect of the time value of money have been taken into account. This was done to determine the finance portion included. The carrying value of trade and other payables is increased by an interest income of R931 (2016: R407) to discount the carrying value to amortised cost for the Company and an interest charge of R8 350 (2016: R6 408) for the Group.

The average credit period on purchases is between 30 and 60 days from date of statement. The Company and Group settle payments to creditors on average 30 days from receipt of the statements. Interest is sometimes charged on trade payables based on the payment policy of the Group. The Company and Group has financial risk management policies in place to ensure that all payables are paid within the credit timeframe.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 23. Financial assets by category

The accounting policies for financial instruments have been applied to the line items below:

	Loans and receivables R '000	Fair value through profit or loss - designated R '000	Available- for- sale R '000	Total R '000
<b>Group - 2017</b>				
Loans to (from) group companies	3 310	-	-	3 310
Other financial assets	48 013	7	222 804	270 824
Cash and cash equivalents	1 065 285	-	-	1 065 285
Trade and other receivables (excl. prepayments, deposits and VAT receivable)	342 067	-	-	342 067
	<b>1 458 675</b>	<b>7</b>	<b>222 804</b>	<b>1 681 486</b>

	Loans and receivables R '000	Fair value through profit or loss - designated R '000	Available- for- sale R '000	Total R '000
<b>Group - 2016</b>				
Loans to (from) group companies	3 310	-	-	3 310
Other financial assets	45 227	10 520	276 763	332 510
Cash and cash equivalents	781 551	-	-	781 551
Trade and other receivables (excl. prepayments, deposits and VAT receivable)	286 460	-	-	286 460
	<b>1 116 548</b>	<b>10 520</b>	<b>276 763</b>	<b>1 403 831</b>

	Loans and receivables R '000	Available- for-sale R '000	Total R '000
<b>Company - 2017</b>			
Loans to (from) group companies	756	-	756
Other financial assets	48 012	222 772	270 784
Cash and cash equivalents	466 785	-	466 785
Trade and other receivables (excl. prepayments, deposits and VAT receivable)	208 273	-	208 273
	<b>723 826</b>	<b>222 772</b>	<b>946 598</b>

	Loans and receivables R '000	Fair value through profit or loss - designated R '000	Available- for- sale R '000	Total R '000
<b>Company - 2016</b>				
Loans to (from) group companies	3 879	-	-	3 879
Other financial assets	45 227	5 018	276 730	326 975
Cash and cash equivalents	263 066	-	-	263 066
Trade and other receivables (excl. prepayments, deposits and VAT receivable)	186 241	-	-	186 241
	<b>498 413</b>	<b>5 018</b>	<b>276 730</b>	<b>780 161</b>

## 24. Financial liabilities by category

The accounting policies for financial instruments have been applied to the line items below:

	Financial liabilities at amortised cost R '000	Fair value through profit or loss - held for trading R '000	Total R '000
<b>Group - 2017</b>			
Other financial liabilities	15 194	5 474	20 668
Trade and other payables (excl. amounts received in advance, deferred grants and VAT payable)	188 185	-	188 185
Bank overdraft	123 721	-	123 721
	<b>327 100</b>	<b>5 474</b>	<b>332 574</b>

	Financial liabilities at amortised cost R '000	Total R '000
<b>Group - 2016</b>		
Other financial liabilities	39 263	39 263
Trade and other payables (excl. amounts received in advance, deferred grants and VAT payable)	272 170	272 170
Bank overdraft	82 734	82 734
	<b>394 167</b>	<b>394 167</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 24. Financial liabilities by category (continued)

	Financial liabilities at amortised cost R '000	Fair value through profit or loss - held for trading R '000	Total R '000
<b>Company - 2017</b>			
Other financial liabilities	-	756	756
Trade and other payables (excl. amounts received in advance, deferred grants and VAT payable)	127 084	-	127 084
Bank overdraft	101 847	-	101 847
	<b>228 931</b>	<b>756</b>	<b>229 687</b>

	Financial liabilities at amortised cost R '000	Total R '000
<b>Company - 2016</b>		
Trade and other payables (excl. amounts received in advance, deferred grants and VAT payable)	139 612	139 612
Bank overdraft	60 000	60 000
	<b>199 612</b>	<b>199 612</b>

#### 25. Revaluation reserve

The revaluation reserve consists of fair value adjustments to the land and buildings of the Company and Group.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Fair value adjustment to land and buildings	508 456	479 565	477 405	450 385

#### 26. Fair value adjustment assets-available-for-sale reserve

The fair value adjustment assets-available-for-sale-reserve comprises all fair value adjustments on available for sale financial instruments. When an asset or liability is derecognised, the fair value adjustment relating to that asset or liability is transferred to profit or loss.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Available for sale financial instruments	5 830	4 442	5 807	4 419

## 27. Revenue

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Sale of goods	1 622 819	1 510 008	400 652	381 956
Construction contracts	(11 966)	(21 349)	(11 966)	(21 349)
Government grants	525 462	542 815	525 462	542 815
Other grants	37 774	33 910	22 718	20 928
	<b>2 174 089</b>	<b>2 065 384</b>	<b>936 866</b>	<b>924 350</b>
<b>The amount included in revenue arising from government grants is as follows:</b>				
Operating activities	446 046	436 479	446 046	436 479
Decommissioning of strategic plants	61 691	58 609	61 691	58 609
LEU fuel and conversion	8 418	1 087	8 418	1 087
Security	8 372	8 113	8 372	8 113
Deferred R&D Safari Grant used	169	3 900	169	3 900
SAFARI-1	-	116	-	116
Deferred MTEF Grant utilised for activities	766	34 511	766	34 511
	<b>525 462</b>	<b>542 815</b>	<b>525 462</b>	<b>542 815</b>

The government grant relating to operating activities is primarily utilised to fund research and development expenses, non-commercial overheads and supplementary activities as required by the Nuclear Energy Act, costs for discarding radioactive waste and for storage of irradiated nuclear fuel.

The South African Government has an obligation to discharge nuclear liabilities resulting from previous strategic nuclear programmes which includes decommissioning and decontamination of disused historic facilities. The Minister of Energy is charged with this responsibility on behalf of government. A Nuclear Liabilities Management Plan (NLMP) was approved by Cabinet in February 2007.

Necsa, as a statutory body created in terms of the Nuclear Energy Act (Act 46 of 1999) has been delegated with certain responsibilities in this regard. It annually receives funds to apply to the decommissioning and decontamination process in terms of the NLMP. Funds received by Necsa for this purpose and not utilised at year end are accounted for as deferred grants.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 28. Operating profit (loss)

Operating profit (loss) for the year is stated after charging (crediting) the following, among others:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Income from subsidiaries (other than investment income)</b>				
Dividends	-	-	61 074	10 088
<b>Operating lease charges</b>				
Premises	1 314	1 600	138	-
Equipment	3 713	3 507	3 600	3 409
Lease rentals	47 470	914	42 481	-
	<b>52 497</b>	<b>6 021</b>	<b>46 219</b>	<b>3 409</b>
<b>Auditor's remuneration - external</b>				
Audit fees	10 283	11 563	5 353	7 073
<b>Other</b>				
(Loss)/Profit on sale of property, plant and equipment	(1 464)	(633)	(84)	(17)
Profit on sale of other financial assets	57	13 963	57	13 963
Reversal of impairment on property, plant and equipment	-	12 823	-	-
Impairment of subsidiary	-	64 796	-	(42 000)
Impairment on loans to group companies	-	1 201	-	-
Depreciation on property, plant and equipment	81 560	77 965	64 097	62 664
Employee costs	869 536	803 457	682 372	639 168
Consulting and professional fees	52 538	39 467	25 723	27 791
Impairment of inventory	21 241	20 803	1 694	1 431



## 29. Investment income

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Dividend income</b>				
Subsidiaries - Local	-	-	61 074	10 088
Listed investments - Local	15	1	-	-
Listed investments - Local	837	768	-	-
<b>Total dividend income</b>	<b>852</b>	<b>769</b>	<b>61 074</b>	<b>10 088</b>
<b>Interest income</b>				
Bank	87 434	65 728	42 020	35 905
Fair value adjustments	26 543	23 141	8 354	5 875
Stage 1 Decommissioning and Decontamination	202 472	218 528	202 472	218 528
Associates	805	705	-	-
<b>Total interest income</b>	<b>317 254</b>	<b>308 102</b>	<b>252 846</b>	<b>260 308</b>
<b>Total investment income</b>	<b>318 106</b>	<b>308 871</b>	<b>313 920</b>	<b>270 396</b>

## 30. Fair value adjustments

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Fair value adjustments	2 919	1 187	5 883	(1 580)

## 31. Finance costs

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Group	425	(829)	-	-
Non-current borrowings	3	(191)	-	-
Trade and other payables	3 028	1 203	3 028	1 203
Finance leases	721	810	478	628
Bank overdraft	1 571	3 936	-	-
Interest paid	237 080	272 137	237 006	262 651
Amortisation of held to maturity liabilities	1 011	1 019	-	-
Fair value adjustments	12 228	14 907	3 135	2 018
<b>Total finance costs</b>	<b>256 067</b>	<b>292 992</b>	<b>243 647</b>	<b>266 500</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

### 32. Taxation

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Major components of the tax expense</b>				
<b>Current</b>				
Local income tax - current period	96 141	80 933	-	-
Current tax 1	462	866	-	-
	<b>96 603</b>	<b>81 799</b>	<b>-</b>	<b>-</b>
<b>Current</b>				
Local income tax - current period	101 993	88 611	-	-
Local income tax - recognised in current tax for prior periods	(1 737)	560	-	-
Deferred tax current	(4 746)	(7 606)	-	-
Foreign income tax for current period	83	234	-	-
Originating from reversing temporary differences	1 005	-	-	-
Capital Gains Tax	5	-	-	-
	<b>96 603</b>	<b>81 799</b>	<b>-</b>	<b>-</b>
<b>Reconciliation of the tax expense</b>				
Reconciliation between accounting profit and tax expense.				
Accounting profit (loss)	67 475	245 446	(124 789)	(86 203)
Tax at the applicable tax rate of 28% (2016: 28%)	18 893	68 725	(34 941)	(24 137)
<b>Tax effect of adjustments on taxable income</b>				
Permanent differences due to non-taxable income and non-deductible expenses	12 787	21 091	-	-
Tax losses carried forward	-	(8 022)	-	-
Permanent difference due to tax status	59 127	-	34 941	24 137
CGT	5	1	-	-
Prior year	-	4	-	-
	<b>90 812</b>	<b>81 799</b>	<b>-</b>	<b>-</b>

The South African Revenue Services has approved an exemption in respect of The South African Nuclear Energy Corporation SOC Limited under section 10(1)(cA)(i) of the Income Tax Act subject to certain conditions. No provision is therefore made for tax for Necsa Company.

### 33. Other comprehensive income

#### Components of other comprehensive income - Group - 2017

	Gross R '000	Tax R '000	Net R '000
<b>Items that will not be reclassified to profit (loss)</b>			
<b>Remeasurements on net defined benefit liability/asset</b>			
Remeasurements on net defined benefit liability/asset	19 191	-	19 191
<b>Movements on revaluation</b>			
Gains (losses) on property revaluation	28 891	-	28 891
<b>Total items that will not be reclassified to profit (loss)</b>	<b>48 082</b>	<b>-</b>	<b>48 082</b>

#### Items that may be reclassified to profit (loss)

<b>Exchange differences on translating foreign operations</b>			
Exchange differences arising during the year	21 689	-	21 689
<b>Available-for-sale financial assets adjustments</b>			
Gains (losses) arising during the year	1 388	-	1 388
<b>Total items that may be reclassified to profit (loss)</b>	<b>23 077</b>	<b>-</b>	<b>23 077</b>
<b>Total</b>	<b>71 159</b>	<b>-</b>	<b>71 159</b>

#### Components of other comprehensive income - Group - 2016

	Gross R '000	Tax R '000	Net R '000
<b>Items that will not be reclassified to profit (loss)</b>			
<b>Remeasurements on net defined benefit liability/asset</b>			
Remeasurements on net defined benefit liability/asset	(11 765)	-	(11 765)
<b>Movements on revaluation</b>			
Gains (losses) on property revaluation	166 992	-	166 992
<b>Total items that will not be reclassified to profit (loss)</b>	<b>155 227</b>	<b>-</b>	<b>155 227</b>

#### Items that may be reclassified to profit (loss)

<b>Exchange differences on translating foreign operations</b>			
Exchange differences arising during the year	8 359	-	8 359
<b>Available-for-sale financial assets adjustments</b>			
Gains (losses) arising during the year	(10 051)	-	(10 051)
<b>Total items that may be reclassified to profit (loss)</b>	<b>(1 692)</b>	<b>-</b>	<b>(1 692)</b>
<b>Total</b>	<b>153 535</b>	<b>-</b>	<b>153 535</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

### 33. Other comprehensive income (continued)

#### Components of other comprehensive income - Company - 2017

	Gross R '000	Tax R '000	Net R '000
<b>Items that will not be reclassified to profit (loss)</b>			
<b>Remeasurements on net defined benefit liability/asset</b>			
Remeasurements on net defined benefit liability/asset	16 647	-	16 647
<b>Movements on revaluation</b>			
Gains (losses) on property revaluation	27 020	-	27 020
<b>Total items that will not be reclassified to profit (loss)</b>	<b>43 667</b>	<b>-</b>	<b>43 667</b>
<b>Items that may be reclassified to profit (loss)</b>			
<b>Available-for-sale financial assets adjustments</b>			
Gains (losses) arising during the year	1 388	-	1 388
<b>Total</b>	<b>45 055</b>	<b>-</b>	<b>45 055</b>

#### Components of other comprehensive income - Company - 2016

	Gross R '000	Tax R '000	Net R '000
<b>Items that will not be reclassified to profit (loss)</b>			
<b>Remeasurements on net defined benefit liability/asset</b>			
Remeasurements on net defined benefit liability/asset	10 061	-	10 061
<b>Movements on revaluation</b>			
Gains (losses) on property revaluation	166 586	-	166 586
<b>Total items that will not be reclassified to profit (loss)</b>	<b>176 647</b>	<b>-</b>	<b>176 647</b>
<b>Items that may be reclassified to profit (loss)</b>			
<b>Available-for-sale financial assets adjustments</b>			
Gains (losses) arising during the year	(10 046)	-	(10 046)
<b>Total</b>	<b>166 601</b>	<b>-</b>	<b>166 601</b>

### 34. Cash generated from operations

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Profit (loss) before taxation	67 475	245 446	(124 789)	(86 203)
<b>Adjustments for:</b>				
Depreciation	81 560	85 489	64 097	62 664
Amortisation	207	380	-	-
Profit/ (Loss) on sale of assets	1 464	633	84	17
Profit/(Loss) on sale of other financial assets	(57)	(13 963)	(57)	(13 963)
Losses on foreign exchange	11 174	79 732	7 078	6 880
Dividend income	(852)	(769)	(61 074)	(10 088)
Interest income	(317 254)	(308 102)	(252 846)	(260 308)
Finance costs	256 067	294 064	243 647	266 500
Fair value (gains) losses	(2 919)	(1 187)	(5 883)	1 580
Impairment losses and reversals	1 330	(64 796)	-	(42 000)
Movements in operating lease assets and accruals	-	-	-	-
Movements in retirement benefit assets and liabilities	(13 445)	3 008	(14 005)	(383)
Bad debts written off	11 231	858	-	-
Amortisation: D&D	9 569	13 247	9 569	13 247
Movements in provisions	63 125	90 726	69 651	(45 726)
Discontinued operations	201	(2 944)	-	-
Impairment loss	-	61 794	-	47 598
Other non-cash flow movements	(12 013)	11 568	(4 693)	141 131
Imputed interest - debtors	(5 471)	(5 927)	(2 461)	(1 445)
Imputed interest - creditors	8 350	6 694	931	407
Fair value adjustments on other financial assets	(1 325)	10 046	(1 325)	10 046
Other movements in fixed assets	-	1 265	-	-
Stage 2 receivables movements	-	10 398	-	10 398
Provision for impairment of debts	-	18 096	-	46 167
Movements in investment contributions for future liabilities	-	2 354	-	2 354
Loss on disposal of subsidiary	17 981	-	-	-
<b>Changes in working capital:</b>				
Inventories	(6 179)	32 131	16 726	20 817
Trade and other receivables	112 189	(22 476)	38 541	9 625
Prepayments	113 208	(96 955)	55 730	(45 199)
Trade and other payables	(83 985)	42 931	(12 528)	48 646
Amounts received in advance	(29 705)	24 655	3 197	90 218
Deposits received	3 880	2 184	-	-
	<b>285 806</b>	<b>520 580</b>	<b>29 590</b>	<b>272 980</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 35. Tax paid

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Balance at beginning of the year	7 476	3 141	-	-
Current tax for the year recognised in profit or loss	(96 603)	(81 799)	-	-
Movement in deferred tax	(3 799)	(12 667)	-	-
Balance at end of the year	(9 633)	(7 476)	-	-
	<b>(102 559)</b>	<b>(98 801)</b>	<b>-</b>	<b>-</b>

#### 36. Commitments

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Authorised capital expenditure</b>				
<b>Already contracted for, but not provided for</b>				
Property, plant and equipment	14 978	39 511	6 593	19 048
This committed expenditure relates to plant and equipment and will be financed through ordinary trading operations.				
<b>Operating leases – as lessee (expense)</b>				
<b>Minimum lease payments due</b>				
- within one year	13 185	6 974	9 398	1 301
- in second to fifth year inclusive	78 273	23 277	65 065	855
	<b>91 458</b>	<b>30 251</b>	<b>74 463</b>	<b>2 156</b>

Operating lease payments represent rentals payable by the Group for certain of its motor vehicles and office equipment. Leases are negotiated for an average term of 3.0 years (2016: 4.0 years).



### 37. Contingencies

By their nature, contingencies will only be resolved when one or more future events occur or fail to occur. The assessment of such contingencies inherently involves the exercise of significant judgement and estimates of the outcome of future events.

Litigation and other judicial proceedings as a rule raise difficult and complex legal issues and are subject to uncertainties and complexities including, but not limited to, the facts and circumstances of each particular case, issues regarding the jurisdiction in which each suit is brought and differences in applicable law. Upon resolution of any pending legal matter, the Company may be forced to incur charges in excess of the presently established provisions and related insurance coverage. It is possible that the financial position, results of operations or cash flows of the Company could be materially affected by the unfavourable outcome of litigation.

#### Guarantees

Guarantees of R866 (2016: R866) were issued to financial institutions as collateral security for housing loans granted by financial institutions to employees. Performance guarantees of R0 (2016: R0) were issued to Absa Bank for a customer.

#### Legal claims

Possible quantifiable legal obligations exists for the Group totalling an estimated R20 255 (2016: R10 000) in connection with disputes with delivery of goods, arrear rentals receivable, unfair labour practice, CCMA disputes and services rendered. These cases are currently being investigated by the Necsa Legal division.

#### Suretyship

A limited deed of suretyship for an amount of up to R20 000 (2016: R20 000) has been given to Pelchem SOC Limited for a Nedbank facility. R14 000 (2016: R14 000) relates to an overnight facility and R6 000 (2016: R6 000) to an asset based finance.

#### Gammatec Middle East General Trading (LLC)

A material uncertainty exists on whether a subsidiary, Gammatec Middle East General Trading LLC, would be able to meet its obligations as they fall due, as this subsidiary's liabilities exceed its fairly valued assets at the end of the reporting period. Gammatec NDT Supplies SOC Limited as a 76% shareholder of Gammatec Middle East General Trading LLC, has given a letter of support to the management and auditors of Gammatec Middle East General Trading LLC that it will provide an appropriate level of financial support to ensure that Gammatec Middle East general trading LLC is in a position to meet its financial liabilities and obligations as and when they fall due for at least a period of 18 months. The Gammatec Middle East General Trading LLC liabilities exceeded its assets with R9 129 at 31 March 2017.

#### NTP Radioisotopes SOC Limited

In June 2013, NTP Radioisotopes SOC Limited, a 100% owned subsidiary of Necsa, signed a suretyship agreement for the amount of R30m for the IDC loan granted to Pelchem SOC Limited for bridging finance. Pelchem is a 100% owned subsidiary of Necsa SOC Limited. In July 2015, NTP Radioisotopes provided a letter of support to NTP Radioisotopes Europe SA that it will provide an appropriate level of financial support to ensure that NTP Radioisotopes Europe SA is in a position to meet its financial liabilities and obligations as and when they fall due for at least a period of 12 months.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

### 38. Related parties

#### Relationships

##### Holding entity

Department of Energy

##### Subsidiaries

Refer to Note 7

##### Associates

Refer to Note 8

##### National government

All national government departments are regarded to be related parties in accordance with circular 4 of 2005: Guidance on the term “State controlled entities” in the context of IAS 24 - Related Parties, issued by the South African Institute of Chartered Accountants. No transactions are implied simply by the nature of existence of the relationship between entities. All directors have given general declarations of interest in terms of the Companies Act.

##### Directors and members of key management

Details of directors and key management remuneration paid are disclosed in Note 39.

The following is a summary of transactions with related parties during the year and balances due at year end:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>National Public Entities</b>				
Services rendered	1 077	2 115	1 077	-
Services received	(40 423)	(40 777)	(40 423)	(40 777)
Trade amount due (to)/from	(10 157)	(12 953)	(10 100)	-
<b>National Government Departments</b>				
Services rendered	525 735	509 086	525 735	1
Services received	-	-	-	(1)
Trade amount due (to)/from	-	21	-	-
<b>Subsidiaries</b>				
Services rendered	-	-	374 508	307 982
Services received	-	-	(4 152)	(3 155)
Dividends income	-	-	61 074	10 088
Loans to/(from) subsidiaries	-	-	756	3 879
Trade amount due (to)/from	-	-	150 230	102 417
<b>Associates</b>				
Services rendered	2 606	5 800	-	-
Services received	(10 180)	(3 856)	-	-
Loans to/(from) associates	3 310	3 310	-	-
Trade amount due (to)/from	1 760	4 001	-	-
<b>Compensation to Directors and Other Key Management</b>				
Short-term employee benefits	64 284	53 388	1 413	603

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 39. Directors' and prescribed officer's emoluments

##### Group Executives

	Taxable allowance R '000	Retirement fund contributions R '000	Other company contribution R '000	Salary R '000	Total R '000
<b>2017</b>					
Mr MU Ramatsui	372	202	354	962	1 890
Dr MS Maserumule	1 286	202	11	964	2 463
Mr ZG Myeza	37	323	341	1 483	2 184
Mr MA Rasweswe	233	189	373	899	1 694
Mr TJ Tselane	461	250	126	1 190	2 027
Ms HNB Khumalo	3	63	29	245	340
	<b>2 392</b>	<b>1 229</b>	<b>1 234</b>	<b>5 743</b>	<b>10 598</b>

	Taxable allowance R '000	Leave Pay R '000	Retirement fund contributions R '000	Other company contribution R '000	Salary R '000	Acting Allowance R '000	Total R '000
<b>2016</b>							
Mr XM Mabhongo	391	100	212	122	1 008	-	1 833
Dr MS Maserumule	728	-	255	143	1 216	-	2 342
Mr ZG Myeza	208	-	298	144	1 417	-	2 067
Mr MA Rasweswe	189	-	153	84	727	138	1 291
Mr TJ Tselane	436	-	236	119	1 124	-	1 915
	<b>1 952</b>	<b>100</b>	<b>1 154</b>	<b>612</b>	<b>5 492</b>	<b>138</b>	<b>9 448</b>

**Non-executives**

	Directors' fees R '000
<b>2017</b>	
Dr KR Kemm (Chairperson)	270
Dr Ambassador MJ Seekoe (Former Chairperson)	22
Adv N Shaik-Peremanov	4
Ms MM Mokuena	3
Dr NT Magau	202
Mr AN Mhlongo	46
Mrs RP Mosia	152
Dr ENN Ngcobo	5
Ms P Bosman	213
Mr ZC Ngidi	179
Mr MPK Tshivhase	260
Mr MS Sekgota	81
Dr GJ Davids	96
Prof. Z Vilakazi	42
	<b>1 575</b>

	Directors' fees R '000
<b>2016</b>	
Dr Ambassador MJ Seekoe (Chairperson)	443
Adv N Shaik-Peremanov	77
Ms MM Mokuena	63
Mr AN Mhlongo	18
Mr J Kellerman (Alternate to NJ Mxakato-Diseko)	2
	<b>603</b>

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 39. Directors' and prescribed officer's emoluments (continued)

##### Executive Director

	Taxable allowance R '000	Retirement Fund Contribution R '000	Other company contributions R '000	Salary R '000	Total R '000
<b>2017</b>					
Mr GP Tshelane	768	382	195	1 960	3 305
	Taxable allowance R '000	Retirement Fund Contribution R '000	Other company contributions R '000	Salary R '000	Total R '000
<b>2016</b>					
Mr GP Tshelane	637	338	498	1 609	3 082

##### Details of service contracts

No director has a notice period in excess of one year and no director's contract makes provision for predetermined compensation on termination exceeding one year's salary and benefits in kind. No directors are proposed for election or re-election at the forthcoming annual general meeting. All the directors have a service contract.

#### 40. Prior period errors

Intercompany dividends of R12.963m from NTP Radioisotopes (NTPR) were incorrectly eliminated in the prior year, which resulted in consolidated dividend income reflected in the AFS. The correction was effected in the current year against the Distributable Reserves that the NTPR uses to pay out dividends.

The prior year Statements of Changes in Equity has been restated to correctly reflect the Non-controlling Interest, Foreign Currency Translation Reserve and Retained Earnings. There has been no changes to Assets, Liabilities and Profit and Loss of the current or prior period.

The errors have been corrected retrospectively and resulted in adjustments as follows:

	2017 R'000	2016 R'000	2015 R'000
<b>Consolidated Statement of Financial Position</b>			
Retained earnings decreased	-	12 963	(1 786)
Distributable reserves increased	-	(12 954)	57
Non-controlling interest	-	(9)	1 729
<b>Statement of comprehensive income</b>			
Investment Income decreased (Note 29)	-	(12 963)	-



## 41. Going concern

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

The ability of the Group to continue as a going concern is dependent on grant funding from government. Funding for the 2017/18 financial year has been approved; and as per the Medium Term Expenditure Framework (MTEF) of the National Government funding has also been allocated for the 2018/19 and 2019/20 financial years.

In considering whether the Group and the Company are going concerns the following is noted:

Necsa is established in terms of the Nuclear Energy Act (the act) and is the successor in title to the Atomic Energy Corporation, which has been in existence since 1950. Its main functions and ancillary powers and functions are prescribed by the act. The act prescribes how Necsa will be funded; it specifically states that, among other sources of funding, Necsa will be funded and provided with capital from money appropriated by Parliament and income derived from the sale or other commercial exploitation of its products. Further, the act requires that Necsa must in respect of each financial year submit a statement of estimated income and expenditure for approval to the Minister of Energy who may approve the statement with the agreement of the Minister of Finance. The act also states that Necsa may not be placed under judicial management or in liquidation except if authorised by an act of Parliament. The Group's intellectual property and its main operations are considered strategic to the republic, hence the direct involvement of government to ensure its continued existence.

Since its establishment and to date the Group's statement of estimated income and expenditure has been approved by the Minister of Energy with the concurrence of the Minister of Finance and the approved funding has been received by the Group. Grant funding for the current year amounted to R599m and funding for the 2017/18 year of R664m has been approved; and the Medium Term Expenditure Framework tabled in Parliament during November 2016 has allocated R702m for 2018/19 and R742m for 2019/20.

The Group exports a substantial portion of its commercial products and as result of the deteriorating global economic environment in recent years it has not been achieving its revenue targets. Consequently expenditure and cash flows have been managed prudently. Although the Group has adequate cash resources, Necsa, the Company, has experienced short-term cash shortages. This is so because the Company's operations (commercial, research and development and State mandated obligations) are integrated resulting in interdependencies and cross subsidisation. The minister, and the National Treasury are aware of these constraints and discussions are ongoing. These short-term shortages are funded from an overdraft facility of R120m. It is also noted that a subsidiary NTP has significant available cash resources of R518m.

In March 2016, Senior Counsel confirmed that Necsa, and not the Department of Energy, is liable to Decommission and Decontaminate (D&D) strategic nuclear facilities currently in operation (Stage 2) and, in terms of Accounting Standards, Necsa has had to recognise this liability in its financial statements, although the D&D process (and the resulting cash flows) may only commence in 2030 or later. Although Senior Counsel's opinion is that the State has an obligation to fund these liabilities, Accounting Standards dictate that such obligation cannot yet be recognised as an asset without Cabinet approval and discussions are underway to obtain such approval. The recognition of this

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 41. Going concern (continued)

liability has negatively impacted the Equity of the Company and the Group in the amount of R255m in the 2015/16 financial year and a further charge of R44m in the current financial year. The recognition of this liability will have no impact on the Company's and the Group's future cash flows until 2030. Refer to Note 44 for further discussion on the Company's D&D obligations.

Despite this significant negative impact to Equity, the Group and the Company are still solvent; and once Cabinet approves funding, solvency will be enhanced.

On the basis of the Group's current financial position, the forecast financial performance and cash flows for the foreseeable future, the grant funding approved for the 2016/17 financial year, the funding allocated for the 2017/18 and 2018/19 financial years, the State's obligations in terms of the act and the ongoing discussions with the State, it is considered that the Group has access to adequate resources to continue in operational existence for the foreseeable future.

#### 42. Public Finance Management Act

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Fruitless and wasteful expenditure</b>				
Opening balance	1 295	273	604	216
Overpayments not recoverable 1	69	639	67	5
Recoveries made	(58)	(1)	(56)	(1)
Internal losses 2	65	384	65	384
Written off to the statement of comprehensive income	(865)	-	(221)	-
<b>Fruitless and wasteful expenditure unresolved</b>	<b>506</b>	<b>1 295</b>	<b>459</b>	<b>604</b>

##### Fruitless and wasteful expenditure

Comments (including actions taken with regard to matters)

- 1) Disciplinary steps have been taken against staff to address the shortcoming.
- 2) This matter is under investigation in order to identify the root cause and persons involved.

##### Criminal or disciplinary steps

The irregular expenditure was investigated according to the treasury guidelines on irregular expenditure, upon investigation it was found that the state did not suffer any loss due to the transgression.

There were no material losses through criminal conduct or irregular expenditure. Therefore criminal steps are not applicable. Disciplinary steps have been taken where applicable.

##### Gifts, donations or sponsorships received

Employees are allowed to receive gifts and courtesies. Gifts and courtesies received above R300 are recorded in a register and approved by the relevant manager. To receive gifts and courtesies valued at more than R3000, employees need to obtain written permission from the Group Executive or CEO.

##### Remissions or payments made as an act of grace

There were no remissions or payments made as an act of grace.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Irregular expenditure</b>				
Functionality criteria specified in request for tender "not clear and specific". However all suppliers were treated consistently using the same template. Therefore the tender process was fair, equitable, transparent and consistent in line with s217 of the South African Constitution.	-	40 452	-	30 345
a. No tax clearance certificate obtained	-	198	-	-
Commitment prior to procurement process completed	-	2 989	-	2 989
Less: Amounts condoned (Note 1 below)	-	(43 639)	-	(33 334)
	-	-	-	-

Note 1: The irregular expenditure has been condoned as follows:

- ▶ R0 (2016 R33 334) approved by Board of Directors of Necsa
- ▶ R0 (2016 R7 068) approved by Board of Directors of NTP
- ▶ R0 (2016 R3 236) approved by Board of Directors of Pelchem

Although the above purchases constitutes irregular expenditure as per the Public Finance Management Act, no losses were incurred due to the financial misconduct.

Effective steps have been taken by management to prevent recurrence of irregular expenditure.

### 43. Prepayments

Payments in advance are not encouraged, although are sometimes necessary in the normal running of the business.

### 44. Decommissioning and Decontamination Stage 1

South Africa announced its intention to abandon the Nuclear Weapons Program in 1989. Stemming from this announcement Necsa started in 1995 with the shutdown of the various strategic nuclear facilities directly linked to the Nuclear Weapons Program while the other strategically related operating nuclear facilities were excluded to continue the maintenance of the Necsa site license and to support some of the current operating facilities to date.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 44. Decommissioning & Decontamination Stage 1 (continued)

These shut-down facilities (some have been Decommissioned and Decontaminated (D&D) while others are scheduled to be D&D) are currently known as past disused strategic nuclear facilities. All the other ancillary nuclear facilities that were strategically used for the Nuclear Weapons Program have been kept operational for the new non-weapons (peaceful application of nuclear energy) mandate and are currently known as the past operational strategic nuclear facilities.

According to the Nuclear Energy Act (No. 46 of 1999), all institutional nuclear obligations vest in Minister of Mineral and Energy (now Energy). Section 1 (xii) (a) states that “The decommissioning and decontamination (D&D) of past strategic nuclear facilities” is an institutional nuclear obligation.

The South African Nuclear Energy Corporation Ltd (Necsa) has been established for the Republic of South Africa in terms of the Nuclear Energy Act 46 of 1999 (the act) to manage and operate the republic’s nuclear and related objectives. Necsa derives its mandate(powers and functions) solely from the act and the Minister of Energy via the Department of Energy (DoE), and is subjected to the policies and procedures designed by the DoE.

It is considered that this D&D responsibility has now been assigned to Necsa by the Minister of Energy.

The National Nuclear Regulator (NNR), an organ of the State, was established in terms of the National Nuclear Regulator Act 47 of 1999. Section 1 (xiv) of the NNR Act makes provision for the granting of nuclear authorisations, also known as Nuclear Installations Licenses (NILs). Section 20 (1) of the act states that “No person may site, construct, operate, decontaminate or decommission a nuclear installation, except under the authority of a nuclear installation licence”.

Section 21 (1) requires that any person wishing to site, construct, operate, decontaminate or decommission a nuclear installation may apply in the prescribed format to the Chief Executive Officer of the NNR for a nuclear installation licence and must furnish such information as the NNR Board of Directors requires. Necsa is currently the license holder of forty-one (41) NILs that were issued by the NNR. The NNR approved NILs issued to Necsa, govern all nuclear activities undertaken in the disused and operational nuclear facilities.

In 2000, Necsa was requested by the then Department of Minerals and Energy (DME) to quantify the total nuclear and related liability on the Pelindaba site arising from the nuclear weapons/strategic program. Necsa then submitted to Cabinet, in April 2004, through the DoE, a Nuclear Liabilities Management Plan (NLMP). The NLMP differentiated between three stages of D&D, namely:

- ▶ Stage 1 - Disused Facilities;
- ▶ Stage 2 - Strategic Operational Nuclear Facilities (currently in use); and
- ▶ Stage 3 - HEU Spent Fuel.

In November 2005, Cabinet approved funding of approximately R1.8bn (2004/5 Rand values) as reflected below:

- ▶ The D&D of disused historical nuclear facilities (Stage 1) of the Nuclear Liabilities Management Plan (R1 526m);
- ▶ Decommissioning and remediation of Thabana waste trenches & waste storage facilities, which were excluded from the NLMP, R270m;
- ▶ The consolidation of nuclear liabilities management funding into a single ring-fenced budget; and
- ▶ That the DoE and the National Treasury work out a programme for the funding of R1.8bn (in 2004/5 Rand values) estimated to discharge the liability over a 28-year period.

In order to provide a monitoring mechanism for effective oversight of the implementation of the approved 2005 Cabinet resolutions, DoE issued a Policy Procedure on the Management of Nuclear Liabilities arising from past strategic nuclear facilities in May 2008. According to the policy procedure, Necsa must submit to DoE a formal reassessment of the liabilities every five years or at a shorter frequency if so required by the minister. The initial methodology for reassessing the liabilities and any changes to the methodology thereafter must be agreed with the DoE prior to implementation.

The re-assessment takes into account the following and is subjected to international experts benchmarking and validation:

- ▶ Review of variables and values used in the assessment model (e.g. interest rates, inflation rates, waste inventories, processing cost, etc.);
- ▶ Review assumptions made in the model;
- ▶ Appropriateness of model used; and
- ▶ Adjustments due to liabilities discharged in previous years.

The assessed amount is adjusted for inflation annually until the next re-assessment. Since 2007/08 Necsa has been receiving annually ring-fenced grants from the State to discharge this liability on behalf of the DoE.

### Stage 1 Liabilities

Until the 2013/14 financial year all the parties considered that the D&D liability vested in the minister and was recognised in the financial statements of the DoE; and Necsa was acting as an agent of the minister with regard to D&D. A Senior Counsel opinion, obtained in March 2016, confirmed that the liability to D&D past strategic nuclear facilities rests with Necsa with regard to both disused and currently in use facilities; and that the State is obligated to fund these liabilities. The minister has accepted this opinion and has transferred this liability as well as Cabinet's approval to fund the Stage 1 liability to Necsa; to be recognised in Necsa's financial statements as from the 2014/15 financial year.

An independent international expert, Crossland Consulting Ltd, has confirmed that the assessment methodology used to determine the liability was in line with international best practice and that the amount was sound and reasonable.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 44. Decommissioning & Decontamination Stage 1 (continued)

After adjusting for inflation and the costs already incurred this liability has been determined to be R2.8bn as at 31 March 2016 and in terms of IAS 37 this liability is recognised as a provision (liability) and the State's funding obligation, approved by Cabinet is recognised as an asset.

#### Stage 2 Liabilities

The Stage 2 facilities are currently in operation and these facilities will only be D&D once operations cease. On the basis of the current capacities of these facilities it is estimated that they will be in use for at least the next 30 years, where after they will be D&D. However, based on international experience, it is considered that these facilities could be refurbished when needed to be used indefinitely.

The Stage 2 facilities include the SAFARI-1 Reactor which NTP Radioisotopes SOC Ltd (NTP), a subsidiary of Necsa, is contracted to manage and operate. In terms of the manage and operate agreement NTP and Necsa will share the D&D costs of SAFARI-1; and NTP will be charged based on the commercial utilisation of the SAFARI-1 by NTP. NTP's contribution is ring-fenced and invested to be utilised when D&D commences.

The Stage 2 Liability has been assessed on the basis of the same methodology as for Stage 1. The re-assessment will be done every 3 years and the assessed amount will be adjusted for inflation until the next re-assessment.

Senior Counsel's opinion is that the State is obligated to fund these liabilities. The Minister has accepted this opinion; and has committed to request Cabinet to approve funding for this liability. In terms of accounting standards the State's funding obligation cannot yet be recognised as an asset without Cabinet approving the funding.

In the meantime the National Treasury has allocated funding in terms of the Medium Term Expenditure Framework (MTEF) as follows (Inclusive of VAT):

- ▶ 2015/16: R 16.120m (received)
- ▶ 2016/17: R 17.086m (received)
- ▶ 2017/18: R 18.112m (received)
- ▶ 2018/19: R 19.162m (committed)
- ▶ 2019/20: R 20.235m (committed)

These funds will be ring-fenced and invested to be utilised when D&D commences.

Assuming the current MTEF contributions committed by the National Treasury (vat exclusive), escalated at average 6% CPI rate, and the investments earning interest at the current long-term Government Bond rate of 9.4% as at July 2016, the full liability will be settled by 2037 after the last MTEF contribution of R48 001, with future value of investment at R1 500 855.



## 45. Vaalputs After Care Liabilities

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
Non-current assets	4 142	4 519	4 142	4 519
Non-current liabilities	76 792	75 080	76 792	75 080
	<b>80 934</b>	<b>79 599</b>	<b>80 934</b>	<b>79 599</b>

### Vaalputs institutional control

In terms of Section 50 of the Nuclear Energy Act, the responsibility for South Africa's institutional nuclear obligations vests in the Minister of Minerals and Energy (now Energy). The management of nuclear waste disposal on a national basis is one of these obligations as defined in Section 1(xii) of the act.

The management of radioactive waste disposal on a national basis is assigned to the National Radioactive Waste Disposal Institute. The Institute is an independent entity established by statute under the provision of section 55(2) of the Nuclear Energy Act to fulfil the institutional obligation of the Minister of Energy. Although the institute was established through the statutes and that Board of Directors were appointed, it is still not fully operational.

In terms of section 30(8) of the Disposal Institute Act, DoE subsequently appointed Necsa on 07 March 2010 to maintain the Nuclear. Installation License for Vaalputs (NIL28) until such time as the NRWDI is in a position to take over these functions to the satisfaction of the NNR.

The liability associated with the “after-care” was previously treated as a contingent liability due to the various uncertainties regarding the reasonableness and plausibility of the cost estimate as well as the uncertainty regarding the radiological end-state of these facilities.

It is envisaged that an assessment of the long-term safety of the site will be conducted at the end of the operational period to determine whether the remaining facilities and the environmental pathways should continue to be monitored after site closure, taking into account the total nuclide inventory as well as updated safety assumptions and conditions at the time. This safety assessment will form the basis according to which post,closure residual risks (engineering and environmental) will be managed in the institutional control period.

The “after-care” liability assessment should follow the same methodology and adhere to the agreed governance processes that were applicable for the past strategic disused facilities to ensure the reasonableness and accuracy of the liability estimate. Such process will have to follow the required governance processes and expert review and verification process to pass the test of being “measured with sufficient reliability”.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 46. Investment contributions for future liabilities

This represents contributions invested / ring fenced for the future decommissioning of facilities.

	2016 R'000	Movement R'000	2017 R'000
NTP - Commercial facilities	19 274	1 201	20 475
SAFARI-1	13 775	1 404	15 179
	<b>33 049</b>	<b>2 605</b>	<b>35 654</b>

#### 47. Risk Management

##### Capital Risk Management

The Group's objectives when managing capital are to safeguard the Group's ability to continue as a going concern in order to provide returns for shareholder and benefits for other stakeholders and to maintain an optimal capital structure to reduce the cost of capital.

In order to maintain or adjust the capital structure, the Group may adjust the amount of dividends paid to shareholder, return capital to shareholder, issue new shares or sell assets to reduce debt. There are no externally imposed capital requirements. There have been no changes to what the entity manages as capital, the strategy for capital maintenance or externally imposed capital requirements from the previous year.

##### Financial Risk Management

The Group's principal financial liabilities comprise loans and borrowings and trade and other payables. The main purpose of these financial liabilities is to finance the Group's operations. The Group has loan and other receivables, trade and other receivables, cash and short term deposits that arrive directly from its operations. The Group also holds available for sale investments.

The Group's activities expose it to a variety of financial risks: market risk (including currency risk, interest rate risk and price risk), credit risk and liquidity risk. Market risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market prices. Market prices comprise four types of risk: interest rate risk, currency risk, commodity price risk and other price risk, such as equity price risk. Financial instruments affected by market risk include loans and borrowings, deposits, available-for-sale investments and derivative financial instruments.

The Group's overall risk management programme focuses on the unpredictability of financial markets and seeks to minimise potential adverse effects on the Group's financial performance. Risk management is carried out by a central department under policies approved by the Board of Directors. This department identifies and evaluates financial risks in close co-operation with the Group's operating units. The Board of Directors provides written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, credit risk and investment of excess liquidity.

### Liquidity Risk

Liquidity risk is the risk that the Group will not have sufficient financial resources to meet its obligations when they fall due, or will have to do so at excessive cost. The risk can arise from mismatches in the timing of cash flows from revenue and capital and operational outflows. Prudent liquidity risk management implies maintaining sufficient cash, the availability of funding through an adequate amount of committed credit facilities. The Group's risk to liquidity is a result of the funds available to cover future commitments. The Group manages liquidity risk through an ongoing review of future commitments and available credit facilities.

The objective of the Group's liquidity and funding management is to ensure that all foreseeable operational, capital expansion and loan commitment expenditure can be met under both normal and stressed conditions. The Group has adopted an overall statement of financial position approach, which consolidates all sources and uses of liquidity, while aiming to maintain a balance between liquidity, profitability and interest rate considerations.

The Group's liquidity and funding management process includes:

- ▶ Strict control on recovering of outstanding debtors;
- ▶ Monthly cash flow forecasts; and
- ▶ Investment of excess funds in low risk, available-on-request investments.

Cash flow forecasts are prepared and adequate utilised borrowing facilities are monitored.

The table below analyses the Group's financial liabilities into relevant maturity Groupings based on the remaining period from the end of the reporting period to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows. Balances due within 12 months equal their carrying balances as the impact of discounting is not significant.

The outstanding balance has been allocated into different categories as per there prior year to provide more comprehensive information.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 47. Risk Management (continued)

	Less than 1 year R '000	Between 1 and 2 years R '000	Between 2 and 5 years R '000	Over 5 years R '000
<b>Group</b>				
<b>At 31 March 2017</b>				
Borrowings	349	2 597	20 248	5 516
Trade and other payables	78 807	62 766	26 430	19 374
Bank overdraft	120 000	-	-	-
<b>At 31 March 2016</b>				
Borrowings	315	2 515	20 271	15 972
Trade and other payables	107 685	91 480	56 793	1 735
Bank overdraft	60 006	2	-	-
	Less than 1 year R '000	Between 1 and 2 years R '000	Between 2 and 5 years R '000	Over 5 years R '000
<b>Company</b>				
<b>At 31 March 2017</b>				
Trade and other payables	102 984	13 678	7 617	1 994
Bank overdraft	120 000	-	-	-
<b>At 31 March 2016</b>				
Trade and other payables	95 010	13 485	29 382	1 735
Bank overdraft	60 000	-	-	-

The table below analyses the Group's derivative financial instruments which will be settled on a gross basis into relevant maturity groupings based on the remaining period from the end of the reporting to the contractual maturity date. The amount disclosed in the table are the contractual undiscounted cash flows. Balances due within 12 months equal their carrying balances as the impact of discounting is not significant.

	Less than 1 month R '000	Between 1 and 3 months R '000	Between 3 months and 1 year R '000
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### Group

#### At 31 March 2017

Forward foreign exchange contracts

- Outflow	(28 534)	(7 278)	(6 731)
- Inflow	168 230	44 859	-
- Net	139 696	37 581	(6 731)

#### At 31 March 2016

Forward foreign exchange contracts

- Outflow	(28 553)	(1 337)	(40 211)
- Inflow	150 101	40 878	572
- Net	121 548	39 541	(39 639)

Less than 1 month R '000	Between 1 and 3 months R '000
--------------------------------	-------------------------------------

### Company

#### At 31 March 2017

Forward foreign exchange contracts

- Outflow	(2 716)	(427)
- Inflow	17 835	-
- Net	15 119	(427)

#### At 31 March 2016

Forward foreign exchange contracts

- Outflow	(3 314)	(40 149)
- Inflow	5 827	-
- Net	2 513	(40 149)

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 47. Risk Management (continued)

##### Interest Rate Risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Group's exposure to the risk of changes in market interest rates relates primarily to the Group's long-term debt obligations with floating interest rates.

As the Group has no significant interest-bearing assets, the Group's income and operating cash flows are substantially independent of changes in market interest rates.

The Group's interest rate risk arises from long-term borrowings and commitments. Borrowings issued at fixed rates expose the Group to fair value interest rate risk. During 2017 and 2016, the Group's borrowings at variable rate were denominated in Rand.

##### Cash Flow Interest Rate Risk

At 31 March 2017, if interest rates on Rand-denominated borrowings and commitments had been 1% higher/lower with all other variables held constant, post-tax profit for the year would have been R7 515 (2016: R5 839) lower/higher, mainly as a result of higher/lower interest expense on floating rate borrowings and commitments.

The sensitivity analysis for interest rate risk assumes that all other variables, in particular foreign exchange rates, remain constant.

##### Credit Risk

Credit risk is the risk of financial loss to the Group if a customer or other counterparty to a financial instrument fails to meet its contractual obligations.

The Group is exposed to credit risk from its operating activities (primarily for trade receivables) and from its financing activities, including deposits with banks and financial institutions, foreign exchange transactions and other financial instruments.

Credit risk consists mainly of cash deposits, cash equivalents, derivative financial instruments and trade debtors.

The company only deposits cash with major banks with high quality credit standing and limits exposure to any one counter-party.

Trade receivables comprise a widespread customer base. Management evaluated credit risk relating to customers on an ongoing basis. Risk control assesses the credit quality of the customer, taking into account its financial position, past experience and other factors. Individual risk limits are set based on internal or external ratings in accordance with limits set by the Board. The utilisation of credit limits is regularly monitored.

The requirement for an impairment is analysed at each reporting period on an individual basis. The calculation is based on actually incurred historical data. The maximum exposure to credit risk at the reporting date is the carrying value of each class of financial asset.

The Group does not hold collateral as security. The Group evaluates the concentration of risk with respect to trade receivables as low, as its customers are located in several jurisdictions and industries and operate in largely independent markets.



Financial assets exposed to credit risk at year end were as follows:

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Financial instrument</b>				
ABSA A-	12 827	6 999	8 386	1 111
Allan Gray	-	-	-	-
Coronation fund	275 640	119 141	145 437	-
FNB BBB	150	854	-	-
Investec BBB	216 799	203 831	148 861	90 006
Momentum	179 168	115 595	30 484	-
Nedbank BBB	305 230	112 823	206 191	982
Old Mutual	1 217	-	1 217	-
Rand Merchant Bank BBB+	59 352	121 135	46 926	110 827
Sanlam AA-	54	54	54	54
Standard Bank BBB	128 306	26 139	103 281	78

### Foreign exchange risk

Foreign currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in the foreign exchange currency. The Group's exposure to the risk of changes in foreign exchange rates relates primarily to the Group's operating activities, foreign exchange risk arises when future commercial transactions or recognised assets or liabilities are denominated in a currency that is not the entity's functional currency.

The Group operates internationally and is exposed to foreign exchange risk arising from various currency exposures, primarily with respect to the US dollar and the Euro. Foreign exchange risk arises from future commercial transactions, recognised assets and liabilities and net investments in foreign operations.

Management has set up a policy to require Group companies to manage their foreign exchange risk against their functional currency. The Group manages its foreign currency risk by entering into forward exchange contracts for foreign currency denominated transactions. To manage their foreign exchange risk arising from future commercial transactions and recognised assets and liabilities, entities in the Group use forward contracts, transacted with Group treasury. Although the forward exchange contracts have not been designated in a hedge relationship, they act as a commercial hedge and will offset the underlying transactions when they occur.

The Group has certain investments in foreign operations, whose net assets are exposed to foreign currency translation risk. Currency exposure arising from the net assets of the Group's foreign operations is managed primarily through borrowings denominated in the relevant foreign currencies.

## Notes to the Annual Financial Statements (continued)

### for the Year Ended 31 March 2017

#### 47. Risk management (continued)

##### Foreign currency sensitivity

The following paragraphs demonstrate the sensitivity to a reasonable change in the foreign currency rate, with all other variables held constant.

##### Trade receivables and payables

At 31 March 2017, if the currency had weakened by 10% against the US dollar with all other variables held constant, post-tax profit for the year would have been R68 777 (2016: R51 365) higher, mainly as a result of foreign exchange gains on translation of US dollar denominated trade receivables.

At 31 March 2017, if the currency had weakened by 10% against the Euro with all other variables held constant, post-tax profit for the year would have been R17 918 (2016: R18 536) higher, mainly as a result of foreign exchange gains on translation of Euro denominated trade receivables and loans receivable.

The Group's exposure to foreign currency changes for all other currencies is not material.

	Group		Company	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Foreign currency exposure at the end of the reporting period</b>				
<b>Current assets</b>				
US Dollar	159 543	185 932	8 234	5 507
Euro	78 658	91 029	5 322	3
GBP	4 985	4 242	-	-
Other	-	7 965	-	-
<b>Liabilities</b>				
US Dollar	69 241	62 848	130	1 797
Euro	12 784	13 963	138	317
GBP	1 999	3 467	-	26
Other	1 514	4 298	-	-
<b>Exchange rates used for conversion of foreign items were:</b>				
USD	13.4	14.7	13.4	14.7
Euro	14.7	16.8	14.7	16.8
GBP	16.8	21.2	16.8	21.2

The Group reviews its foreign currency exposure, including commitments on an ongoing basis. Although the foreign exchange contracts have not been designated in a hedge relationship, they act as a commercial hedge and will offset the underlying transactions when they occur.

### Price risk

The Group is exposed to equity securities price risk because of investments held by the Group and classified on the consolidated statement of financial position as available-for-sale. To manage its price risk arising from investments in equity securities, the Group diversifies its portfolio. Diversification of the portfolio is done in accordance with the limits set by the Group.

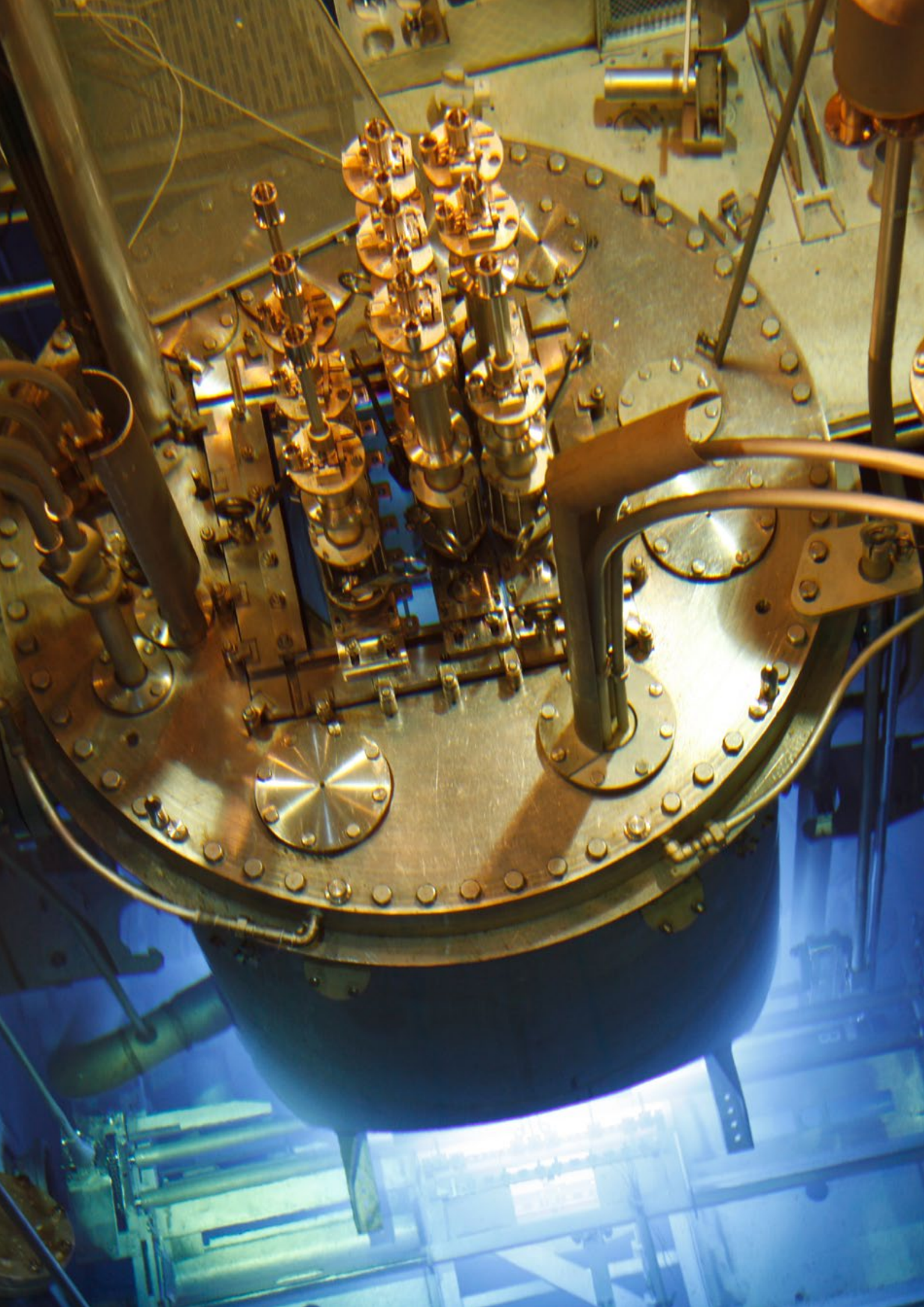
The table below summarises the impact of increases/decreases. The analysis is based on the assumption that the equity price has increased/decreased by 5% with all other variables held constant:

#### Group

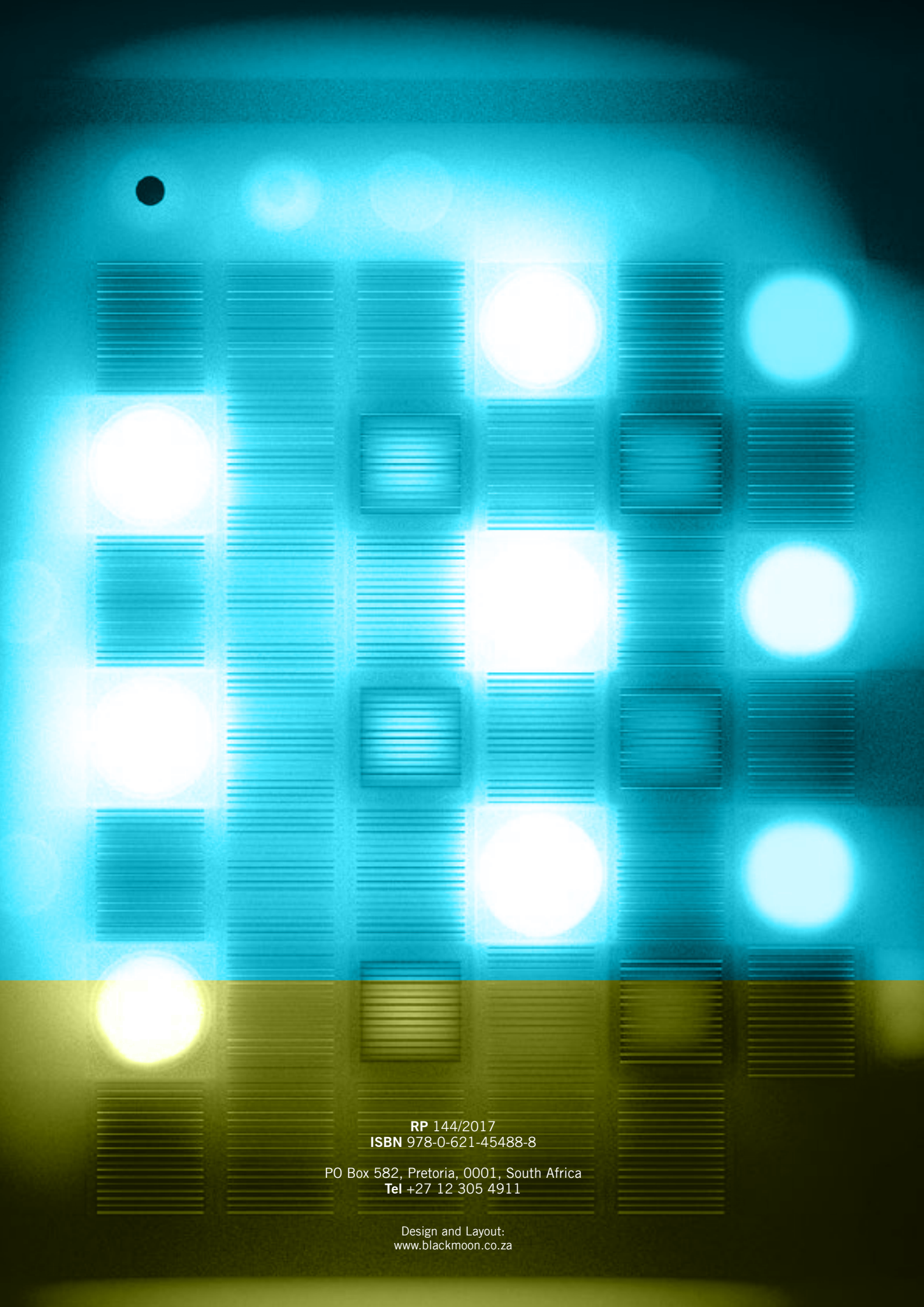
	Impact on post profit in Rand		Impact on other components of equity in Rand	
	2017 R '000	2016 R '000	2017 R '000	2016 R '000
<b>Financial Instrument</b>				
Coronation Unit Trusts	-	-	43 351	2 116

Only this, and nothing more.





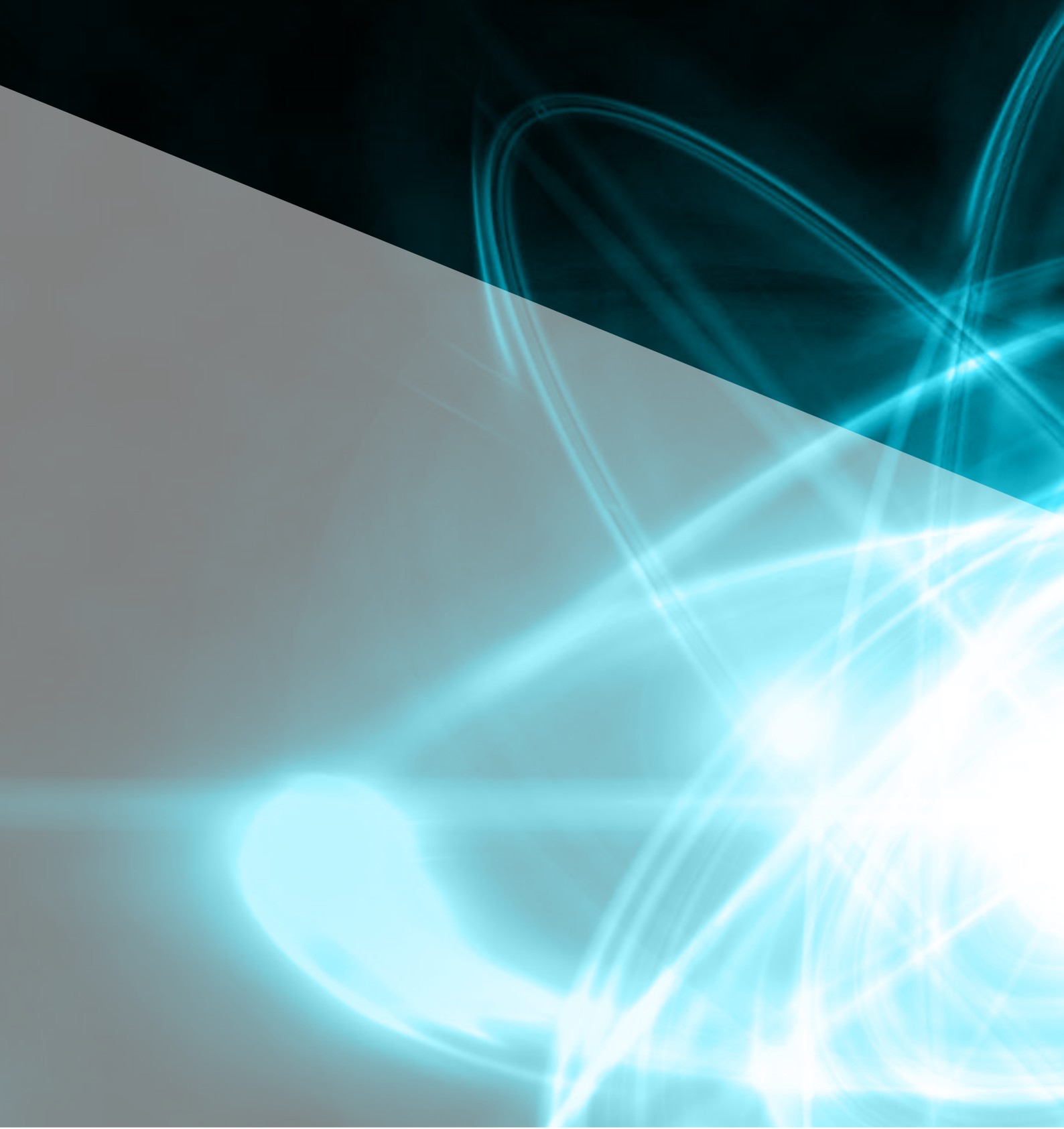




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