



NATIONAL NUCLEAR REGULATOR

For the protection of persons, property and the environment against nuclear damage.





1st STEERING COMMITTEE MEETING: GLOBAL NUCLEAR SAFETY AND SECURITY NETWORK

IAEA, VIENNA AUSTRIA

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MSc nuclear sciences, ITC-19, POPPS (nuclear security)

2-4 April 2012

SOUTH AFRICAN PERSPECTIVE

State President: Mr Jacob G. Zuma (<http://www.gcis.gov.za/>)

Location: Southern tip of Africa, surrounded by Indian and Atlantic oceans

Political and economic region: SADC (Southern African Development Community) (<http://www.sadc.int/>) and African Union (AU) (<http://www.au.int/en/>)

Capitals: Pretoria (administrative), Cape Town (legislature), Bloemfontein (judicial)

11 official languages: English, isiNdebele, isiXhosa, isiZulu, Sesotho sa Leboa, Sesotho, Setswana, Afrikaans, siSwati, Tshivenda, Xitsonga (<http://www.info.gov.za>)

Key economic sector: mining, transport, energy,
manufacturing, tourism, agriculture

Population: Total: 50 586 757

Male: 24 515 036

Female: 26 071 721

Gross Domestic Product: US\$286 billion (Yr 2011/12)

Economic growth: 3-4 % (Yr 2011/12)

(<http://www.eastasiaforum.org/2011/04/01/south-africa-joins-bric-with-china-s-support/>)



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National programme for energy supply: Integrated Resource Plan (IRP2010, 6 May 2011)

- Long-term outlook for the generation mix in South Africa
- Recognises that supply/demand balance will be tightest during 2011-2012 as additional supply options are relatively limited until new build capacity starts to come on stream.
- Partnership between Government, Business, Labour, Civil Society and Eskom.
- South Africa's electrical energy will, by 2030, comprise 48% coal, 14% nuclear, 16% renewable energy, 9% peaking open cycle gas turbine, 6% peaking pump storage, 5% mid-merit gas and 2% hydro.

Current nuclear power generation: nuclear power generated by national electricity utility, ESKOM

- 1 nuclear power plant: Koeberg Nuclear Power Station, Western Cape
- 2 units (2X900 Mwe, Framatome/Areva technology design, PWR type, commissioned 1984 and 1985)
- Nuclear power source: 3.7 w / o ²³⁵U (enrichment)
- ESKOM supplies 95% electricity in SA, 45% in Africa, nuclear generation at 5.3% in SA (http://www.gcis.gov.za/resource_centre/sa_info/pocketguide/2010/017_energy.pdf)



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KOEBERG NUCLEAR POWER PLANT (ESKOM: DEPT. OF PUBLIC ENTERPRISE)



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NATIONAL LEGISLATIVE FRAMEWORK

NUCLEAR ACTS

- Act 46 of 1999 Nuclear Energy
- Act 47 of 1999 National Nuclear Regulator
- Act 53 of 2008 National Radio Active Waste
- Act 87 of 1993 Non-Proliferation of WMD
- Act 15 of 1973 Hazardous Substances

INTERNATIONAL OBLIGATIONS

- Non-Proliferation Treaty 1970
- Safeguards Agreement 1991
- Additional Protocol 2002
- Convention on PPNM 1980
- Pelindaba Treaty 2009
- Zangger Committee 2000
- Nuclear Supplier Group 2011

NUCLEAR NOTICES

- Government Notice 2007

NUCLEAR POLICIES

- Nuclear Energy 2003

(http://www.energy.gov.za/files/policies_frame.html)



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MANDATE OF THE NNR

- The National Nuclear Regulator Act (Act No 47 of 1999) (NNRA) established the National Nuclear Regulator (NNR).
- The NNRA came into force on 24 February 2000.
- The promulgation of the NNRA, which deals exclusively with the regulation of the nuclear industry, provides for the separation of the promotional and Regulatory functions in the nuclear industry in South Africa.
- The promotional aspects of nuclear activities in South Africa are legislated by the Nuclear Energy Act (Act No 46 of 1999)

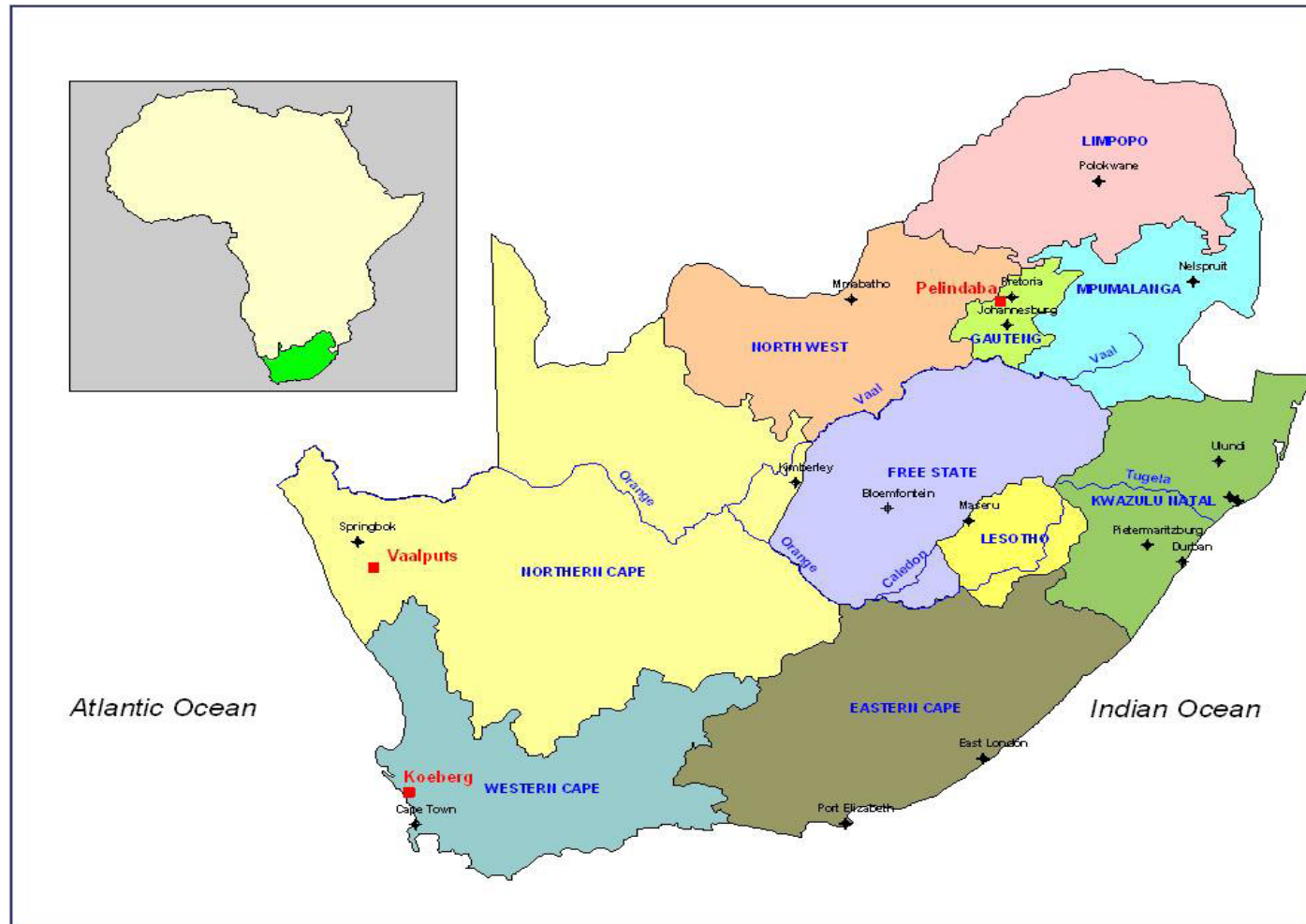
(www.nnr.co.za)



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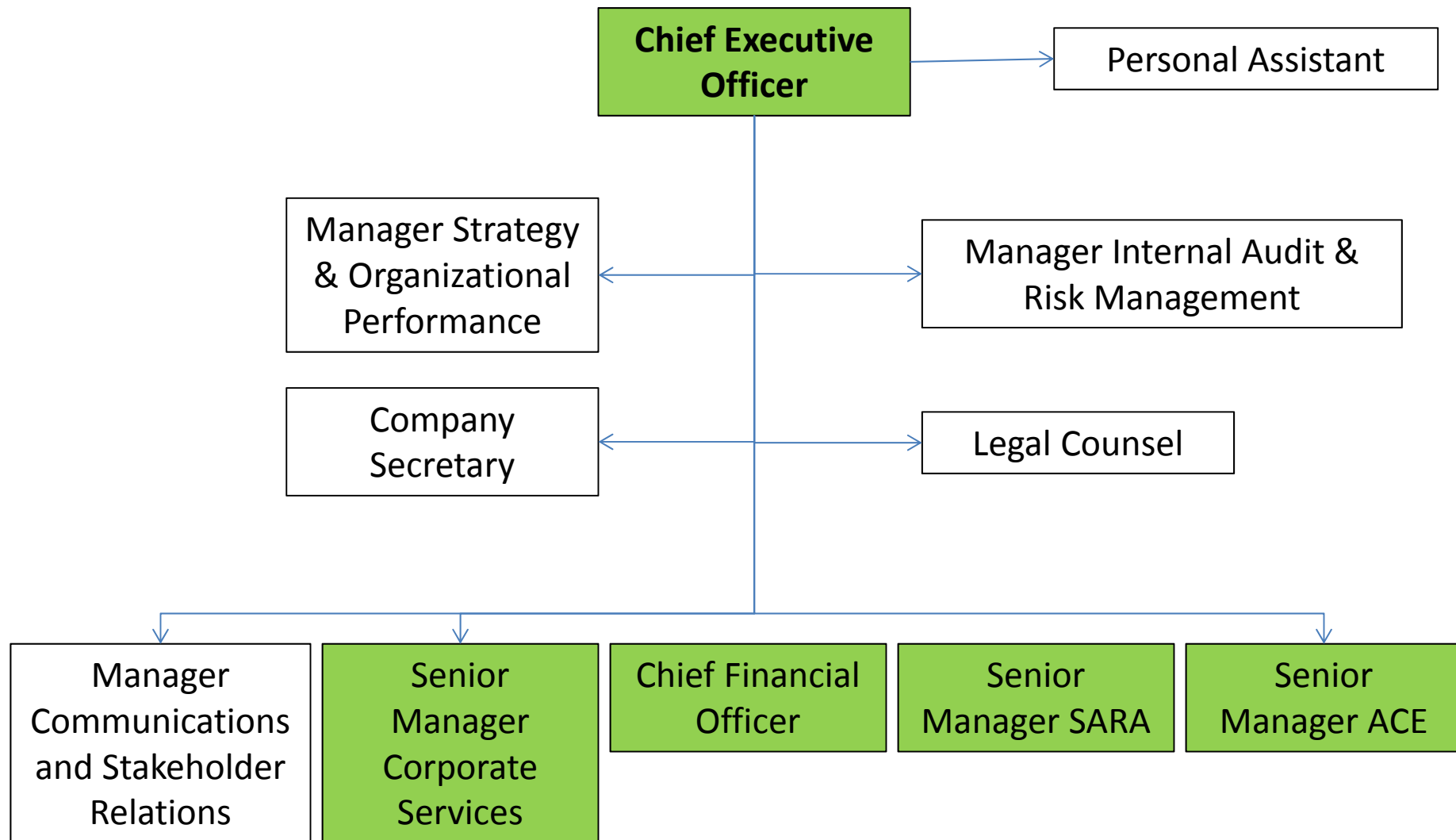
SPREAD OF NUCLEAR FACILITIES/INSTALLATIONS AND NORM AUTHORISATION HOLDERS



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TOP MANAGEMENT STRUCTURE WITH EXECUTIVE COMMITTEE



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NETWORKS AFFECTING NUCLEAR SAFETY & NUCLEAR SAFETY STANDARDS

Safety standards and regulatory practices adopted by NNR are in line with international nuclear safety standards of the International Atomic Energy Agency (IAEA) and the International Commission on Radiation Protection (ICRP) as well as other international norms and standards such as INSAG, USNRC 10 CFR 50 , ASME Standards , IEEE standards etc

WANO regional centre: ESKOM (Koeberg, NPP) affiliated with Atlanta as category 1

Regional regulatory network: FORUM OF NUCLEAR REGULATORY BODIES IN AFRICA

(FNRBA). The purpose of FNRBA is to provide for the enhancement, strengthening and harmonisation of the radiation protection, nuclear safety and security regulatory infrastructure and framework among the members of FNRBA; and to provide for mechanisms for the FNRBA to be an effective and efficient internationally recognized forum for the exchange of regulatory experiences and practices among the nuclear regulatory bodies in Africa.

Multinational Design Evaluation Programme (MDEP): a multinational initiative to leverage the resources and knowledge of national regulatory authorities

South Africa looking to go on New Build programme. Two design-specific working under consideration (AP1000 Westinghouse, EPR Areva)

- NNR will join once preferred design is identified



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- Vendor Inspection Cooperation Working Group
- Digital Instrumentation and Controls Working Group (DICWG)
- Codes and Standards Working Group (CSWG)

INES SCALE: communicating to the public in an open and consistent way the safety significance of nuclear and radiological events

IAEA: South Africa has been a member state of the IAEA since 1957 and has the following Multilateral Agreements in force;

- Agreement on the Privileges and Immunities of the IAEA
- Convention on the Physical Protection of Nuclear Material
- Convention on Early Notification of a Nuclear Accident
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Nuclear Safety
- Application of Safeguards in Connection with Treaty on the Non-Proliferation of Nuclear Weapons.



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- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)
- African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA) - Fourth Extension



SAFEGUARDS AGREEMENT

- Agreement between the IAEA and the Government of the Republic of South Africa for Application of Safeguards in Connection with the Treaty on the Non- Proliferation of Nuclear Weapons 1744.
- Protocol Additional to the Agreement between the Government of the Republic of South Africa and the International Atomic Energy Agency for the App



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Key organisations in the sector include;

- The DOE plays a leading governance role regarding nuclear technology, non-proliferation and safety. The Minister of Energy is the executive authority responsible for overseeing the Nuclear Energy Corporation of South Africa (Necsa) and the National Nuclear Regulator (NNR).
- Necsa undertakes and promotes research and development in the fields of nuclear energy, radiation sciences and technology, medical-isotope manufacturing, nuclear liabilities management, waste management and decommissioning. Necsa's reactor-produced radioisotopes are exported to more than 50 countries.
- The NNR oversees safety regulation of nuclear installations at Necsa's Pelindaba site, Vaalputs Radioactive Waste Disposal Facility, the Koeberg Nuclear Power Station, certain mines (NORM industry) and other small users



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- The Department of Health Directorate: Radiation Control issues licences for:
 - Group III hazardous substances (electronic product generating X-rays, other ionising beams, electrons, neutrons or other particle radiation or non-ionising radiation); and
 - Group IV hazardous substances (radioactive material outside a nuclear installation, which does not form part of or is used or intended to be used in the nuclear fuel cycle, and which is used or intended to be used for medical, scientific, agricultural, commercial or industrial purposes).
- The Koeberg Nuclear Power Station is responsible for electricity generation. It is government-owned through the public entity, Eskom, which reports to the Minister of Public Enterprises.
- iThemba Laboratories is responsible for medical isotopes and medical applications. This public entity falls under the Department of Science and Technology.
- The Nuclear Fuels Corporation (NUFCOR) is responsible for uranium-ore refinement and export. It is privately owned by AngloGold.
- National Disaster Management Centre, Pretoria



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BILATERAL AGREEMENTS WITH INTERNATIONAL ASSOCIATES

Active Bilateral Agreements

Country	Date signed	Expiry date	Period remaining
USA (NRC)	14 Dec 2009	14 Dec 2014	2 years
Canada (CNSC)	17 Sep 2007	17 Sep 2012	7 months
France (ASN)	17 Sep 2007	17 Sep 2012	7months
UK (HSE) ONR	16 Dec 2009	16 Dec 2014	2 years
S. Korea (KINS)	21 Sept.2011	NA	NA



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LESSONS FROM FUKUSHIMA EVENT

- Following the Fukushima accident the NNR required Eskom and Necsca to reassess the safety of Koeberg and SAFARI-1 respectively along similar lines to the so-called stress tests conducted internationally.
- In response to the NNR directive of May 2011, Eskom and Necsca conducted the assessments and submitted their respective safety reassessment reports in December 2011. The NNR has completed its review of these reports, with the following conclusions:
 - The assessments conducted conform to the NNR directive and are in accordance with international practice.
 - The nuclear installations have been adequately designed, and are maintained and operated to withstand all the external events that were considered in the original design base.



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- Nothing has been found to warrant curtailing their operation or to question the design margins of these facilities.
- The safety reassessments identified a number of potential improvements to further reduce risk beyond the design requirements. Eskom and Necsa will be required to implement such improvements.
- As anticipated, given the short timescale for the reassessment, follow-up studies are still to be performed to confirm the conclusions and to consolidate the formal licensing documentation.
- The NNR has identified 5 areas for improvement of the Regulatory Standards and Regulatory Practices. These areas for improvement will be addressed as part of the current review of the Regulatory Framework project.
- In preparation for an expanding nuclear programme, the NNR has implemented a strategy and plan to review the Regulatory Standards and Practices, to provide greater clarity and consistency across different technologies. The review of the regulatory standards will incorporate the lessons learnt from the Fukushima event.



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CO-OPERATIVE GOVERNANCE AGREEMENTS

- Department of Mineral Resources: Mine Health & Safety Inspectorate
- Department of Energy : Electricity & Nuclear
- Department of Health Directorate: Radiation control
- Department of Water and Environmental Affairs
- Department of Transport: Civil Aviation Authority
- Department of Transport: South African Maritime Safety Authority
- Department of Transport: Railway Safety Regulator
- Department of Transport: Road Traffic Management Corporation
- Department of Labour



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REGIONAL COOPERATION: NUCLEAR SAFETY & SECURITY REGULATORS

- FNRBA: Forum for Nuclear Regulatory Bodies in Africa
- Strengthening Radiation Protection infrastructure in Member States
 - Building Nuclear Safety infrastructure in New Comer States



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THANK YOU FOR YOUR ATTENTION

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