Nuclear Energy




energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

CONTENTS

LEGISLATIVE MANDATE

To ensure secure and sustainable energy provision for socio-economic development

MISSION

To regulate and transform the sector for the provision of secure, sustainable and affordable energy

VISION 2014

A transformed and sustainable energy sector with universal access to modern energy carriers for all by 2014

VISION 2025

Improving our energy mix by having 30% of clean energy by 2025

VALUES

Batho-Pele

Ethics

Honesty

Integrity

Accountability

Proffessionalism

Ubuntu

A. Introduction

South Africa has an energy intensive economy mainly as a consequence of the exploitation of the country's mineral resources. Coal accounts for over 90% of the total electricity generating capacity. This is mainly due to the abundant coal deposits in the north-eastern parts of the country.

This resulted in South Africa building its first nuclear power station in the Western Cape during the 1980's in order to ameliorate the situation. Although at present nuclear power accounts for only approximately 6% of electricity generated in the country, it is very important in an area where there are no coal reserves.

Concerns over increases in the price of coal, reserve exhaustion and global warming, partly as a result of greenhouse gas emissions and other atmospheric pollutants, necessitate a departure from the over-reliance on electricity generated from coal.

South Africa also possesses sizeable uranium reserves and has an extensive uranium mining industry, making the country one of the important producers of uranium in the world. The presence of this primary energy source in South Africa is a key element of security of energy supply nationally.

B. Core function

The Department of Energy's function on Nuclear is to administer all matters related to nuclear energy as required by legislation and international agreements. These can be divided into three key activities, namely Nuclear Safety, Nuclear Technology, and Nuclear Non-Proliferation.

Nuclear energy, technology and safety policies facilitate the integration of the nuclear sector in various facets of South African society. These policies position the South African industry to be world-class leaders in various fields of nuclear expertise.

The nuclear sector in South Africa is mainly governed by the Nuclear Energy Act 1999, Act 46 of 1999 and the National Nuclear Regulator (NNR) Act 1999, Act 47 of 1999. These Acts are administered by the Department of Energy.

Other legislation that also have some relevance for the nuclear industry are the Hazardous Substances Act, the Non-Proliferation of Weapons of Mass Destruction Act, the Patent Act, the National Strategic Intelligence Act, the National Key Points Act, the Protection of Constitutional Democracy Against Terrorist and Related Activities Act, the Mine Health and Safety Act, the Mineral and Petroleum Resources Development Act,

the National Environmental Management Act, the National Water Act and the Dumping at Sea Control Act.

C. Key Activities

i. Nuclear Safety

The provisions for Nuclear Safety are implemented by the National Nuclear Regulator, which reports to the Minister of Energy.

The National Nuclear Regulator was established and is governed in terms of the National Nuclear Regulator Act, Act 47 of 1999, which came into effect on 20 February 2000.

The NNR is responsible for exercising regulatory control over the safety of nuclear installations, certain types of radioactive waste, irradiated nuclear fuel and the mining and processing of radioactive material. It is also responsible for the protection of persons (workers and members of the public), environment and property from the harmful effects arising from ionising radiation produced by radioactive material.

Government has established a legal framework to manage radioactive waste as set out in the new Nuclear Energy Act, No. 46 of 1999, which commenced on 24 February 2000 and which place the responsibility with government. The Radioactive waste Management Policy and Strategy for South Africa was approved in 2005. Following the approval of the Policy, the National Committee on Radioactive Waste Management was established in 2006. This is a committee of government that will oversee the implementation of the policy and strategy. The National Radioactive Waste Disposal Institute Act, Act 53 of 2008 was promulgated in January 2009.

The Department of Energy is also responsible for nuclear disaster management as required by the Disaster Management Act, Act No.57 of 2002, which is administered by the Department of Provincial and Local Government.

ii. Nuclear Non-Proliferation

The main objective of the Non-Proliferation is to ensure that nuclear material, facilities, equipments and related technologies are used for peaceful purposes only.

International Obligations are executed through the following:

- South Africa acceded to the Treaty on the Non-Proliferation of Nuclear Weapons on 10 July 1991. The objective of the Treaty is to prevent spread of Nuclear Weapons other than that 5 Nuclear Weapon States (United States, United Kingdom, France, China, and Russia), facilitate peaceful nuclear co-operation between Treaty members and provide foundation for nuclear disarmament.
- Agreement of 16 September 1991 between the Government of the Republic of South Africa and the International Atomic Energy Agency for the Application of Safeguards in connection with the treaty on the Non-Proliferation of Nuclear Weapons.
- South Africa concluded Additional Protocol (Protocol Additional to the agreement between the RSA and the IAEA for the application of safeguards in connection with the treaty on the non-proliferation of nuclear weapons) on 13 September 2002
- Nuclear Supplier Group. Nuclear Supplier Group is a 45 member group of nuclear supplier which seeks to contribute to the non-Proliferation of nuclear weapons through the implementation of guidelines for nuclear related exports but that is accordance with a particular country's laws. South Africa joined the NSG on 5 April 1995.
- The Zannger Committee and NSG differ slightly in the scope of their trigger list. The Zannger list is redistricted to items falling under Article (III).2 of the NPT.
- The Convention on the Physical Protection of Nuclear Material (CPPNM), entered into force in 1987. It obliges States Parties to implement specific protection measures for nuclear material in international transport and ensure protection at the levels specified in the Convention, of nuclear material used for peaceful purposes on their territories, ships or aircraft during international nuclear transport. The Convention was amended in July 2005. South Africa ratified the original Convention on 17 September 2007. The process to accede to the amended Convention is in progress.
- The Pelindaba Treaty, also called the African Nuclear-Weapon-Free Zone Treaty is a treaty prohibiting the production and absolute control over the nuclear weapons in the African region. The Pelindaba Treaty was opened for signature in Cairo on 11 April 1996. All 53 members of the African Union have signed the Treaty.

iii. Nuclear Technology

The main state asset co-ordinating research and development in the the nuclear sector is the South African Nuclear Energy Corporation (Necsa), established in terms of the Nuclear Energy Act, Act No. 46 of 1999.

Apart from several ancillary functions, the main functions of Necsa are to undertake and promote research and development in the fields of nuclear energy and radiation sciences and technology; process source material, special nuclear material and restricted material; and co-operate with persons in matters falling within these functions.

It also develops and utilises nuclear technology as part of the National System of Innovation. The corporation serves the State's nuclear institutional obligations. Its growth strategy is aimed at contributing to national and regional socio-economic development in line with the New Partnership for Africa's Development.

Necsa is also responsible for the following institutional obligations on behalf the State:

- Decommissioning and decontamination of past strategic nuclear facilities;
- Management of nuclear waste disposal on a national basis;
- Application of radiation technology for scientific and medical purposes;
- Operation of the **SAFARI-1** nuclear reactor;
- Operation of the Phelindaba site and accompanying services; and
- Execution of the safeguards function.

The implementation of the Nuclear Energy Policy of 2008 is a key mission of the Department of Energy. The policy provides a framework within which prospecting, mining, milling and use of nuclear materials as well as the development and utilisation of nuclear energy for peaceful purposes shall take place.

South Africa participates in the Generation IV International Forum (GIF) on Nuclear Technology Development after acceding to the GIF Framework Agreement in April 2008. The objective of GIF Framework Agreement is to establish a framework for international collaboration to foster and facilitate achievement of the purpose and vision of GIF, namely the development of concepts for one or more generation (IV) systems that can be licensed, constructed and operated in a manner that will provide a competitively priced and reliable supply of energy while satisfactorily addressing nuclear safety, waste, proliferation and public concerns.

South Africa is a member of INPRO together with 21 other countries. The objective of INPRO is to support the safe, sustainable, economic and proliferation-resistant use of nuclear technology to meet the global energy needs of the 21st century.

D. Women and Youth Issues

The Department of Energy also supports associations such as WiNSA and SAYNPS.

The Women in Nuclear South Africa was formally launched by the former Deputy Minister Susan Shabangu in 2003 to be the voice of the women in the nuclear sector. The purpose of the organization is to serve as a focal point for the development of strategies for the empowerment of women within the nuclear sector.

The South African Young Nuclear Professionals was established in 2004 and launched by the Minister of Minerals and Energy in August 2006. SAYNPS represents the youth in the nuclear sector and derives its membership from companies in the nuclear sector and also universities.

E. Glossary

- INPRO: International Project on innovative Nuclear Reactors and Fuel Cycles
- Necsa: South African Nuclear Energy Corporation
- NNR: National Nuclear Regulator
- Nuclear Energy: Nuclear energy is the process of creating heat through the fission process. Fission process takes place when the nucleus of a heavy atom like uranium is split into two when struck by a neutron.
- Nuclear Non-Proliferation: the prevention of increasing the number of countries possesing Nuclear Weapons.
- Radioactive Waste: Material that contains or contaminated with radio-nuclides at concentrations or activity greater than clearance levels as established by the regulatory body and for which no use is foreseen.
- SAYNPS: South African Young Nuclear Professional Society
- WiNSA: Women in Nuclear South Africa

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