NATIONAL NUCLEAR REGULATOR

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

Regulation of existing and new nuclear power stations in South Africa in the light of the Fukushima Accident

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NATIONAL STRATEGY FOR EXPANSION OR INTRODUCTION NUCLEAR POWER

National Strategy so far has been positioned in as far as:

- The Nuclear Energy Policy of 2008 – provides a framework for nuclear power generation for South Africa
- National Integrated Resource Plan 2010 – Identified 9.6GWe for Nuclear Power by 2030.
- Government has establish recently constituted the National Nuclear Energy Executive Coordination Committee (NNEECC), led by the Deputy President and Ministers from the Department of Energy (DoE), Department of Public Enterprises (DPE), Department of Mineral Resources DMR, Department of Environmental (DEA) Affairs working at Cabinet level.
- Government has embarked on planning initiatives to support nuclear expansion as an enabler to create a basis for growth of the economy.

Koeberg Nuclear Power Station

Regulation of Existing nuclear installations

- The National Nuclear Regulator (NNR) is mandated to provide for the protection of persons (the public and workers), property and the environment against nuclear damage as the competent authority for nuclear regulation in South Africa through the National Nuclear Regulator Act, Act No 47 of 1999 (NNR Act).
- Koeberg Nuclear Power Station in Cape Town, South Africa is licensed in terms of process-based licensing. The operating organisation has a system of licensing in which the safety envelope for operation has been agreed with the regulator.

Regulation of Existing nuclear installations

- The regulatory requirements of the Safety Regulations promulgated through the NNRA comprise general requirements in respect of respect good engineering practice, ALARA, the defence-in-depth principle and specific radiation dose limits.
- Dose limits are categorised for normal operation and operational occurrences for workers and the public.
- The safety regulations also prescribe occupational risk limits for the workers as well as risk limits for the public for all possible events that could lead to radioactive exposure.

Regulation of Existing nuclear installations

- Following the accident at the Fukushima Daiichi nuclear power plant in Japan the National Nuclear Regulator of South Africa (NNR) directed nuclear authorisation holders Eskom to perform a safety reassessment of Koeberg facilities equivalent to the ''stress tests'' conducted internationally. The aims of the safety reassessments were to:

- Identify vulnerabilities of the plant.
- Evaluate the safety margins for beyond design basis accidents.
- Identify modifications, safety measures and technical features to be implemented in order to strengthen defence-in-depth and improve the current level of safety of the NPP.

Short term safety measures proposed by Eksom

- Installation of hardened suction and discharge points for portable emergency equipment.
- Emergency associated instrumentation and electrical equipment.
- Strengthening key emergency equipment.
- Improving emergency lighting of the plant.
- Constructing a portable equipment storage facility.
- Upgrading onsite and offsite communication systems.

Long term safety measures

- Installing filtered containment venting.
- Additional protection for diesel generators.
- Additional auxiliary feed-water inventory and diesel driven feed-water pumping.
- Upgrading non-safety related buildings.
- Providing alternative spent fuel cooling.

Long term safety measures

- Installing passive thermal shutdown seals on primary pumps.
- Providing external connection points for reading critical plant parameters.
- Ensuring that essential rooms are watertight.
- Protecting bund walls, sumps and drains against flooding.
- Installing an alternate ultimate heat sink.

Regulation of new nuclear power plants

The NNR requires that New Nuclear Technology projects comply with the highest level of safety and security. The NNR approach to regulation is to set overall safety standards and objectives and requires the applicant or authorisation holder to demonstrate compliance through conducting safety assessments in terms of these safety standards.

The regulatory approach involves the use of regulations, safety standards, expounding on our regulatory philosophy, incorporating international experience feedback on generic safety issues, and also taking cognisance of lessons learnt from the Fukushima accident.

Safety measures for reducing the release of radioactivity

- Safety systems for long duration heat removal.
- Termination and control of the severe accident.
- Providing safety systems to mitigate the progression of a severe accident.
- Prevention of the degraded core.
- Well formulated procedures for effective man-machine interface, operator responsiveness, and safety culture.
- Maintain containment integrity.

Technical Issues

Technical issues which are part of the early engagement process with Eskom are as follows:

- External Events (tsunamis, earthquakes, floods, etc.)
- Design objectives for new nuclear installations
- Manufacturing oversight
- Types of and stages of nuclear authorisations for nuclear installations
- The Public participation process
- Format and content of Public Information Document
- Emergency Planning technical basis
- Digital Control and Instrumentation

Conclusion

- The existing regulatory framework is being strengthened in line with international standards and developments.
- The Nuclear Safety Action plan stemming from the Fukushima accident is being implemented.
- The operating organisation, Eskom, has formulated strategies to counteract external events that the plant may be subjected to.
- Technical issues resulting from Fukushima type accidents are being addressed.
- Design measures for new nuclear power plants are also formulated to ensure the highest level of safety for NPPs.
- The safety fundamentals of the IAEA are being implemented as part of the revision of the South Africa regulatory framework.
- The Regulatory Regime for ensuring safety must ensure that the safety standards are all-encompassing and providing improved safety levels.

CLOSURE

THANK-YOU FOR YOUR ATTENTION