



**NATIONAL NUCLEAR REGULATOR**  
*For the protection of persons, property and the environment against nuclear damage.*

**REGULATORY PREPAREDNESS FOR NEW BUILD IN SOUTH AFRICA**

FEBRUARY 2015

**DR B TYOBKA, CEO**




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**1. INTRODUCTION**

- Nuclear Energy Policy (NEP 2008):
  - Promote nuclear as the electricity supply option
  - Contribute to the national programme of social and economic transformation, growth and development
  - Reduction of greenhouse gas emission for the development and utilization of nuclear energy for peaceful purposes
  - Participation of public entities in uranium value chain
  - Promote energy security for South Africa
  - Skills development related to nuclear energy
- Integrated Resource Plan (IRP 2010)
  - Gazetted on 6 May 2011
  - 20 year electricity plan




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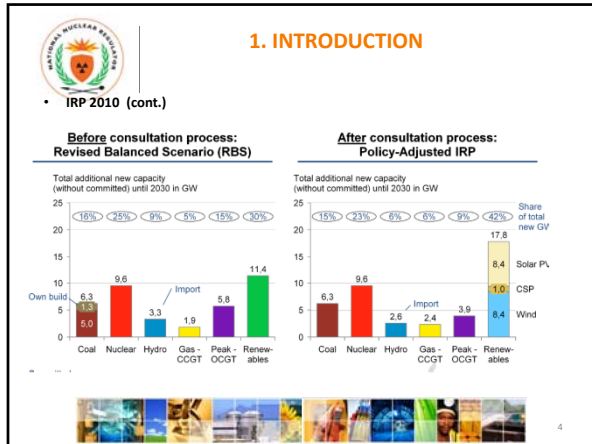
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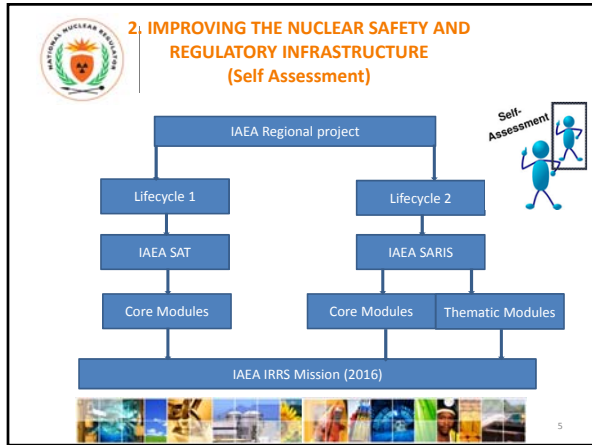
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- 2. IMPROVING THE NUCLEAR SAFETY AND REGULATORY INFRASTRUCTURE (Self Assessment)**
- IAEA Regional project to strengthen national regulatory infrastructure and promote regional cooperation among Regulatory Bodies
  - Life Cycle 1 Self Assessment performed in 2010 using IAEA standards and methodology (SAT)
  - Action plan to address findings approved in December 2011 and address amongst others:
    - Review and update of the regulatory standards and processes;
    - Regulatory training and development programme;
    - Establishment of source registers;
    - National remediation strategy;
    - Radiation instrumentation verification and calibration;
    - Update of QMS and establish library facilities; etc.

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 **2. IMPROVING THE NUCLEAR SAFETY AND REGULATORY INFRASTRUCTURE (Integrated Nuclear Infrastructure Review)**

- IAEA team of international experts visited South Africa from 30 January to 8 February 2013
- Carried out a review of South Africa's nuclear infrastructure
- First INIR mission to generating nuclear country, the first in Africa
- Review of 19 infrastructure issues
- Against IAEA publication "Milestones in the Development of a National Infrastructure for Nuclear Power"
- Milestones approach and guidelines ensure infrastructure required for the safe, responsible and sustainable use of nuclear technology




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 **2. IMPROVING THE NUCLEAR SAFETY AND REGULATORY INFRASTRUCTURE (INIR)**

- The IAEA INIR mission identified strengths
  - regulatory self-assessment
  - environmental impact assessment
  - grid development
  - stakeholder involvement
- Specific recommendations and suggestions identified to strengthen national nuclear infrastructure for nuclear power programme expansion;
- Action plan has been agreed and being implemented by the various NNECC working subgroups




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 **2. IMPROVING THE NUCLEAR SAFETY AND REGULATORY INFRASTRUCTURE (EPREV)**

- Need for EPREV identified following Fukushima safety assessment review as well as a recommendation from INIR; Included as a deliverable in country Nuclear Safety Action Plan
- IAEA EPREV mission took place 2-12 February 2014
- Full scope EPREV, including all facilities and activities (nuclear material and radioactive sources)
- Basis of review IAEA GS-R-2 "Preparedness and Response for a Nuclear or Radiological Emergency"
- Number of Good Practices, specific recommendations and suggestions to strengthen emergency preparedness and response framework;
- Action plan developed and some aspects are being implemented

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 **2. IMPROVING THE NUCLEAR SAFETY AND REGULATORY INFRASTRUCTURE (NNEECC)**

- The NEP of 2008 calls for the establishment of National Nuclear Energy Executive Coordination Committee (NNEECC), constituted by relevant Ministers and led by President, recently renamed the Energy Security Cabinet Sub-Committee
- National Energy Technical Committee (NETC) for DGs of various government departments, the NEWG as well as 6 sub working groups; As regulator we participate in some of the sub working groups.
- NEWG exercise oversight over all aspect of NEP and ensures alignment of all actions with national policies;
- NESWGs develops and recommends strategies to the NEWG addressing issues identified (INIR, EPREV, self assessments) in preparation and for implementation of new build programme:




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 **2. IMPROVING THE NUCLEAR SAFETY AND REGULATORY INFRASTRUCTURE (NNEECC)**

- To this end Vendor workshops have been conducted with 5 countries (China, France, Korea, Russia and USA) that have concluded Inter Governmental Agreements with South Africa
- The aim of the Vendor Workshops was to inform the procurement strategy and approached to be adopted for selection of the preferred technology



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 **3. OPTIMISING THE REGULATORY FRAMEWORK (NNR Act Amendments)**

- NNR Act (Act 47 of 1999) established the National Nuclear Regulator
- Part of a ten years cycle process to ensure the relevance and certainty of the law but also informed by lessons learnt from licensing of major projects such as the PBMR, self assessments conducted as well as recommendations from internal missions such as INIR and EPREV.
- The amendments specifically seeks to address;
  - ✓ Nuclear security - an area previously not adequately covered in the Act
  - ✓ Improvement of the enforcement regime
  - ✓ Licensing regime for Nuclear Vessels and Military Nuclear Vessels
  - ✓ Propose additional functions to ensure the comprehensiveness and completeness of the functions undertaken and the powers assumed by the Regulator
  - ✓ Aligning definitions and terminology in the Act with IAEA glossary



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### 3. OPTIMISING THE REGULATORY FRAMEWORK (NNR Regulations)

- Change in NNR Document hierarchy following ruling of the Cape High Court that Regulations 287 on Developments around Nuclear Installations be set aside;
- New document hierarchy does not include requirements documents (RD's and LD's) anymore
- Gap analysis performed assuming implementation of new document hierarchy and plan implemented to revise the entire suite of regulations and guidance documents
- To date all regulations that have been identified for development have been completed and have either been submitted to the Executive Authority for promulgation or with the NNR Board for consideration



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### 3. OPTIMISING THE REGULATORY FRAMEWORK (NNR Regulations)

Regulation Matrix	
General Nuclear Safety Regulations (Section 36 of NNR Act)	Specific Nuclear Safety Regulations (Section 36 of NNR Act)
1. Scope of Regulatory Control	a. Nuclear Facilities
2. Nuclear Authorisations	b. Waste Disposal Facilities
3. Management of Safety	
4. Safety Assessment	<i>Administrative Regulations</i>
5. Radiation Protection and Waste Safety	i. Financial liability
6. Transport Safety	ii. <i>Enforcement (System of fines still to be developed)</i>
7. Emergency Planning	iii. Public Safety Information Forum
<i>General Nuclear Security Regulations (Section 36 of NNR Act)</i>	iv. Public Participation
1) Nuclear security and PPS for NI's, etc.	



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### 3. OPTIMISING THE REGULATORY FRAMEWORK (Guidance documents)

- The focus of the NNR has now shifted to the review and update of the guidance documents
- The aim is to provide a comprehensive suite of regulatory guidance documents that will support the new regulations that have been developed.
- The new draft regulations are much more detailed and comprehensive compared with the existing regulations (SSRPs) and contain many of the requirements from existing requirement documents (LDs and RD's).
- The following RGs have been developed:
  - ✓ RG-0006: Guidance on Physical Protection Systems for Nuclear Facilities;
  - ✓ RG-0007: Regulatory Guide on Management of Safety;
  - ✓ RG-0008: General Transport Safety guidance;
  - ✓ RG-0011: **Guidance for the Siting of Nuclear Facilities;**
  - ✓ RG-0012: **Guidance on Construction Management for Nuclear Facilities;** and
  - ✓ RG-0013: Training and Registration of appointed Medical Practitioners.



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 **3. OPTIMISING THE REGULATORY FRAMEWORK (Guidance documents)**

- The following RGs have been identified for development in the next FY:
  - ✓ Safety Assessments for Nuclear Facilities
  - ✓ V&V of Evaluation and calculational models
  - ✓ Licensing of NPP operators
  - ✓ Management of NORM tailing dams and waste rocks;
  - ✓ National Dose Register;
- As an interim measure the NNR developed previously the following Position Papers of which some informed the content of the new regulations and guidance documents being developed:
  - ✓ PP-0008: Design Authorisation Framework
  - ✓ PP-0009: Authorisations for nuclear installations
  - ✓ PP-0012: Manufacturing of components for nuclear installations
  - ✓ PP-0014: Consideration of External Events for new nuclear installations
  - ✓ PP-0015: Emergency Planning technical basis for new nuclear installations
  - ✓ PP-0016: Conformity Assessment Framework for Pressure Equipment in nuclear service
  - ✓ PP-0017: Design and Implementation of Digital Instrumentation and Control for nuclear installations



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 **4. REGULATORY CAPACITY (Resources)**

- Current staffing – 128
- The SGs at both units at Koeberg Nuclear Power plant are due for replacement by 2018. 10 new positions were identified and filled for SG replacement project.
- The Board had approved 24 positions for New Nuclear Build projects. SGR resources will be utilized for the New Nuclear Build projects.
- TSO appointed to provide specialised resources




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 **4. Regulatory Capacity (Nuclear and Radiation Safety Centre of Excellence)**

- The NNR has identified the need to establish a Nuclear and Radiation Safety Centre of Excellence to:
  - ✓ Conduct research addressing nuclear safety of new build technologies (PWRs, Research reactors, Front & back end)
  - ✓ Technical support for NNR (TSOs are fundamental to the activities of regulatory bodies internationally)
  - ✓ HR training needs for NNR (inspectors, specialists, etc.)
  - ✓ Specialized skills are utilized by the NNR and needed on a project by project basis from time to time i.e. SGR project currently underway
- Host institution and collaborating institutions have been identified
- Memorandum of Agreement, including staffing, is being finalised with host institution
- Funding framework is being discussed with host institution
- In take of 1st students planned for 2016



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**4. Regulatory Capacity**  
(Nuclear and Radiation Safety Centre of Excellence)

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      Board[CoE Board] --> Director[CoE Director (NNR)]
      Director --> Group1[Nuclear Systems & Structural Analysis Group]
      Director --> Group2[Nuclear Safety & Radiation Protection Group]
      Director --> Group3[Reactor Systems & Risk Analysis Group]
      Director --> Group4[Radio-active Sources & Nuclear Data]
  
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- **NNR expectations:**
  - ✓ Teaching: Under graduate as well as post graduate programmes
  - ✓ Research: Applied research, publications, etc.
  - ✓ Facilities: Computer codes, laboratories, instrumentation, equipment, etc.

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**4. Regulatory Capacity**  
(New Infrastructure)

- Environmental Surveillance laboratory being commissioned with capacity to analyse for gamma, beta, alpha and gross alpha/beta analysis

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**4. Regulatory Capacity**  
(Regulatory Emergency Response Centre)

- Regulatory Emergency Response Centre being established and will have the following capabilities:
  1. Online radiation monitoring;
  2. Audio visual communication;
  3. Online data from facilities; and
  4. System of analysis codes.

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 **5. Concluding remarks**

- Success of nuclear programmes requires a well defined, transparent and predictable regulatory environment supported by adequate expertise, facilities and resources
- To achieve this the NNR has initiated or has been involved in various activities to optimize and improve on our existing regulatory framework, facilities and resources
- I'm confident that we have learnt from past local and international licensing and construction experiences with nuclear new build and as an organisation will be ready to regulate effectively and efficiently any new applications for new build we may receive

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**THANK YOU**



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