NATIONAL NUCLEAR REGULATOR

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

REGULATORY AUTHORITY PERSPECIVE TO NUCLEAR POWER

FEBRUARY 2014

DR MB TYOBEKA

CONTENTS

1. Regulatory Framework in South Africa

2. The progress and implication of Integrated Nuclear Infrastructure Review (INIR) in South Africa

3. Nuclear technology safety and localization challenges

LEGISLATIVE FRAMEWORK

- The nuclear sector in South Africa is mainly governed by the
  - Nuclear Energy Act, Act 46 of 1999 (NEA)
  - National Nuclear Regulator Act, Act 47 of 1999 (NNRA)
  - National Radioactive Waste Disposal Institute Act (Act 53 of 2008)
  - Disaster Management Act (57 of 2002)
  - Nuclear Energy Policy (2008)
  - Radioactive Waste Management Policy and Strategy (2005)
  - Integrated Energy Resources Policy (2010)

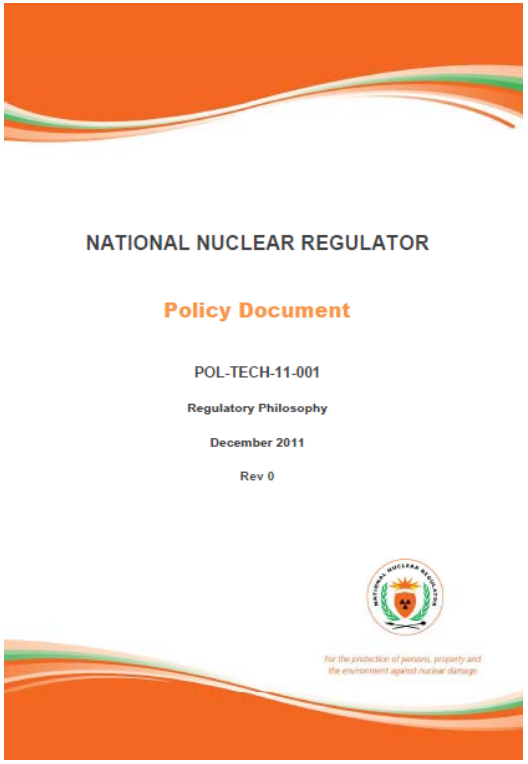
- The Hazardous Substances Act, Act 15 of 1973 (HSA), provides
  - Group III hazardous substances (involving exposure to ionising radiation emitted from equipment)
  - Group IV hazardous substances (radioactive material not at nuclear installations or part of the nuclear fuel cycle, for example fabricated radioactive sources and medical isotopes)

REGULATORY FRAMEWORK (Nuclear)

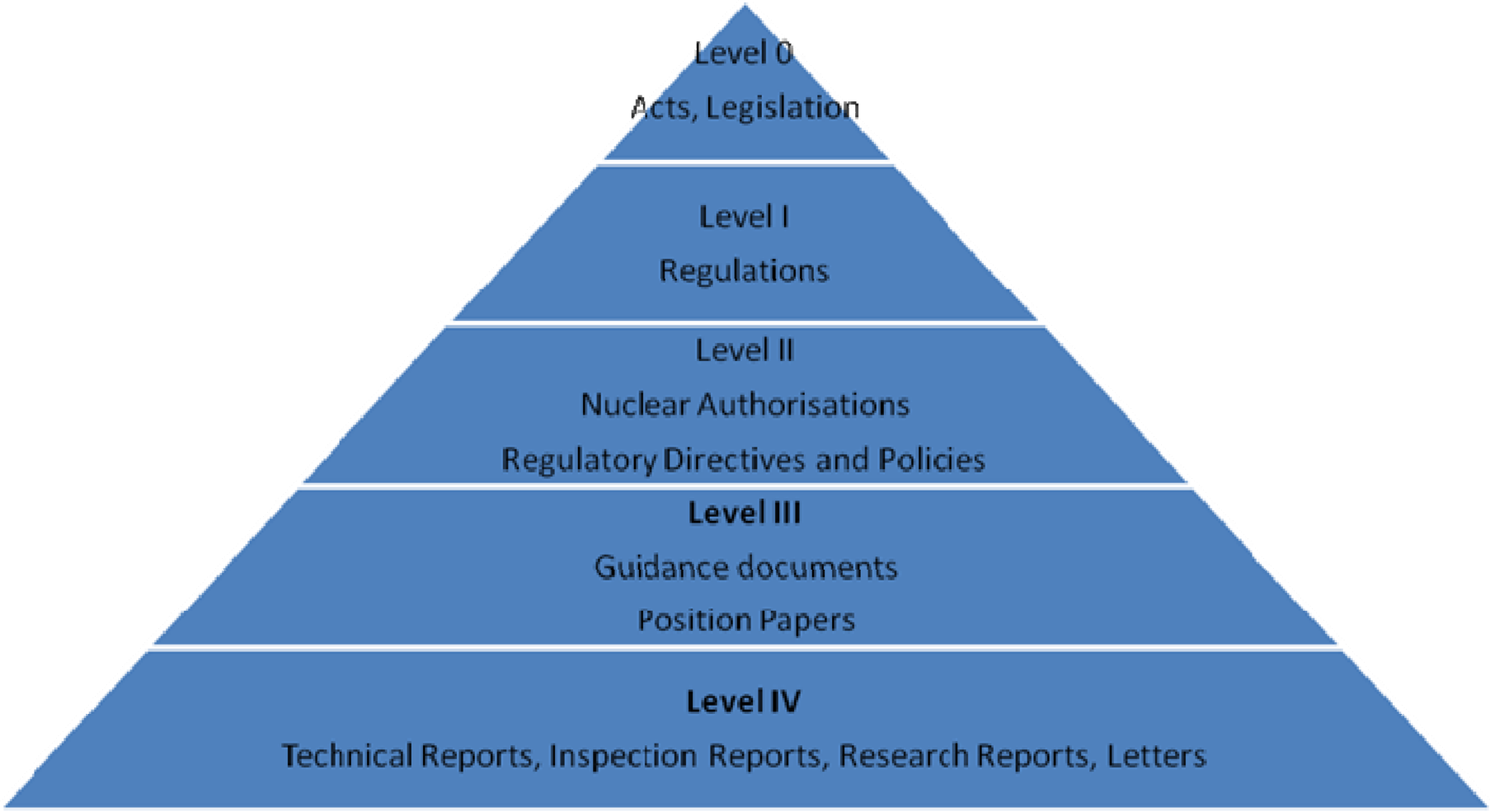
- **Regulatory Standards**
  - **Regulations and Requirements Documents**
  - **Guidance**
  - **Position Papers & Regulatory Research**
- **Authorisations**
  - **Nuclear Installation License**
  - **Certificate Of Registration**
  - **Certificate Of Exemption**
  - **Nuclear Vessel License**
- **Not standards for all facilities and activities**
- **Standards not in line with latest international standards**

REGULATORY PHILOSOPHY

- Regulatory Self Assessment conducted in 2010
- Review of regulatory framework
- POL-TECH-11-001, Regulatory Philosophy Rev 0 issued January 2012
- Describes the regulatory philosophy of the NNR and provides the overall basis of the safety standards and regulatory practices
- Contains the propose new suite of safety standards
- Defines the NNR new technical documents hierarchy



TECHNICAL DOCUMENT HIERARCHY



REGULATIONS

- **PART A: General Nuclear Safety Regulations**
  - Scope of Regulatory Control
  - Licensing and Certification
  - Management of Safety
  - Safety Assessment
  - Transport Safety
  - Radiation Protection and Waste Safety
  - Emergency Planning

  - **PART B: General Nuclear Security Regulations**

REGULATIONS

- **PART C: Specific Nuclear Safety Regulations**
  - Nuclear Installations
  - NORM
  - Waste Disposal Facilities
  - Siting

- **PART D: Administrative Regulations**
  - Liability for Nuclear Damage
  - Enforcement
  - Cooperative Governance
  - Public Safety Information Forum
  - Public Participation

REGULATORY GUIDANCE

- At least 9 discipline areas identified for Regulatory Guides
- The priority areas informed by the regulations, industry priorities and the nuclear expansion programme
- Regulatory guidance for the 2013-14 financial year
  1. Management of safety
  2. Nuclear security and
  3. Transport safety

POSITION PAPERS (NEW BUILD)

- Types of and stages of nuclear authorisations for nuclear installations
- Design Assessments
- External Events
- Manufacturing oversight
- Emergency Plan technical basis
- Digital Instrumentation and Control (Draft)
- Conformity Assessment Framework for Pressure Equipment

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NUCLEAR EXPANSION

- Integrated Resource Plan (IRP) 2010 allocated 9600 MW for nuclear power
- The Nuclear Energy Policy (2008) sets out the roles and responsibilities of government and the other key stakeholders for Nuclear Power
- Defines a National Nuclear Energy Executive Coordination Committee (NNEECC), which has been established and is chaired by the President of South Africa
- NNEECC has adopted a phased decision making approached
- A nuclear energy technical committee, led by the relevant directors-general, reports to the ministers, and a nuclear energy working group, incorporating various working subgroups, is led by senior officials
- The NNEECC has determined that Eskom, the utility in South Africa, will be the owner/operator of the new nuclear power plants.

INTEGRATED NUCLEAR INFRASTRUCTURE REVIEW (INIR)

- **IAEA team of international experts carried out a review of South Africa's nuclear infrastructure from 30 January to 8 February 2013**
- **First INIR mission to generating nuclear country, the first in Africa**
- **Review 19 infrastructure issues identified in the IAEA publication "Milestones in the Development of a National Infrastructure for Nuclear Power"**
- **Milestones approach and guidelines ensures infrastructure required for the safe, responsible and sustainable use of nuclear technology**
- **The IAEA INIR team identified strengths such as regulatory self-assessment, environmental impact assessment, grid development and stakeholder involvement.**

INTEGRATED NUCLEAR INFRASTRUCTURE REVIEW (INIR)

- **Specific recommendations and suggestions have been identified to help South Africa strengthen its nuclear infrastructure as it expands its nuclear power programme**

- **Action plan has been agreed and actions items are being implemented by the various working subgroups functioning under the NNEECC.**

EMERGENCY PREPAREDNESS REVIEW (EPREV)

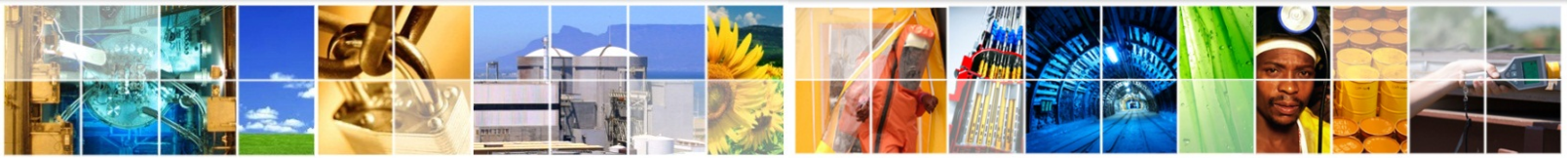
- **IAEA team of international experts carried out a review of South Africa's capabilities and arrangements for emergency preparedness and response from 2-12 February 2014**

- **Outcome of the INIR and Fukushima review, and included in the country Nuclear Safety Action Plan**

- **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" and Self-Assessment conducted by South Africa**

- **The IAEA Team identified a number of Good Practices and also specific recommendations and suggestions to help South Africa strengthen its emergency preparedness and response framework**



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LOCALIZATION CHALLENGES

- Capacity of local industry including relevant knowledge, skills and experience
- Integration and coordination of stakeholders (NNEECC) and phased approached to decision making;
- Key decisions outstanding by NNEECC leading to uncertainty wrt time lines, codes and standard, localisation content, etc.
- Absence of national nuclear codes and standards and non-prescriptive approach to regulation
- Understanding and experience with the codes and standards of potential vendor countries (Local experience limited to codes such as ASME, RCCM and IEEE)
- Suppliers, operator and regulator competence in codes and standards of vendor country

LOCALIZATION CHALLENGES

- Pre-qualification processes of potential RSA suppliers
- Strict quality and safety management requirements for manufacturing of the components
- Potential conflict between administrative requirements of vendor country code and the national conformity assessment framework
- Local industry has limited experience with nuclear quality and safety management requirements, associated standards and practices


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Position Paper

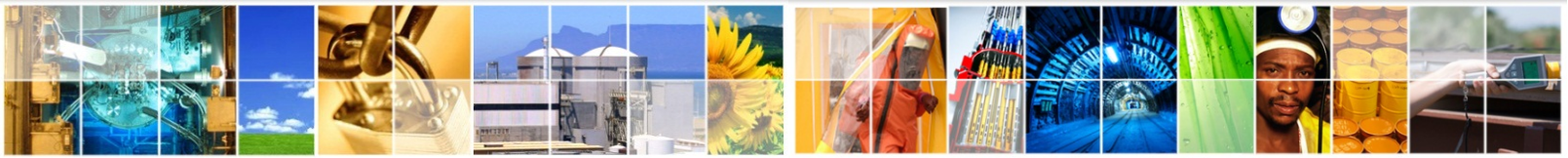
No	Title	Rev.
PP-0012	MANUFACTURING OF COMPONENTS FOR NUCLEAR INSTALLATIONS	0

Approved: Mr. O Phillips Date:

Senior Manager: Standards, Authorisation, Review and Assessment

Signature:

Unrestricted



REGULATORY REQUIREMENTS FOR QUALITY AND SAFETY

- **RD-0034 defines the quality and safety management requirements that must be complied in a graded approach**

- **RD-0034 must be complied with by all organisations involved in the life cycle of the NPP (owner, designer, suppliers and sub suppliers) which could have a influence on the nuclear or radiation safety of the plant**

- **Defines the Principles for Safety Culture implementation within the IMS framework**

- **Products classified considering importance to nuclear safety and allocated to RD-0034 levels**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Requirements
Document

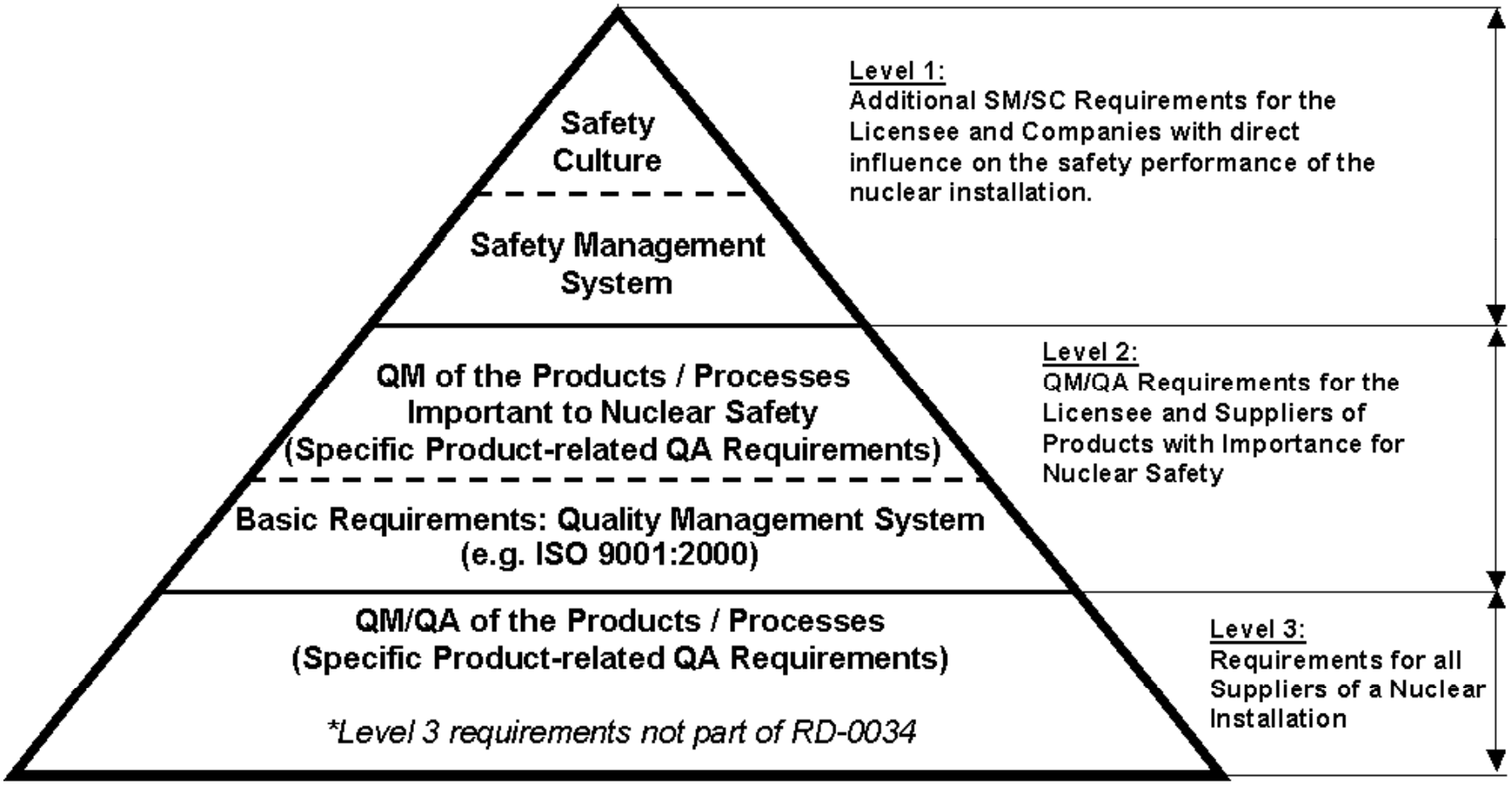
No.	Title	Rev.
RD-0034	Quality and Safety Management Requirements for Nuclear Installations	0

Approved:
GA Clapisson
Acting Chief Executive Officer

Date of issue: 15/09/2008

Revision Date:

REGULATORY APPROACH TO MANUFACTURING



REGULATORY APPROACH TO MANUFACTURING

- **Authorisation to Manufacture required, typically included in the authorisation for construction**

- **Manufacturing of long lead items allows subject to pre-condition for authorisation**

- **Supplier qualification against RD-0034 requirements**

- **Component manufacturing**
  - ✓ **Quality Control Plan**
  - ✓ **Documents to be provided prior to manufacturing including safety evaluation, design input, design, manufacturing processes, etc.**

- **Regulatory oversight during supplier qualification and component manufacturing**

THANK YOU