NUCLEAR POWER PROGRAMME DEVELOPMENT REGULATORY BODY IN POWERIA

REGULATOR GROUP:

1. Mr. Hasmadi HASSAN – Malaysia
2. Mrs. Serene Ihsan Mousa MUKATTASH – Jordan
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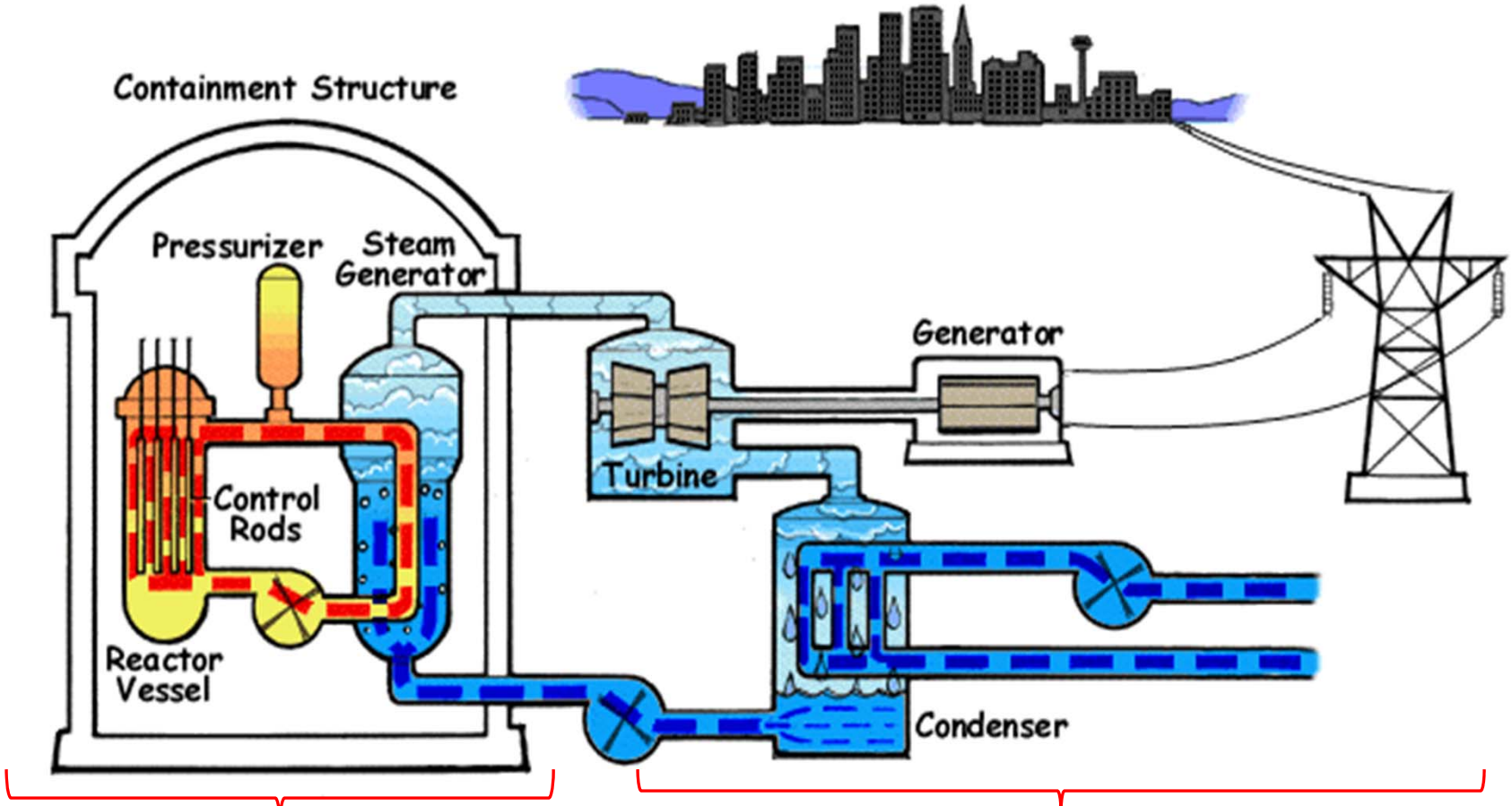
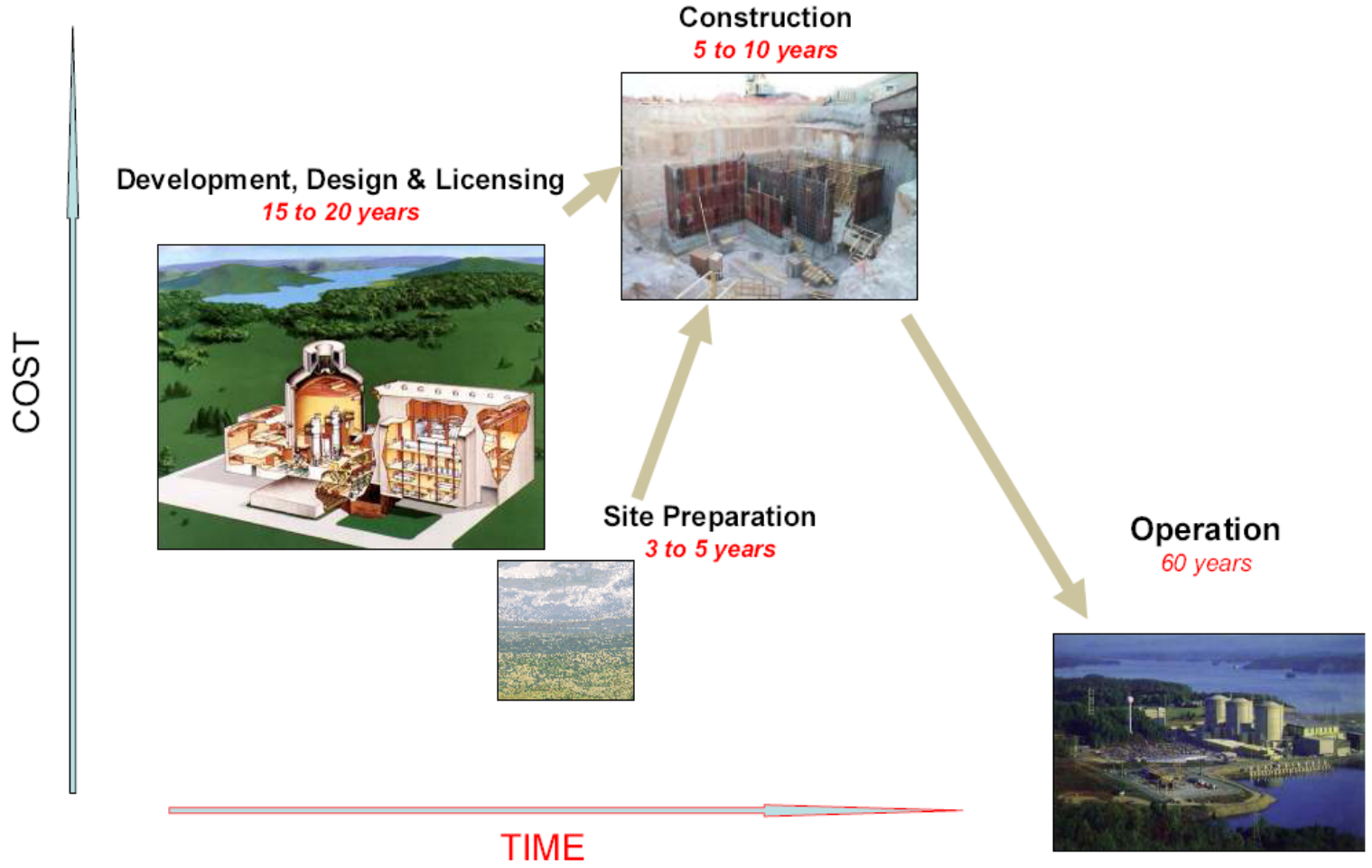
6. Mr. Waddah ALHANAI – United Arab Emirates

AUTHORITIES INVOLVED IN REGULATING THE NUCLEAR POWER PLANT



STEPS IN ADVANCED FOR THE NUCLEAR POWER PLANT DEPLOYMENT

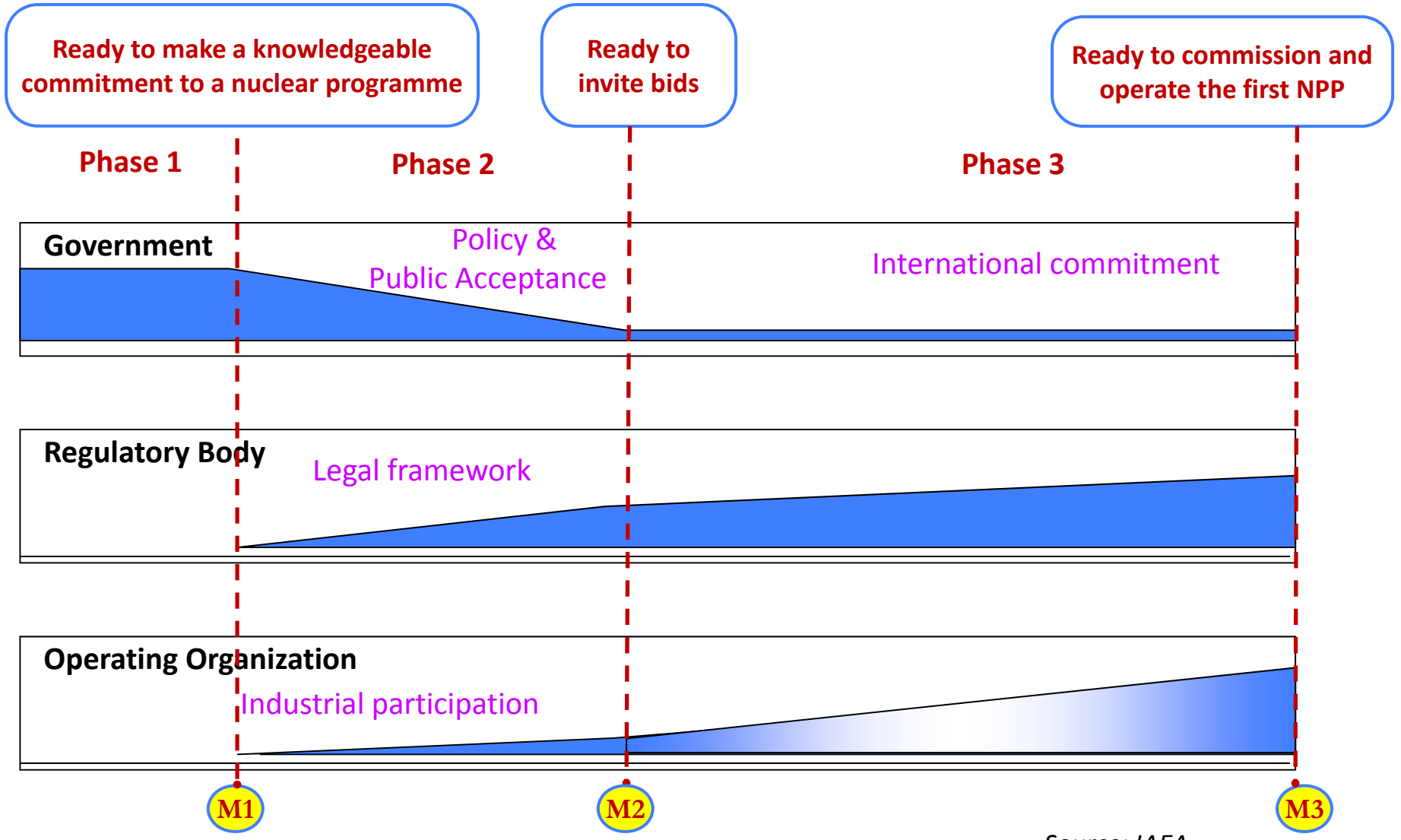


POTENTIAL ROLE OF NUCLEAR ENERGY?

KEY QUESTIONS THAT NEED TO BE ADRESSED:

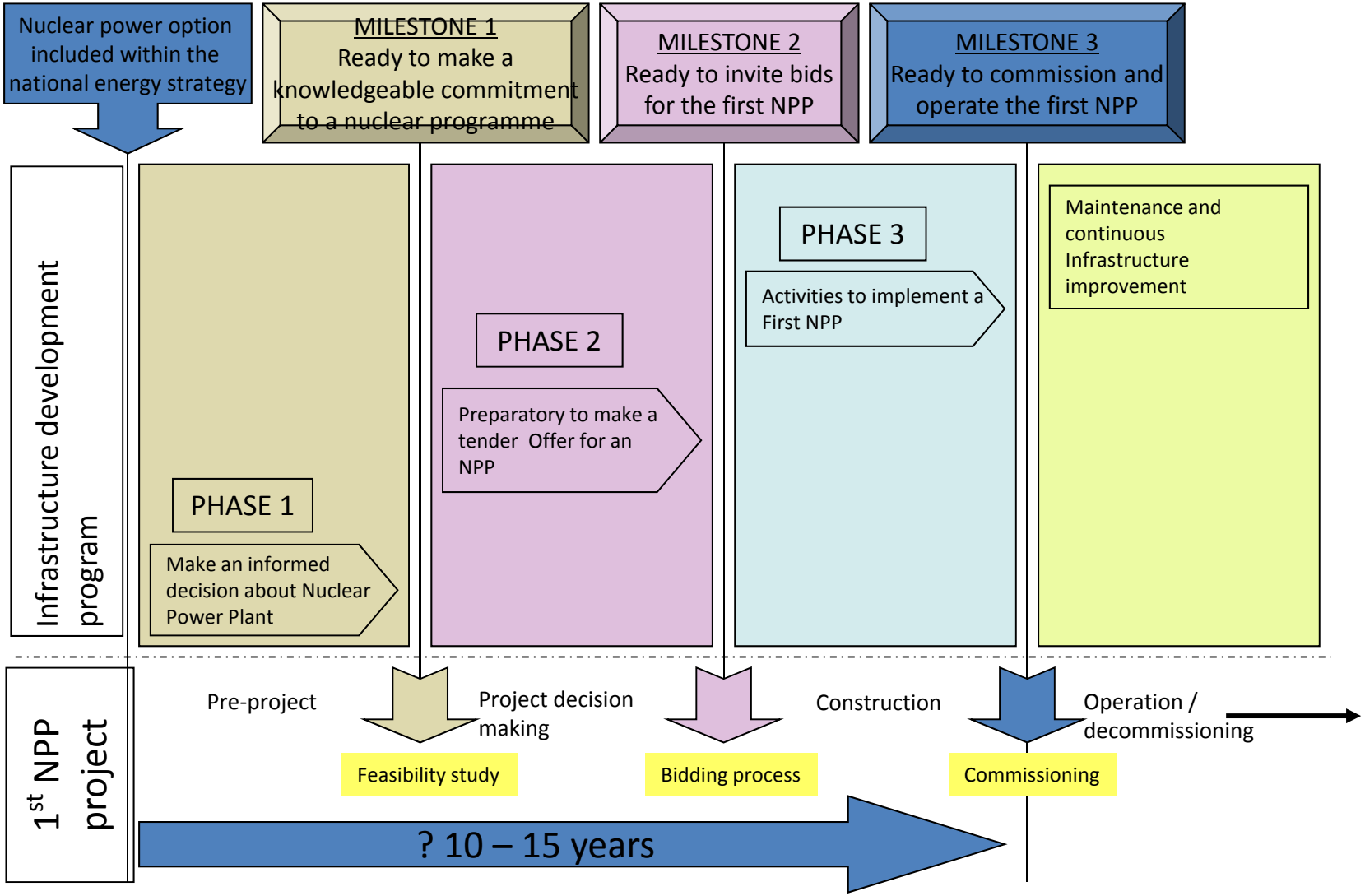
- **POLICY ON NUCLEAR DEVELOPMENT**
  - Nuclear as an option for electricity generation post 2017
  - Nuclear Fuel Cycle Policy
  - Waste Management Policy
  - Capacity building
- **TECHNICAL VIABILITY**
  - Nuclear reactor technology
- **ENVIRONMENT**
- **ECONOMIC VIABILITY**
  - Life cycle cost
  - Cost of generation
  - Project financing
- **LEGISLATION**
  - Nuclear Governance
- **SAFETY**
  - Safety culture
  - Public information
- **SECURITY**
  - Supply of nuclear fuel & fuel services

Roles & Responsibilities of Key Players



Source: IAEA

NUCLEAR INFRASTRUCTURE DEVELOPMENT PROGRAMME



.Source : IAEA – TECDOC – 1555 Managing the First Nuclear Power Plant Project.

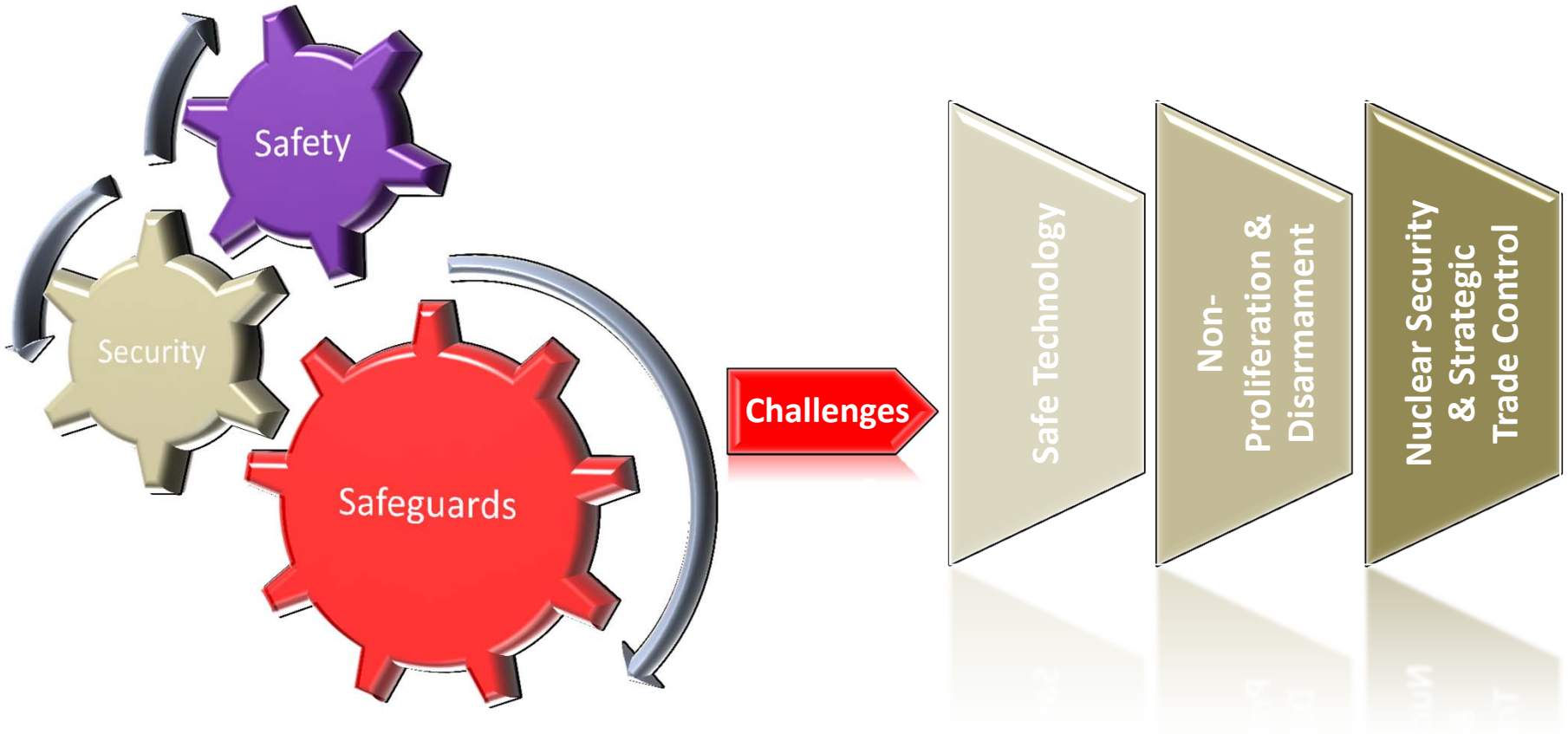
Infrastructure issues and milestones (NE series guide NG-G-3.1)

ISSUES	MILESTONE 1	MILESTONE 2	MILESTONE 3
National position			
Nuclear safety			
Management			
Funding and financing	CONDITIONS	CONDITIONS	CONDITIONS
Legislative framework			
Safeguards			
Regulatory framework			
Radiation protection			
Electrical grid			
Human resources development			
Stakeholder involvement			
Site and supporting facilities			
Environmental protection			
Emergency planning			
Security and physical protection			
Nuclear fuel cycle			
Radioactive waste			
Industrial involvement			
Procurement			

Summary of Conditions to achieve the milestones (Sample from NE series guide NG-G-3.1)

Infrastructure Issue	Milestone 1 – Ready to Make a Knowledgeable Commitment to a Nuclear Programme	Milestone 2 – Ready to Invite Bids for the First NPP	Milestone 3 - Ready to commission and operate the first NPP
3.1. National Position	•NEPIO established and staffed •Safety, security and non-proliferation needs recognized •Appropriate international legal instruments identified •Comprehensive legal framework identified •Establishment of effectively independent regulatory body recognized •Nuclear power inserted in nation's development strategy •Needs of project management identified •Human resources needs surveyed •Financial resources evaluated •Arrangements for handling and storage of radioactive waste identified •Supply of national and international components and services assessed •Transparent communication and interaction regarding the nuclear programme established	•National legislation enacted •International legal instruments adopted •Regulatory body established •An effective SSAC established •Financial and operational modalities established •Policy for nuclear fuel cycle established •Legal & financial arrangements for decommissioning established •Socio-political involvement established •Stakeholder involvement established and maintained •Policy for national industrial participation established •Human resources development programme started •Safeguards programme provided •Security programme provided •Radiation protection and emergency plans established •International standards for environmental protection adopted •Commitments and obligations of owner/ operator organisations established	•Implementation national laws and regulations assured •Regulatory body funds and staff assured •Technical & managerial owner's competence verified by regulatory body •Acceptable level of socio-political involvement maintained •Sufficient financing availability assured •Human and physical resources assured •Appropriate funding plan for waste, long term spent fuel management and decommissioning implemented and assured
3.2 Nuclear Safety	Recognized the need for : •Relevance of nuclear safety •Long-term commitment for the first NPP •Cooperation in international partnerships •Need of intergovernmental instruments on safety •Support through international co-operation •Independent regulatory body	•Safety responsibilities by all stakeholders recognized •Legal and governmental framework consistent with Fundamental Safety Principles implemented •Safety culture evaluated •Regulatory body able to evaluate the safety submission	•Safety culture adopted by the constructor, engineer, operator and regulatory body organisations •Regulatory body prepared to determine whether an adequate appreciation for safety is present and with the authority to act independently •Programs to maintain technical skills and management attitude to assure strong safety culture are in place

Regulatory Challenges



IDENTIFICATION OF THE CRITICAL TASK PERFORMED BY NRA

IDENTIFICATION OF THE CRITICAL TASK PERFORMED BY NRA

2nd phase : Prepare a tender offer for an NPP

- Need to develop the national nuclear safety policy and safety culture statement - substantive work begins for ensuring the necessary level of technical and institutional competence is achieved by State and commercial organizations.

- Establish framework and capabilities
  - Enact legal framework - of new provision on the existing law or have a new legal framework – Comprehensive Nuclear Law (2nd Phase);
  - Establish a comprehensive regulatory body on nuclear facility

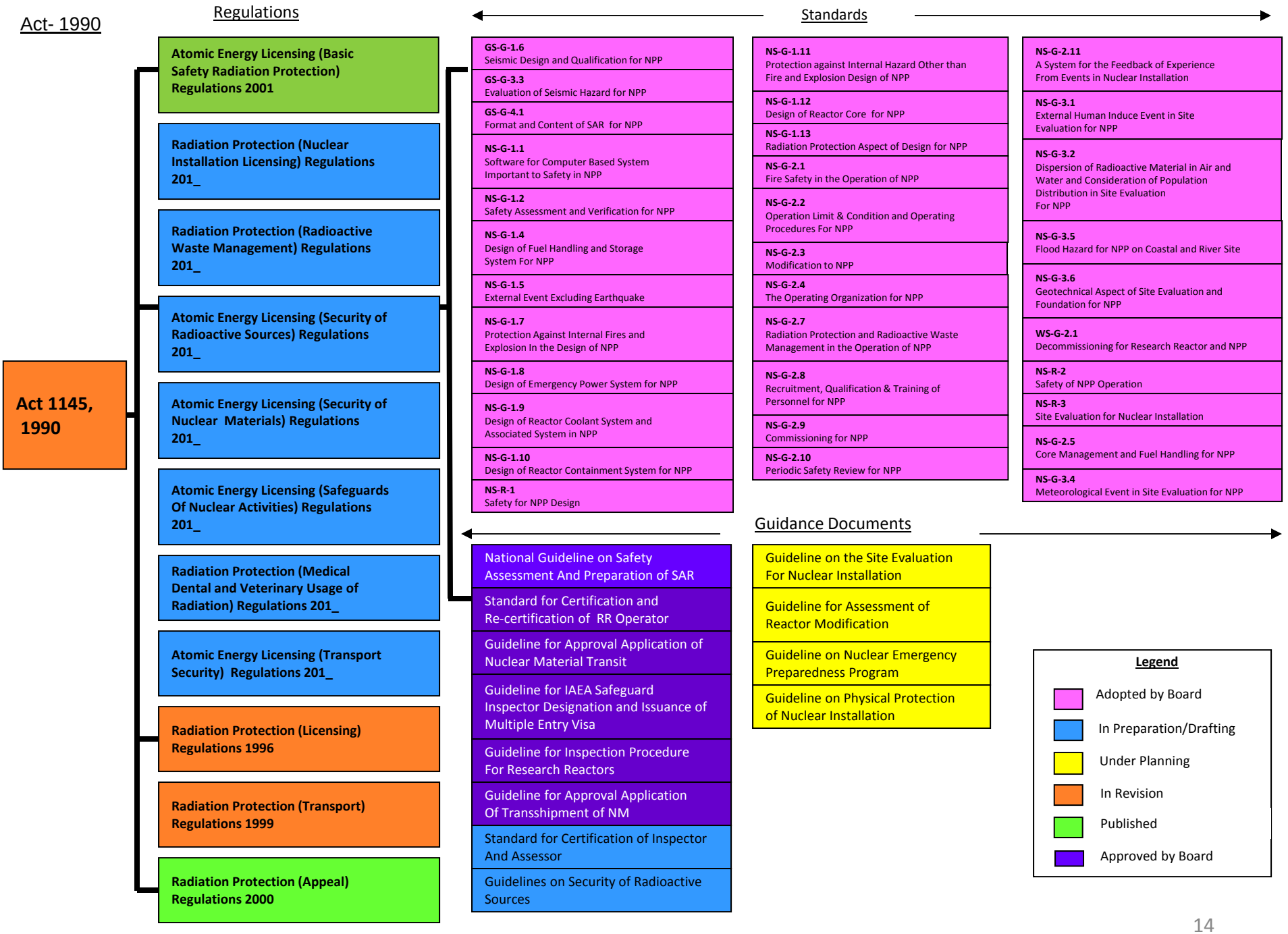
- Development of the subsidiary legislations such as nuclear reactor licensing, waste management; safeguards etc;

IDENTIFICATION OF THE CRITICAL TASK PERFORMED BY NRA

3rd phase : : Policy decision for NP project ~ start of construction

- Human capability – new organization structure as to cater the NPP;
  - Ensure the necessary level of technical/institutional competence is achieved

- International commitment - need to signed and ratified the related international conventions and treaties such as:-


Act- 1990
Regulations
Standards
Act 1145, 1990
Atomic Energy Licensing (Basic Safety Radiation Protection) Regulations 2001
Radiation Protection (Nuclear Installation Licensing) Regulations 201_
Radiation Protection (Radioactive Waste Management) Regulations 201_
Atomic Energy Licensing (Security of Radioactive Sources) Regulations 201_
Atomic Energy Licensing (Security of Nuclear Materials) Regulations 201_
Atomic Energy Licensing (Safeguards Of Nuclear Activities) Regulations 201_
Radiation Protection (Medical Dental and Veterinary Usage of Radiation) Regulations 201_
Atomic Energy Licensing (Transport Security) Regulations 201_
Radiation Protection (Licensing) Regulations 1996
Radiation Protection (Transport) Regulations 1999
Radiation Protection (Appeal) Regulations 2000
GS-G-1.6 Seismic Design and Qualification for NPP
GS-G-3.3 Evaluation of Seismic Hazard for NPP
GS-G-4.1 Format and Content of SAR for NPP
NS-G-1.1 Software for Computer Based System Important to Safety in NPP
NS-G-1.2 Safety Assessment and Verification for NPP
NS-G-1.4 Design of Fuel Handling and Storage System For NPP
NS-G-1.5 External Event Excluding Earthquake
NS-G-1.7 Protection Against Internal Fires and Explosion In the Design of NPP
NS-G-1.8 Design of Emergency Power System for NPP
NS-G-1.9 Design of Reactor Coolant System and Associated System in NPP
NS-G-1.10 Design of Reactor Containment System for NPP
NS-R-1 Safety for NPP Design
NS-G-1.11 Protection against Internal Hazard Other than Fire and Explosion Design of NPP
NS-G-1.12 Design of Reactor Core for NPP
NS-G-1.13 Radiation Protection Aspect of Design for NPP
NS-G-2.1 Fire Safety in the Operation of NPP
NS-G-2.2 Operation Limit & Condition and Operating Procedures For NPP
NS-G-2.3 Modification to NPP
NS-G-2.4 The Operating Organization for NPP
NS-G-2.7 Radiation Protection and Radioactive Waste Management in the Operation of NPP
NS-G-2.8 Recruitment, Qualification & Training of Personnel for NPP
NS-G-2.9 Commissioning for NPP
NS-G-2.10 Periodic Safety Review for NPP
NS-G-2.11 A System for the Feedback of Experience From Events in Nuclear Installation
NS-G-3.1 External Human Induce Event in Site Evaluation for NPP
NS-G-3.2 Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation For NPP
NS-G-3.5 Flood Hazard for NPP on Coastal and River Site
NS-G-3.6 Geotechnical Aspect of Site Evaluation and Foundation for NPP
WS-G-2.1 Decommissioning for Research Reactor and NPP
NS-R-2 Safety of NPP Operation
NS-R-3 Site Evaluation for Nuclear Installation
NS-G-2.5 Core Management and Fuel Handling for NPP
NS-G-3.4 Meteorological Event in Site Evaluation for NPP
Guidance Documents
National Guideline on Safety Assessment And Preparation of SAR
Standard for Certification and Re-certification of RR Operator
Guideline for Approval Application of Nuclear Material Transit
Guideline for IAEA Safeguard Inspector Designation and Issuance of Multiple Entry Visa
Guideline for Inspection Procedure For Research Reactors
Guideline for Approval Application Of Transshipment of NM
Standard for Certification of Inspector And Assessor
Guidelines on Security of Radioactive Sources
Guideline on the Site Evaluation For Nuclear Installation
Guideline for Assessment of Reactor Modification
Guideline on Nuclear Emergency Preparedness Program
Guideline on Physical Protection of Nuclear Installation
Legend
Adopted by Board
In Preparation/Drafting
Under Planning
In Revision
Published
Approved by Board

Guidelines

Strengthening the current Regulatory Framework for 3'S

1. Guidelines for SIA, EIA & RIA for NPP
2. Guidelines for Preparation of SAR for NPP
3. Guidelines for the Authorization and Oversight of NPP
4. Guidelines for Application and Acceptance of Compliance Requirements for Design & Construction of NPP
5. Guidelines for Site Evaluation of Nuclear Power Plant
6. Guidelines for Public Participation on Major Regulatory Decision
7. Guidelines for Implementing Safeguards Agreement and Additional Protocol in Poweria
8. Guidelines on Operational Radioactive Waste Management Strategy including Safety Case and Safety Assessment

NUCLEAR TREATIES & CONVENTIONS

No.	Treaty, Convention or Agreement:
1.	1956 Statute of the International Atomic Energy Agency (IAEA)
2.	1968 Treaty on the Non-proliferation of Nuclear Weapons (NPT)
3.	1992 Agreement between the Government of Poweria and the IAEA for the Application of Safeguards in Connection with the NPT Comprehensive Safeguards Agreement)
4.	1997 Additional Protocol to the IAEA Comprehensive Safeguards Agreement
5.	1959 Agreement on Privileges and Immunities of IAEA
6.	1986 IAEA Convention on Early Notification of A Nuclear Accident
7.	1986 IAEA Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency

NUCLEAR TREATIES & CONVENTIONS

No.	Treaty, Convention or Agreement:
8.	1979 Convention on the Physical Protection of Nuclear Material (CPPNM)
9.	2005 Protocol to Amend the Convention on Physical Protection of Nuclear Material.
10.	1994 Convention on Nuclear Safety
11.	1963 Vienna Convention on Civil Liability for Nuclear Damage
12.	1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage
13.	1997 Convention on Supplementary Compensation for Nuclear Damage
14.	1997 Joint Convention on the Safety of Spent Fuel Management and on Safety of Radioactive Waste Management

NUCLEAR TREATIES & CONVENTIONS

No.	Treaty, Convention or Agreement:
15.	1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (Partial Test Ban Treaty, PTBT)
16.	1967 Treaty on Principles Governing the States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty)
17.	1972 Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea Bed and the Ocean Floor and in its Sub-soil Thereof (Sea-bed Treaty)
18.	1996 Comprehensive Nuclear Test-Ban Treaty (CTBT)
19.	2005 International Convention on Suppression of Acts of Nuclear Terrorism

Also need to implement & comply with internationally-binding United Nations Security Council Resolution 1540 (2004) on non-proliferation of weapons of mass destruction by non-State actors.

IDENTIFICATION OF THE CRITICAL TASK PERFORMED BY NRA

3rd phase : Policy decision for NP project ~ start of construction

- Cooperation with local higher institutions – education as early as secondary school and colleague – prerequisite for preparation for future human development in NPP

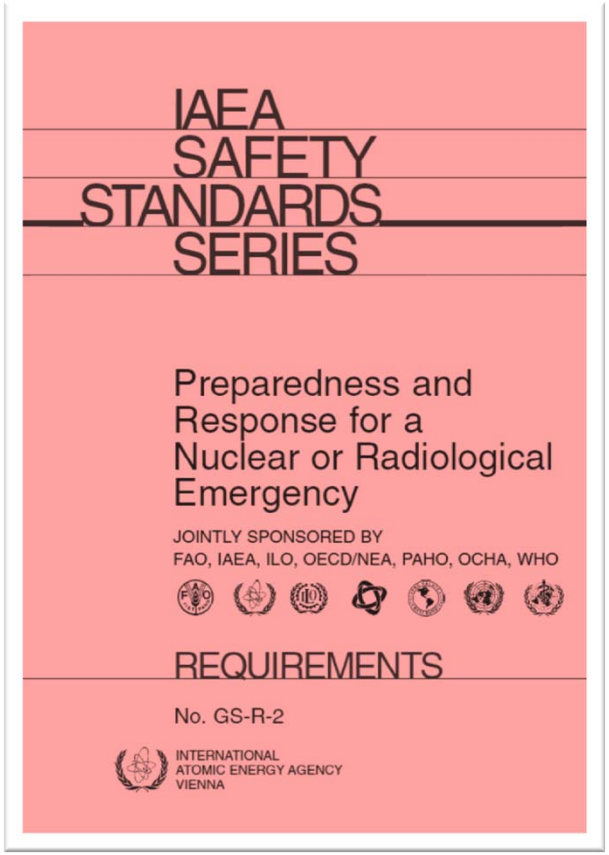
- Collaboration with international body & cooperation with IAEA – training and fellowship in NPP

- Need to develop as competence body – establish the Technical Support and Scientific Organization (TSO) – further tertiary education and long-life education/training

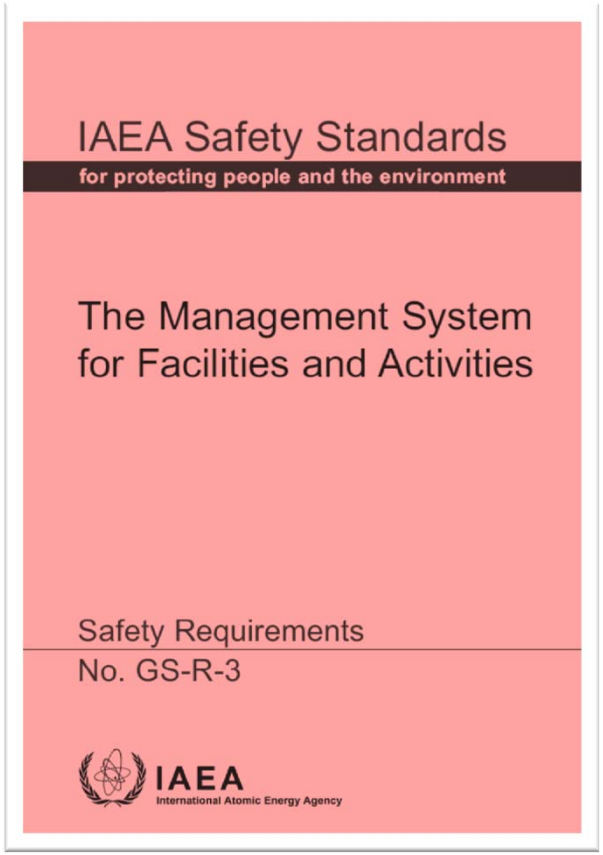
REGULATORY APPROACH TO BE ADOPTED FOR NPP

Poweria regulations based on main IAEA standards for the NPP. Poweria use the following General Safety Requirements and Specific Requirements

Preparedness and Response for a Nuclear or Radiological Emergency Safety Requirements
Series No. GS-R-2

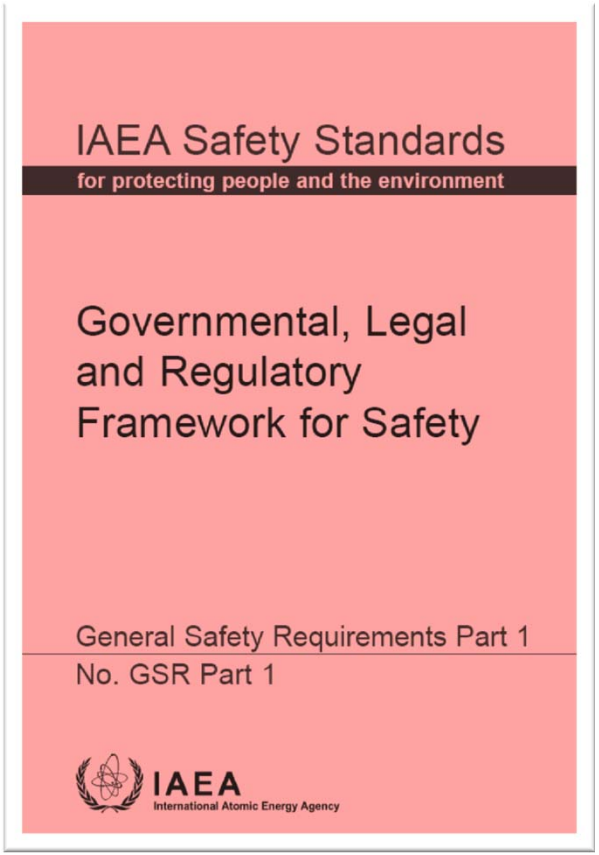


The Management System for Facilities and Activities
Safety Requirements
Series No. GS-R-3

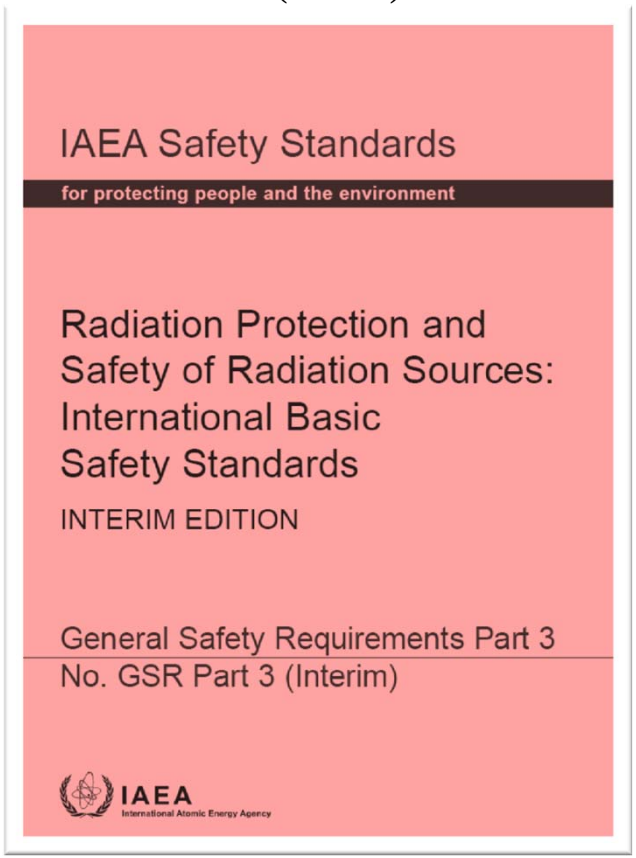


Poweria regulations based on main IAEA standards for the NPP. Poweria use the following General Safety Requirements and Specific Requirements

Governmental, Legal and Regulatory Framework for Safety General Safety Requirements Part 1 Series No. GSR Part 1, published Monday, October 04, 2010.

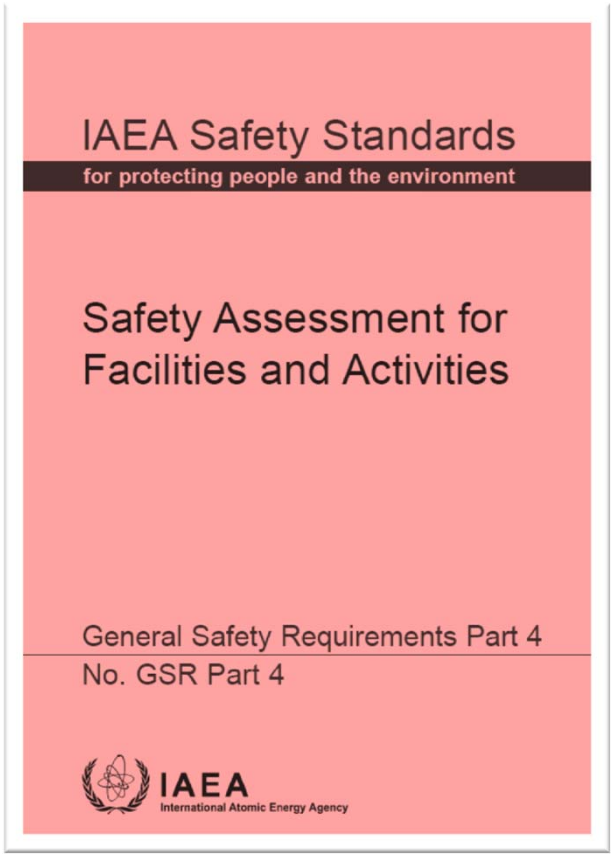


Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - Interim Edition General Safety Requirements Part 3 Series No. GSR Part 3 (Interim)

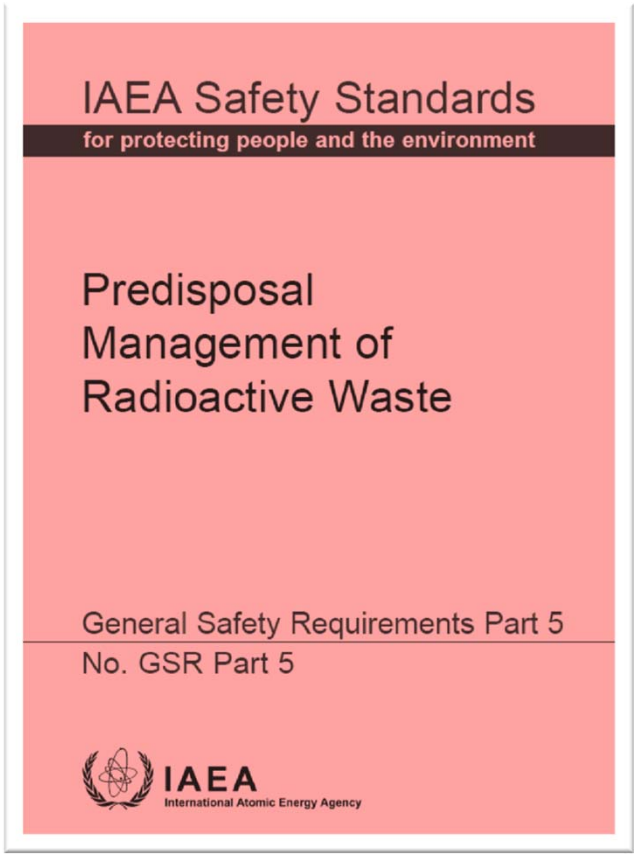


Poweria regulations based on main IAEA standards for the NPP. Poweria use the following General Safety Requirements and Specific Requirements

Safety Assessment for Facilities and Activities
General Safety Requirements Part 4
Series No. GSR Part 4

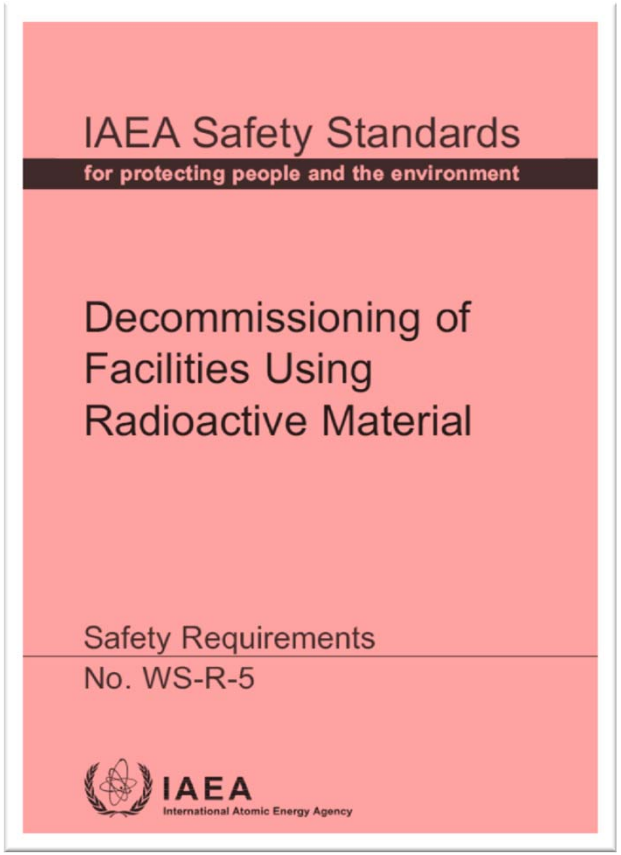


Predisposal Management of Radioactive Waste
General Safety Requirements Part 5
Series No. GSR Part 5

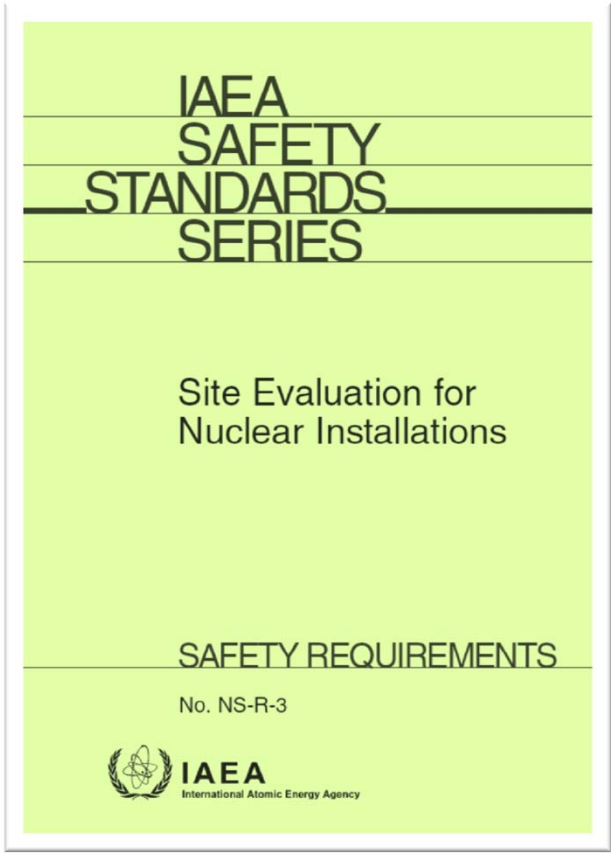


Poweria regulations based on main IAEA standards for the NPP. Poweria use the following General Safety Requirements and Specific Requirements

Decommissioning of Facilities Using Radioactive Material Safety Requirements Series No. WS-R-5

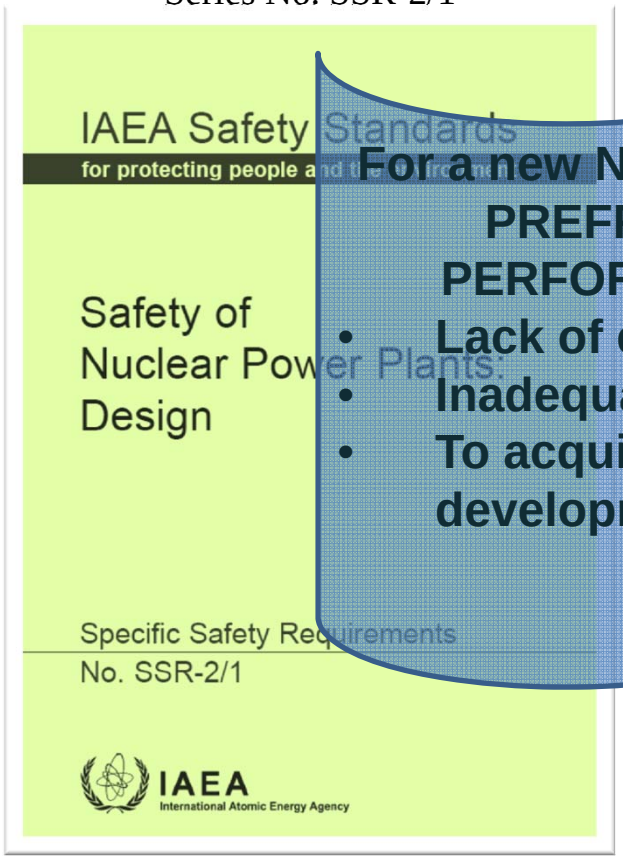


Site Evaluation for Nuclear Installations Safety Requirements Series No. NS-R-3

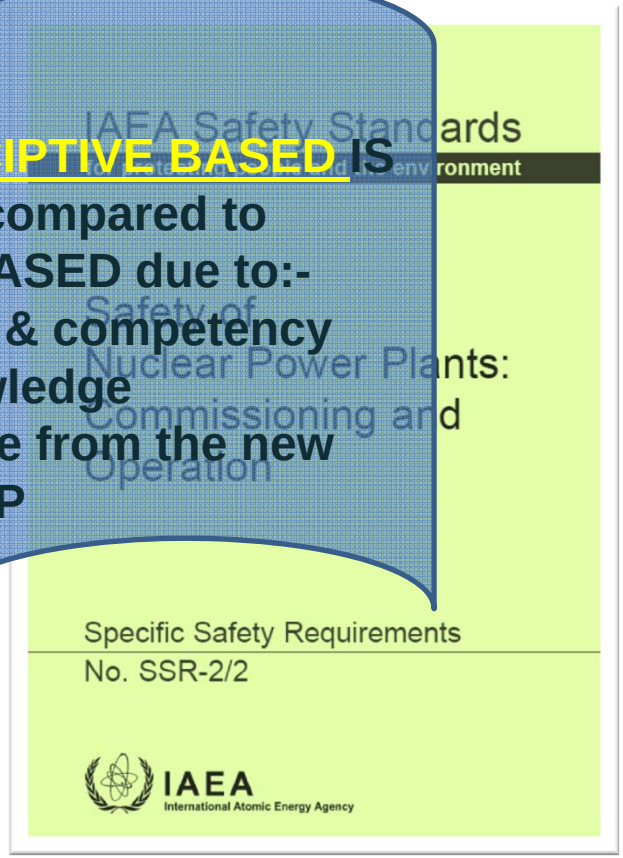


Poweria regulations based on main IAEA standards for the NPP. Poweria use the following General Safety Requirements and Specific Requirements

Safety of Nuclear Power Plants: Design Specific Safety Requirements
Series No. SSR-2/1



Safety of Nuclear Power Plants: Commissioning and Operation Specific Safety Requirements
Series No. SSR-2/2

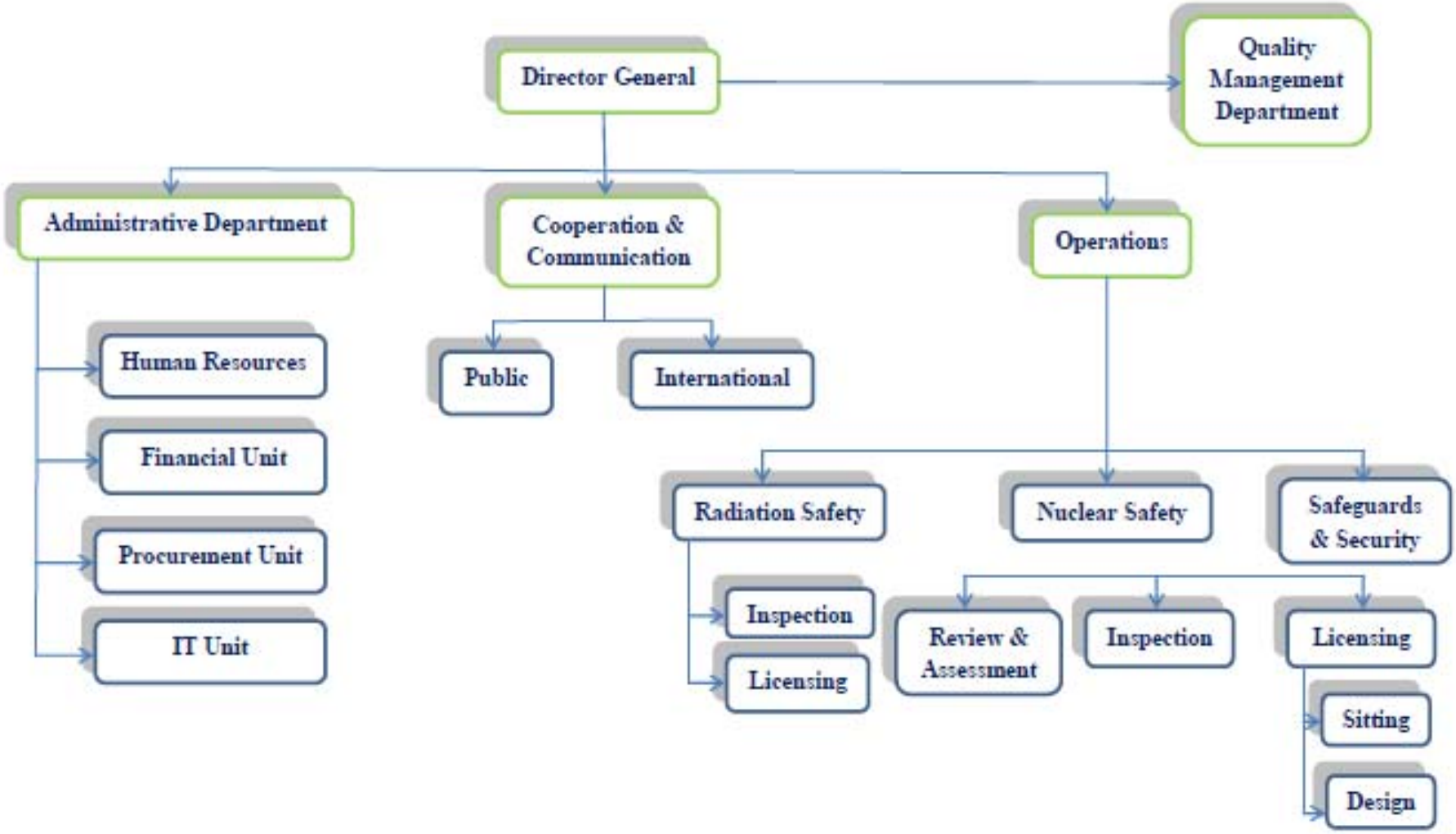


For a new NPP, PRESCIPTIVE BASED IS PREFFERED as compared to PERFORMANCE BASED due to:-

- **Lack of experience & competency**
- **Inadequate of knowledge**
- **To acquire expertise from the new development of NPP**

PROPOSAL FOR A NEW ORGANIZATIONAL CHART FOR NRA

NEW ORGANIZATION CHART FOR NRA



IDENTIFICATION OF CRITICAL COMPETENCIES REQUIRED AND THE AVAILABILITY

VISION

The Poweria Atomic Energy Agency is a modern, competent nuclear regulatory authority enjoying general public's respect and confidence whose activities are considered necessary by the public for the purpose of ensuring nuclear safety and radiological protection.

MISSION

The Poweria Atomic Energy Agency through its regulatory and supervisory activities aims to ensure that activities involving exposure to ionizing radiation are conducted safely both for workers and the general public.

STRATEGY

In order to fulfill the Poweria Nuclear Agency mission in a systematic way, complying with the highest standards, it is necessary to:-

- Prepare and execute provisions of laws enabling the implementation of nuclear program;
- Prepare and retain competences and human resources in proportion to tasks of the nuclear regulator;
- Develop and update safety requirements, including their strict enforcement

LAWS

- Laws of Poweria
- Laws of European Union(if Poweria is in Europe)
- International Law

Legal Department

Legal Department consists of two units:

- Regulation Unit is responsible for developing and expressing opinions with regard to draft versions of normative acts and expressing opinions on draft version of the European Union's laws as well as drafts of provisions and recommendations of international organizations. The Unit also issues Official Journal of the Poweria Nuclear Atomic Agency.

- Jurisdiction Control and Legal Representation Unit is responsible for controlling (in terms of formal requirements) drafts of administrative acts of the Nuclear Agency President and other nuclear regulatory bodies and representing the Nuclear Agency President and Agency before the courts.

The Communications Department

- The Department Communications also performs tasks of the Nuclear Agency President regarding information to the general public and cooperation with media as well as international cooperation on nuclear safety and radiological protection.

Nuclear Safety Department Competencies

- Nuclear Safety Department is responsible for the performance of tasks of the Nuclear Agency President concerning nuclear safety, including the functioning of system for coordination of control and oversight of nuclear facilities.
- Nuclear Safety Department comprises five units:
- Nuclear Installation Assessment Unit is responsible for preparing licenses for the conduct of activities consisting in the construction, commissioning, operation and decommissioning of nuclear facilities, as well as reviewing and verifying documentation and conducting safety analyses of nuclear installations.
- Nuclear Installation Inspection Unit is responsible for planning and performing inspections in nuclear facilities and preparing recommendations, orders and injunctions in case of non-compliances. In addition, the Unit is responsible for issuing authorization to laboratories and expert organizations whose assistance may be used by inspectors during inspection in a nuclear power plant. The Unit also deals with matters regarding examinations for candidates applying for authorizations to perform activities important for ensuring nuclear safety and radiological protection in a nuclear power plant.

Nuclear Safety Department Competencies

- Non-proliferation Unit is responsible for oversight and control of accountancy and status of nuclear material in Poweria. For this purpose, the Unit cooperates with the International Atomic Energy Agency and European Atomic Energy Community within the framework of international nuclear material safeguard system. Employees working in this Unit perform inspections (acting independently or jointly with international organizations) regarding nuclear material.
- Radioactive Waste Unit is responsible for the supervision and control of radioactive waste and spent nuclear fuel management in nuclear facilities and radioactive waste repositories. For this purpose the Unit also performs inspections and prepares recommendations, orders and injunctions in case of non-compliances.
- Reactor Technology Unit is responsible for analyzing experience gained during construction and operation of research reactors and nuclear power plants worldwide from the perspective of Poweria Nuclear Power Program.

Radiation Emergency Department

- Radiation Emergency Department is responsible for the performance of tasks of the Poweria Nuclear Agency President concerning regular assessment of national radiation situation and participation in procedures involving radiation emergency.

Radiation Emergency Department

- Radiological Protection Department is responsible for the performance of tasks of the Nuclear Agency President regarding radiological protection.

- The Department accepts notifications and prepares licenses for the conduct of activities involving exposure to ionizing radiation, such as:-
  - manufacturing, processing, storage, disposal, transport or use of nuclear material, radioactive sources and radioactive waste as well as the trade in these materials, and also isotopic enrichment,
  - production, installation, use and maintenance of the equipment containing radioactive sources and trade in such devices;
  - commissioning and use of the equipment generating ionizing radiation;
  - commissioning of laboratories and workrooms using ionizing radiation sources, including X-ray laboratories;

Radiation Emergency Department

- intentional addition of radioactive substances in the processes of manufacturing consumer products and medical devices, trade in such products, and also the import into the Republic of Poweria territory, and export from this territory of such devices;

- intentional administration of radioactive substances to humans and animals, for the purposes of medical or veterinary diagnostics, therapy or research;

- In addition, the Department conducts inspections in entities performing the above activities.

- Radiological Protection Department is also responsible for preparing decisions to grant authorizations to be employed in a position important for ensuring nuclear safety and radiological protection and authorizations of radiation protection officers.

Poweria Nuclear Power Program

- **Phase I:**

  Development and adoption by the Council of Ministers PNP Program.

- **Phase II:**

  The choice of location and the signing of a contract for the construction of the first unit of the first NPP.

- **The Phase III:**

  The development of the technical design and obtaining necessary permits.

- **Phase IV:**

  Construction and connection to the first unit of the first nuclear power plant.

- **Phase V:**

  Completion of the first nuclear power plant to start construction of a second nuclear power plant

PROPOSAL PLAN FOR THE COMPETENCIES AND AVAILABILITY REQUIRED

PROPOSAL PLAN FOR COMPETENCIES REQUIRED

			SUPPORT									
		DIRECTOR	MANAGER	OFFICERS								
ADMINISTRATION		1										
HR			1	5								
FINANCE			1	3								
PROCUREMENT			1	2								
IT			1									
	HELPDESK			2								
	EDMS			1								
	SERVERS			2								
	PORTAL			1								
IMS			1	3								
					SENIOR SPECIALIST	SPECIALIST						
COOPERATION COMMUNICATION						1						
PUBLIC				5								
INTERNATIONAL				2								
OPERATIONS		1										
RADIATION SAFETY			1									
	INSPECTION				1	4						
	LICENSING				1	3						
SECURITY			1									
NUCLEAR SAFETY			1									
	INSPECTION				1	5						
	LICENSING				1							
	SITING/DESIGN					7						
SAFEGUARD			1									
TOTAL		2	9	26	4	20		GRAND TOTAL				61

Thanks you for Being a GOOD LISTENER!