



REGULATORY CHALLENGES IN PREPARING FOR THE REGULATION OF NEW REACTOR SITING: MALAYSIA EXPERIENCE



**Regional Workshop on Volcanic,
Seismic and Tsunami Hazard Assessment Related to NPP
Siting Activities and Requirements and Annual Meeting of
STG, Jakarta, 13–17.June.2011**





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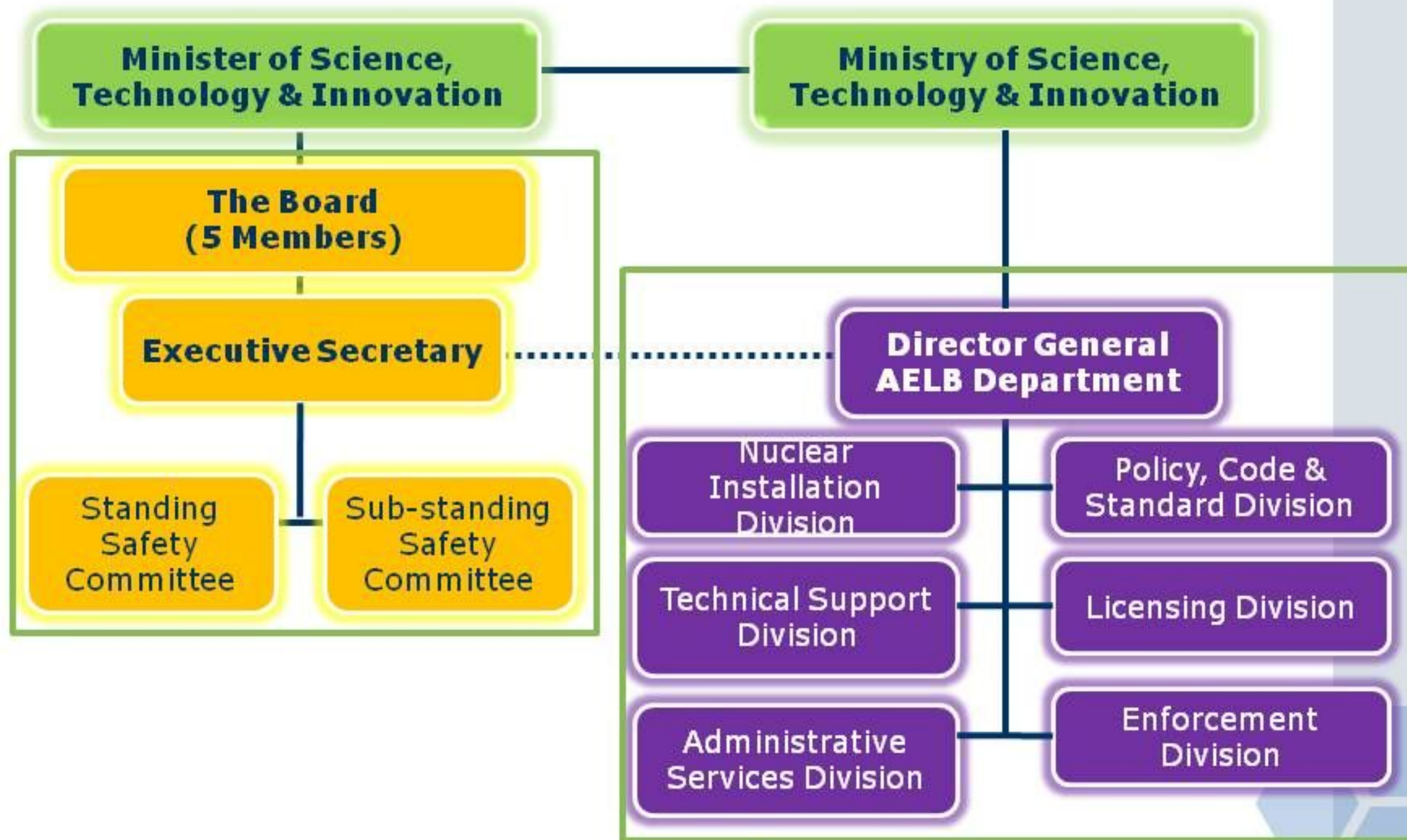
MALAYSIAN LEGAL FRAMEWORK

CURRENT NUCLEAR INSTALLATION LICENSING

NUCLEAR POWER IN MALAYSIA

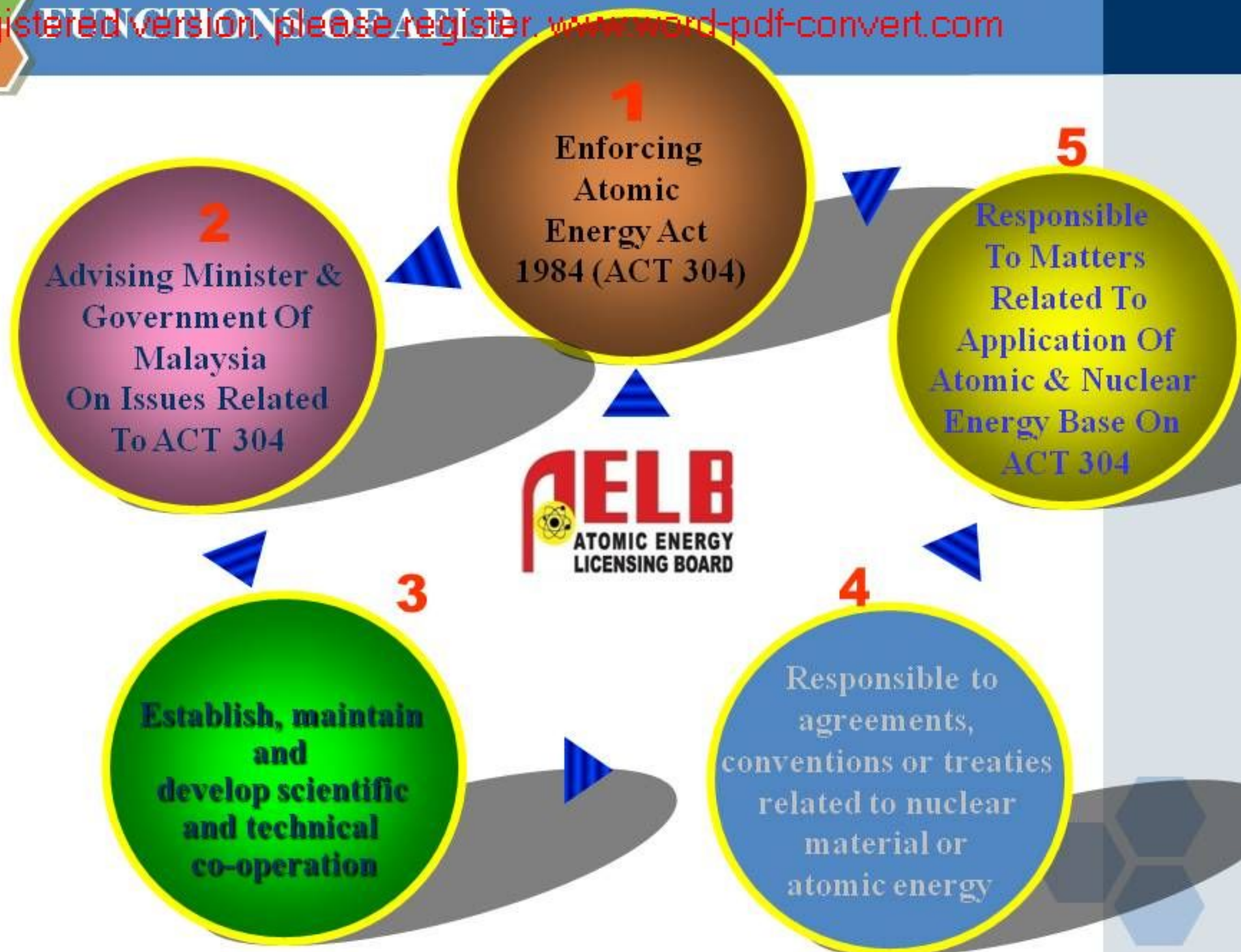
PREPARATION FOR REGULATORY

CHALLENGES





FUNCTIONS OF AELB





Atomic Energy Licensing Act, 1984

Regulations

Orders and Conditions of License

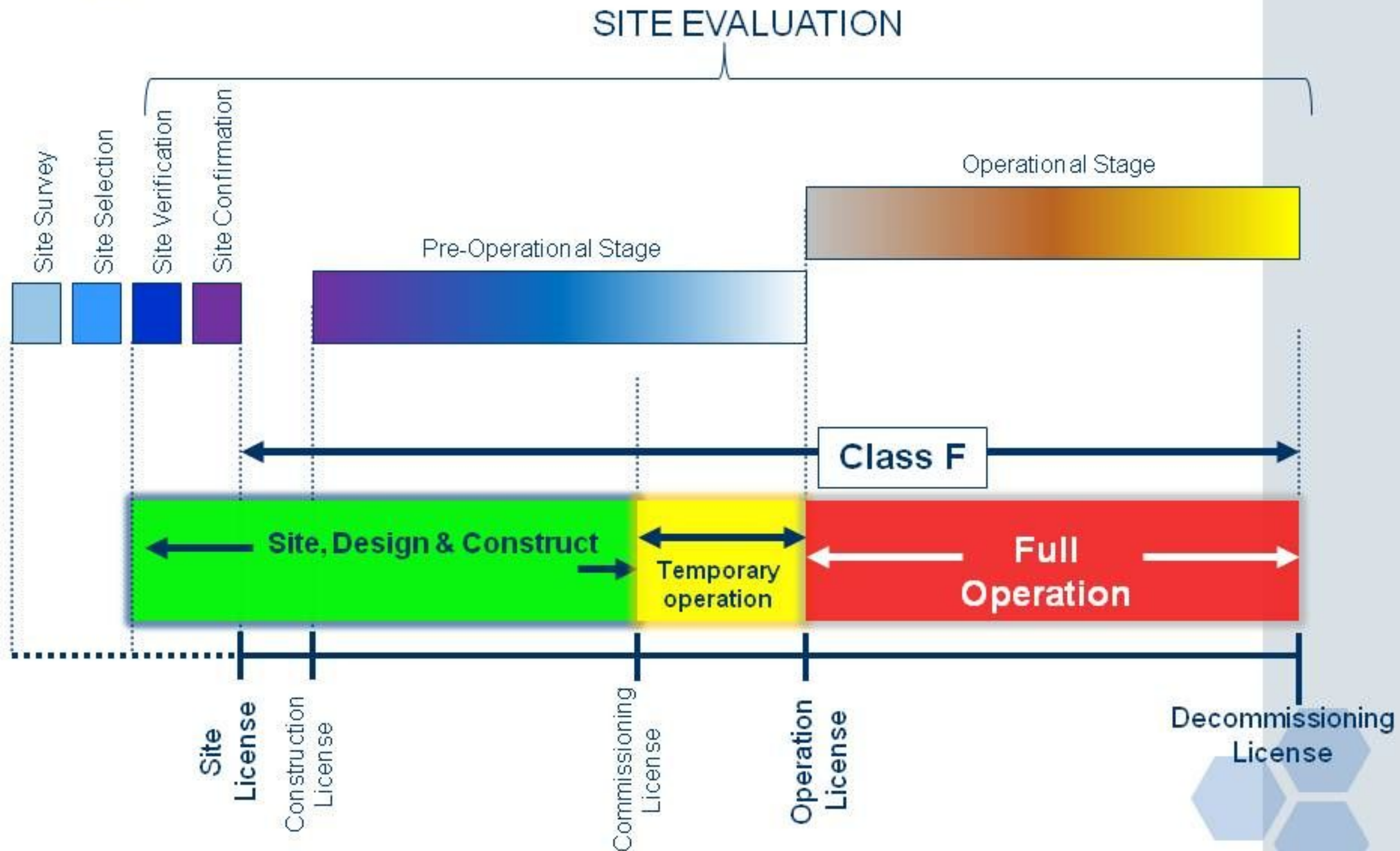
Guidelines, Codes and Standards

- Act: provides the basic law concerning the development and utilization of atomic energy and safety regulations.
- Regulations: provides more detailed provisions entrusted by the Act.
- Provides additional requirement which not stated in the regulations or special matters related to provisions entrusted by the Act
- Provides guides, codes and standards to comply with and achieve goal impose in regulations



CURRENT NUCLEAR INSTALLATION LICENSING PROCESS

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NUCLEAR POWER IN MALAYSIA

- The Malaysian government has announced to consider NPP as renewable energy
- A policy decision for having NPP has not been made
- Education and training of nuclear engineers with MSc and PhD is an important priority beside public information
- Major Familiarization Activities conducted in 2009
 - 2 Inter-Agency Familiarization Workshop on NP policy and program,
 - 1 International Conference on NPP
 - Public Talks on NP awareness



ACHIEVEMENT

[CKB 1] NPP DEVELOPMENT PPROG: ACHIEVEMENT IN THE LAST 5 YEARS-

10 Dec. 2010: - **Policy, Strategy and Plan**

Cabinet Decision to establish a Nuclear Energy Programme Implementing Organisation (NEPIO)

16 July 2010: as a Company Limited by Guarantee (CLG) under the Prime Minister

Cabinet Decision to adopt a National Nuclear Policy

10 June 2010:

10th Malaysia Plan incorporated new National Energy Policy with nuclear energy as long-term option for the Peninsula, and with need for feasibility study, human capital training & awareness campaigns.

26 June 2009:

Cabinet Decision for nuclear energy to be one of fuel options for electricity supply post-2020, especially for the Peninsula, for a Nuclear Power Infrastructure Development Plan (NPIDP)

to be prepared by 2012 & for the establishment of a Nuclear Power Development Steering Committee (JPPKN)

10 Sept. 2008:

Cabinet Decision to draft a National Nuclear Policy

29 Aug. 2008:

2009 Budget Speech in Parliament to explore nuclear energy & formulate new National Energy Policy

4 Apr 2010:

Economic Council decision to expedite nuclear power implementation with first unit to be operational preferably by 2020.

Jan. 2006:

Nuclear Malaysia comprehensive paper to EPU & MOSTI for the Formulation of A Long-Term National Nuclear Energy Policy & Development Strategy



1 June to 27 July 2010:

National Key Economic Areas (NKEA) Laboratory developed an Entry Point Project (EPP) for nuclear power deployment under the Economic Transformation Programme (ETP).

25 Oct. 2010: Launching of ETP by the Prime Minister

<http://www.aelb.gov.my>



CABINET COMMITTEE ON ENERGY

NUCLEAR POWER DEVELOPMENT STEERING COMMITTEE (Cabinet Decision 26th June 2009)

Ministry of Energy, Green Technology & Water

PROGRAM DEVELOPMENT WORKING COMMITTEE



- Educational Program and Public Awareness
- Human Capital Development
- Technology Assessment

PROJECT DEVELOPMENT WORKING COMMITTEE



- Site Identification
- Nuclear Fuel Procurement Planning
- Nuclear Power Plant Conceptual Design, including Project Management and Quality Assurance

REGULATORY DEVELOPMENT COORDINATION WORKING COMMITTEE



- Regulation and Licensing of Electricity Generation
- Regulation and Licensing of Nuclear Power Plant
- International Legal Instrumentation





NUCLEAR ENERGY PROGRAMME



- Malaysia Nuclear Power Corp (MNPC) officially form on 7th January 2011
- Its function are:
 - To plan, spearhead and coordinate the implementation of nuclear energy development for Malaysia and to take necessary action to realize the development of the first NPP
 - To ensure the development of nuclear infrastructure for the country is in line with the IAEA guidelines covering 19 key area
 - To identify company or SPV to be owner and/or operator of NPP





CHART OF MNPC



IMMEDIATE ACTIVITIES OF NNPC


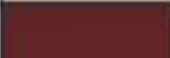




- ❖ To implement a comprehensive and effective communication plan to win public support and acceptance of NP development
- ❖ To assist Malaysia's participation in adhering international nuclear legal instruments in order to access nuclear technology as well as local legal and regulatory development
- ❖ To ensure adequate budget for planned project preparatory activities
- ❖ To select preferred candidate site(s)
- ❖ To appoint an international consultant via selective tendering to undertake feasibility study, prepare bid document and detailed site investigation as part of the NP infrastructure development plan

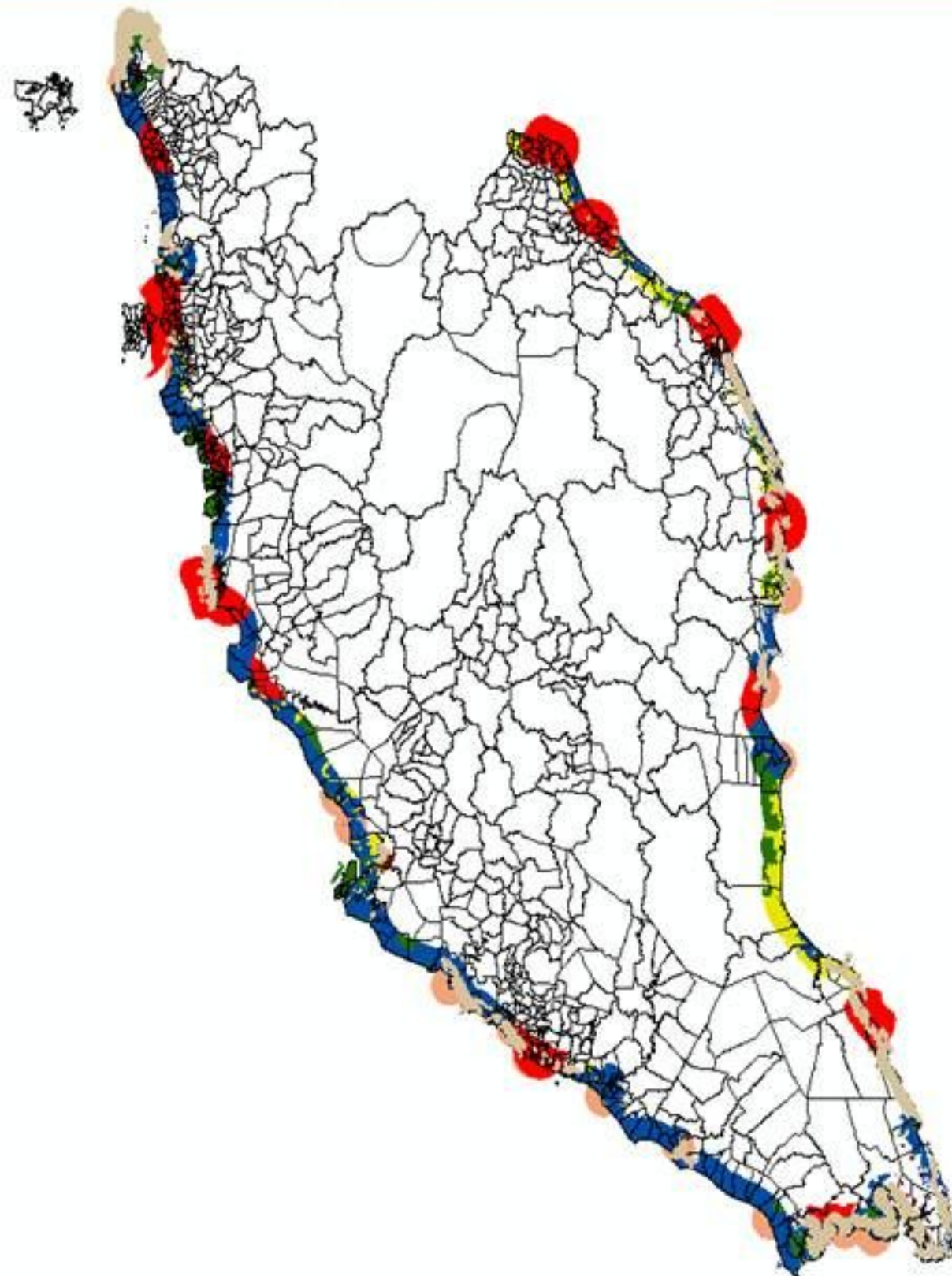




IDENTIFICATION OF POTENTIAL SITES

An example of desktop study that can be undertaken to identify Potential Sites by using GIS tool to overlay the mandatory & rejection criteria (using various digitized maps) onto a base topography map.

Colour Code	Mandatory & Rejection Criteria
	Contour
	Population Density
	Distance to Population Center
	Flight Path
	Flood Prone
	ESA
	Geology

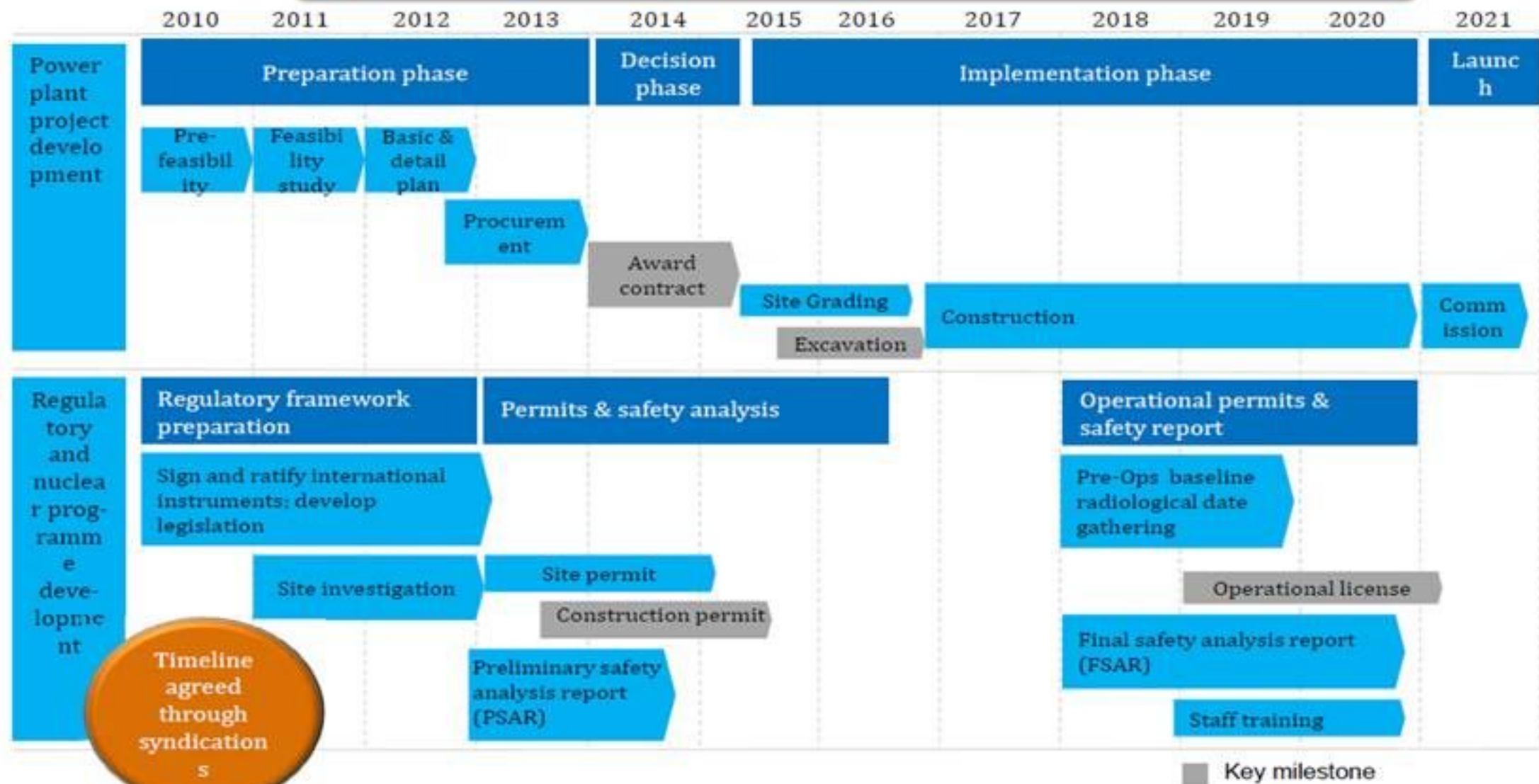




FRAMEWORK

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[CKB 4] Preparatory activities- timeline





PREPARATION FOR REGULATORY CONTROL OF NPP

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- **Amendment of Current Act and Regulations;**
 - Atomic Energy Licensing Act;
 - Radiation Protection (Basic Safety Standard) Regulations
 - Radiation Protection (Licensing) Regulations
 - Radiation Protection (Transport) Regulations
- **Establishments of New Regulations**
 - Nuclear Installation Licensing;
 - Nuclear Security;
 - Nuclear Safeguard;
 - Waste management;
- **Development of New Standards and Guidelines related to nuclear power plant safety, security and safeguard**
 - Siting
 - Design
 - Commissioning
 - Operation
 - Decommissioning



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ACT 304,
1984

- Atomic Energy Licensing (Basic Safety Radiation Protection) Regulations 2010
- Radiation Protection (Nuclear Installation Licensing) Regulations 201_
- Radiation Protection (Radioactive Waste Management) Regulations 201_
- Atomic Energy Licensing (Security of Nuclear Materials) Regulations 201_
- Atomic Energy Licensing (Security of Radioactive Sources) 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 1986
- Radiation Protection (Transport) Regulations 1989
- Radiation Protection (Appeal) Regulations 1990

- GS-G-1.1 Selim to Design and Qualification for NPP
- GS-G-3.3 Evaluation of Selim to Hazard for NPP
- GS-G-4.1 Formatted Context 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

- 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

STANDARDS

- NS-G-1.1 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 Induced 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

- Guideline on the Site Evaluation For Nuclear Installation
- Standard for Research Reactor Modification
- Guideline on Nuclear Emergency Preparedness Program
- Guideline on Physical Protection of Nuclear Installation

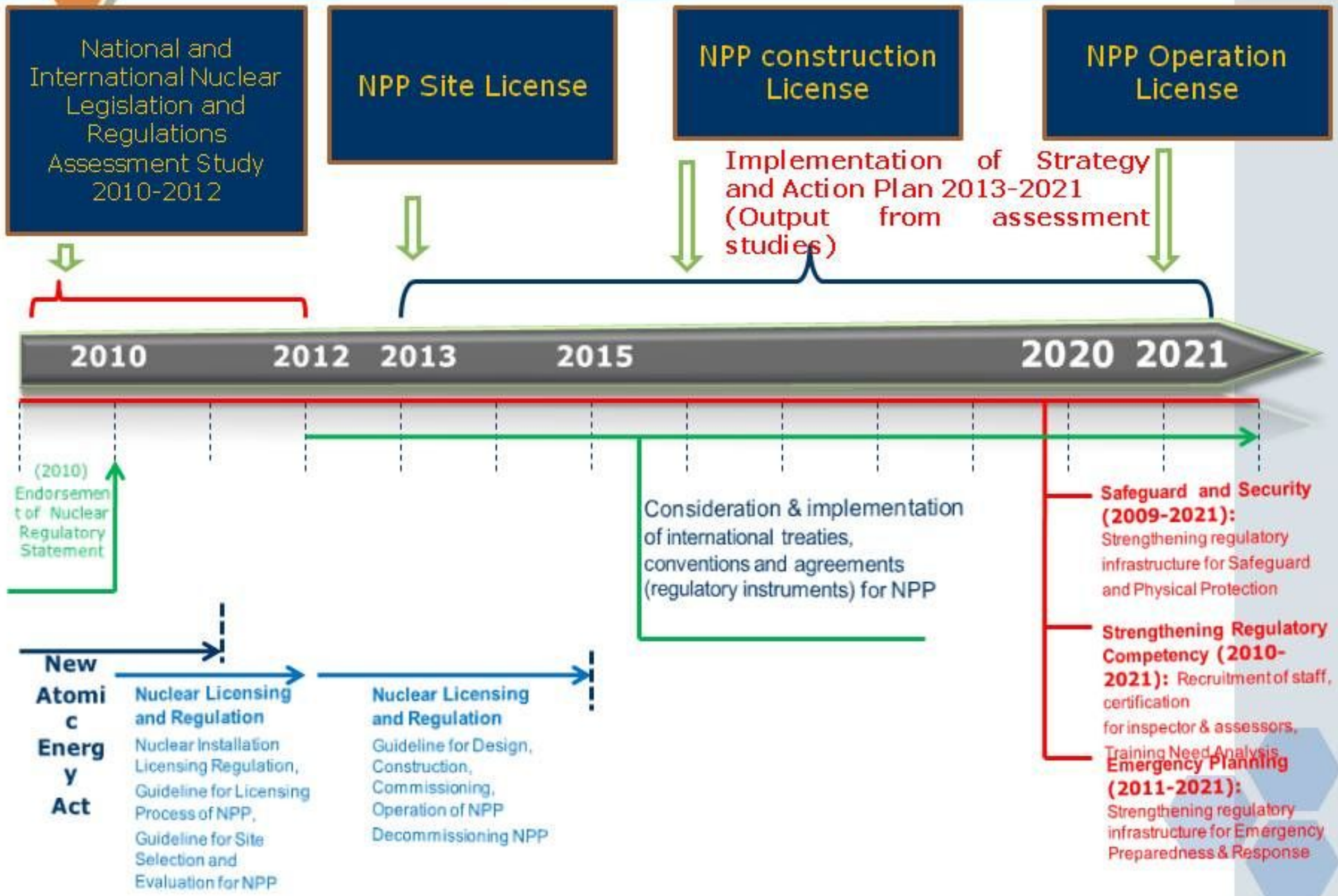
Petunjuk

- Adopted by Board
- In Preparation/Drafting
- Under Planning
- In Revision
- Published
- Approved by Board

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REGULATORY MILESTONE





STATUS OF NUCLEAR INTERNATIONAL TREATIES, CONVENTIONS AND AGREEMENTS



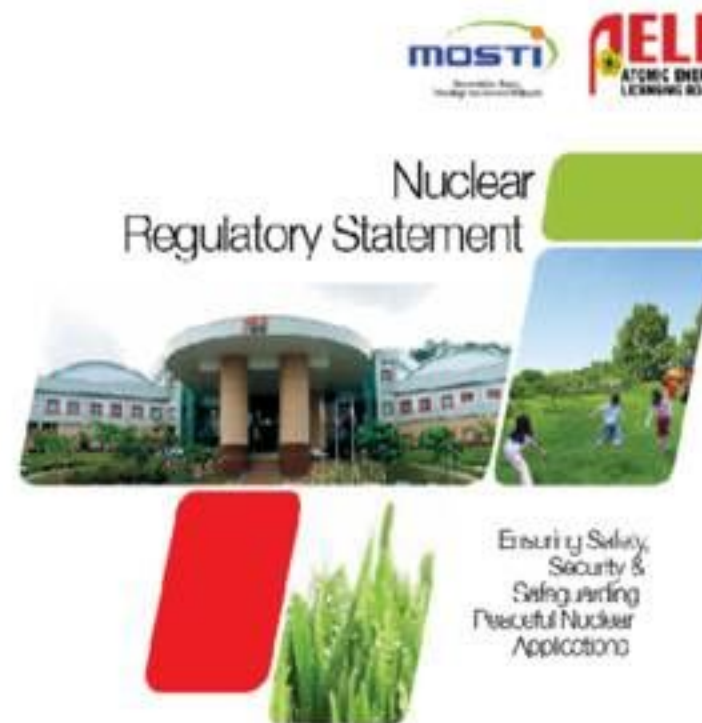


23 November 2010

Board Approval on Nuclear Regulatory Statement,

5 Principles:

- ✓ Effective Independence
- ✓ Openness
- ✓ Transparency
- ✓ Efficiency
- ✓ Reliability



6 Keys Strategies

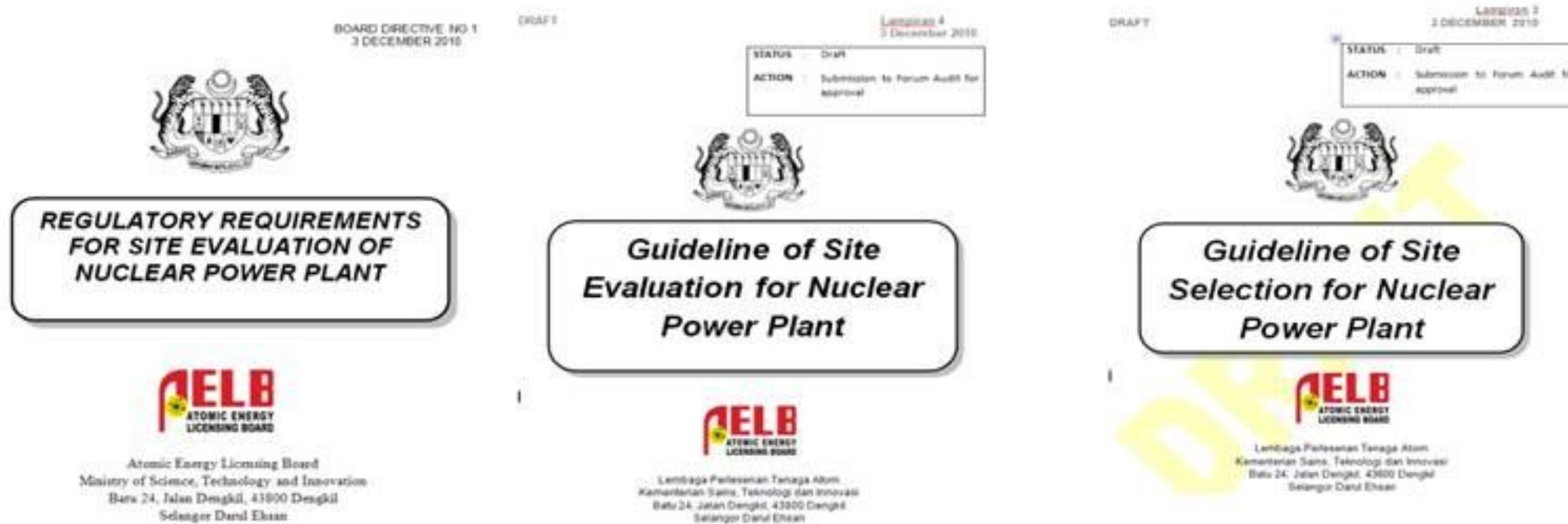
Conclusion of the Nuclear Regulatory Statement;

It is reaffirm that the assurance of nuclear safety, security, safeguards is the highest priority of the regulatory authority and ensures that such an important roles is Performed dutifully to secure nuclear safety, security and safeguards to protect public and the environment



SITING DOCUMENTS

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- Draft 3 Regulatory documents related to siting of NPP prepared in 2010 by Nuclear Safety Committee on Siting
- Will be table to Board Meeting for endorsement
- Expected to be completed by Q3 2011



NEED TO STRENGTHEN SAFETY ASSESMENT

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SITE LICENCE	CONSTRUCTION LICENCE	OPERATION LICENCE	
		TEMPORARY	FULL
<ul style="list-style-type: none"> • Site Evaluation Report • Description of the proposed installation and activities • Physical characteristic of the site • Population distribution • Present land use • Radiological, Environmental & social impact assessment • Pre-operational radiological monitoring programme • A description of storage facilities for radioactive materials or nuclear materials on the site • Decommissioning plan • Any additional information required by appropriate authority 	<ul style="list-style-type: none"> • Preliminary Safety Analysis Report • General layout and detail plan and design of the facility • Updated EIA & RIA • Postulated initiating event (A statement with respect to potential accidents and unscheduled releases of wastes and hazardous materials from the facility) • Additional information required by appropriate authority 	<ul style="list-style-type: none"> • Any change, in the material used or in the design • Radiation Protection Programme (A description of proposed measures to control radiation exposures) • A detail medical surveillance programme • A programme for initial and periodic training • Operational radiological monitoring programme (quality and quantity of effluents to be released from the facility) • A statement (proposed) of the potential accident scenario and the emergency response plan (proposed) of an accident) • A statement of the potential high level of threat (plan and procedures to prevent loss, theft, unauthorized used) • Any additional information Required 	<ul style="list-style-type: none"> • Final Safety Analysis Report • Any additional information required by appropriate Authority
<p>Note: Preliminary SAR – Siting,</p>	<p>Intermediate SAR – Construction</p>	<p>Final SAR - Operation</p>	

Adequate number of trained regulatory staffs needed to undertake technical review for each stages of licensing process



CHALLENGES

- Strengthen effective Legal & Regulatory Infrastructure
- Licensing mechanism for first nuclear power plant – how to integrate effectively
- Cooperation with other authority in NPP Licensing Process – environmental, occupational safety & health, National security, land development and planning,
- Development of regulatory expertise in safety aspect of NPP
 - Various field of nuclear and engineering aspect
 - Plant operations and maintenance
 - Certification of assessor and inspector for NPP
- Knowledge Managements :
 - exchange of experts
 - knowledge transfer
 - Public Communication





Thank You!

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