

# Progress of Decommissioning Planning, Legal Framework and Status of Costing



Workshop on the Research Reactor Decommissioning Activities: Cost Estimates  
30 March - 03 April 2009, Manila, Philippines

# Content

1. Legal and Regulatory System in Malaysia
2. Decommissioning Status
  - i. Provision Under the Current Act 304
  - ii. Provision Under Radiation Protection (Licensing) Regulations 1986
  - iii. Provision Under License Condition
3. Progress of Decommissioning Planning
  - i. Legal Framework
    - a) Provision Under the Projected Act
    - b) Provision Under the Projected (Nuclear Installation Licensing) Regulations 200\_
  - ii. Costing
4. Conclusion

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# Hierarchy of Legal System

**Atomic Energy Licensing Act, 1984**  
**ACT 304**

- **Act:** provides the basic law concerning the development and utilization of atomic energy and safety regulations.

**Regulations**

- **Regulations:** provides more detailed provisions entrusted by the Act.

**Orders and Conditions of License**

- **Provides additional requirement** which not stated in the regulations or special matters related to provisions entrusted by the Act

**Guidelines, Codes and Standards**

- **Provides guides, codes and standards** to comply with and achieve goal impose in regulations

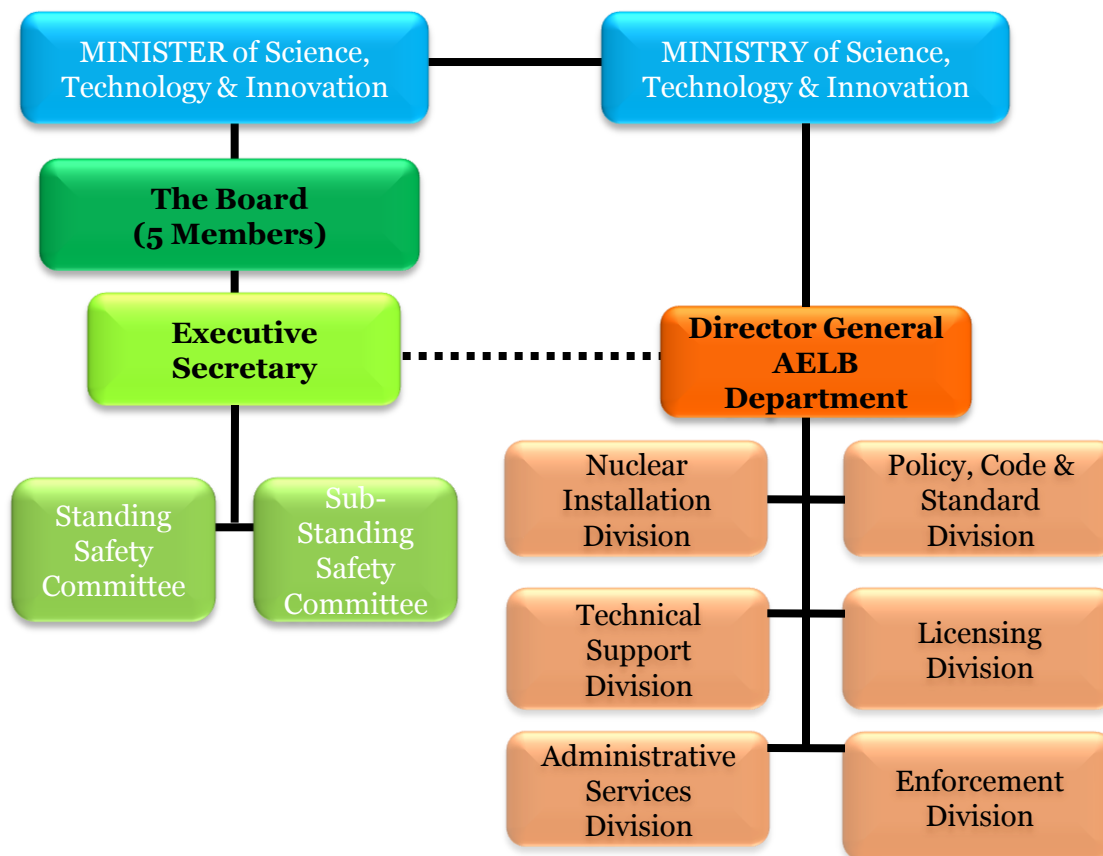
# Legal and Regulatory System

- Main Act:
- Atomic Energy Licensing Act 1984 (Act 304)
  - To provide for the regulation and control of atomic energy;
  - For the establishment of standards on liability for nuclear damage; and
  - For matters connected therewith or related thereto.

- Regulatory Body:  
Atomic Energy Licensing Board (AELB) was established under Section 3 of the Act. 304

Ensuring safety, security and safeguarding peaceful Nuclear Activities

## Atomic Energy Licensing Board (AELB)



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## Atomic Energy Licensing Act 1984 (Act 304) – provision for decommissioning

- No clear provision for decommissioning.
- ***Part III, Control and Licensing:***

***Section 12.(1)*** *Without prejudice to the requirements of any other law, no person shall-*

*(a) site, construct or operate a nuclear installation;*

*(b) deal in, possess or DISPOSE of any radioactive material, nuclear material, prescribed substance or irradiating apparatus,*

*unless he is the holder of a valid license issued under section 16(5) by the appropriate authority for such purpose and as specified in the license.*

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## Radiation Protection (Licensing) Regulations 1986 – provision for decommissioning

- Part II, Classification of License:

**Section 10.** A Class G license is a license-

- (a) to DISPOSE a radioactive materials, nuclear materials, prescribed substances or their wastes;
- (b) to store radioactive materials, nuclear materials, prescribed substances or their waste prior to their disposal; or
- (c) to DECOMMISSION a milling installation, nuclear installation, waste treatment facility, irradiating apparatus or sealed source apparatus.

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## Licence Condition – provision for decommissioning

- **Licence Condition No. 7: Safety Analysis Report (SAR) Document**

7.1 Licensee shall establish a Safety Analysis Report (SAR) document based on the LEM/TEK/55, *Guidelines for the Preparation and Assessment of Safety Analysis Report Document for Research Reactor*.

7.2 Licensee shall comply and implement the Safety Analysis Report (SAR) document as what has been submitted to the Board. This document shall be updated in accordance to any changes/amendment to the operational procedure or on instruction by the Board.

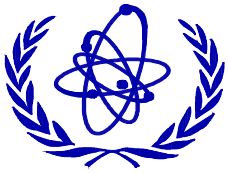
(Chapter 19 of SAR : Decommissioning)

- **Licence Condition No. 36: Decommissioning**

Licensee shall officially inform the Board on the intention to decommission nuclear installation not later than 30 working days after the official decision has been made by the person responsible to the licence, together with a complete decommissioning program.

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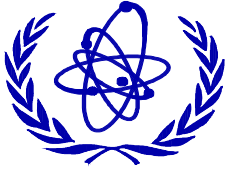
# Decommissioning of Nuclear Facilities

- Conclusions and Recommendations -



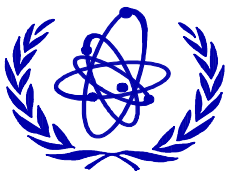
**Ernst Warnecke**  
- IAEA Consultant -

**R<sup>2</sup>D<sup>2</sup>Project: Workshop on 'Planning'**  
**Manila; 15-19 September 2008**



## Main Issues

1. Completion / updating of the national legal and regulatory framework addressing decommissioning (Regulators)
2. Providing guidance to operators on relevant aspects of D+D planning based upon the national situation (Regulators)



## Current Status

	Legal and regulatory framework	Independent regulatory body	Requirements	Standard Review Plan	Competent /qualified staff	Clear roles and responsibilities	One lead organization
Malaysia	Y UR EO 2009	N UR Early 2010	Y UR EO 2009	N 2010	Y NT/NM	Y	Y

### Legend:

**UR** Under revision;

**NM** Need more staff members;

**NT** Need training for staff members;

**Cont** Continuing ;



**NR** Need revision

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# LEGAL FRAMEWORK PROGRESS

	2007				2008				2009				2010				2011					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
<b>Amendment of Act 304</b>	Projected ACT 200_																					
<b>Revision of Current Regulations</b>	Licensing Regulation 1986, Basic Safety Standard Regulation 1988, Transport Regulation 1989																					
<b>Development of New Regulations</b>	Waste Management Regulation (2009), Nuclear Installation Licensing (2009), Safeguard Regulations (2010), Nuclear Security Regulations (2011)																					
<b>Supervision of NPP (Licensing &amp; Enforcement)</b>							Inter-Agency Meeting with relevant Regulatory Authority (MHLG, EC, DOE, DOSH)															
<b>Adoption of IAEA Standards</b>	49 Documents related to Research Reactor & NPP																					
<b>Bilateral Cooperation</b>	MoU with BAPETEN, Indonesia (2008)																					
									MoU with KINS, Korea													

## 1. Legal and regulatory framework : Under Revision

### **Atomic Energy Licensing Act 200\_ (Projected Act) – provision for decommissioning**

#### **PART III : CONTROL AND AUTHORIZATION**

- **Section 15 (1) – (3):** Authorization Requirements;

#### **PART VIII : DECOMMISSIONING**

- **Section 44 (1) – (8) :** Decommissioning Requirements;
  - **Sub-section (5) – (8) :** Decommissioning Plan;
  - **Sub-section (2) – (8) :** Responsibilities of Licensee in Decommissioning; and
- **Section 45 (1) – (2) :** Financing of Decommissioning.

## Legal and Regulatory Framework : UR (Cont'd):

### Atomic Energy Licensing Act 200\_ (Projected Act) – provision for decommissioning

- **Section 15(1) : Authorization Requirements**

*Without prejudice to the requirements of any other law, no person shall, with or without intention, undertake any of the following activities-*

*(a)planning, designing, siting, constructing, commissioning, operating including **extended shutdown or decommissioning** a nuclear installation;*

*(b)dealing with any radioactive material, nuclear material, prescribed substance or irradiating apparatus,*

*unless he is the holder of a valid authorization issued under Section 23(3) by the regulatory authority for such purpose and as specified in the authorization.*

## Legal and Regulatory Framework : UR (Cont'd)

### **Atomic Energy Licensing Act 200\_ (Projected Act) – provision for decommissioning**

- **Section 44 : Decommissioning Requirements**
- (1) Any nuclear installation shall not be decommissioned without prior approval by the regulatory authority.
- 
- (2) .... shall perform a baseline survey of the site, including radiological conditions, prior to construction, to develop information for comparison with the end state after decommissioning.
- 
- (3) .... shall prepare and maintain relevant documents and record for a specified period of time before, during and after decommissioning as determined by regulatory authority.

## Legal and Regulatory Framework : UR (Cont'd)

### **Atomic Energy Licensing Act 200\_ (Projected Act) – provision for decommissioning**

- **Section 44 :** Release from regulatory control
  
- (4) The regulatory authority shall evaluate the end state of the nuclear installation after decommissioning; activities have been completed to ensure that relevant regulatory requirements have been met.
  
- 
  
- (5) The nuclear installation site shall not be released from regulatory control until the licensee has demonstrated that the end state in the decommissioning plan has been reached and that any other additional regulatory requirements have been met.

## Legal and Regulatory Framework : UR (Cont'd)

### **Atomic Energy Licensing Act 200\_ (Projected Act) – provision for decommissioning**

- **Section 44 : Decommissioning Plan**
- (6) The licensee shall provide periodic reviews, updates, revisions and changes of the decommissioning plan shall follow the maximum time intervals between such reviews and updates as specified by the regulatory authority.
- 
- (7) Any revision and updates of the decommissioning plan reflecting significant changes shall be approved by the regulatory authority.
- 
- (8) The licensee shall submit the final decommissioning plan for approval and specified by the regulatory authority within an established period after the cessation of licensed activities.
-

## Legal and Regulatory Framework : UR (Cont'd)

# Atomic Energy (Nuclear Installation Licensing) Regulations 200\_ – provision for decommissioning

### **Part IX : Decommissioning License**

Section 15 : Technical Requirements;

Section 16 : Release From Regulatory Control.

### **Part IX : License Fee**

Section 19 : Decommissioning Fund

## 2. Independent Regulatory Body : UR

### **Atomic Energy Licensing Act 200\_ (Projected Act)**

*“regulatory authority” means Director-General, head of the department in the Ministry responsible for matters under this Act acting as the Executive Secretary;*

#### **Part I : Preliminary**

#### **Section 2 : Application of the Atomic Act**

*The Atomic Act shall have the force of law on Malaysia and for that purpose shall be construed in accordance with the provisions of this Act.*

#### **Section 3 : Act binds the Government**

*(1) This Act shall be binding on the Government.*



## 2. Independent Regulatory Body : UR (Cont'd)

### **Atomic Energy Licensing Act 200\_ (Projected Act)**

#### **Section 7 : Executive Secretary**

- (1) The Director-General, head of the department in the Ministry responsible for matters under this Act shall be the Executive Secretary to the Board.
- (2) The Executive Secretary whose powers, duties and functions shall be –
  - (a) To administer this Act and any regulations and order made thereunder;
  - (b) To be responsible for and to co-ordinate all activities relating to radioactive material, nuclear material, irradiating apparatus and prescribed substance ...;
  - (c) To control by the issuance of authorizations which is in par with the requirements of the Act;

## 2. Independent Regulatory Body : UR (Cont'd)

### **Atomic Energy Licensing Act 200\_ (Projected Act)**

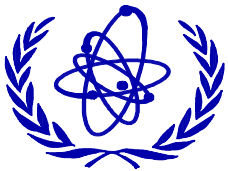
(Cont'd)

(2) The Executive Secretary whose powers, duties and functions shall be –

(d) ... delegate to any person or class of persons. (whether by name or office) such or part of its powers and duties under this Act as it may think fit.

(e) To conduct, enforce and regulate in relation to any aspect of developing criteria for safety, security and safeguard of radioactive material, nuclear material, irradiating apparatus and prescribed substance;

(f) ... (l).



	DP Milestones	Graded Approach	Authorization strategy	Opportunities for improvement
Malaysia	Operator submits DP by 2009	Depends on size/type of facilities	Multi-step	Yes

**DP - Decommissioning Plan**

## Licence Condition – provision for decommissioning

- **Licence Condition No. 36: Decommissioning**

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## Legal and Regulatory Framework : UR

### **Atomic Energy Licensing Act 200\_ (Projected Act) – provision for decommissioning**

- **Section 45 : Financing of Decommissioning**
- **(1)** An application for a license to construct and operate a nuclear installation shall ensure that adequate financial resources shall be available when needed to cover the costs associated with safe decommissioning, including the management of resulting radioactive waste.
- 
- **(2)** Financial requirements shall be in place to ensure proper decommissioning and shall be determined, reviewed and updated as required by the regulatory authority.
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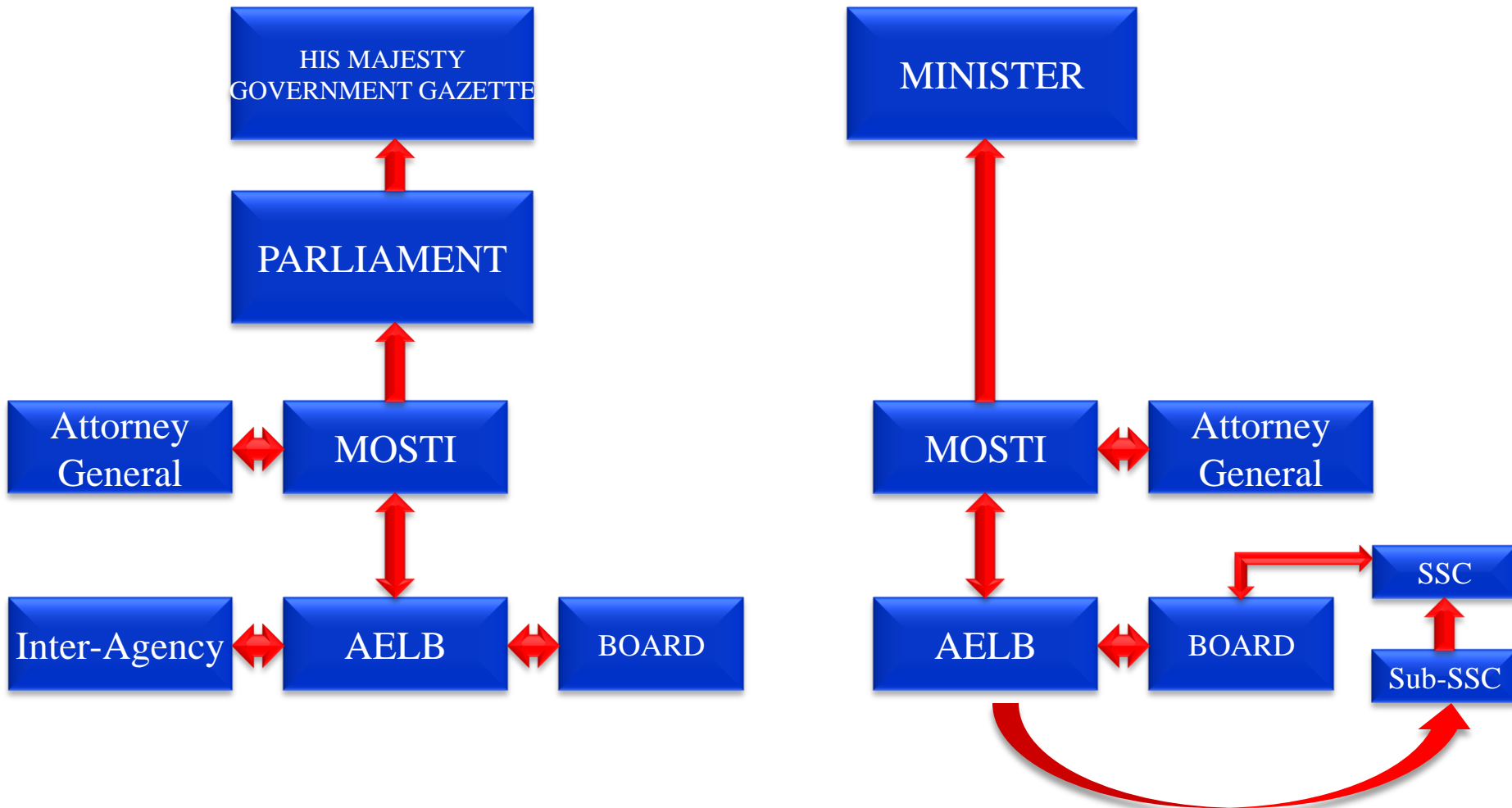
## Legal and Regulatory Framework : UR

# Atomic Energy (Nuclear Installation Licensing) Regulations 200\_ – provision for decommissioning

- **Decommissioning Fund**
- 19 (1) A minimum decommissioning fund of 15% of the capital cost of the nuclear installation and its site shall be established by the Licensee before introduction of nuclear or radioactive material into the plant.
- (2) This fund may be reviewed by the Board as deemed necessary
- (3) The Licensee shall comply with mechanisms established by the Board to accumulate this decommissioning fund during a specified period of time.
- (4) This fund shall be secured and protected from being depleted for other purposes.

- 1. Legal and regulatory framework : Under Revision
- 2. Independent Regulatory Body : Under Revision

## Flow Chart For The Development of ACT Regulations





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# Conclusion

Decommissioning of nuclear installation can be successfully achieved through a complete and updated legal and regulatory framework, clear responsibility of regulatory authority and operating organization, absolute decision and support from top management, financial requirements already in place as well as establishment of independent regulatory body.

# Thank you.



## Interpretation:

- ❖ “Decommissioning License” mean a license to decommission any nuclear installation;
- ❖ “Decommissioning” means all steps leading to the release of a nuclear installation other than a repository from regulatory control. These steps include the processes of decontamination and dismantling;
- ❖ “Nuclear installation” means a nuclear fuel fabrication plant, research reactor (including subcritical and critical assemblies), nuclear power plant, spent fuel storage facility, enrichment plant or reprocessing facility;
- ❖ “Release from regulatory control” means that the Decommissioning Licence is terminated and that the Licensee is released from licensing responsibilities
- ❖ “research reactor” means nuclear reactor mainly for the generation and utilization of neutron flux and ionizing radiation for research and other purpose, including experimental facilities associated with the reactor and storage, material testing, handling, simulator and treatment facilities for radioactive materials on the same site that are directly related to safe operation of the research reactor;
- ❖ “site” means the area containing the nuclear installation building and its associated facilities defined by a boundary