



Regional Workshop on the Management of Training Systems for Nuclear and Radiological Safety

MALAYSIA

ERMA HAFIZA BINTI IBRAHIM

ermahafiza@aelb.gov.my

THE DEPARTMENT OF ATOMIC ENERGY MALAYSIA (ATOM
MALAYSIA)



The Department of Atomic Energy Malaysia (Atom Malaysia)

Our Mission:

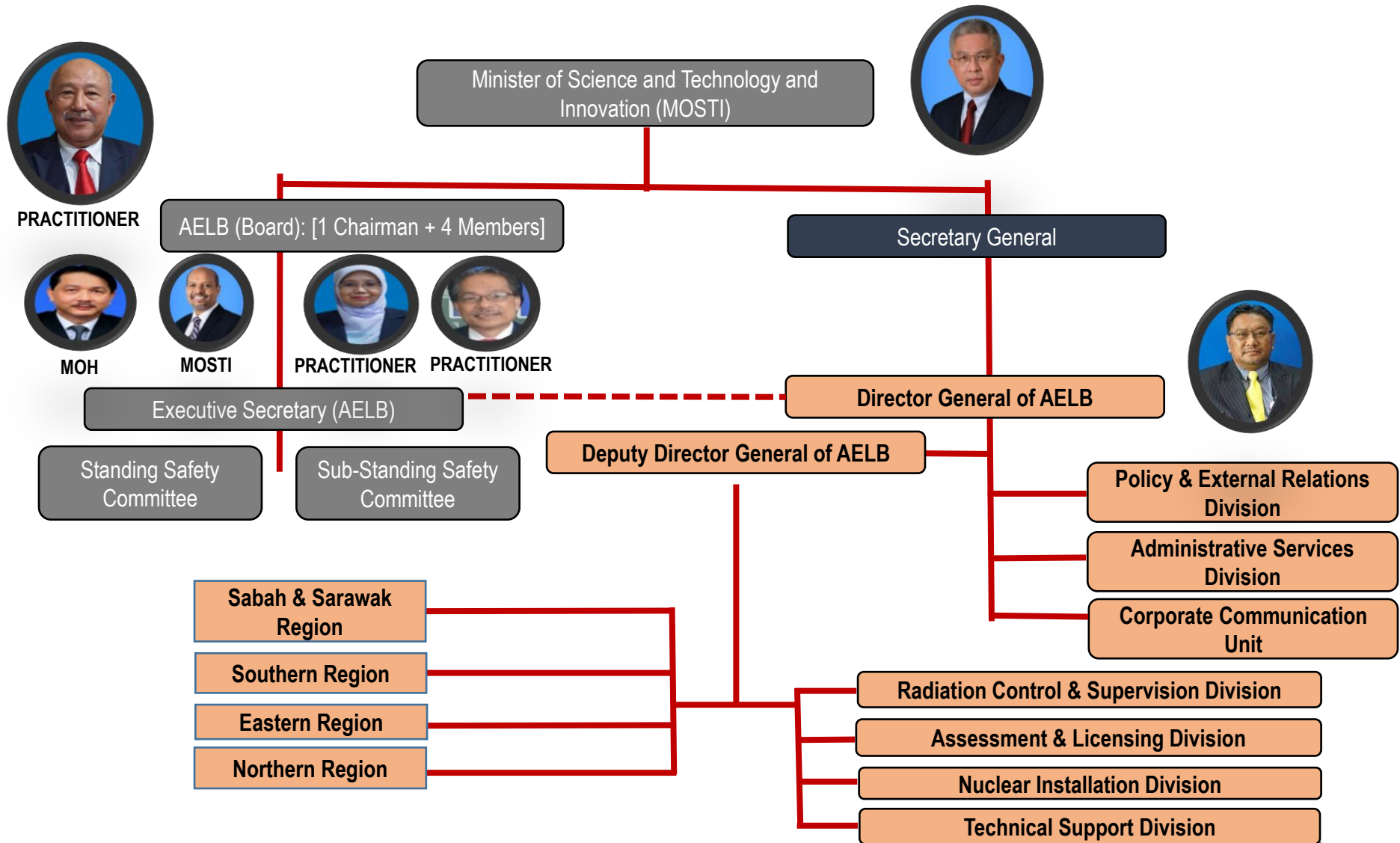
To regulate the use of atomic energy for nation's wealth and well being

Our Vision:

An effective regulatory body for Safety, Security and Safeguards in atomic energy activities

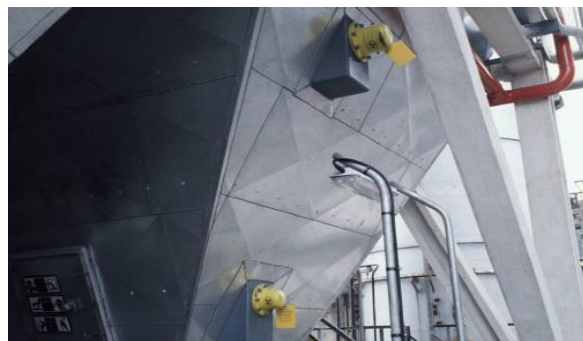
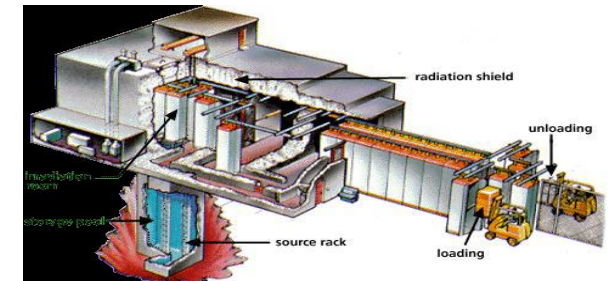


Organization Structure



Nuclear/ Radiation Activities in Malaysia

Activities	Number of Licensee
Irradiating Cell	6
Industrial Radiography	90
Gauge	853
Sales	281
Education & Research	48
Mineral	31
TOTAL	1309





a. Objectives, scope and main elements

- To develop and sustain the national capability and competency for peaceful, safe and secure use of atomic energy activities in Malaysia
- To oversee, manage and centralize overall nuclear and radiation safety training to ensure uniformity of implementation
- To strengthen training program with systematic approaches based on the training need assessment (present and future)

b. Main national institutions involved

- The Department of Atomic Energy Malaysia (Atom Malaysia) : Regulatory Body (non-medical)**
- Medical Radiation Supervision Division (MOH) : Regulatory Body (medical)
- The Malaysian Nuclear Agency (TSO, nuclear technology research facility)
- Educational Institutes (UKM, UTM, UNITEN)
- Approved Training Provider (Class H Licensees)

Responsibilities for the implementation of the national strategy on E&T

i) Atom Malaysia & Medical Radiation Supervision Division (MOH) : Regulatory Body

i) RADIATION PROTECTION (LICENSING) REGULATIONS 1986

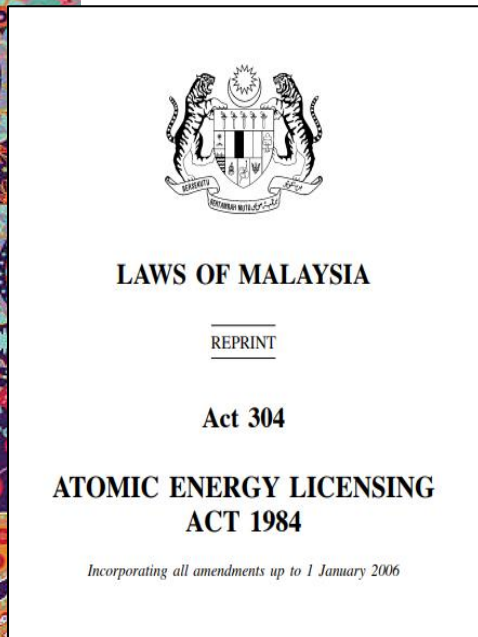
PART III GENERAL CONDITIONS FOR OBTAINING A LICENCE

12. The general conditions for obtaining a licence shall be as follows: (a) the **applicant shall employ or otherwise engage a person or persons having the necessary knowledge, skill and training** to ensure that the activities sought to be licensed are carried out in such a manner as **to protect the health of workers and members of the public and to minimize danger to life, property and the environment**; and (b) the applicant's proposed equipment, facilities and procedures shall be adequate to protect the health of workers and members of the public and to minimize danger to life, property and the environment.

ii) ATOMIC ENERGY LICENSING (BASIC SAFETY RADIATION PROTECTION) REGULATIONS 2010

Employment of radiation protection officer and qualified expert

16. (1) The **licensee shall employ a radiation protection officer**. (2) Notwithstanding subregulation (1), the licensee may employ **a qualified expert as approved by the appropriate authority** to carry out the duties of a radiation protection officer.



Responsibilities for the implementation of the national strategy on E&T

ii) Malaysian Nuclear Agency (Nuklear Malaysia)

- Training agency for RPO, NDT and radiation workers
- Collaboration with JAEA to implement the Instructor Training Course (ITC) in the field of reactor engineering, environmental radiation monitoring and emergency preparedness

iii) Universities

- **The National University of Malaysia (UKM)** : Bachelor of Science Degree (BSc) in Nuclear Science & Masters (MSc) in Nuclear and Radiation Safety
 - Nuclear and Quantum Engineering Department, Korea Advanced Institute of Science and Technology (KAIST) : Summer School program
 - International UKM-Bordeaux 1 Winter School and 2nd International UKM-Bordeaux 1 Summer School on Fundamentals of Nuclear Power, France
 - MOU with Atom Malaysia (student internship, invited lecturers)
 - **The University of Technology Malaysia (UTM)** : Bachelor in Nuclear Engineering
 - **The University Tenaga Nasional (UNITEN)** : Bachelor in Mechanical Engineering (with a minor in nuclear)
- iv) **Certification Committee: National Committee for the Certification of Radiation Protection Officer**
- v) **Approved training provider (Class H License) : Radiation workers and RPO**

Funds for the implementation

- Malaysia government fund



- International body/agency (IAEA, USDOE, WINS, IRSN and etc)



WORLD INSTITUTE FOR
NUCLEAR SECURITY



Interesting activities, events, programs in 2022/2023:

1. Symposium “Eye For The Future: Sustainable Regulatory Excellence” and AELB Client’s Day



Interesting activities, events, programs in 2022/2023:

2. Licensing Clinic



3. Refresher Course for Reviewer and Inspection Officer



15 November 2022

4. Outreach and awareness



5. International Nuclear Science, Technology and Engineering Conference 2022 (iNuSTEC)

15 November 2022

Country presentation



12

6. Regional Meeting on Advancing Nuclear Science Education For Sustainable Development



15 November 2022

Country presentation



13

7. Nuclear Safety and Security Course for The Frontline Officers



National Centre for Nuclear Response Management (NCRNM)

15 November 2022

Country presentation



Nuclear Security Support Centre (NSSC)

14

Systematic approach to training

ANALYSIS of training needs

- Competency analysis using SARCoN

DESIGN of training programs

- Annual Training Operational Plan involving technical and generic training
- Plan and implement training at least 7 days a year for each staff (Item 6.2 of the IMS Manual, *Quality Objectives and Planning to Achieve Them*)
- Structured database (i-Pakar)

DEVELOPMENT of training materials

- Topical areas: Nuclear safety, security, safeguards (3S), Emergency Preparedness Response (EPR), soft skills such as integrity, communication, team work)

IMPLEMENTATION of training

- Virtual and physical approach
- Classroom and hands-on training
- Duration of training 3-5 days / 2 weeks
- Availability of training packages: Internal staff

EVALUATION of training effectiveness

- Feedback form officer and their supervisor
- Sharing session
- Submit report

Systematic approach to training

Annual Training Operational Plan

- The certification course for reviewing and inspection officer
- The refresher course for reviewing and inspection officer



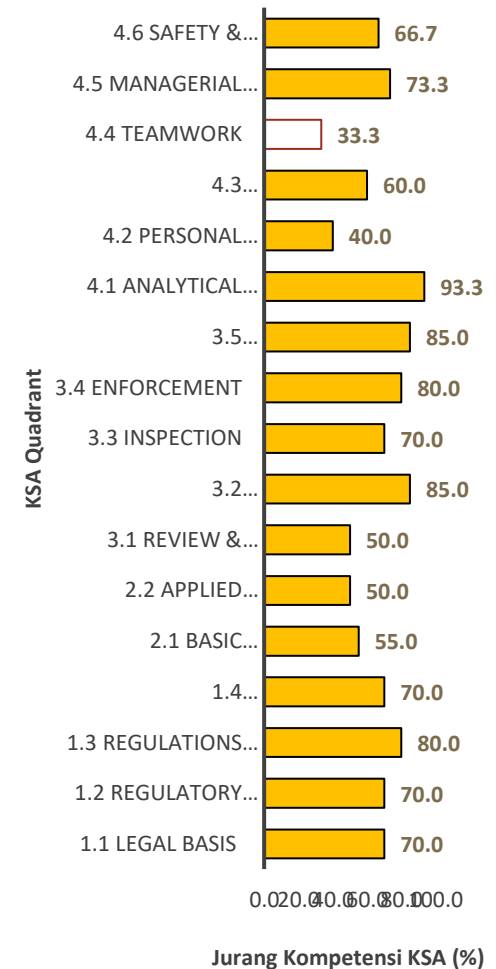
Assessment of competence needs

Sample 1

The sample case refers to officer with the range of < 5 years of work experience.

The focus of training need to be tailored more related to quadrant 1 and 3 as well as with quadrant 4.

Nama	Seksyen/Gred Jawatan	Bidang Kompetensi	Jurang (%)	(Sangat perlu) > 66.7%	(Perlu) 33.4% - 66.6%	(Kurang perlu) < 33.3%
		Kuadran 1				
		Legal Basis	70			
		Regulatory policies and approaches	70			
		Regulations and regulatory guides	80			
		Management system	70			
		Kuadran 2				
		Basic science and technology	55			
		Applied science and technology	50			
		Kuadran 3				
		Review and assessment	50			
		Authorization	85			
		Inspection	70			
		Enforcement	80			
		Development of regulations and guides	85			
		Kuadran 4				
		Analytical thinking and problem solving	93.3			
		Personal effectiveness and self-management	40			
		Communication	60			
		Team work	33.3			
		Managerial competences and leadership	73.3			
		Safety and security culture competence	66.7			



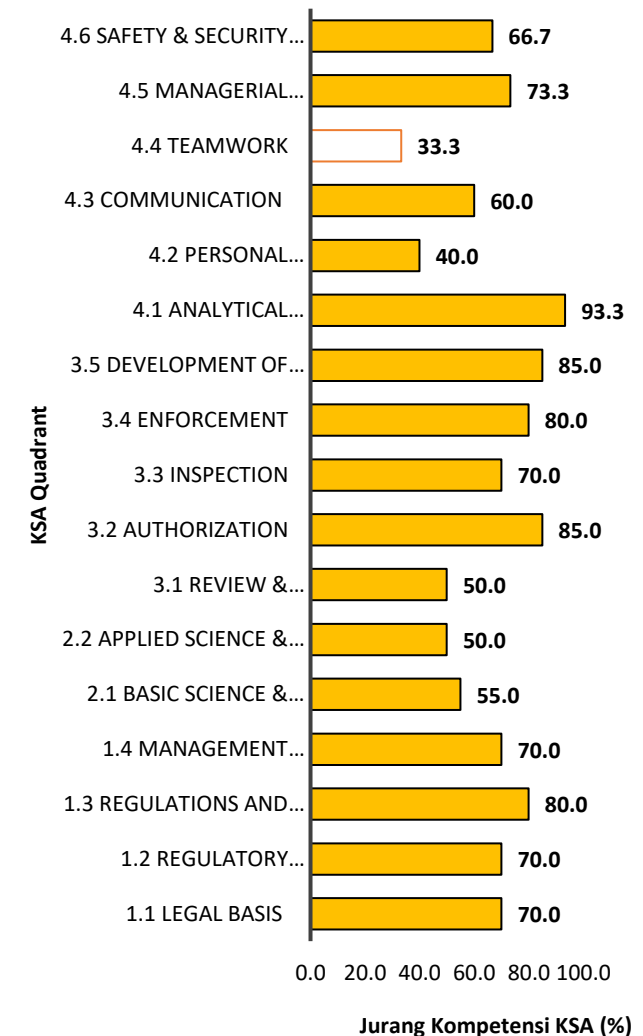
Assessment of competence needs

Sample 2

The sample case refers to officer with the range of 6 – 10 years of work experience.

The focus of training need to be tailored more related to quadrant 1 and 4.

Nama	Seksyen/Gred Jawatan	Bidang Kompetensi	Jurang (%)	(Sangat perlu) > 66.7%	(Perlu) 33.4 % - 66.6%	(Kurang perlu) < 33.3 %
		Kuadran 1				
		Legal Basis	40			
		Regulatory policies and approaches	40.5			
		Regulations and regulatory guides	48.9			
		Management system	42.9			
		Kuadran 2				
		Basic science and technology	49.5			
		Applied science and technology	20.5			
		Kuadran 3				
		Review and assessment	15.4			
		Authorization	30			
		Inspection	15.2			
		Enforcement	27.3			
		Development of regulations and guides	25			
		Kuadran 4				
		Analytical thinking and problem solving	47.6			
		Personal effectiveness and self-management	46.2			
		Communication	59			
		Team work	45.8			
		Managerial competences and leadership	54.2			
		Safety and security culture competence	33.3			



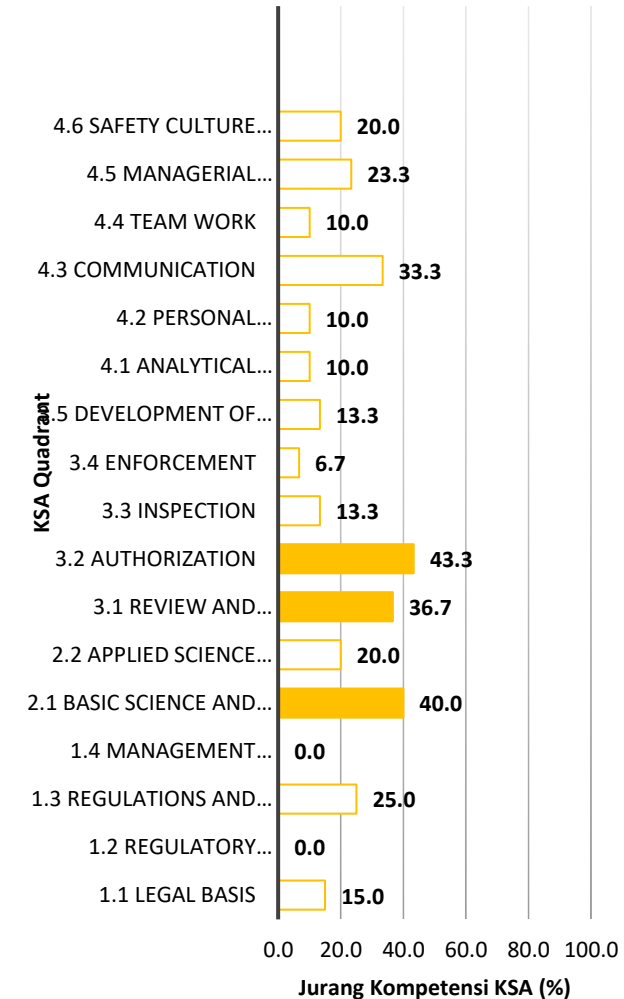
Assessment of competence needs

Sample 3

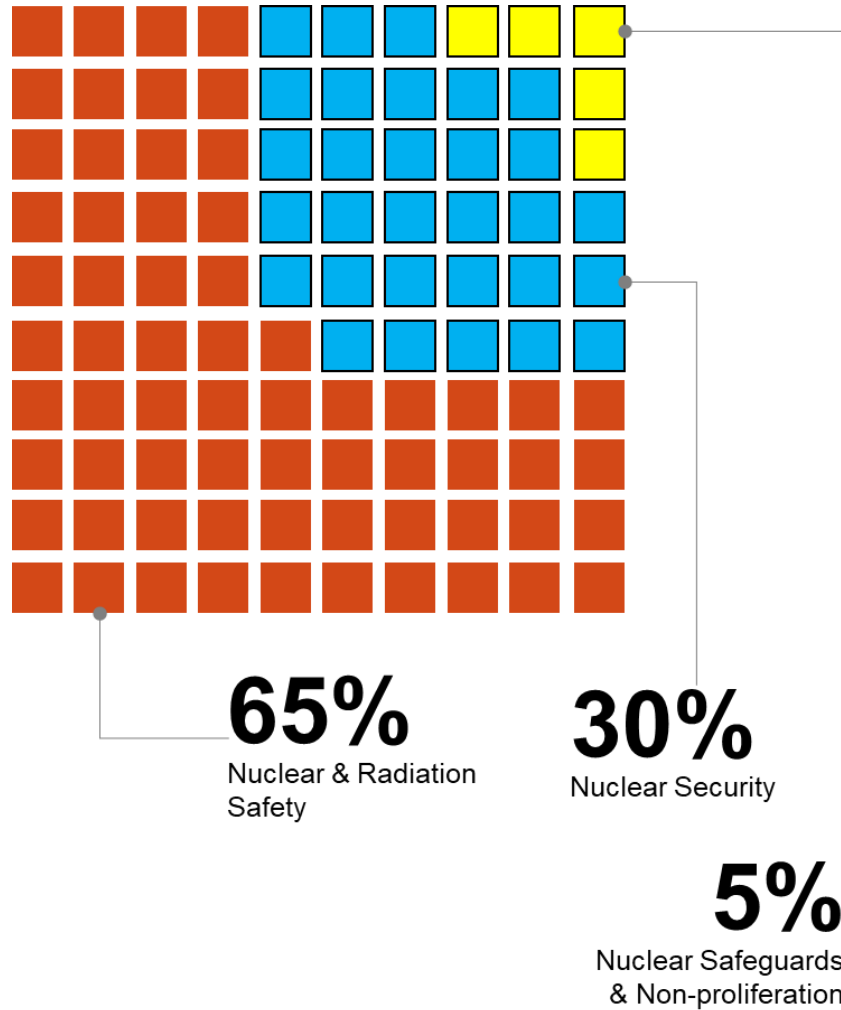
The sample case refers to officer with the range of > 10 years of work experience.

The focus of training need to be tailored more related to quadrant 2 and 3.

Nama	Seksyen/Gred Jawatan	Bidang Kompetensi	Jurang (%)	(Sangat perlu) > 66.7%	(Perlu) 33.4 % - 66.6%	(Kurang perlu) < 33.3 %
		Kuadran 1				
		Legal Basis	15			
		Regulatory policies and approaches	0			
		Regulations and regulatory guides	25			
		Management system	0			
		Kuadran 2				
		Basic science and technology	40			
		Applied science and technology	20			
		Kuadran 3				
		Review and assessment	36.7			
		Authorization	43.3			
		Inspection	13.3			
		Enforcement	6.7			
		Development of regulations and guides	13.3			
		Kuadran 4				
		Analytical thinking and problem solving	10			
		Personal effectiveness and self-management	10			
		Communication	33.3			
		Team work	10			
		Managerial competences and leadership	23.3			
		Safety and security culture competence	20			



Assessment of competence needs



KRITERIA #1:
Training Records

KRITERIA #2:
Interest

KRITERIA #3:
SARCoN analysis

Training management

- Atom Malaysia was certified by the ISO 9001:2015 Quality Management System.
- Item 6.2 of the IMS Manual, *Quality Objectives and Planning to Achieve Them* outlined the matter on training “ Plan and implement training at least 7 days a year for each staff”
- Item 7.2 of the IMS Manual, *Competence*, stated that the department will determine the expertise that must be available to its staff who carry out tasks that affect service requirements” and where necessary, provide training or take appropriate action for meet the needs of expertise”.
- AELB-ISO-9 Sem.2 Pind.00 : The procedure for the certification of reviewing and inspection officer
- AELB-KOD-1 Sem.5 Pind.01 : Training Management Procedure

Topical areas (Nuclear safety, security, safeguards (3S), Emergency Preparedness Response (EPR), soft skills such as integrity, communication, team work)

structured database (i-Pakar)

updating process (LEM/SPP-technical guidance document)

Availability of training packages (internal staff)

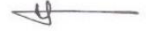
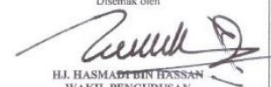
MANUAL SISTEM PENGURUSAN BERSEPADU	AELB-MSPB-1	Tarikh : 04.10.2020 Semakan : 3 Pindaan : 00
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SALINAN TERKAWAL	
DISAHKAN OLEH	TARIKH
	5.10.2020
PENGURUS DOKUMEN	

LEMBAGA PERLESENAN TENAGA ATOM
KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI

MANUAL SISTEM PENGURUSAN BERSEPADU

AELB-MSPB-1

Disediakan oleh	Tarikh
 KAMARUL ZAMAN BIN SHAFIE PEGAWAI SAINS	4.10.2020
Disemak oleh	Tarikh
 HJ. HASMADY BIN HASSAN WAKIL PENGURUSAN	4.10.2020
Diluluskan oleh	Tarikh Kelulusan/Kuasa
 HJ. MOHD PAUZA BIN MOHD SOBARI KETUA PENGARAH	4/10/2020

Challenges in education and training

At national level

- Lack of comprehensive policy to develop and implement education and training programs as national coordinator
- Currently no national strategy on education and training in nuclear and radiation safety
- Dual authorities (Atom Malaysia vs MRSD MOH)

At organizational level

- Rotation policy within department
- HRD is only a section within organization-lack of personnel to cover HRD and training roles for the whole department
- Financial





Networking and sharing in E&T

- Readiness for networking
 - Conference
 - Committee for National Certification of Radiation Protection Officer (JKPPPS)
 - Malaysia Nuclear Society
 - The ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM)
 - Asian Nuclear Safety Network (ANSN)
 - IAEA Safety Standards Committee
 - IAEA Global Nuclear Safety and Security Network (GNSSN)
 - Forum For Nuclear Cooperation in Asia
- IT means for networking
 - (MASTIC- Science & Technology)
 - Atom Malaysia website (LEM/TEK-for licensees/public), Laman Warga and I-Pakar (internal staff)
- Catalogue of training packages
 - Nuklear Malaysia
 - Class H Licensees
- Language of training packages
 - Malay & English

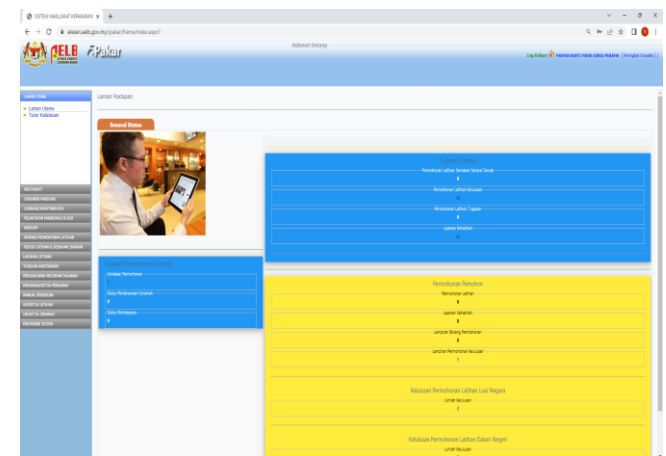
Future plans in education and training

At national level

- Strengthening 3S (Safety, Security and Safeguards) module in education curriculum (school and university)
- Improving coordination and cooperation among main national institutional involved in capacity building mainly in nuclear and radiation safety; Research Institutes, Universities and Regulatory Bodies.
- Improving national commitment on capacity building via establishing a national policy and strategy on educational and training

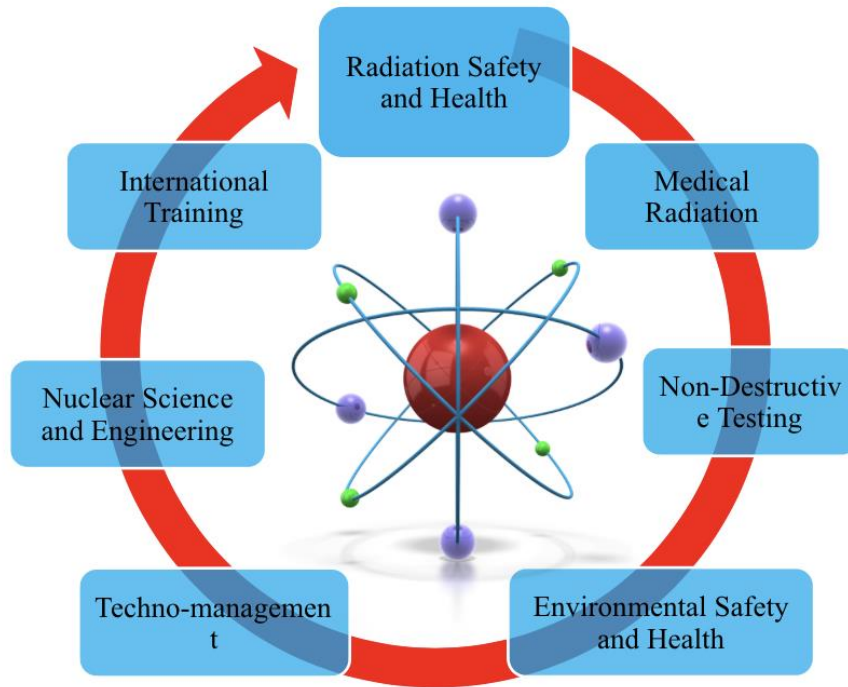
At organizational level

- Upgrade and improving knowledge information System management (i-Pakar)
- e-Learning platform



Centre of Nuclear Excellence Malaysian Nuclear Agency

THRUST AREAS OF TRAINING



Source: Centre of Nuclear Excellence (CoNE)



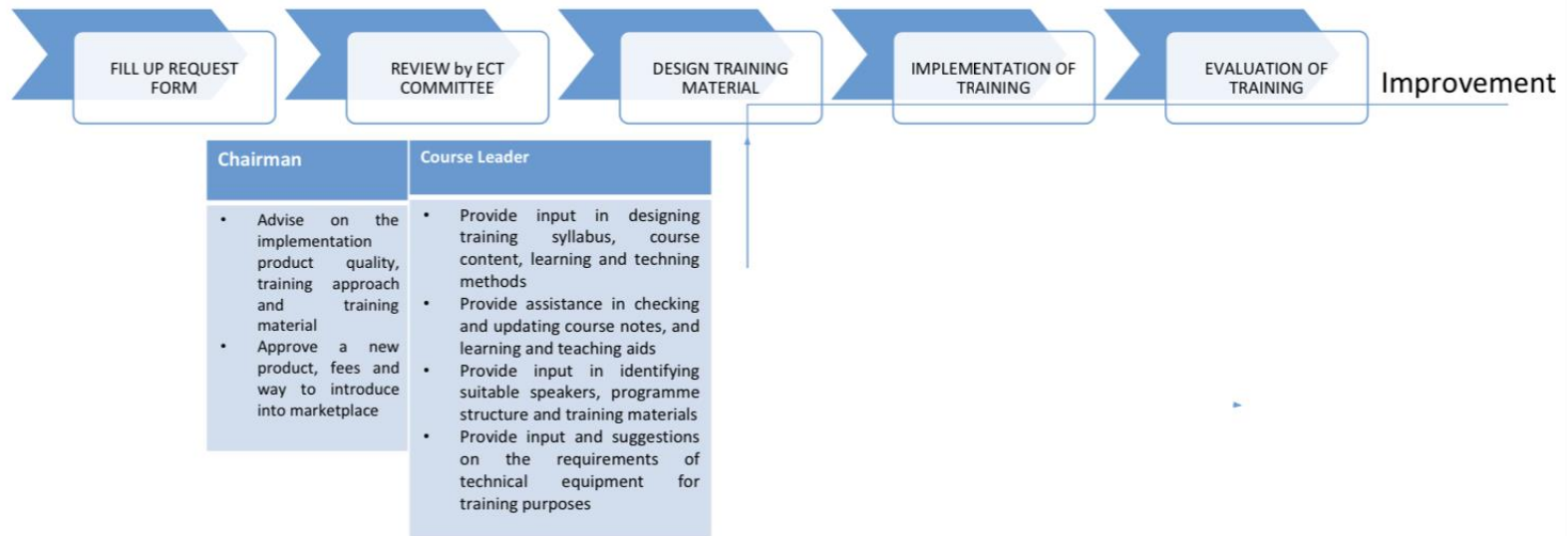
- The centre is entrusted with the task of implementing training programmes in the following sectors to enhance necessary skills, promote greater safety awareness and establish a competent workforce to play a greater role in national development agenda.
- Conducted by a pool of qualified and experienced facilitators and supported by well equipped facilities and extensive research experiences. Courses are regularly updated based on changing needs of regulatory requirements and expert advice.
- From 1996-2022 : >56k trainee (local & international)



FLOW OF DEVELOPMENT OF NEW TRAINING PRODUCT



NUKLEAR



[Template] Request form for development of new training products

Permohonan Pembangunan/ Reka Bentuk Produk Latihan Baharu/ Request for Development/Design New Training Products
SD 002
Rev: 014 Dec 2020

Borang Permohonan Pembangunan/ Reka Bentuk Produk Latihan Baharu
Request Form for Development/Design New Training Products

1. Nama Pemohon
Name of Requester
2. Tajuk Kursus
Title of the Course
3. Objektif Umum
Course Objectives (General)
4. Objektif Pembelajaran
Learning Objectives
5. Tempoh
Duration
6. Justifikasi/Alasan
Justification/Reason
7. Peserta/Audien Sasaran & Sektor Aktiviti
Target Participant/Audience & Economic Sector
8. Keperluan Sumber
Resource Requirements

Permohonan Pembangunan/ Reka Bentuk Produk Latihan Baharu/ Request for Development/Design New Training Products
SD 002
Rev: 014 Dec 2020

9. Garisgar Program
Course Outline

Module	Topics	Duration (hrs)	Training Approaches/ Methodology

10. Approval

Supervisor Approval

Supervisor & Official Stamp	Date:
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First Review

Manager MTC	Date:
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Comment:

Final Review

Chairman ECT/DDG (Corporate)	Date:
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Approval to Market

Chairman ECT/DDG (Corporate)	Date:
Approved / Not Approved	

[Template] Evaluation form

Agensi Nuklear Malaysia / Course Evaluation Form
PNM/CP-01-001
Rev: 01/14 Dec 2020

**NUKLEAR
MALAYSIA**

AGENCI NUKLEAR MALAYSIA (NUKLEAR MALAYSIA)

**BORANG PENILAIAN KURSUS
(Course Evaluation Form)**

**MXR 100
AMALAN KENDALIAN TERBAIK DALAM SINAR-X PERUBATAN
(GOOD HANDLING PRACTICE IN MEDICAL X-RAY)
24 OGOS 2020**

Sila isikan penilaian anda mengikut skala bintang berikut.
Please fill in your evaluation according to the following star rating

*****	Cemerlang/ Excellent	[.5]
****	Baik/Good	[.4]
***	Memuaskan/Average	[.3]
**	Lemah/Poor	[.2]
*	Sangat Lemah/Very Poor	[.1]

Pandangan anda membantu kami mempertingkatkan prestasi kursus
Please assist us in improving the course effectiveness by giving your frank assessment

A. Objektif-objektif kursus (umum)/ Course objective (general)

A1 Pada pandangan anda, adakah kursus ini menepati objektifnya/
How well do you feel the course achieved its stated objective ☐

B. Kandungan kursus (umum)/ Course content (general)

B1	Tahap keperincian/ Level of detail	☐
B2	Urutan/ Layout and sequence	☐
B3	Paras kefahaman/ Ease of understanding	☐
B4	Kegunaan dalam kerja/ Applicability to work/Beneficial to work	☐

Komen (jika ada)/ Comment (if any).....
.....
.....

Agensi Nuklear Malaysia / Course Evaluation Form
PNM/CP-01-001
Rev: 01/14 Dec 2020

C. Kandungan kursus (khusus)/ Course content (specific)

TAJUK/ TOPIC	KANDUNGAN/ CONTENT	PEMAHAMAN/ UNDERSTANDING	PERSEMBAHAN PENCERAMAH/ SPEAKER PRESENTATION	KOMEN/ COMMENT
Tajuk/Topic 1				
Tajuk/Topic 2				
Tajuk/Topic 3				
Tajuk/Topic 4				
Tajuk/Topic 5				
Tajuk/Topic 6				
Tajuk/Topic 7				

D. Umum/ General

D1 Nilai kursus/ Course value ☐

D2 Kekuatan kursus/ Strength of the course
.....
.....

D3 Kelemahan kursus/ Weakness (es) of the course
.....
.....

D4 Cadangan/ Komen
Suggestions/ other comments
.....
.....

**E. Logistik / Kemudahan
Logistic / Facility**

Makanan/ Food/ refreshment ☐

Pengangkutan/ Transportation ☐

Evaluation : Kirkpatrick Model
Level 1 - Reaction
Level 2 - Learning
Level 3 - Behavior
Level 4 - Results

Agensi Nuklear Malaysia / Course Evaluation Form
PNM/CP-01-001
Rev: 01/14 Dec 2020

F. Bantuan dan perkhidmatan urusetia/ Secretarial assistance and services

Komen, jika ada/ Comment, if any.....
.....
.....

Siapakah di kalangan kakitangan kami yang menyenangkan anda semasa kursus?/
Which of our employees delighted you most during your training?
.....
.....

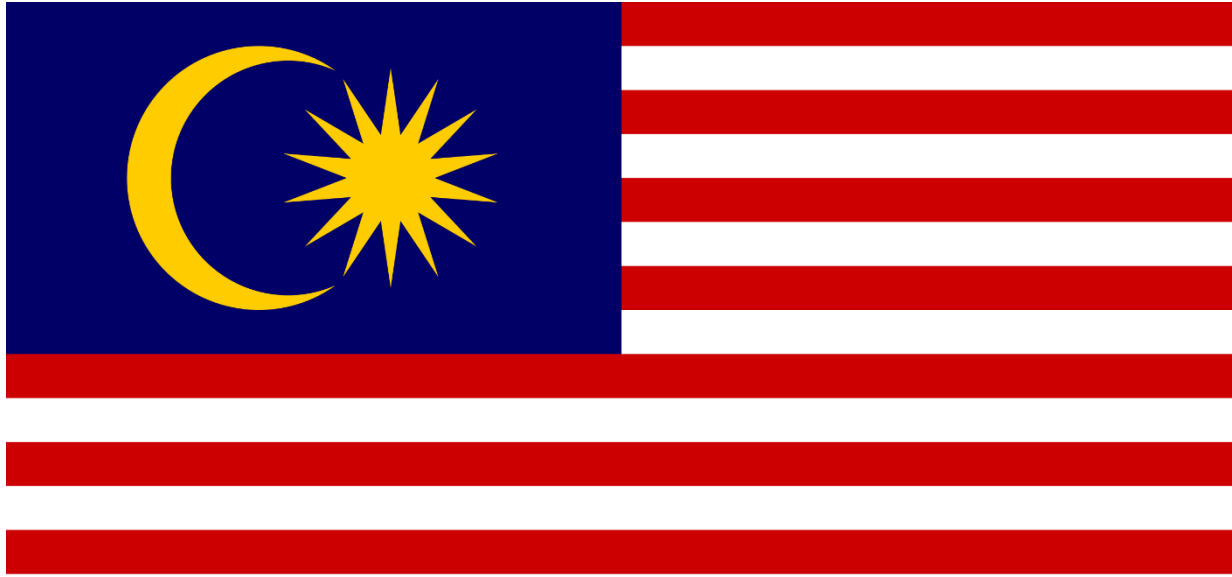
**G. Adakah anda mencadangkan kursus ini kepada rakan sekerja/kawan
Would you recommend this course to your colleagues or friends**

Ya/ Yes ☐ Tidak/ No ☐

Jika ya, sila berikan maklumat
If yes, please give detail

Nama/ Name:

Organisasi & Alamat
Organization & Address:



Thank you!

