

The Capacity Building Service
ETReS
Education and Training Review Service



IAEA

International Atomic Energy Agency

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1. Introduction

✓ **Requirements**

Ensuring sufficient and competent human resources in all areas of nuclear and radiation safety, emergency preparedness and response is an important cross cutting subject within the IAEA safety requirements, also in various safety guides and in a number of safety and technical documents.

Moreover it is a major area of effort in security.

✓ **Impact on Safety**

Non compliance with the IAEA requirements and recommendations in this area has an impact in nuclear and radiation safety.

✓ **Operational Experience Feedback**

Lack of adequate training and competence of human resources appears repeatedly in connection to incidents and accidents, both relating to facilities and activities.

✓ **Mutual Learning**

All MS have to deal with the area of Human Resources, E&T and knowledge management. Peers from the MS and the IAEA can assist reviewing, facilitate benchmarking and mutual learning in this area

✓ **Strategic Approach**

Identifying needs and areas of improvement through self assessment and external review is in line with the NS strategic approach to Education and Training.

1. Introduction



*“a **systematic and integrated** approach that includes education and training, human resource development, knowledge management and knowledge networks to develop and **continuously improve** the governmental, organizational and individual competencies and capabilities necessary for achieving a **safe, secure and sustainable nuclear power Programme**”*

- ✓ Capacity Building Action in Nuclear Safety Action Plan
- ✓ Development of Agency wide capacity Building Concept (four pillar HRD, E&T, KM and KN)
- ✓ Three level where capacity needs to be build Governmental, organizational and individual
- ✓ No service existed before based on this Agency wide CB concept
- ✓ ETReS is an IAEA Education and Training Review Service that looks at all areas of the integrated Capacity Building concept

3. Chronology of Development

ANSN/ETTG requested a peer review on Education and Training for the Asian Region (ETTG plenary meeting, Japan)

Objective: to provide assistance in defining and implementing a national strategic plan for E&T, share experience, benchmarking

Fukushima



2012
Integrated Capacity Building concept

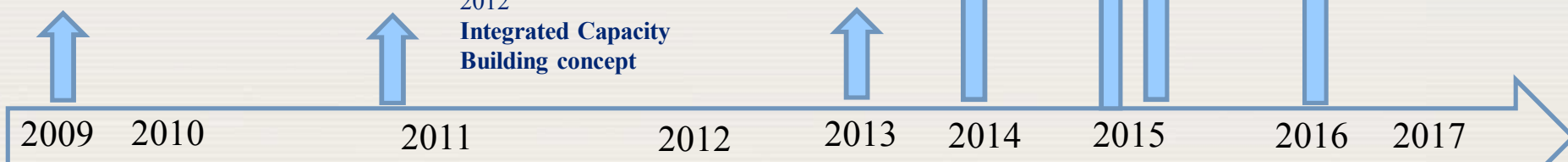
ETReS mission Pakistan

ETReS mission Malaysia

ETReS mission The Philippines

ETReS mission Thailand

TC regional WS and mission South Africa planned



Draft Guidelines were developed in 2010 and

ETReS guidelines developed based on the CB self assessment concept

First ETReS mission in Indonesia

Regional ETReS WS TC Asia, TC Europe

Regional ETReS ANNuR & FNRBA

Argentina, Mexico expressed interest



2. Guidelines, self-assessment methodology & scope

Self assessment Methodology is simple and straight forward.

It consists of asking 4 questions:

- 1.-What is needed?
- 2.- What is available and adequate to meet the needs?
- 3.- What is not available or needs improvement in order to meet the needs?
- 4.- How can the deficiencies be remedied?

For example:

If the requested scope of the ETReS is only Module 3 (the regulator) then ETReS becomes SARCoN, if SARCoN has been applied this module is finished

The 4 Questions are asked for

Cross cutting Areas of CB:

| | |
|----------|-----------------------------|
| Area I | Education and Training |
| Area II | Human Resources Development |
| Area III | Knowledge Management |
| Area IV | Knowledge Networks..... |

The 4 Questions are addressed in a modular way:

Module 1. Government, Ministry

Module 2. Universities, Educational institutions

Module 3. Regulators (this is SARCoN)

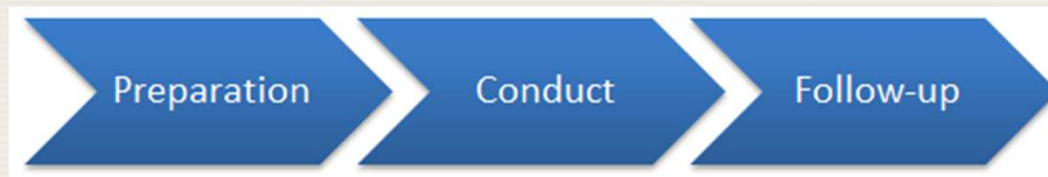
Module 4 TSO

Module 5 Activities and Operators of Facilities


(at the moment this module in ETReS has been applied only for nuclear installations). For radioactive sources there another a specific appraisal known as EduTA

Aprox. total of 130 if the 5 modules included in the scope

2. Self Assessment Approach



2. ETReS Guidelines



IAEA
International Atomic Energy Agency
Atoms for Peace

ETReS GUIDELINES
**GUIDELINES FOR THE IAEA NUCLEAR SAFETY
EDUCATION AND TRAINING REVIEW SERVICE**

Version 25 August 2015

[Type text]

English (U.K.)

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DPP for Guidelines approved, a draft finalized and applied. Module 5 would need revision of the scope to include all NS's areas

2. Examples of self assessment: Example of questions

III.3. SELF-ASSESSMENT: QUESTIONS FOR OTHER ORGANIZATIONS (CAPACITY BUILDING MODULE II)

Table III-2

| Area | Subject | What is needed? | What is Available? | What is Missing? | Action to Fill Gap? |
|------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|---------------------|
| Human Resources Development | Recruitment | The organization should actively recruit new staff in order to make sure the qualification and capability of its personnel | | | |
| | Needs Assessment | The organization should perform competence needs assessment based on the prospective nuclear power programme of the country | | | |
| | | The organization should perform training needs assessment based on the prospective nuclear power programme of the country | | | |
| | | The organization might use the IAEA tools to assess their competence and training needs | | | |
| Education and Training | Internal Capacity | The organization might have its own training facilities and trainers to support its capacity building activities | | | |
| | External Support | The organization should have formal arrangements with national educational and training institutes in order to support its capacity building activities | | | |
| | | The organization should use regional or international training institutes/nuclear organizations in order to train its personnel | | | |

2. Examples of self assessment: Assessment of national E&T and human resources

List of documentary information

The Member State requesting the nuclear safety education and training review (the host country) is requested to provide the review team with the documents and materials in English listed in the following table. Please tick the last column in the following table if the respective document is being provided.

| Number | Document/material | Pleased |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| 1 | Reports of self-assessments of each organization being reviewed, following the guidelines of Appendices B-F. | <input checked="" type="checkbox"/> |
| 2 | Legislation (laws, mandates and regulations, including drafts) governing nuclear safety, with particular reference to education and training | - In Indonesian |
| 3 | Regulations and guidance issued by regulatory body on education and training | - In Indonesian |
| 4 | Copy of national education programme (universities and technical institutions), including: <ul style="list-style-type: none"> Course title and short description; Course duration; Number of faculty and students; Research arrangements; Facilities and equipment (laboratories, simulators etc.); Faculty and facility development plans; Evaluation methodology. | <input checked="" type="checkbox"/> In Indonesian |
| 5 | Copy of the in-house training programme (i.e. internal courses or other available to the house staff) for the regulatory body, operating organizations, and TSOs, including: <ul style="list-style-type: none"> Course title and short description; Course duration Number of faculty and students; Research arrangements; Facilities and equipment (laboratories, simulators etc.); Faculty and facility development plans; Evaluation methodology. | <input checked="" type="checkbox"/> |
| 6 | Approval/ certification/ accreditation procedures for providers (institutions) of training and training centres | <input checked="" type="checkbox"/> |
| 7 | Lists of training course providers/centres and training courses, indicating which of them are approved/certified/ accredited and by whom | <input checked="" type="checkbox"/> |
| 8 | A list of training courses held in the past calendar year (or similar period for which records are available) and the number of participants attending. | <input checked="" type="checkbox"/> |
| 9 | Other (please specify): e.g. the INIR (Integrated Nuclear Infrastructure Review); and the ISE (Integrated Safety Evaluation) of the ANSN | <input checked="" type="checkbox"/> |

Numbers of nuclear facilities and people employed

Please provide information on the numbers of various types of facilities and people employed in them, as in the following tables.

| Facilities involved with nuclear safety | Number in country | | | | | | |
|--------------------------------------------------------------------------------|---------------------|--------------------------------|-----------------------------|-------------------------|----------------------|------------------|-------------------|
| | Facilities | | Approximate number of staff | | | | |
| | Existing facilities | Additional facilities foreseen | Operating staff | Technical support staff | Administrative staff | Regulatory staff | E&T professionals |
| Research reactors | 3 | - | 73 | 157 | 69 | 12 | - |
| Power reactors | - | 2 | - | - | - | - | - |
| Fuel cycle facilities | 1 | - | 63 | 126 | 29 | 8 | - |
| Waste management facilities | 1 | - | 43 | 86 | 25 | 5 | - |
| Universities and technical institutes teaching nuclear safety-related subjects | 4 | - | See below | | | | |
| Training organizations | 1 | - | - | 50 | 29 | - | 6 |
| Other (specify) | - | - | - | - | - | - | - |

For the Regulatory Body (RB), provide information on the numbers of staff for the various regulatory functions:

| Regulatory Staff | Regulatory functions | | | | |
|--------------------------------------------------------------------|------------------------|--------------------------|-----------------------|----------------------------|-------|
| | Regulations and Guides | Licensing/ Authorization | Review and Assessment | Inspection and Enforcement | Other |
| Number of professional staff employed in the Reg. Body by function | 18 | 26 | 23 | 31 | 28 |

For Universities and technical institutes teaching nuclear safety-related subjects:

| University or Technical Institute + | Name of Department | | | | | |
|---------------------------------------------------|------------------------------------------|----------------------|-----------|-------------|-------------------|------------------------|
| | Physics / Engineering Physics Department | | | | | |
| | Full Professors | Assistant Professors | Lecturers | Researchers | Graduate Students | Undergraduate Students |
| Number of professional staff employed by function | | | | | | |
| • UGM | 1 | 0 | 31 | - | 3 | 186 |
| • UI | 4 | 10 | 24 | - | 230 | 520 |
| • ITB | 5 | 8 | 13 | - | 25 | 350 |
| • STIN | 1 | - | 29 | 1 | - | 320 |

2. Examples of self assessment: Example of answers and reviews' comments

APPENDIX C. EVALUATION OF SELF-ASSESSMENT FOR UNIVERSITIES, PROFESSIONAL TRAINING INSTITUTES, AND OTHER TRAINING ORGANIZATIONS

Table C.1

| Area | Subject | What is needed? | What is available? | What is missing? | Action to fill gap? | Evaluation |
|---------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basis and Framework for Nuclear Safety Education and Training | Organisational framework | The academic educational institutions, the professional training institutes and other independent training organizations should be ready and well positioned to play in the national system of education and training in nuclear safety | <p>The academic educational institutions training institutes that offer nuclear safety subjects:</p> <ul style="list-style-type: none"> ▲ Physics Engineering, University of Gajah Mada, Yogyakarta ▲ Department of Physics, University of Indonesia, Depok – Jakarta ▲ Department of Physics, Bandung Institute of Technology, Bandung ▲ Polytechnique Institute of Nuclear Technology – BATAN, Yogyakarta ▲ Center for Education and Training – BATAN, Jakarta ▲ Training Center – BAPETEN, Jakarta | | | <p>Are necessary educational programmes identified? (Nuclear Engineers – is a small fraction, many other engineering specialties are needed) Was it decided what level is needed for various jobs - BSc, MSc? Is only High School education considered? There should be many other educational and training providers (like technical schools, etc.)</p> |
| | | The tasks, responsibilities and funds to the various organizations should be clearly defined and assigned | All of those are governmental institutions and were established by government / formal decree | | | To be discussed how this criterion is understood. |

2. Examples of self assessment: Example of answers and reviews 'comments

| | | | | | | |
|---------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Legal framework | The policies, strategies and plans with respect to current and future use of nuclear power plants and research reactors should include the nuclear education and training | Included in the curriculum | | | The response is not clear. Please provide information on strategies and plans. |
| | | The existing and new laws, policies, rules and regulations should include the nuclear E&T | Accommodated in the curriculum | | | The response is not clear. For example, what rules and regulations address E&T matters? |
| | Human resources, infrastructure and funding | Sufficient number of qualified faculty members are needed and recruitment new staff | Sufficient The recruitment of new staff is occurred based on the needs and government quota | | | Please provide information how these needs are identified and satisfied. (It relates to the strategy and plans.) |
| | | Appropriate facilities, equipment are needed to assist the nuclear E&T | <ul style="list-style-type: none"> ▲ Lecture room ▲ Education and training laboratory ▲ Library ▲ Computer and internet facility The facilities are used for education and training activity and also for developing the capacity of lecturer or trainer | | | Was the appropriateness matched to the future needs? Are any long- and medium-term plans for providing resources commensurate with the needs? |
| | Appropriate funding of the E&T institutions should be assured | Funded by annual government budget | | | Are any long- and medium-term plans for providing resources commensurate with the needs? | |
| Competencies and Training in Nuclear Safety | Competencies and subject matter expertise | Well defined competencies and subject matter expertise in topics related to nuclear safety are required of the faculty members in the universities | Qualification of the lecturers are Doctor degree and have teaching experiences as well as research on their specialization. The teaching subject are selected comply with their specialization (teaching and research experiences) | | | The response is not clear. Are such competencies as Design Safety Requirements, Safety Analysis, Risk Assessment, PSA, Deterministic Safety Analysis, etc. ensured / available? |

4. Use, Users and Benefits

- CB self assessment provides a baseline for national/organisational enhancement programs
 - Improvement and development plans for National and regional Training Centers
 - Improvement and development plans for the organisations, i.e. Regulatory Body
 - NS consistency in criteria for assessment of and assistance to the MS
 - Baseline to fulfil the gaps through cooperation and support
 - Baseline for strategic mid term planning (both MS and NS support programs) i.e. Are there are common regional challenges to prioritize?
 - Baseline for assessment of implementation: were the gaps reduced after follow up and implementation of support?
 - Harmonised Regional Profiles for Capacity Building
 - Good practices shared
- ✓ It looks at the integrated CB concept (E&T, HRD, KM and KN)
 - ✓ Modules 1-4 of the Questionnaires address major common areas for CB and offer a common integrated approach
 - ✓ Module 5 is flexible and can be adapted to facilities/activities, needs for future nuclear development plans (embarking)
 - ✓ It can be used to assess Training Centers from MS who cooperate with the IAEA through inter alia practical arrangements

5. Conclusions and future actions

- ETReS is the only CB service fully in line with the integrated concept
- Streamline of Peer Review services
- In the past was focussing on nuclear installations
- Ongoing work to extend the questionnaires
- Extended scope to include safety knowledge management
- More focus on radioactive sources and other applications.

***Thank you
for your attention***