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Capacity Building, Education and Training in Nuclear and Radiation Safety

Dominique Delattre
IAEA, Vienna
Austria

Strada Costiera 11, 34151 Trieste, Italy - Tel.+39 040 2240 111; Fax +39 040 224 163 - sci_info@ictp.it

Education and Training for Capacity Building in Nuclear Safety and Security

Dominique Delattre

With Rejane Spiegelberg Planer

Safety and Security Coordination Section
Department of Nuclear Safety
r.spiegelberg-planer@iaea.org

Capacity Building

"Capacity building for nuclear safety and security is the systematic and integrated approach to develop and continuously improve individual, organizational and regulatory competences and capabilities necessary for achieving and sustaining high levels of nuclear safety and security in Member States."

"The IAEA Department of Nuclear Safety and Security will through the implementation of its capacity building strategy, support the establishment of the necessary conditions and environment that help to develop, enhance, and continuously improve the international nuclear community's capacity building efforts."

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Supporting Capacity Building through

Nuclear Installation Safety

Radiation and Waste Safety

Education and Training

Emergency Preparedness and Response

Nuclear Security

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Framework for the IAEA E&T programme

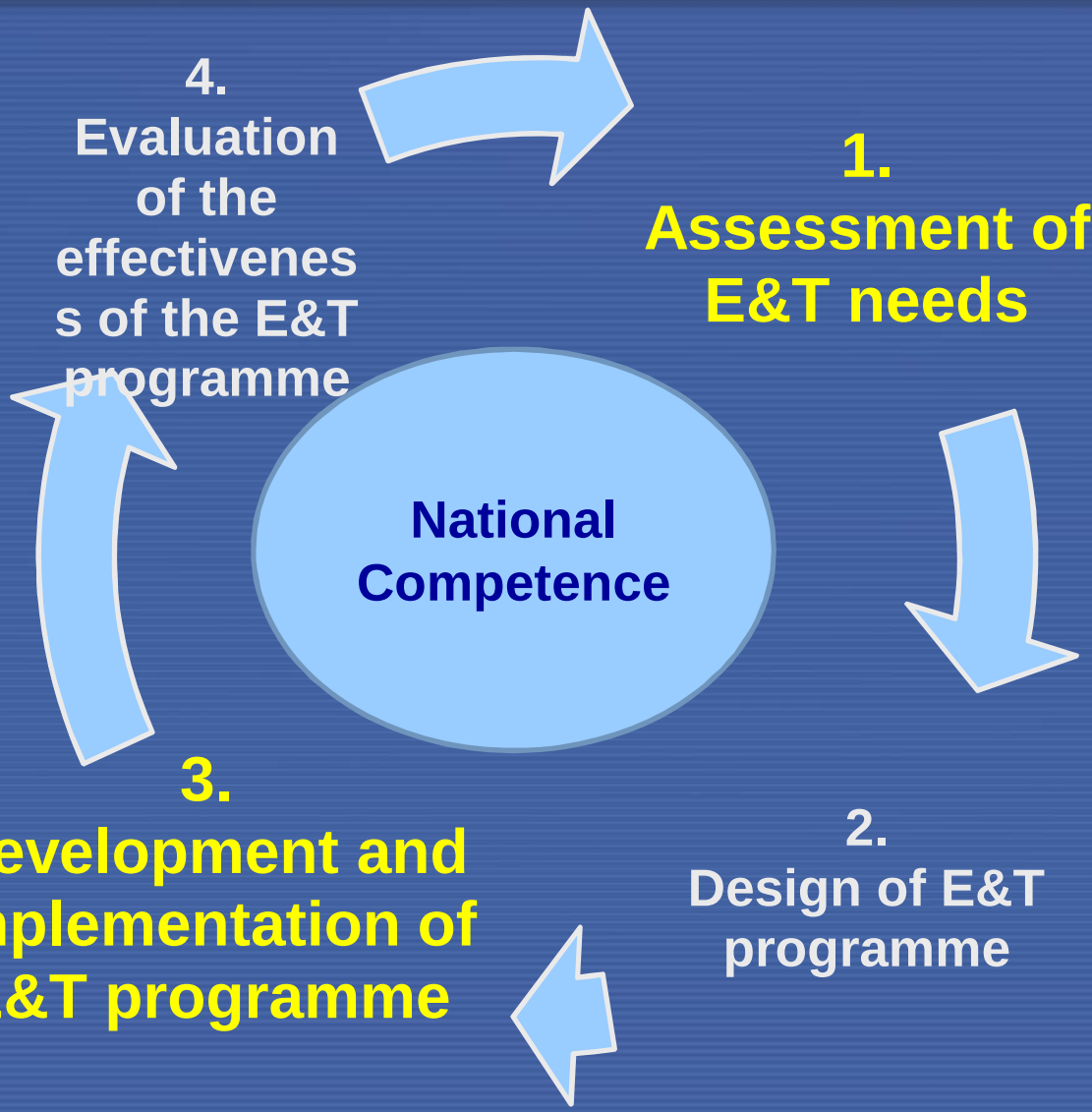
- Achieving self sustainability in Member States
- Further strengthening regional expertise, networking and sharing of knowledge and experience
- Capacity building through Education and Training

- Strategic Plan for Education and Training in Radiation and Waste Safety (Note 2010/44)
- Strategy for Education and Training in Nuclear Safety (Note 2001/19)

Objectives of E&T support to MS

- To build and strengthen competencies within MS as part of their capacity building efforts
  - *Development of E&T programmes that are based on IAEA Safety Standards*
- *Development of E&T infrastructures that are matched to current and foreseeable needs*
- To promote a harmonized framework for the provision of E&T in Member States.

Framework for building competences through education and training



1. Assessment of E&T needs

- To identify and prioritize the education and training needs based on current and foreseeable practices and activities within the country

  - Relevant organizations that need safety competences
  - Levels of proficiency required



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IAEA appraisals, assessment, review

- ✓ EduTA:
  - Education and Training Appraisal for Radiation Protection and the Safety of Radiation Sources
- ✓ SARCoN:
  - Systematic Assessment of Regulatory Competence Needs in Nuclear Safety
- ✓ Independent EPREV:
  - Emergency Preparedness Review

    - In addition, fact finding missions and advisory meetings are organized to assist in self-assessment of education and training

2. Design the E&T programme

- Promoting synergies among organizations and institutions
- Seeking national coordination and exchange of information at national, regional and interregional level
- Preparing for the training of new staff based on recruitment programmes arising from the assessment phase

Taking into consideration the availability of national and regional resources

3. Development and implementation

Utilizing national resources, as far as practicable, that can be supplemented by external assistance, where needed

…and based on the IAEA Safety Standards

- ✓ Educational courses
- ✓ Training workshops, seminars, train-the-trainers
- ✓ Networking and dissemination of information
- ✓ Knowledge management, transfer and retention
- ✓ National, regional or interregional competency building centres

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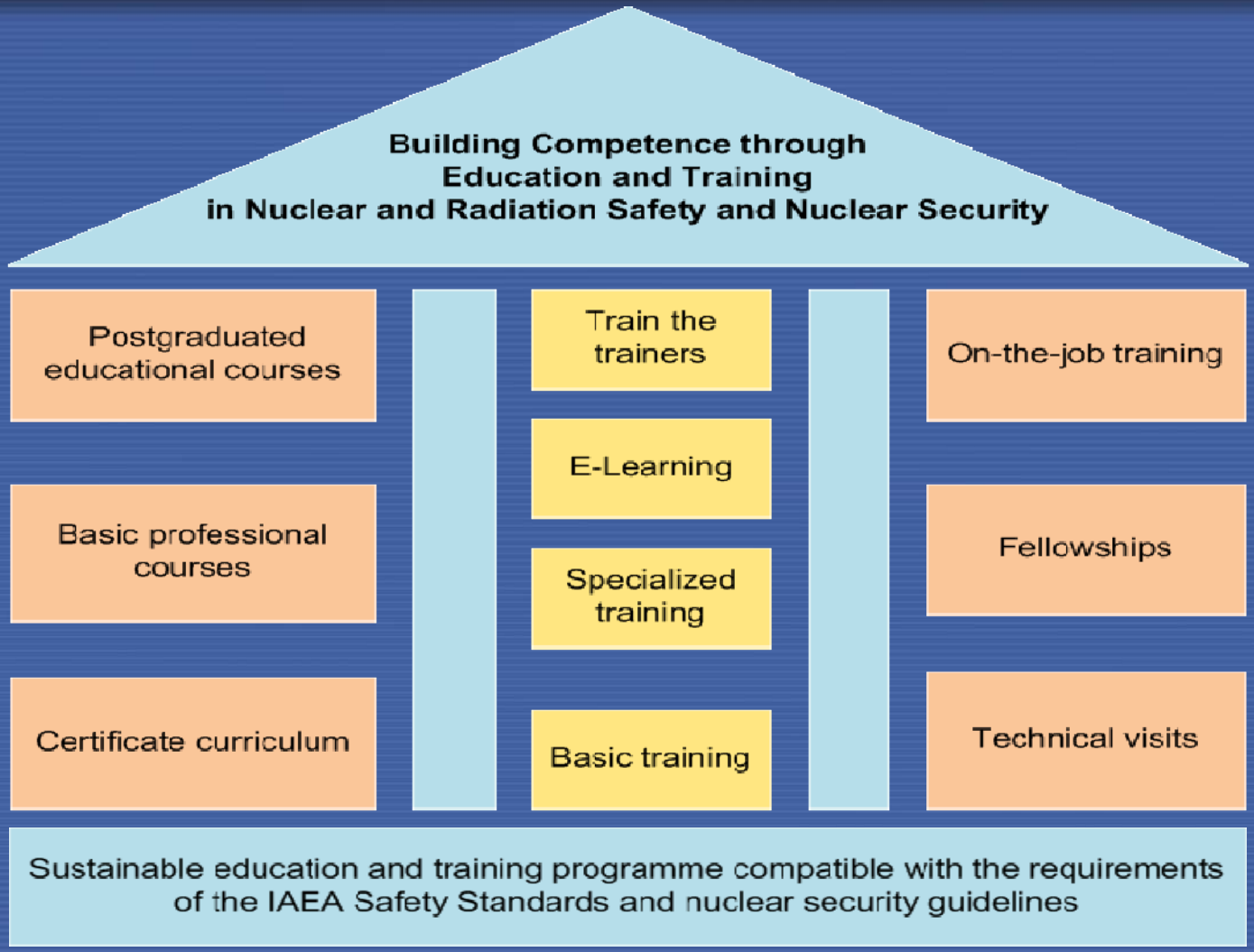
3. IAEA Competence building tools



Competence building tools: knowledge sharing, transfer and retention

- Global and regional knowledge sharing networks
  - International Regulators Network (RegNet)
  - Asian Nuclear Safety Network
  - Global Nuclear Safety and Security Network (GNSSN)
  - FORO
  - others
- National, regional or interregional competency building centres

Evaluation

- To ensure that the intended outcomes are achieved
- To identify further needs analysis, programme development, programme implementation
- To facilitate the continuing improvement of programmes

Working Group on Coordination of Education and Training Support to Member States

A. Luciani, NSRW
A Braunegger-Juelich, NSNS
E. Buglova, IEC
M. Moracho Ramirez, NSNI

Coordination: R. Spiegelberg Planer, SSCS
Chair: K. Mrabit, Section Head SSCS

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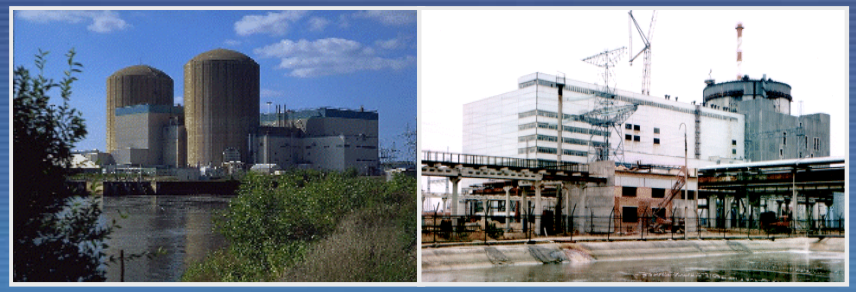
Nuclear Installation Safety



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Framework for E&T in Nuclear Safety

3 levels

- **Level 1 –Basic Training:**
  - a broad overview of all the safety concepts and their application to nuclear power plants
- **Level 2 - Specialized Knowledge:**
  - a detailed understanding of the areas important to nuclear safety covered in Level 1
- **Level 3 - Specific Expert Knowledge:**
  - knowledge in support to specific tasks to be performed by the local organizations involved in the programme

Training courses, Workshops, seminars, Train-the -trainers

Basic Knowledge

- Professional Training Courses on Nuclear Safety
- Fundamentals of Nuclear Engineering

Standard Training Courses and lectures on the IAEA safety standards covering:

- Regulatory Control of Nuclear Power Plants
- Safety Assessment of Nuclear Power Plants
- Operational Safety of Nuclear Power Plants
- Safety of Research Reactors of Nuclear Power Plants

Training materials

Training material for trainers based on tailor-made workshops on/covering in the areas:

- Regulatory Control
- Safety Assessment
- Operational Safety
- Safety of Research Reactors

Multimedia based materials supporting the IAEA Safety Standards (CDs, Videos, etc)

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Emergency Preparedness and Response

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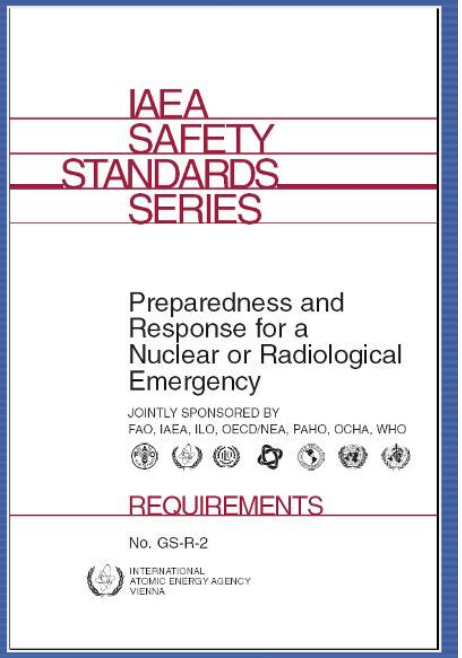
Knowledge transfer in the field of EPR

"Response arrangements should be made"

"Skills and knowledge required to do this"

"People with response functions must be trained"

"Sustainable training schemes need to be developed"



Challenges

More demand for training

- Growing awareness of the importance and the issues of radiological EPR, in general
- Growing request from the embarking states for upgrading national EPR infrastructure
- High number of new trainees (e.g. first responders)

Target groups

- Decision makers
- Emergency planners
- Emergency resposnse coordinators
- Staff of regulatory bodies
- Radiation protection officers
- Radiological assessors
- Medical personnel
- First responders
- Training officers
- Public information officers

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Emergency Preparedness and Response

- Standardization:
  - training courses/workshops
  - train-the-trainers' workshops
  - modules for augmenting existing national training
- New approaches:
  - cascade training model
  - train-the trainers
  - Interregional -> regional -> sub-regional -> national
- New training tools:
  - e-learning, internet for information sharing
- Emphasis on practical aspects (functionality, drills, exercises
- Multi-purpose national trainers: to train fire, police, civil defence

- Lecture material
  - Define format (PPT with notes)
  - Define objectives/module
  - Modules matching documents
- Supporting material
  - CD-ROM (enabling translation)
  - Training manual/checklists for organization of courses
  - Standard tests
  - Computer code for work sessions
  - Reviewed videos
  - Standard emergency exercises

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Training

1. Developing a national capability for response to a nuclear or radiological emergency
2. First response to a radiological emergency
3. Procedures for medical response to a nuclear or radiological emergency
4. Preparedness and response for an emergency at a nuclear power plant (nuclear emergency response)
5. Preparedness and response for an emergency at a research reactor
6. Preparing, conducting and evaluating an emergency response exercise
7. Expanded response to a radiological emergency
8. Medical education for nuclear or radiological emergency preparedness
9. Public Information management in a nuclear or radiological emergency
10. Monitoring during a nuclear or radiological emergency

Radiation, Transport and Waste Safety

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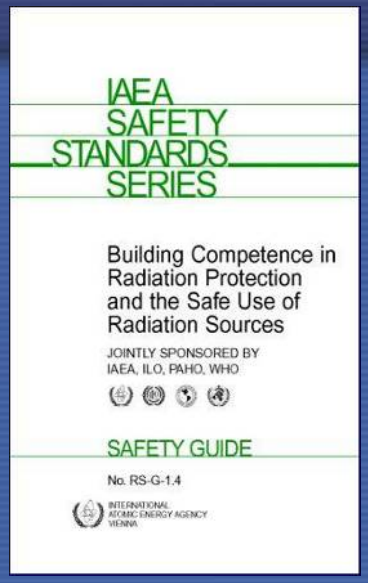
IAEA STRATEGIES FOR BUILDING COMPETENCE



1. Collection of national data and analysis of education & training needs

2. Design of national strategy tailored to meet national needs

3. Implementation of national strategy

4. Evaluation and feedback

National competence in radiation safety

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IAEA COMPETENCE BUILDING TOOLS

Postgraduate educational course on radiation protection and safety of radiation sources

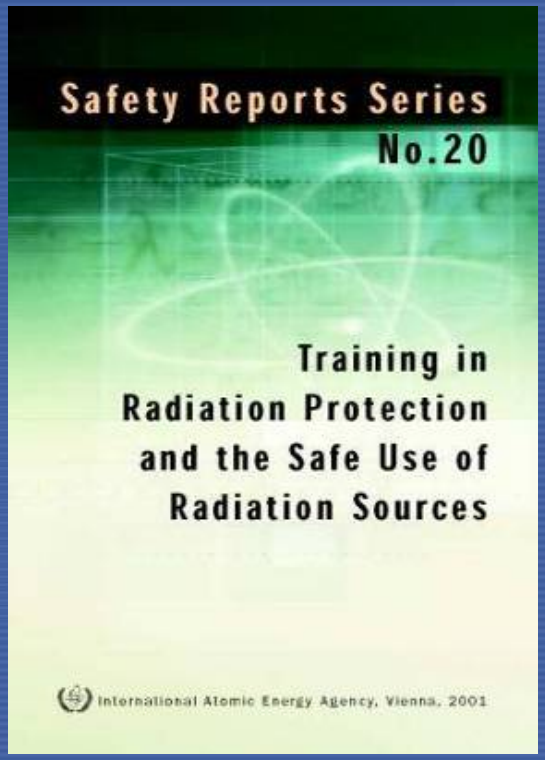
To meet the initial education & training requirements of young professionals in the field of radiation protection and the safety of radiation sources

- **Future leaders and decision makers**
- **Qualified Expert of the future**

IAEA COMPETENCE BUILDING TOOLS

Specialized Training Courses

- Focused on specific target audience or specific subject
- Short duration, typically 1 to 2 weeks
- Provide in-depth knowledge
- Participants
  - professional/technical staff
  - often have attended a Postgraduate educational course and/or have relevant work experience



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IAEA COMPETENCE BUILDING TOOLS

Radiation Protection Officer

- An individual technically competent in radiation protection matters relevant for a given type of practice who is designated by a registrant or licensee to oversee the application of the relevant requirements of the IAEA Safety Standards

RPO training material

- Core material, plus
- Supplementary 'practice–specific' material for medical and industrial practices

Target Audience

- People likely to be designated by the registrant or licensee to oversee the application of IAEA Safety Standards.

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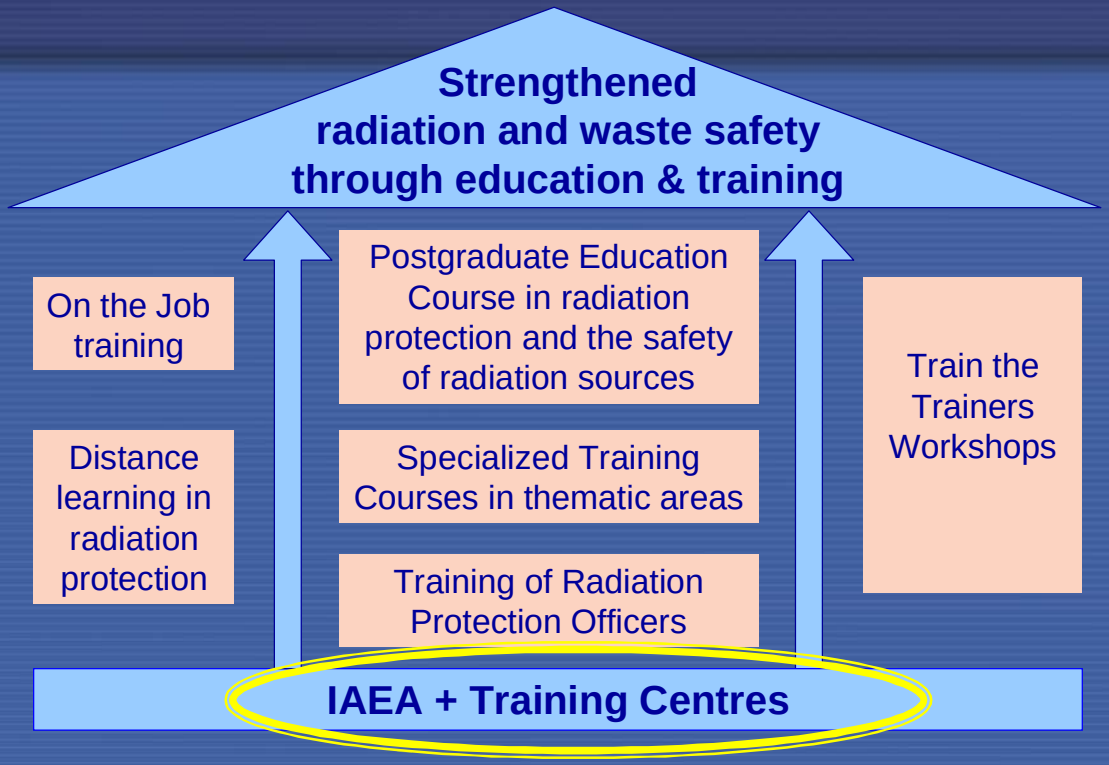
IAEA REGIONAL TRAINING CENTRES



Regional training centres are strong
regional resources
for building competence through education and training
in radiation, transport and waste safety

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E&T in Nuclear Security

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IAEA Assistance in Nuclear Security: Human Resource Development

Training Programme

Goal: Fill gaps between the actual performance of personnel and the required competencies and skills needed to meet requirements relating to nuclear security.

Educational Programme in Nuclear Security

Goal: Transfer in-depth and sustainable knowledge in the area of nuclear security and foster nuclear security culture.

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Nuclear security

- M.Sc. Programme in Nuclear Security
- Certificate Programme
  - One semester programme: specialists with an overview in all areas of nuclear security and with specialization in particular topics (Content: most M.Sc. courses reduced to contain only essential information)

- Computer Based Training for Law Enforcement Officers

Nuclear Security Support Centre

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Nuclear Security Support Centre

Primary objectives are:

- Develop **human resources** through the implementation of a tailored training programme
- Develop a **network** of **experts**
- Provide **technical support** for lifecycle equipment management and **scientific support** for the detection of and the response to nuclear security events

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Expressed Interest in Nuclear Security Education

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Nuclear Safety & Security

Featured articles

IAEA calls for cordon around highly contaminated areas at former nuclear site

At a gathering to mark the International Day against Nuclear Tests, held in Astana, Kazakhstan on 26 August 2010, the IAEA expressed its commitment to the Kazakhstani government and its people to assist in rehabilitating and developing the closed nuclear test site at Semipalatinsk, Kazakhstan, which was, in part, heavily contaminated by radioactivity. Full story »

China and IAEA to strengthen cooperation in Nuclear Security

The IAEA and China Atomic Energy Authority (CAEA) signed a practical arrangement in the field of nuclear security in Beijing on 16 August 2010. IAEA Director General Yukiya Amano and CAEA Chairman Chen Qiufa signed the arrangement, which calls for strengthening the

Areas of expertise

- Incidents & Emergencies
- Nuclear Installation Safety
- Nuclear Security
- Radiation, Transport & Waste Safety

Resources

- Safety Standards
- Security Guidelines
- Organizational chart
- Safety Glossary

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- **Education & Training**

Training Resources and Materials

The establishment of sustainable education and training programmes is fundamental for the safe, secure and efficient development of the nuclear field. The IAEA offers a wide spectrum of activities in support of education, training, human resource development and capacity building including interregional, regional and national training courses and workshops; assist visits and review services; mentoring programmes; networks of managers and specialists for sharing good practices; publications that accumulate best international practices; supply of training materials and training tools; and internship programmes for the younger generations.

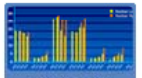
Main Training and Information Pages


Education and Training in Nuclear Safety


Education and Training in Nuclear Installation Safety


Radiation, Transport and Waste Safety


Managing Human Resources in the Nuclear Field


Analysis for Sustainable Energy Development


Participating in the IAEA-TC Programme

Training Materials

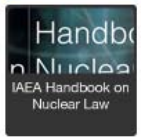

Radiation Protection of Patients : Free Material


Nuclear Installation Safety Training Support


Training Packages for Specialized Events


NPES Publications and Documents


Nuclear Knowledge Management - Main Activities



IAEA Handbook on Nuclear Law

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Education and Training in Nuclear Safety


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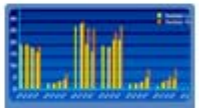
Managing Human Resources in the Nuclear Field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