

IAEA ACTIVITIES IN EDUCATION AND TRAINING IN RADIATION, TRANSPORT AND WASTE SAFETY: CURRENT STATUS AND FUTURE CHALLENGES

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IAEA
International Atomic Energy Agency

INTERNATIONAL ATOMIC ENERGY AGENCY

Membership: 150 Member States

Headquarters in Vienna, Austria + offices in New York, Geneva, Tokyo,
Toronto, Monaco. Staff ~ 2360

Regular Budget = Euro 277 million + Extra budgetary = US \$80 million



Main Functions

Verification of Peaceful Uses

Promotion of Safety

Transfer of Technology



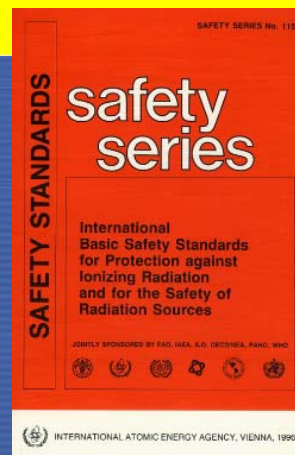
IAEA STATUTORY FUNCTIONS IN RADIATION SAFETY

IAEA statutory functions in radiation safety

to facilitate and
service international
undertakings

to establish
Standards of
radiation safety

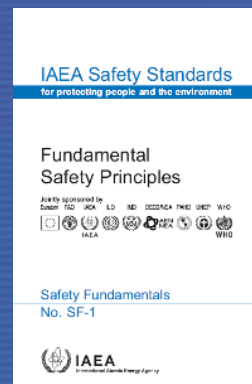
to provide for
the application of
the standards



Education & Training
Technical cooperation
Radiation Safety Services

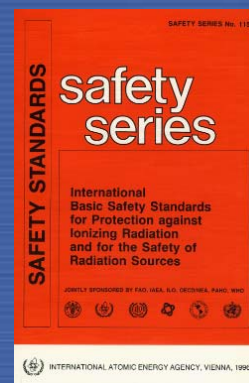
ESTABLISHMENT OF INTERNATIONAL SAFETY STANDARDS

Fundamentals



Underlying principles aimed at politicians and regulatory bodies

Requirements



Specific obligations and responsibilities (“shall”)

Guides



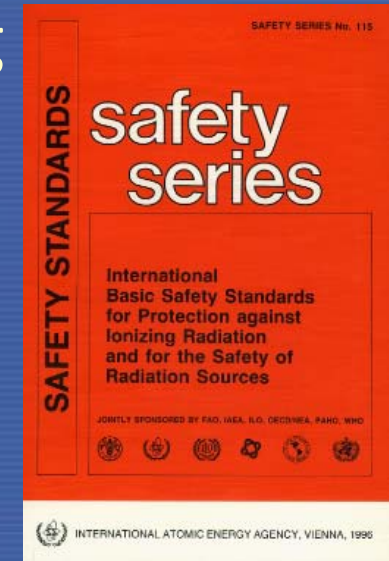
Recommendations to support requirements (“should”)

IAEA'S RADIATION SAFETY STANDARDS PROGRAMME

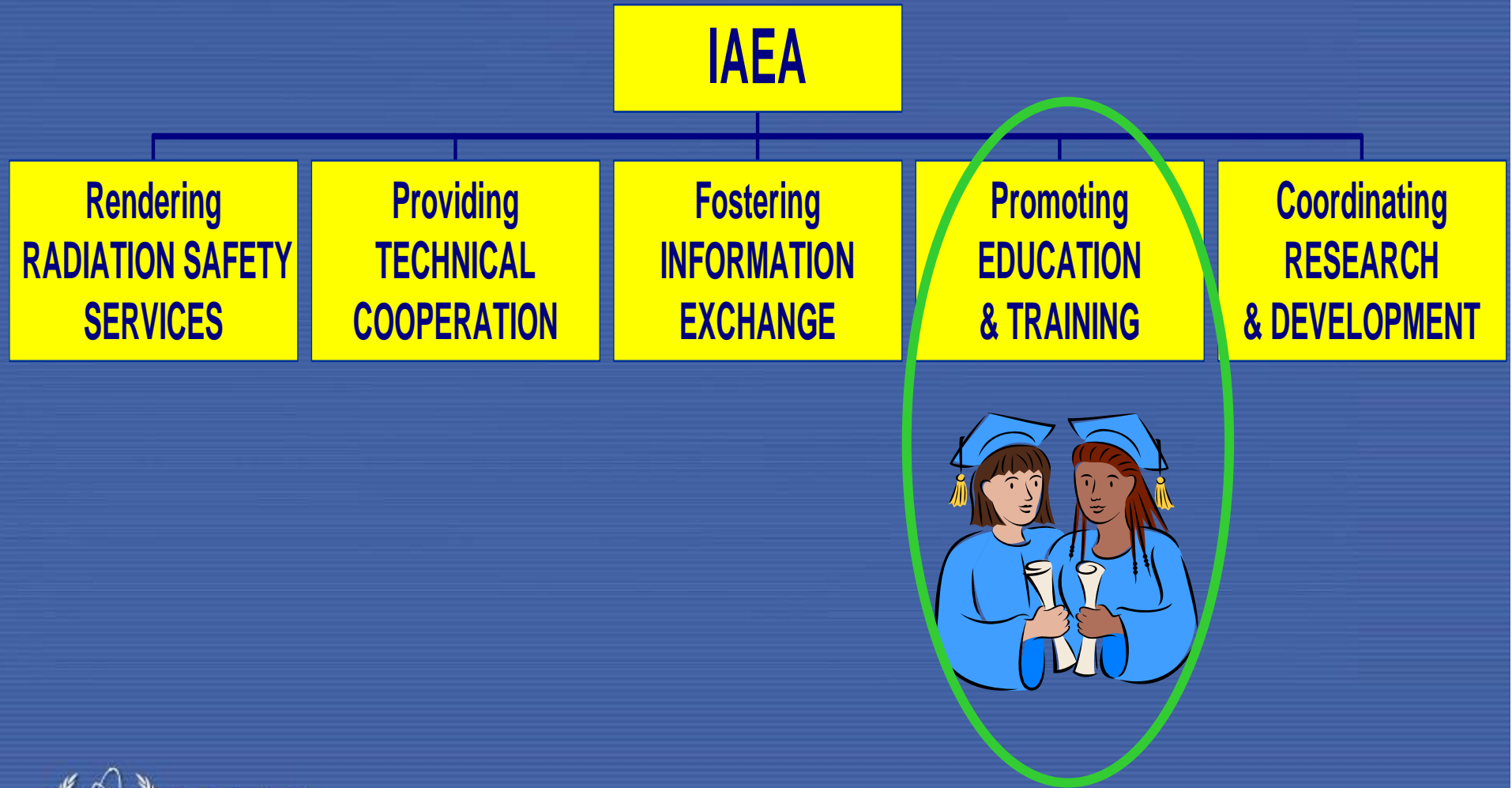
- IAEA Safety Standards are not legally binding on Member States but may be adopted by them, at their own discretion, for use in national regulations in respect of their own activities

however...

- IAEA Safety Standards are binding on the Agency in relation to its own operations and to operations assisted by the IAEA; and
- Member States receiving IAEA assistance are obliged to apply IAEA Safety Standards



STATUTORY FUNCTION: TO PROVIDE FOR THE APPLICATION OF IAEA SAFETY STANDARDS



WHY IS EDUCATION & TRAINING IN RADIATION SAFETY IMPORTANT?

Education and training can result in many benefits, such as

- *Stronger regulatory oversight*
- *Better protection of workers, patients & public*
- *Improved safe management of radioactive waste*
- *Safer transport of radioactive material*
- *Prevention of accidents and/or mitigation of consequences*
- *Overall increase in safety*

Examples of what happens when there is inadequate radiation safety...

A FARM OR SOURCE STORE?



Seed irradiator: Cs-137 ~ 22TBq (600 Ci) in 1965

'DISPOSAL' OF RADIOACTIVE SOURCES





**DISUSED SELF-CONTAINED IRRADIATOR
Co-60 ~ 370-740 TBq (10-20,000 Ci)**

**DISUSED TELETHERAPY HEAD IN
TRANSPORT CONTAINER
Cs-137 ~ 26 TBq (700 Ci)**



HIGH ACTIVITY SOURCES



COBALT-60 SOURCE FOUND IN SCRAP METAL



ABANDONED HIGH ACTIVITY SOURCES



ABANDONED URANIUM MINING AND MILLING FACILITIES

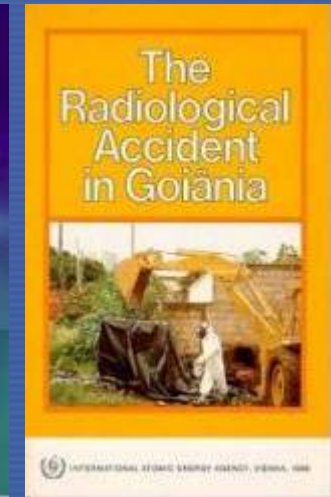
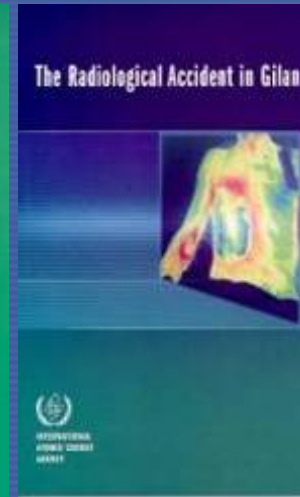
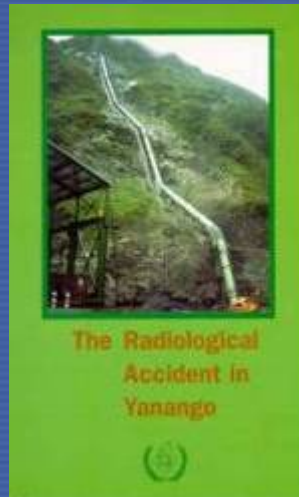
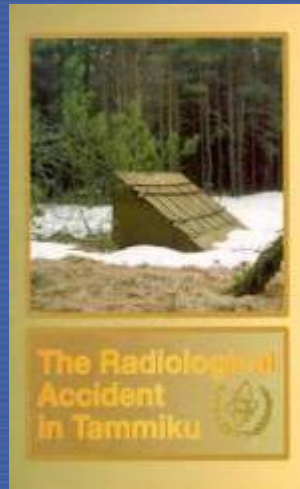


VULNERABLE STORAGE OF DISUSED HIGH-ACTIVITY SOURCES



IAEA PUBLICATIONS ABOUT RADIATION ACCIDENTS

www-pub.iaea.org/MTCO/publications/acces.asp



...and the consequences



IAEA STRATEGIC APPROACH TO RADIATION AND WASTE SAFETY



A “Strategic Approach to Education and Training in Radiation and Waste Safety” endorsed by the IAEA General Conference in 2001

Aim: to establish sustainable education and training programmes for radiation and waste safety in Member States

A steering committee of international experts in education and training advises the IAEA secretariat on implementation of this strategic plan.

MECHANISMS AND ACTIVITIES TO IMPLEMENT THE STRATEGIC PLAN

**Strengthened
radiation and waste safety
through education & training**

Distance
learning in
radiation
protection

On the Job
training

Postgraduate
Education Course in
radiation protection
and the safety of
radiation sources
(PGEC)

Specialized Training
Courses in thematic
areas

Train the
Trainers
Workshops

IAEA + Training Centres (Regional & National)



IAEA REGIONAL TRAINING CENTRES

IAEA regional training centres offer courses in 5 languages:
Argentina (Spanish); Belarus (Russian); Greece (English); Malaysia
(English); Morocco (French); South Africa (English) Syria (Arabic)



INTER CENTRE NETWORK

A network of the 7 IAEA regional training centres has been developed, to:

- facilitate communication and exchange of information
- disseminate training material
- provide feedback from participants and lecturers
- harmonize training centre management

Consideration being given to developing a broader network of training centres involved in radiation protection

POST-GRADUATE EDUCATIONAL COURSES IN RADIATION PROTECTION AND SAFETY OF RADIATION SOURCES

- **Aim**

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

- **Participants**

Science/engineering degree and have been selected to work in the field of radiation protection and safety of radiation sources

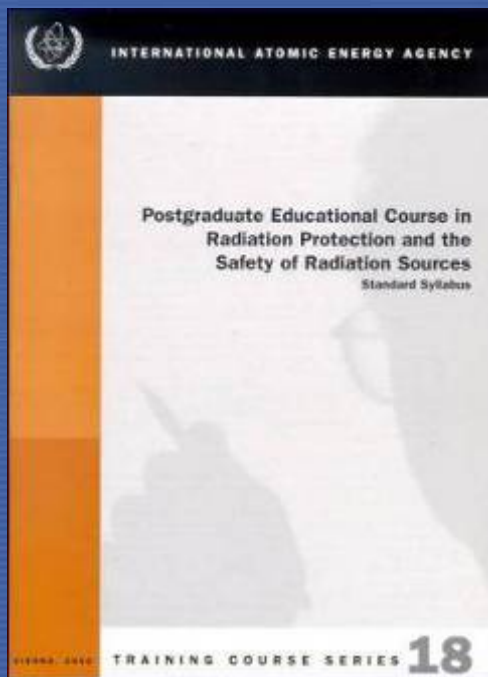


- Learning material available in Arabic, English, French, Russian & Spanish
- Duration ~ 22 weeks

POST-GRADUATE EDUCATIONAL COURSES IN RADIATION PROTECTION AND SAFETY OF RADIATION SOURCES

Syllabus (based on IAEA Safety Standards) includes:

- Fundamentals
- Quantities and measurements
- Biological effects of ionizing radiation
- Principles of radiation protection
- Regulatory control



- External and internal exposures
- Protection of workers
- Medical exposures
- Exposure of the public
- Intervention in chronic and emergency exposure situations
- Train the Trainers

POST-GRADUATE EDUCATIONAL COURSES IN RADIATION PROTECTION AND SAFETY OF RADIATION SOURCES

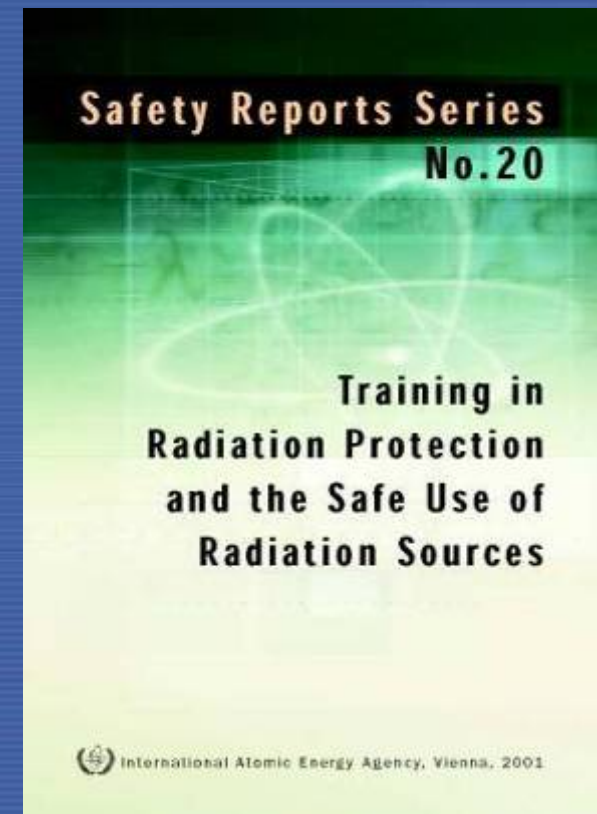
Future improvements for PGEC

- Revise syllabus to be consistent with: new ICRP recommendations; and revised international Basic Safety Standards & other new IAEA Safety Standards
- More use of study groups and case studies; less focus on traditional 'class-room' techniques
- Sharing of good practices and lessons learned among the regional training centres



SPECIALIZED TRAINING COURSES/WORKSHOPS

- Focused on specific target audience or specific subject:
 - regulators, lawyers, customs officers; industrial & medical users; waste safety; transport safety; protection of workers, patients, public...
- Typically 1 to 2 weeks
- Participants:
 - professional/technical staff
 - often have attended PGEC and/or have relevant work experience



TRAINING OF RADIATION PROTECTION OFFICER

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.

OTHER TRAINING MECHANISMS

On the Job Training and fellowships

- Work under experienced supervisor(s)
- Typically 1 – 3 months

Distance learning

- Ideal when students far from training centres, insufficient time/funds
- Permits participants to study at own pace
- Success depends on self-motivation

E-learning

- Potentially powerful tool to supplement other training mechanisms
- Needs user-friendly interface

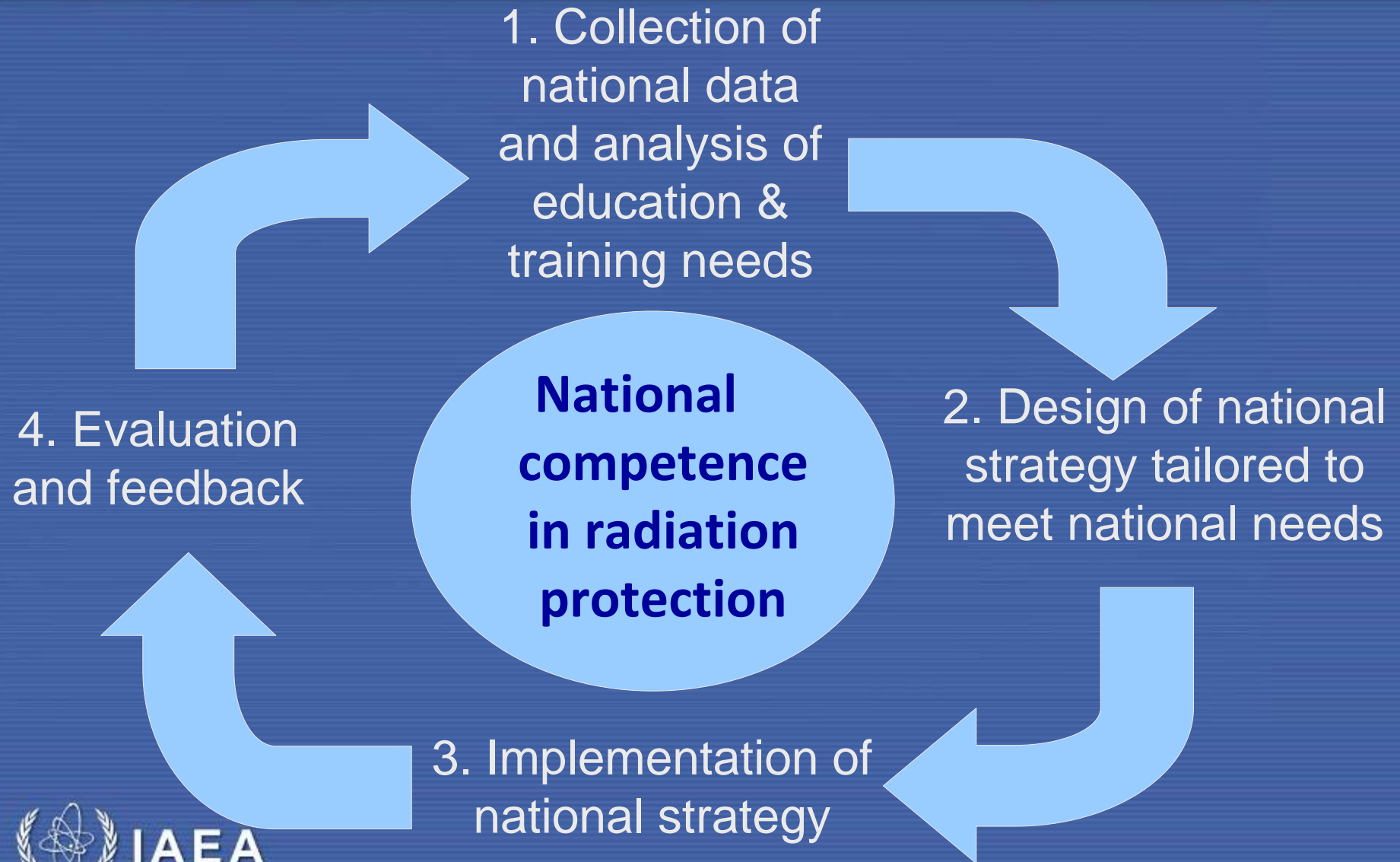
TRAIN THE TRAINERS

Aimed to develop appropriate skills to build a core of national and regional trainers in radiation protection

Training material includes:

- presentational and communication skills
- organization of training events
- practical exercises
- familiarization with IAEA developed training material

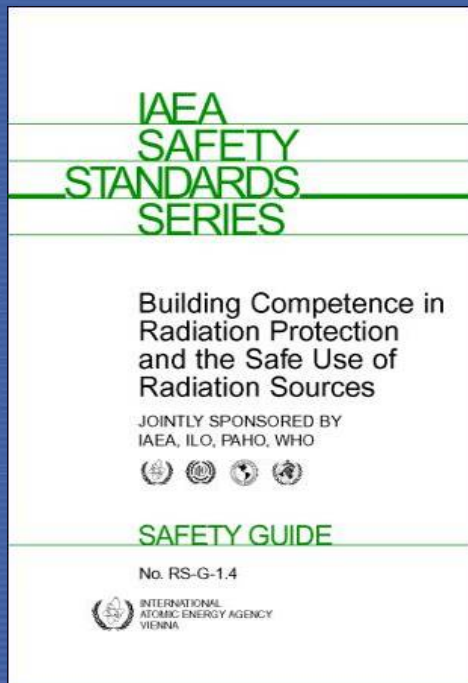
NATIONAL STRATEGY FOR BUILDING COMPETENCE IN RADIATION PROTECTION



NATIONAL STRATEGY FOR BUILDING COMPETENCE IN RADIATION PROTECTION

Key elements to consider:

- Strategy should be based on national needs
- Current and foreseeable radiation facilities and activities
- Current levels of competence, training resources



- National resources
- Regional or international resources
- Monitor effectiveness periodically

Implementation will require high level of national commitment

CONCLUSIONS

Much has been achieved, including: sustainability of E&T at regional level; comprehensive portfolio of training material in multiple languages; large range of training events

Future focus will be on strengthening education and training at the national level through encouraging Member States to develop and implement their own national strategy based on identified needs

Success will ultimately depend upon the commitment of
Member States

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Welcome to Radiation, Transport & Waste Safety

Current News

-  **General Conference 2009 - NSRW and NEFW organized a side event on licensing of geological repositories.** This event was co-sponsored by the Swedish Radiation Authority and took place the Wednesday 16 September 2009 ... [more](#)
-  **The 2009 International ISOE ALARA SYMPOSIUM - IAEA to host annual event.** This symposium will take place on 13-15 October, 2009. It will focus on Occupational Exposure Management in Nuclear Facilities ... [announcement](#)
-  **Naturally Occurring Radioactive Material (NORM) - 6th International Symposium** - The Sixth International Symposium on (NORM VI) will be held in Marrakech, Morocco on 22-26 March 2010. The symposium is being ... [more](#)
-  **Justification of Medical Exposure in Diagnostic Imaging - International Workshop held** - Jointly Sponsored by the European Commission(EC) and IAEA, this workshop took place on 2-4 September, 2009 to ... [more](#)
-  **IAEA Safety Standards Committees hold joint meetings in Vienna** - Between 29 June - 2nd July, three of the four IAEA Safety Standards Committees, RASSC, WASSC and TRANSCC met in Vienna to discuss, inter-alia new ... [more](#)
-  **Radiation Protection and Optimization in Computed Tomography** - second regional training course held in Managua, Nicaragua, 17-21 August 2009. This course was hosted by the Nicaraguan National University (UNAN), in collaboration ... [more](#)

Resources

- IRPA-12 Conference: Full Papers
- Code of Conduct on the Safety and Security of Radioactive Sources

Page links

- Recent activities
- Archive

Director



Director Eliana Amaral

Organisation

Our Work

- Decommissioning
- Environmental Assessment
- Exposure to Natural Radiation
- Occupational Protection
- Protection of Patients
- Source Safety and Security
- Transport Safety
- Waste Management
- Home Page

NS Quick Links

