

EDUCATION AND TRAINING IN RADIATION PROTECTION IAEA PERSPECTIVE

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IAEA

International Atomic Energy Agency

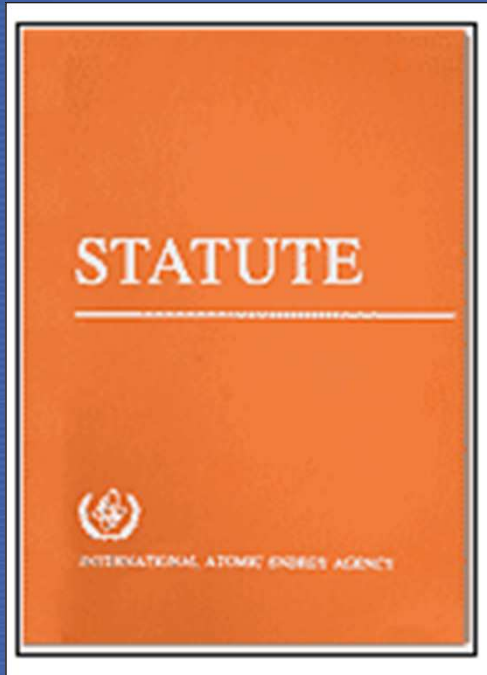
Outline

- IAEA mission, functions and organization
 - *Role of Education and Training (E&T)*
- IAEA support to Member States in the field of E&T in radiation protection
 - *Strategic Plan for E&T in radiation protection, 2011-2020*

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IAEA mission



The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world.

It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose.

IAEA mission



- **Promoting Safeguards & Verification**
 - To Prevent the Further Spread of Nuclear Weapons
- **Promoting Science & Technology**
 - To mobilize peaceful applications of nuclear science and technology for critical needs in developing countries
- **Promoting Safety & Security**
 - To protect people and the environment from harmful radiation exposure

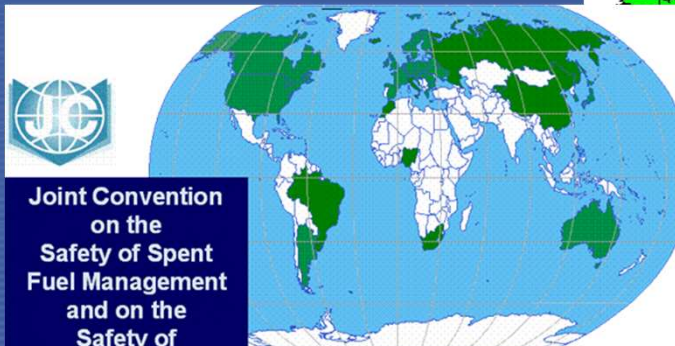
IAEA Safety functions

IAEA Functions in Radiation & Waste Safety (Article III.A.6)

To facilitate and
service international
conventions and
other undertakings



Code of Conduct on
the safety and security of
radioactive sources



Joint Convention
on the
Safety of Spent
Fuel Management
and on the
Safety of
Radioactive Waste
Management



IAEA Safety functions

IAEA Functions in Radiation & Waste Safety (Article III.A.6)

To facilitate and
service international
conventions and
other undertakings

To establish
standards of
safety

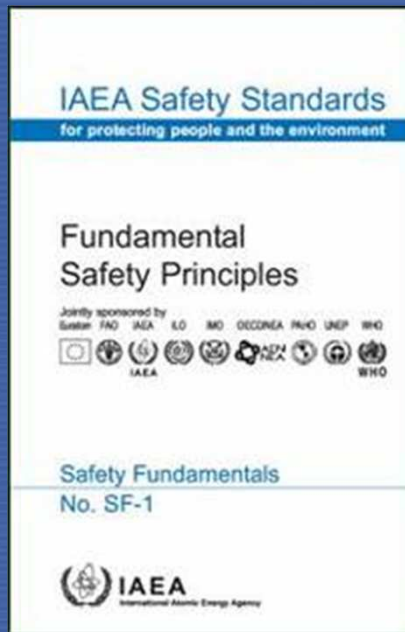
To provide for
the application of
international standards

IAEA Safety functions

Establishing standards

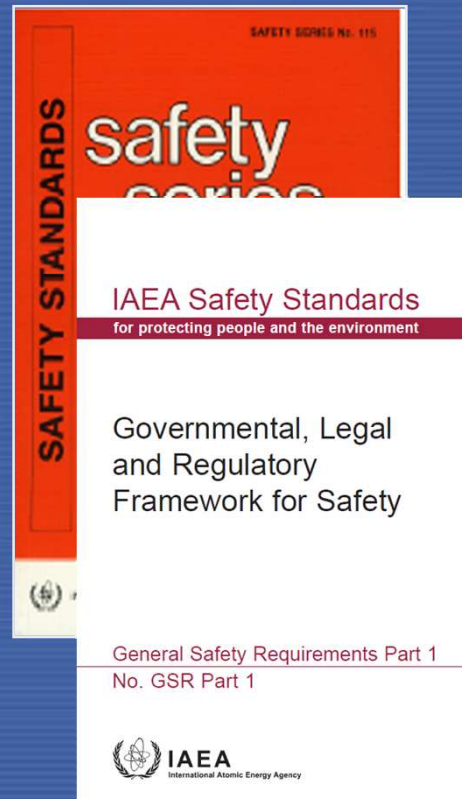
Principles

Safety Fundamentals



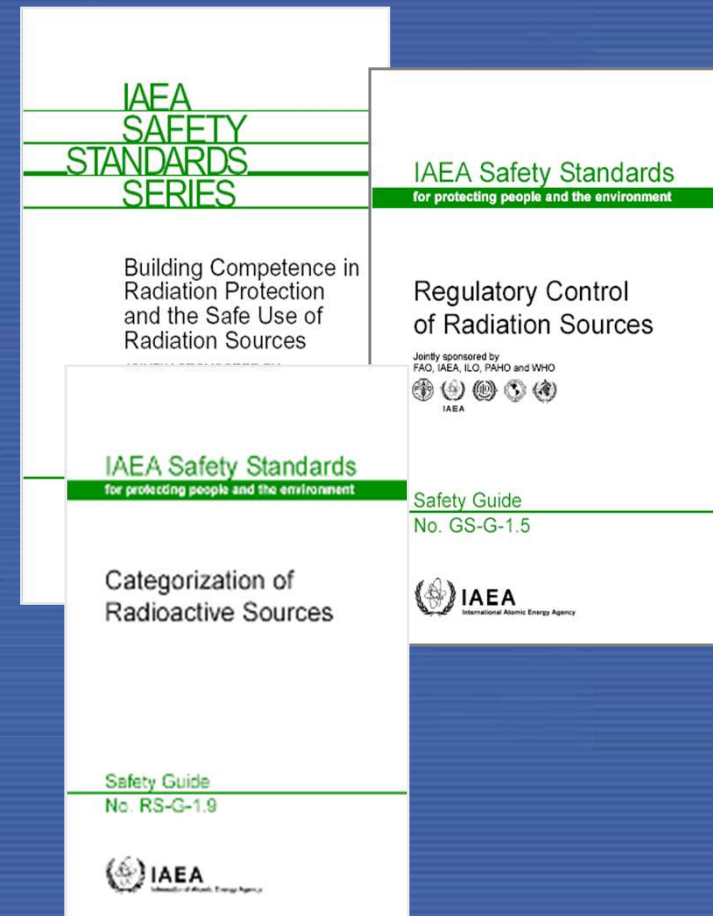
“Shall”

Safety Requirements



“Should”

Safety Guides



IAEA Safety functions

IAEA Functions in Radiation & Waste Safety (Article III.A.6)

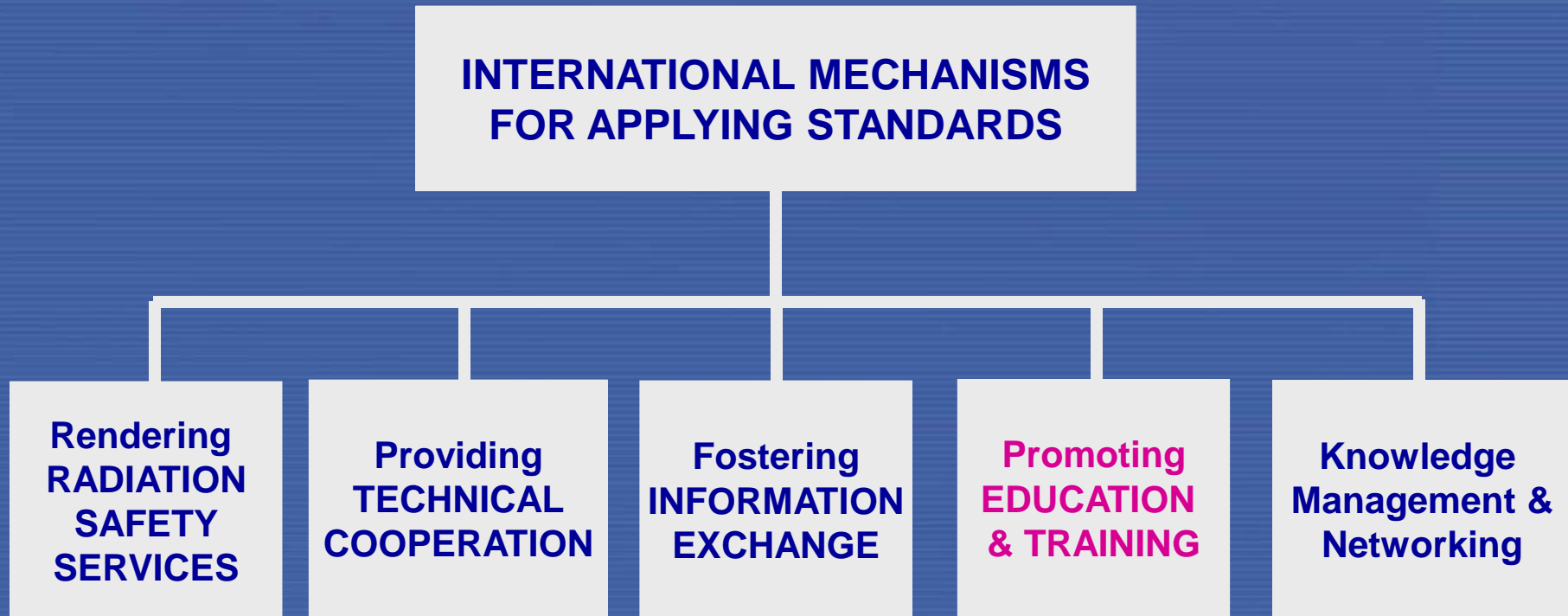
To facilitate and
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safety

To provide for
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international standards

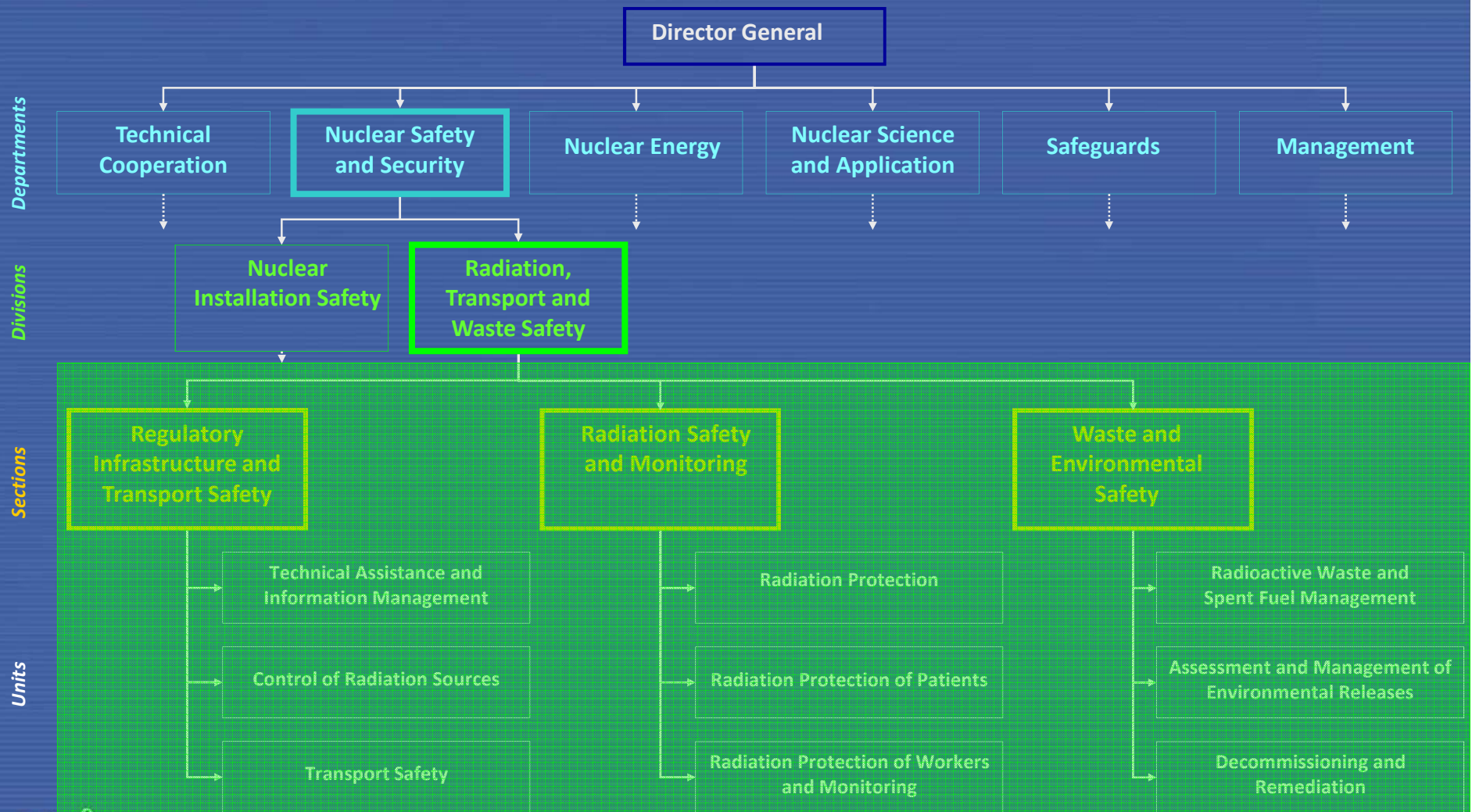
IAEA Safety functions

Application of international standards



Education and Training
is one of the mechanisms and primary strategies
for assisting Member States
in the application of the standards

IAEA Organization



- IAEA mission, functions and organization
 - *Role of Education and Training (E&T)*

- IAEA support to Member States in the field of E&T in radiation protection
 - *Strategic Plan for E&T in radiation protection, 2011-2020*

Background

- The provision and support of E&T has always been a core activity for the Agency with an ongoing mandate via various General Conference Resolutions
- By the end of 2000 the level of Agency effort was considerable, exceeding an average of more than US \$2 million per annum
- At that time a decision was taken to undertake an **internal evaluation** of the overall E&T Programme.

Background

- Conclusions of the 2000 internal evaluation:
 - Need for a more integrated approach within the Agency with respect to E&T activities;
 - Need for a more corporate image for E&T activities;
 - Provision of, and support for, E&T in Member States tended to be on a reactive rather than a proactive basis;
 - The general approach tended to create a culture of dependency rather than sustainability.

BACKGROUND

- On the basis of the internal evaluation and in response to GC(44)/RES/13 in 2000 , a

Strategic Approach to Education and Training in Radiation Protection and Waste Safety, 2001- 2010

was noted by the IAEA Policy Making Organs in 2001

- **A Steering Committee** with experts from Member States and the Secretariat, was established with the aim of advising the Agency on the implementation of the strategic approach and making recommendations

BACKGROUND

- Towards the end of the **10-year period**, a revised and updated strategic approach,

Strategic Approach to Education and Training in Radiation, Transport and Waste Safety, 2011–2020

was endorsed by the Steering Committee on December 2009 and was noted by the Board in September 2010



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2010/Note 44

Note by the Secretariat

Strategic Approach to Education and Training in Radiation, Transport and Waste Safety 2011–2020 (Continuation of the Strategic Approach 2001–2010)

A ten-year strategy for education and training in radiation and waste safety was developed¹ by an Advisory Group of experts from Member States, and subsequently noted by the 2001 General Conference in GC(45)RES/10 which urged the Secretariat to implement the aforementioned strategy. A steering committee, comprising experts from regional and collaborating centres in Member States, international organizations and the Secretariat, was established to advise the Agency on the implementation of the strategy and to make recommendations as appropriate.

Subsequent General Conference Resolutions GC(46)RES/9, GC(47)RES/7, GC(48)RES/10, GC(49)RES/9, GC(50)RES/10, GC(51)RES/11, GC(52)RES/9 and GC(53)RES/10 have underlined or emphasized the importance of sustainable programmes for education and training in nuclear, radiation, transport and waste safety, and have also welcomed the ongoing commitment of the Secretariat and Member States to the implementation of the strategy.

Towards the end of the ten-year period, the steering committee made an analysis of the overall achievements based on the effectiveness of the various components of the 2001–2010 strategy. The steering committee, noting the achievements of the 2001–2010 strategy, revised and updated it and recommended that it be continued for the period 2011–2020.

¹ Note by the Secretariat 2001/Note 20

STRATEGIC APPROACH 2011- 2020

- MAIN ELEMENTS OF THE STRATEGY

What is it about?

- IMPLEMENTATION OF THE STRATEGY

Who and How?

- MONITORING PROGRESS

When ?

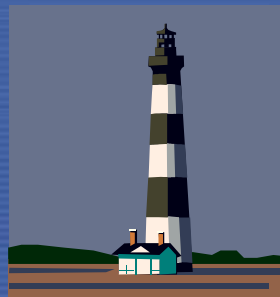
MAIN ELEMENTS OF THE STRATEGY

- Vision
- Objectives
- Outputs

MAIN ELEMENTS OF THE STRATEGY

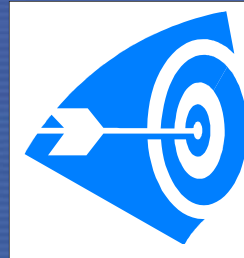
- **Vision**

*Education and training infrastructures
for building and maintaining national competence in radiation,
transport and waste safety,
consistent with IAEA safety standards,
are in place in Member States*



MAIN ELEMENTS OF THE STRATEGY

■ Objectives

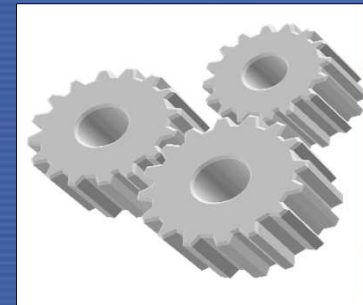


- To strengthen radiation, transport and waste safety infrastructures through building competence in Member States (MS)
- To facilitate the development and implementation of a national strategy for E&T in radiation, transport and waste safety in MS
- To ensure that E&T programmes in MS address the requirements of the IAEA safety standards.

MAIN ELEMENTS OF THE STRATEGY

■ Outputs

- Guidance on the establishment and implementation of a national strategy for building competence
- Development of training material and organization of training courses (PGEC, Train-the-Trainers, RPO training, STCs)
- Long-term agreements with Regional Training Centres (RTCs).



STRATEGIC APPROACH 2011- 2020

- MAIN ELEMENTS OF THE STRATEGY

What is it about?

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IMPLEMENTATION OF THE STRATEGY

■ Key roles

- IAEA
- Member States
- Regional Training Centres (RTCs)



IMPLEMENTATION OF THE STRATEGY

■ Activities:

- Development and effective use of competence building tools ■
- Effective use of Regional Training Centres ■
- Development of National Strategies for building competence ■



IMPLEMENTATION OF THE STRATEGY

Competence building tools

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

On the Job
training

Distance
learning in
radiation
protection

Postgraduate Education
Course in radiation
protection and the safety
of radiation sources

Specialized Training
Courses in thematic areas

Training of Radiation
Protection Officers

Train the
Trainers
Workshops

IAEA + Training Regional Centres



IMPLEMENTATION OF THE STRATEGY

Competence building tools: PGEC

- **General aim of the course**

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

- **Participants qualifications & experience**

Formal education to science/engineering degree level and have been selected to work in the field of radiation protection and safety of radiation sources in their country



- Learning material available in Arabic, English, French, Spanish & Russian
- Standard syllabus prepared in 2002
- Duration of PGEC ~ 22 weeks

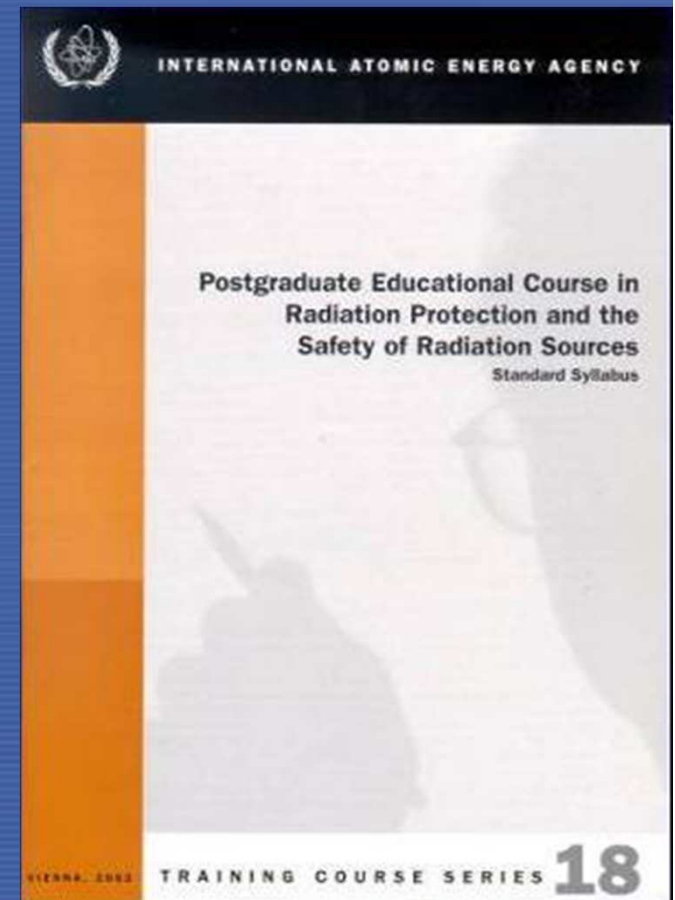


IMPLEMENTATION OF THE STRATEGY

Competence building tools: PGEC

Syllabus (based on IAEA Safety Standards, International guidance and terminology) includes:

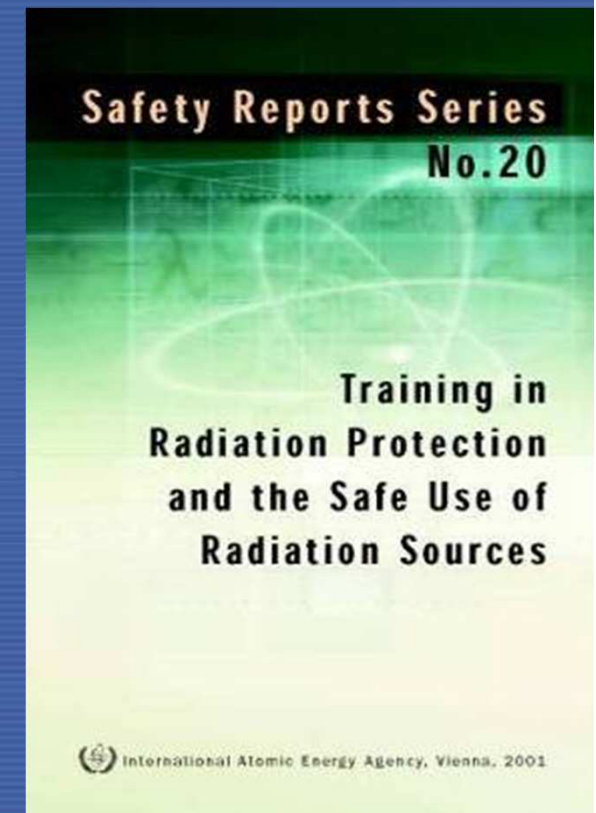
- Fundamentals
- Quantities and measurements
- Biological effects of ionizing radiation
- Principles of radiation protection
- Regulatory control
- External and internal exposures
- Protection of workers
- Medical exposures
- Exposure of the public
- Intervention in chronic and emergency exposure situations
- Train the Trainers



IMPLEMENTATION OF THE STRATEGY

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 PGEC and/or have relevant work experience



IMPLEMENTATION OF THE STRATEGY

Competence building tools: Specialized Training Courses

- Examples:
 - Training for regulators: Authorization and inspection of medical and industrial
 - Radiation safety for customs officers, lawyers
 - Occupational protection
 - Internal, external dose assessment; workplace monitoring
 - Waste safety
 - Radiation protection in medical and industrial practices:
 - Prevention of accidental exposures in radiotherapy
 - Safe transport of radioactive material

IMPLEMENTATION OF THE STRATEGY

Competence building tools: Training of RPO

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.

IMPLEMENTATION OF THE STRATEGY

Competence building tools: Other mechanisms

On the Job Training and fellowships

- important component of overall training programme
- Work under experienced supervisor
- Duration 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

IMPLEMENTATION OF THE STRATEGY

Competence building tools: Train the Trainers

Aimed to develop communication skills to build a core of national/regional trainers in radiation protection

Training material includes:

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

TTT module now included on the PGEC

IMPLEMENTATION OF THE STRATEGY

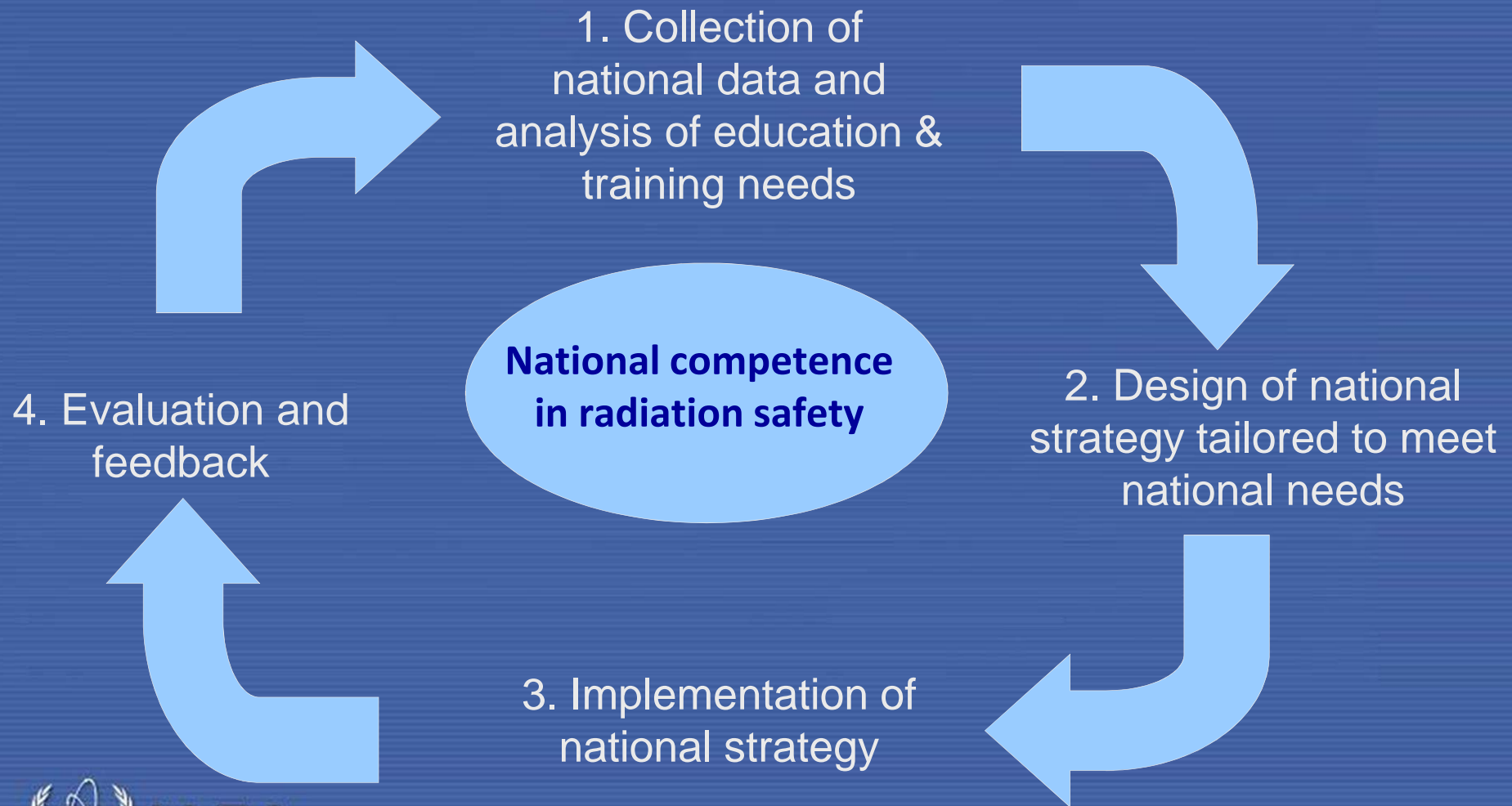
Regional Training Centres

- IAEA regional training centres include Argentina (Spanish); Belarus (Russian); Greece (English); Malaysia (English); Morocco (French); *South Africa (English)*, Syria (Arabic)
- Increasing use of local lecturers and less dependency on IAEA support indicates improved self sustainability



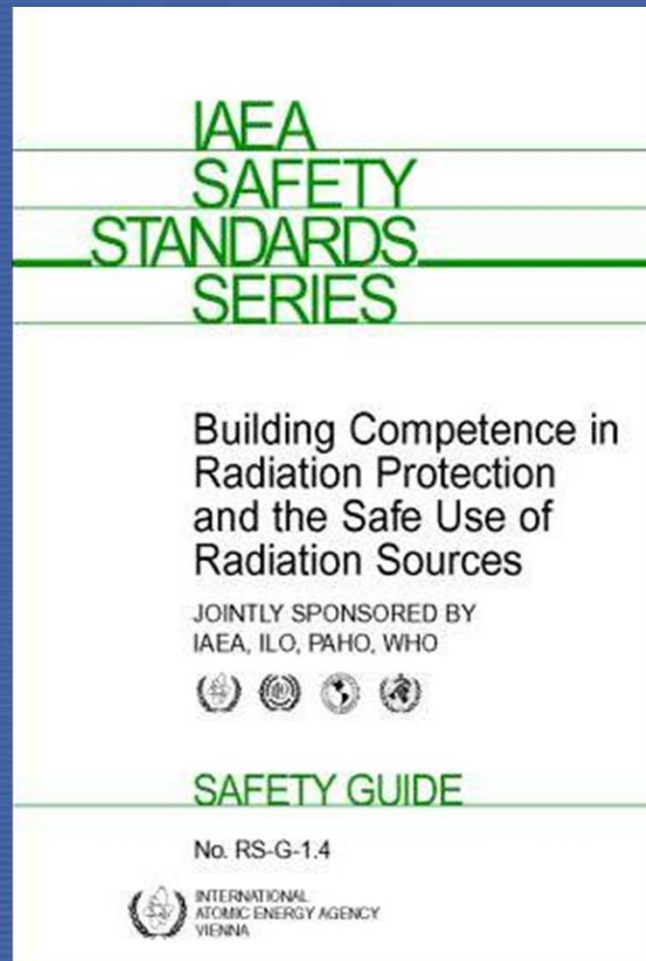
IMPLEMENTATION OF THE STRATEGY

National strategy for building competence in radiation protection



IMPLEMENTATION OF THE STRATEGY

National strategy for building competence in radiation protection



STRATEGIC APPROACH 2011- 2020

- MAIN ELEMENTS OF THE STRATEGY

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- MONITORING PROGRESS

When?

MONITORING PROGRESS

- Steering Committee established in 2002 to:
 - Advise the Secretariat on possible ways to meet the objectives on the priorities for the development of training material and activities
 - Establish performance indicators to assess the level of implementation
 - Evaluate the effectiveness of the E&T activities
 - Review and advise on the implementation of the strategy

MONITORING PROGRESS

- Key milestones

	Phase I : Preparation	Phase II: Promotion	Phase III: Implementation
Activities	Complete the development of tools and guidance for building competence	Dissemination of tools and guidance at regional levels and among the Member States	Development of strategies for building competence in Member States
Major role:	IAEA	RTCs	MS

Some numbers...

- E&T activities in the Division of Radiation, Transport and Waste Safety

(responsible officer from the division)

Year	No of Fellows	No of Scientific Visitors	No of Training Courses	No of Training Course Participants	No of Lecturers
2005	62	45	20	372	13
2006	94	72	32	548	18
2007	75	71	26	479	22
2008	58	46	31	515	23
2009	64	75	29	493	27
2010	116	49	30	461	21
Total	469	358	168	2868	124

Division of Radiation, Transport and Waste Safety

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 - ▶ Conventions & Codes
 - ▶ Services for Member States
 - ▶ Special projects
 - ▶ **Training**
 - ▶ Meetings

Good 4 3 2 1 0 Poor

Radiation, Transport & Waste Safety

Current news

-  **Regulatory Supervision of Legacy Sites - IAEA hosts first Working Forum** - In order to provide regulatory organizations an opportunity to exchange ideas concerning needs for regulatory supervision of legacy sites, the IAEA ... [read more](#)
-  **Occupational Exposure in Medical Applications - Regional Workshop held in Adelaide, Australia** - Under its Asia-Pacific Regional Project, the IAEA, in cooperation with the Australasian Radiation Protection Society recently ... [read more](#)
-  **Latin America Regional Congress of Radiation and Nuclear Safety (IRPA)** - In cooperation with the IAEA, the IRPA regional congress for Latin America took place in Medellin, Colombia, on 11-15 October, 2010 ... [read more](#)
-  **IAEA Board of Governors approves draft Safety**

Resources

- [IRPA-12 Conference: Full Papers](#)
- [Code of Conduct on the Safety and Security of Radioactive Sources](#)
- [Organization](#)
- [Recent activities](#)

Featured Article

Posted on September 12 2010



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Specialized training

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 - Meetings

Training packages for specialized events

Developed by the Division of Radiation, Transport and Waste Safety

Occupational Radiation Protection

- IAEA Training on Assessment of Occupational Exposure due to Intakes of Radionuclides
- IAEA Training on Assessment of Occupational Exposure due to External Radiation Sources
- IAEA Training on Occupational Radiation Protection
- Radiation Protection and the Management of Radioactive Waste in the Oil and Gas Industry
- IAEA Training on Neutron Monitoring
- IAEA Training on Work Place Monitoring

Protection of Patients

- IAEA Training on Radiation Protection in Diagnostic and Interventional Radiology
- IAEA Training on Radiation Protection in Nuclear Medicine

Resources

- Emergency Preparedness and Response training
- Occupational Radiation Protection training
- IAEA Publications on Training

Good 4 3 2 1 0 Poor
rate this page

Division of Radiation, Transport and Waste Safety

Specialized training: example of web resources for RPOP



The screenshot shows the IAEA Radiation Protection of Patients (RPOP) website. The header includes the IAEA logo and the text "IAEA Radiation Protection of Patients (RPOP)". A search bar for RPOP is located in the top right. The main navigation menu includes "Home", "Information for", "Additional Resources", "Special Groups", and "Member Area". On the right side of the header, there are links for "About Us", "Our Work", and "IAEA.org".

The left sidebar contains a menu for "Information for" with sub-items: "Health Professionals", "Member States", and "Patients". Below this is a "Member Area" section with sub-items: "Member States Area" and "Drafts Management Area".

The main content area is titled "Free Material" and features a "Home > Training" breadcrumb. A central graphic displays a "DRAFT Training Package IAEA Training Material on Radiation Protection in PET/CT". To the right of this graphic is a list of training topics, each with a right-pointing arrow:

- Diagnostic and Interventional Radiology
- Radiotherapy
- Nuclear Medicine
- Prevention of Accidental Exposure in Radiotherapy
- Cardiology
- PET/CT

Below the list, a paragraph states: "The training material on this site is available for free downloading (subject to conditions specified in 'Intended use' and 'Disclaimer' below), and are on the topics of Radiation Protection in:"

Under the heading "English", there is a bulleted list of the same training topics:

- Diagnostic and Interventional Radiology
- Radiotherapy
- Nuclear Medicine
- Prevention of Accidental Exposure in Radiotherapy
- Cardiology
- PET/CT

Thank you for your attention

