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International Atomic Energy Agency

IAEA School on Nuclear and Radiological Leadership for Safety

Asian Nuclear Safety Network Education and Training Topical Group
Regional Workshop on the Management of Training Systems for Nuclear and Radiation Safety
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Philippines Nuclear Research Institute, Manila, Philippines

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Content

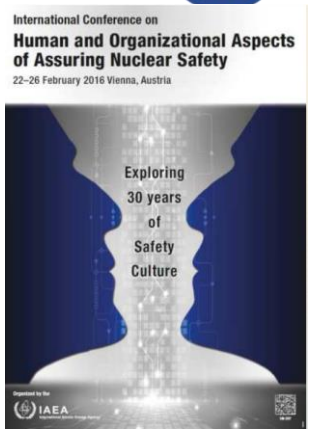
- The IAEA School of Nuclear and Radiological Leadership for Safety:
- Why the School
- School concept and methodology
- Delivery
- Future plans

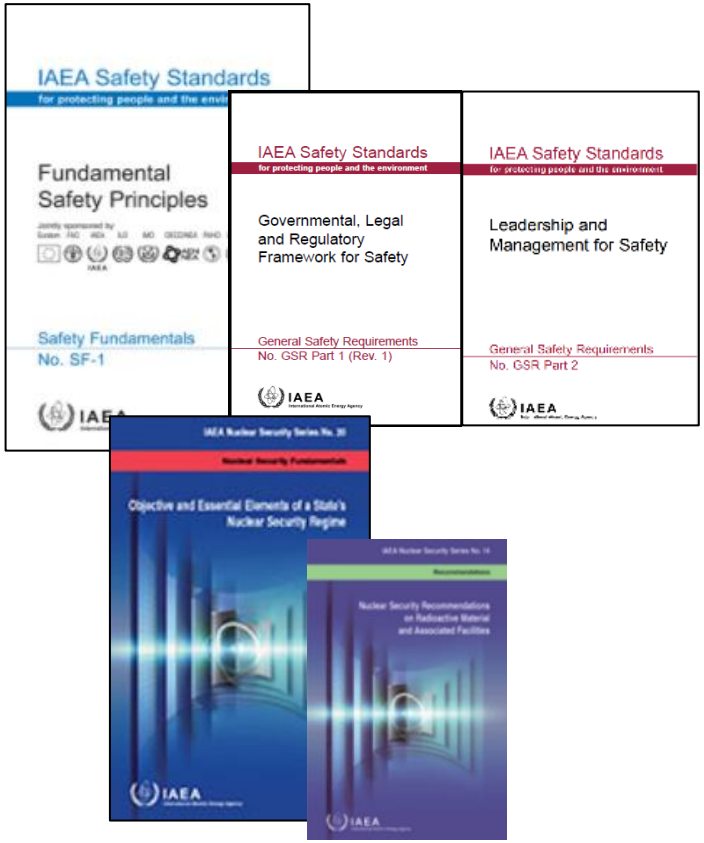
Why the School?

Importance of Leadership

General Conference Resolutions

Observations and lessons





Leadership, a culture for safety have been increasingly recognized as highly important in the international community, including a number of conferences, events and Fora

And in our Safety standards and security guidance

What is the School's concept?

Audience: Leadership for **future leaders**, **junior/ mid career professionals**

Multiple Perspectives: **nuclear** and **radiological** safety, **security, normal operation** and in **emergencies**, operator, user and regulator perspective

Experiential Learning: based on real scenarios studied through practical cases, role play, root cause, prevention dialogues, reflection exercises, "games"

Methodology

- experiential learning
- case studies
- group dynamics
- role play
- lectures

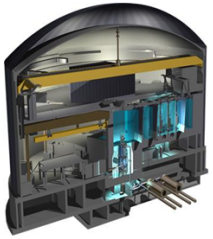
Cases Study Component

The cases are inspired in real life incidents. They are well documented and include pictures, organigrams, timeline of events, letters and roles descriptions

RI makes its neutron beam facilities and expertise available to visiting scientists. Every year, hundreds of researchers from various countries visit RI. More than 400 experiments are selected by a scientific review committee and performed annually.

Whilst some researchers are working on engine designs, fuels, plastics, and household products, others are investigating biological processes at the cellular and molecular level. Still others may be elucidating the physics that could contribute to the electronic devices of the future. RI can specially tailor its neutron beams to probe the fundamental processes that help explain how our universe came into being, why it looks the way it does today, and how it can sustain life. RI also collaborates closely (and at different levels of confidentiality) with the R&D departments of industrial enterprises.

All of the scientists working at RI - chemists, physicists, biologists, crystallographers, specialists in magnetism and nuclear physics - are also experts in neutron research and technology and their combined know-how is made available to the scientific community.



The key and vital infrastructure of RI is its nuclear research reactor, built from 1969-1971 and continually updated since. In particular, a new reactor vessel was installed in 1994. Although the maximum power of the reactor is moderate (58 MW), the fact that the RI site is located within a densely populated university environment close to a large city occasionally raises concerns about its safety amongst neighbouring communities.

RI Reactor Safety Features

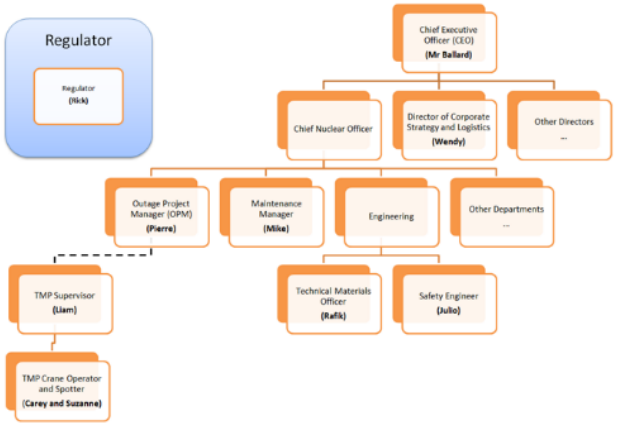
Owing to periodic refurbishments, RI's reactor is designed to meet current safety requirements. This includes component structures, equipment, and procedures necessary to ensure safety even in case of major events which could interrupt the normal cooling of the reactor core. These events, which fell under specific scrutiny as part of the Stress Test, include earthquakes and major external floods. Provided in Annex 1 is an excerpt from the RI website to respond to frequently asked questions about reactor safety.

RI Organisation

RI is governed by a Board that is constituted of representatives from the RI funding States.

Reporting to independently to the Board is the Radiological Protection and Security Office (RPSO). The RPSO is responsible for radiation exposure monitoring on-site (reactor operators and neutron scientists) as well as off-site (environmental monitoring). It is also responsible for the security measures on-site (physical protection of nuclear material, protection of the RI site, and personnel and visitor security monitoring).

Annex 4 – Organization Chart



Annex 6 – Example Complaint from a Patient

To: Head of Radiotherapy Service

Dear Ms Marie,

I am a patient receiving radiotherapy treatment and started my treatment one month ago during the morning shift. During my treatment, my Radiotherapist found some signs for concern on my skin and decided stop the treatment for 5 days.

Last Monday I came to the hospital to restart my treatments and your Administrative Assistant notified me that I will now receive my treatments during your new third shift.

Yesterday, while receiving treatment during this third shift I notified the technician that I needed to see the doctor as I felt ill. He responded that a radiotherapist was not available. He further explained that the evening shift is new and that he is alone and should I wish to see a radiotherapist, I needed to return in the morning.

I have a complaint concerning this situation. I don't understand why nobody except a single technician is available for this new shift.

I would appreciate a prompt response.

Best regards,

Signed

Mr T

January 15, 2017

Cases Study

Some of the **Case Studies** focusing on:

- Medical Applications
- Nuclear Power Plants operation
- Emergency Preparedness and Response
- Development of the Legislative Framework for Safety
- Establishment of a Regulatory Body
- Accidents in other industries
- Loss of a radioactive source

Extended to cover safety and security, new cases

Trainer package

Script of the Case Study

Presentation of the Case Study events

Teaching notes

Group dialogues

Conclusion

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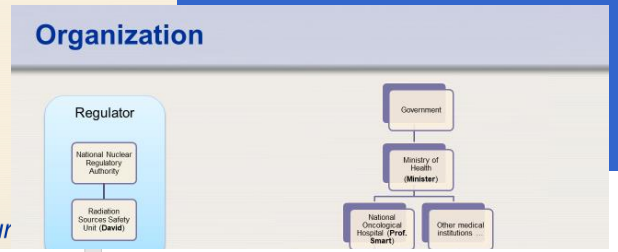
Case Study #1

Unintended Medical Exposur



Case Study #1 - *TEACHING NOTE*

Unintended Medical Exposure

Please note that students are provided with the full Case Study, which includes:

- **Setting the Scene** – Background context of the case, including country profile a actors involved in the case
- **Description of the Challenge** – The 'story' of the case, which serves as discussion
- **Leadership Considerations** – The points students are to reflect on for the case
- **Suggested references** – Listing of IAEA references that support the case
- **Annexes** – Supporting materials used to provide more information, complexity, r the case

This teaching note is meant to be used in conjunction with the full Case Study. References to t Study are included where appropriate; however, text from the Case Study is not duplicated he

Timeline of key events of the case

- **September 2016** – Patients complain about the unavailability of radiotherapy treatme hospital and the Director of the Hospital requests additional resources from the Minist
- **November 2016** – Biennial inspection of the Hospital completed by the National Reg Authority with no major findings
- **December 2016** – Minister of Health requests that the Director of the Hospital meet t increased demand for radiotherapy treatments without additional resources – the Direc requests that the Head of Radiotherapy Service introduce a third shift for treatments w most skilled and experienced radiotherapy technician to work alone – no notification i provided to the Radiation Protection Officer or the Regulator
- **January 2017** – The third shift (from 18:00 to 22:00) with a single radiotherapy techr introduced – within a few weeks, the Head of Radiotherapy Service is made aware of complaints from patients assigned to the third shift – at the end of month, a Radiother informs the Director of the Hospital of a case of unintended medical exposure to one p the Head of Radiotherapy Services, the Radiation Protection Officer, and the Regulato informed of the incident
- **February 2017** – The Director of the Hospital receives a letter of complaint from the mistreated patient – the Head of Radiotherapy Services is informed and asked to take corrective measures, which she does in the form of a simple interview –the Radiation Protection Officer and the Regulator are not informed
- **April 2017** – A local newspaper publishes a scathing editorial about the Hospital

Assignment questions for students

This case is to be considered primarily from the viewpoints of two main players:

1. Marion, Head of Radiotherapy Services at the Hospital; and
2. David, Head of the Radiation Sources Safety Unit at the National Regulatory Authorit

Case Study #1

Unintended Medical Exposure

TEACHING NOTE

- Dealing effectively with competing goals;
- Effectively seeking information as a leader;
- Making decisions for safety; and

Case Study 1 – Unintended Medical Exposure

Learning Objective

Setting goals for safety, this includes the following elements:

- *Dealing effectively with competing goals;*
- *Effectively seeking information as a leader;*
- *Making decisions for safety; and*
- *Communicating the basis of safety relevant decisions.*

1. **Root cause analysis**
   a. Assign groups of 5-7; ask each group to determine the root causes of the event
      i. They can use tools such as the 5 why's
      ii. Ask each group to map out (or draw) their analysis
      iii. 10-15 minutes
   b. 30 minutes full class discussion
   c. Ask each group to discuss the barriers that could have prevented each 'why'
      i. 10-15 minutes
   d. 30 minutes full class discussion
2. **Position play**
   a. Assign groups of 3-6 for each major character within the case, i.e.:
      i. Professor Smart
      ii. Marion
      iii. Carlos
      iv. Mark
      v. Regulator David
   b. In addition assign one small group of 2-3 people to be a reflection group
      i. They may also play the role of external stakeholders (patients/families)
   c. Ask each group to discuss what they believe to be the principle goals of their characters
      i. 5-10 minutes
   d. 15 minutes full class discussion
      ✓ *Principle goals may include, inter alia:*
      - *Professor Smart – adhering to governmental demands, ensuring the financial viability of the hospital*
      - *Marion – adhering to the Professor's request, providing more service for the increased number of patients*
      - *Carlos – ensuring patients get the best possible care*
      - *Mark – providing more service for the increased number of patients. ensuring the patients get the best possible care*

Lecture Component

Presentations are given in different areas., i.e.:

IAEA safety standards

A culture for safety

Integrated management systems

Leadership models

Systemic approach to safety

Human and organizational factors

Communication

“Tools and Games” Component

Log in/ Log out

Objective: To tune into/out of the day, to recap and reflect on the lessons learnt

Appreciative inquiry

Objective: get to know each other, ice breaking, establishing a positive atmosphere

Emotional thermometer

Objective: to build a picture of the energy v.s. emotional status of the group

Examples of Tools and Games (Cont.)

Master Frogger

Objective: To balance quality production/safety, on radiological risks

Safety Path

Objective It can be used to illustrate teamwork and human factors

Evaluation

Initial/ final test

Test on the cases study

Feedback questionnaire

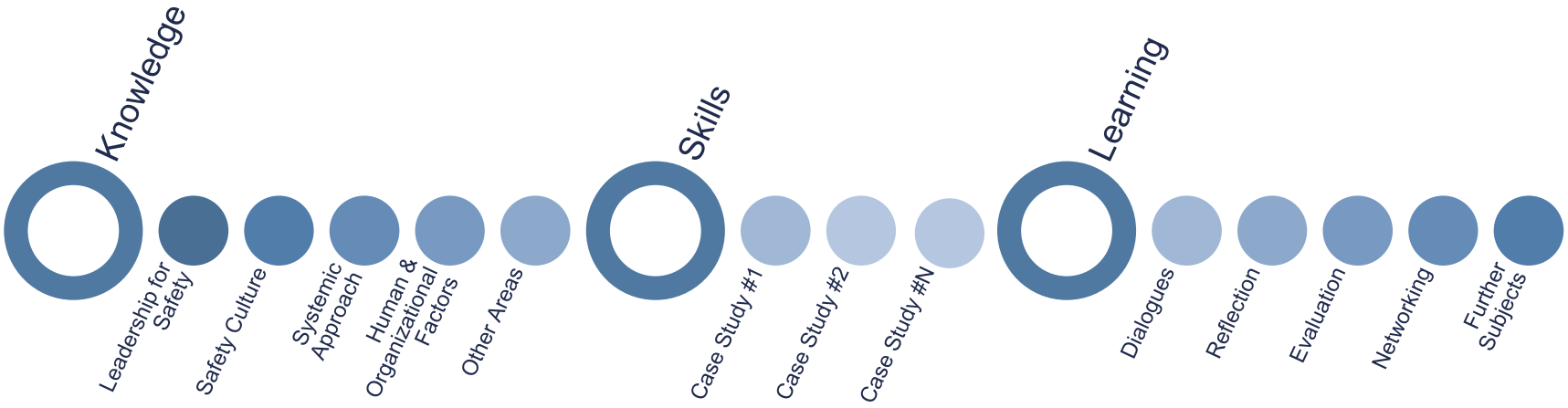
Longer term evaluation:

After 2-3 years. Plan to assess impact and use of the learnings by the participants

Tailored, Modular, National, Regional

The School's programme has a duration of 2-weeks but can be tailored:

- to national needs,
- to shared regional approach
- 2–3-day demonstrations
- to a condensed 1-week programme
- to delivering in different Agency's languages



Leadership School in numbers

19 Schools

400 Participants

80 Nationalities

Participants' profile

Work experience

5-15 years

Professional background

- regulatory bodies
- technical support organizations
- operators/ users

Gender

32% 68%

Average age

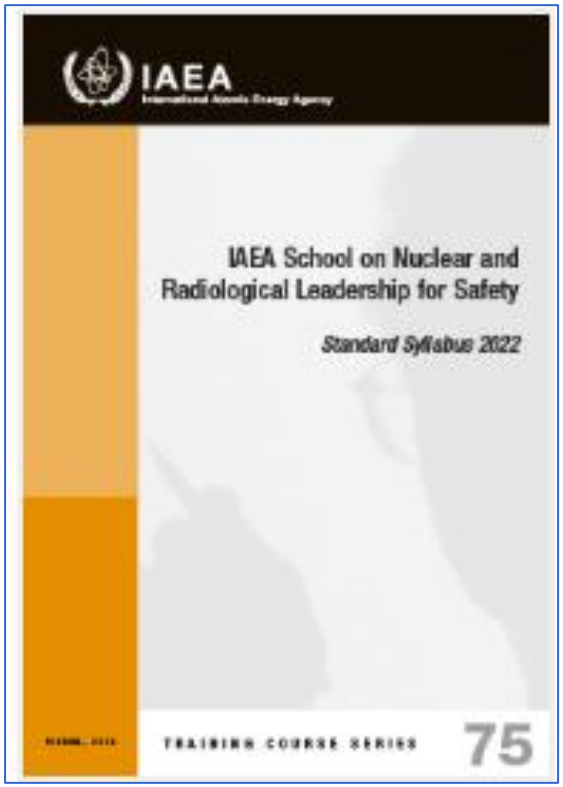
37 YEARS

E-support

- A platform for the Leadership developed on the CLP4Net
- A dedicated space for each school is created
  - ✓ General information and reference material for the upcoming school
  - ✓ Community Forum for registered users – specifically participants and teachers, where they can chat and share experience
  - ✓ Facilitators only collaboration space, including teaching materials and notes
  - ✓ Access to eLearning walkthroughs of the case studies
  - ✓ Assessment tools and questionnaires designed to assess the school and its impact

Further development Plans

- Further e-Learning development
  - Videos and e-Learning modules
- Refresher course
- Further Alumni engagement
- Translation of the material (already in French and Spanish)



Train-the-trainers programme – increasing of the poll of expert facilitators

Future Plans

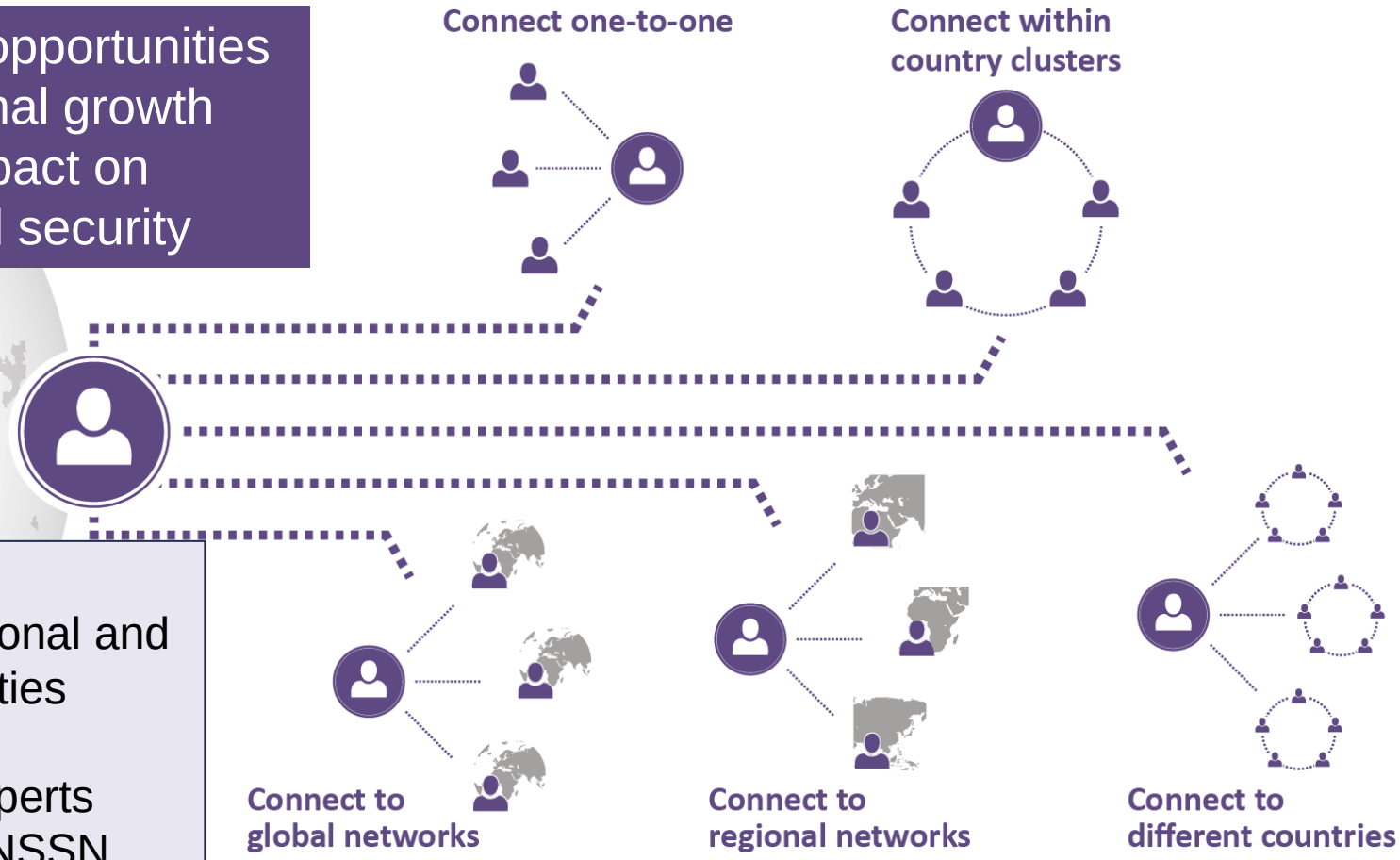
Partnership, Learning, Sustainability

1. **Incorporating lessons** and knowledge from the Agency
2. **Regional network of training centres** that provide the School in cooperation with the Agency
3. **Link to other Agency programmes** TC,
4. **Link to Training Providers** in Member States
5. **Link to capacity building programmes** of Member States
6. **Link to relevant research and university programmes** in Member States
7. **Knowledge transfer between countries** of the region and interregional

Global Nuclear Safety and Security Network

IAEA

- Learning opportunities
- Professional growth
- Bigger impact on safety and security



Since 2011:
Over 500 regional and national activities

Over 5000 experts involved in GNSSN activities

Regional Networks and Associations

- Asian Nuclear Safety Network (ANSN)
- Arab Network of Nuclear Regulators (ANNuR)
- Network (EuCAS) European and Central Asian Safety
- Forum of Nuclear Regulatory Bodies in Africa (FNRBA)
- Ibero-American Forum of Radiological and Nuclear Regulatory Agencies (FORO)

Implementation Plans

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2023

Regional Leadership School Japan – 20 February-3 March

Regional Leadership School for FNRBA countries English in Vienna – 15-26 May

Regional Leadership School in Nice – 12-23 June

Regional Leadership Regional School for FNRBA countries French in Vienna – 14-25 August

National School China, 6-10 November

National School UAE, 20-24 November

2024

Regional Leadership School Japan – 19 February-1 March

Train the Trainers – April

National School Pakistan – 10-14 June

Regional School (USA, Asia Pacific) May, June

Regional School Latino America (November)

International School ICTP Trieste (November)

Official website

https://www.iaea.org/services/education-and-training/training-courses/international-school-on-nuclear-and-radiological-leadership-for-safety

Building a New Generation of Leaders for Nuclear Safety] | IAEA

Building the New Generation of Leaders for Nuclear Safety

Maria Moracho Ramirez, IAEA Department of Nuclear Safety and Security
Marina Melin, IAEA Department of Nuclear Safety and Security

JUN
23
2023

Discussions among participants on the importance of nuclear safety at nuclear facilities and the role of leadership. (Photo: M.Melin/IAEA)

Co-funded by
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Related stories

IAEA Event Highlights Agency's School on Nuclear and Radiological Leadership for Safety

Strengthening Nuclear and Radiological Leadership for Safety

Test and Learn: IAEA Conducts

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Thank you!

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