



## Innovative Approach for Strengthening Radiation Safety Training

### THE RATIONALE

In the area of radiation safety, IAEA training is currently provided through either basic or specialized courses. Some Member States expressed an interest that the IAEA develops an overall framework of competence with associated training for the key-personnel targeted by IAEA Safety Standards—regulatory staff, qualified experts (QE) in radiation protection, and radiation protection officers (RPOs). To increase effectiveness and efficiency of such training, the IAEA plans to further strengthen the innovative approaches to training.

### OBJECTIVE

The objectives of the project are to: a) clarify the learning paths and the training needs at different levels; b) unify learners' experience and c) enhance the effective use of e-learning and innovative technologies, such as games, virtual or augmented reality to maximize the learning experience of audiences having similar interests and competence needs and to increase the return on investment, with necessary funds to develop the e-learning materials.

### PROJECT ACTIVITIES

A competence framework for regulators, QEs and RPOs with a learning model path to achieve the needed competence will be outlined. Additionally, the current gaps in the relevant IAEA training material will be identified, through IAEA internal review and consultancy meetings with experts.

Through consultancy meetings, expert home based assignments, and/or vendor contracts, the identified additional training material to develop the competence of regulators, RPOs and QE, to address the training gaps will be designed, developed and/or converted to e-learning, taking into account the most effective training delivery to achieve the desired level of competence, combining face-to-face and e-learning components. Training material might be translated into other languages subject to the availability of funding.

### DURATION

2020–2025

### BENEFICIARY COUNTRIES

All IAEA Member States

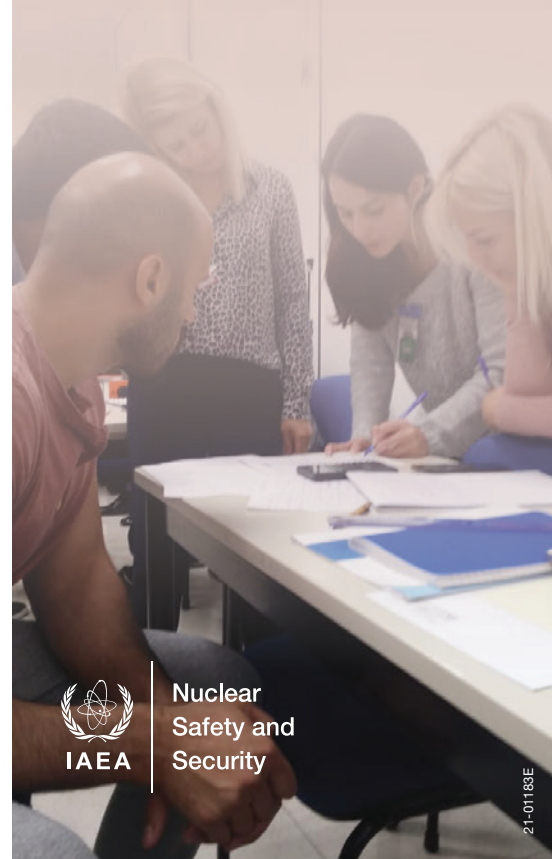
### EXPECTED RESULTS

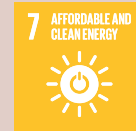
The project is expected to result in an increased availability and effectiveness of IAEA training material for facilitating competence building in radiation safety in Member States in line with IAEA Safety Standards. The newly developed training material will facilitate and support the implementation of all the training activities through the Agency's programmes (e.g. TCP), ensuring and enhancing the impact of the project.

### TOTAL ESTIMATED BUDGET

*Budget (EUR) with 7% PSC included*

|              |                   |
|--------------|-------------------|
| Year 1       | €64 200           |
| Year 2       | €192 600          |
| Year 3       | €192 600          |
| Year 4       | €492 200          |
| Year 5       | €802 500          |
| <b>Total</b> | <b>€1 744 100</b> |





## Responsible and safe management of radioactive waste and spent fuel

### THE RATIONALE

A wide range of activities, such as the operation of nuclear installations, the medical use of ionizing radiation in diagnostics and therapy, and the use of radionuclides in science and for industrial purposes, generates radioactive waste that has to be safely managed. Despite best efforts, a safety regime for the management of radioactive waste and spent nuclear fuel is not fully implemented in all countries.

### OBJECTIVE

In collaboration with Member States and international organisations, the IAEA is working to establish a global safety regime for the management of radioactive waste and spent nuclear fuel, which is continuously reviewed and, if necessary, revised for further improvement.

This project is focused on identifying remaining challenges and assisting Member States with the development and application of safety regimes for radioactive waste management, including predisposal and disposal management, and the radiological impacts to workers and the public. It also aims to support Member States with the development and implementation of strategies that address the long-term management of spent nuclear fuel, including disposal of high-level waste and spent fuel considered as waste. It will also help to disseminate experience and know-how in radioactive waste and spent nuclear fuel management and support the build-up of capacities in participating countries.

### PROJECT ACTIVITIES

- **Planning and development of national radioactive waste and spent nuclear fuel management programmes.** Providing assistance to participating countries.
- **Evaluate the status of radioactive waste management.** This includes identifying steps still to be taken by participating countries for the development of safe waste management programmes.
- **Development and achievement of safe management solutions.** Providing assistance in respect of all types of radioactive waste and spent fuel in participating countries.
- **Model safety cases for radioactive waste disposal facilities.** These will be developed to build competence in both regulators and operators.
- **Assessment of post-closure radiological impacts.** Internationally agreed methods will be developed and disseminated for the assessment of radiological impacts to people and the environment.

### DURATION

Four years

### BENEFICIARY COUNTRIES

All Member States developing safety regimes for radioactive waste and spent nuclear fuel management and disposal

### EXPECTED RESULTS

The project will identify needs and provide the necessary assistance to Member States in the safe and comprehensive management of radioactive waste and spent nuclear fuel, in line with international safety standards. Ultimately, it will assist all targeted countries to reach a high level of safety in the management of all types of waste, including its disposal.

### TOTAL ESTIMATED BUDGET

*Budget (EUR) with 7% PSC included*

|              |                |
|--------------|----------------|
| Year 1       | 130 005        |
| Year 2       | 141 240        |
| Year 3       | 196 655        |
| Year 4       | 32 100         |
| <b>Total</b> | <b>500 000</b> |



Nuclear  
Safety and  
Security



## Building capacity in Member States for enhancing control of natural radiation in buildings

### THE RATIONALE

Long-term exposure due to radon has been acknowledged by the World Health Organization as the second leading cause of lung cancer after smoking, resulting in 3-14% of all lung cancers worldwide. Requirements for the protection of the public against exposure due to radon indoors were strengthened in the revision of the International Basic Safety Standards published in 2014. This project will address radon exposure in homes and other buildings, including exposure due to both radon and gamma radiation from building materials.

### OBJECTIVE

The IAEA is already implementing a programme to help Member States address the challenges of radon in homes. It will now facilitate the formulation of an extended radon policy and a policy for controlling the radionuclide content of building materials in participating countries, working closely with the World Health Organization and other relevant organizations and agencies.

Through this project, the IAEA will assist countries with an emerging system of radiation protection to comply with the requirements of the International Basic Safety Standards for the protection of the public from natural sources of radiation, specifically radon in buildings and gamma radiation emitted by building materials.

### PROJECT ACTIVITIES

- **Training courses/workshops.** These will cover the basic requirements for developing effective radiation protection of the public against increased exposure due to radon, reflecting also building materials.
- **Training material.** This will be focused on the control of radionuclides in building materials
- **Expert missions to Member States upon request.**
- **Educational kits.** Natural radioactivity and radioactivity in the environment will be the focus of these kits, intended for schools.
- **E-learning.** Intended for higher education of building professionals.
- **Training materials.** Intended for doctors.

### DURATION

Three years

### BENEFICIARY COUNTRIES

Member States with emerging national radon action plans and those considering developing or adopting national radon action plans

### EXPECTED RESULTS

This project will result in the improved capability of participating countries to control public exposure due to radon and gamma radiation in dwellings. It will also increase awareness of radon among doctors and young people through the provision of targeted information material.

### TOTAL ESTIMATED BUDGET

*Budget (EUR) with 7% PSC included*

|              |                |
|--------------|----------------|
| Year 1       | 162 640        |
| Year 2       | 248 240        |
| Year 3       | 162 640        |
| <b>Total</b> | <b>573 520</b> |







# Strengthening radiation protection in medical radiation practices

## THE RATIONALE

Medical exposure to radiation differs from occupational and public exposure in that people are deliberately, directly and knowingly exposed for their benefit. Two principles of radiation protection apply to medical exposure – justification and optimization. More actions are needed to promote the AAA approach (awareness, appropriateness and audit) recognized by the IAEA to be effective in facilitating justification of medical exposure. In addition, practical tools need to be developed for the optimization of radiation protection and safety of individuals undergoing medical exposure. The potential for accidents when using radiation in medicine may increase as procedures are often highly complex, requiring input from many different staff groups.

## OBJECTIVE

The IAEA has developed effective tools for information and knowledge exchange through the dedicated Radiation Protection of Patients website, as well as the resources to support education and training of healthcare professionals. The objective of this project is to assist Member States in strengthening the implementation of justification and optimization and improving prevention of medical radiation incidents and accidents. In particular, the future plan is to address the specific needs of professionals who are not yet fully involved in training despite using high dose imaging procedures.

## PROJECT ACTIVITIES

- **Training packages and e-learning modules.** These will be produced in different languages and will focus on specific aspects of radiation protection and safety in medical uses, to support the education and training of health professionals.
- **Multi-media informational material.** Providing information to health professionals, patients and the public on the benefits and risks of radiation in medicine.
- **Diagnostic Reference Levels.** Tools will be developed to support patient exposure monitoring and tracking, as well as the establishment and use of diagnostic reference levels.
- **Further development of educational reporting systems on accidents in medical uses of radiation.**
- **Tools for strengthening competences and skills.** These tools will be developed to support regulatory officers in evaluating radiation protection and safety infrastructure in the medical uses of ionizing radiation.

## DURATION

Two years

## BENEFICIARY COUNTRIES

All Member States

## EXPECTED RESULTS

The project is expected to result in the development and implementation of practical approaches and effective tools to support Member States' efforts in strengthening the implementation of justification and optimization of radiation protection and safety in medical uses of ionizing radiation.

## TOTAL ESTIMATED BUDGET

*Budget (EUR) with 7% PSC included*

|              |                |
|--------------|----------------|
| Year 1       | 236 470        |
| Year 2       | 202 230        |
| <b>Total</b> | <b>438 700</b> |





## Regional coordination of coastal emergency preparedness and response arrangements for port and maritime radiological emergencies for Member States in the Mediterranean region

### THE RATIONALE

The IAEA is productively working with all Member States in the Mediterranean region on the development, enhancement and testing of national capabilities for nuclear and radiological emergency preparedness and response. Even so, some functional and infrastructural areas require further improvement in the region.

### OBJECTIVE

The project aims to help Member States enhance their capabilities to respond to nuclear or radiological emergencies occurring in coastal ports and within the Mediterranean basin. This will be achieved through a combination of regional and national activities focused on improving existing arrangements, harmonizing them with international standards for emergency preparedness and response, and establishing coordination arrangements through the development of a Regional Maritime Emergency Response Plan.

The IAEA is also developing guidance on preparedness for and response to maritime emergencies, in collaboration with the International Maritime Organization; as well as coordination arrangements for the Response and Assistance Network to enhance the provision of international assistance in case of maritime nuclear or radiological emergencies.

### PROJECT ACTIVITIES

- **Self-assessment:** Each participating country will conduct self-assessment on preparedness and response in the case of port and maritime nuclear or radiological incidents and emergencies and on regional coordinating mechanisms.
- **Capabilities and resources from other Mediterranean States:** A list will be compiled of the support that could be provided to participating countries when responding to port and maritime nuclear or radiological emergencies in the Mediterranean basin, within the framework of the Response and Assistance Network (RANET).
- **Regional emergency response plan:** To address the coordination of participating countries responding to port and maritime nuclear or radiological emergencies, as well as coordination with the IAEA and other Mediterranean States.
- **Pilot training for responders:** Training will focus on preparedness for and response to port and maritime radiological emergencies.
- **Regional exercise:** An exercise will be held to test the regional emergency response plan and verify the success of the project.

### DURATION

Four years

### BENEFICIARY COUNTRIES

Member States in the Mediterranean Region of Africa and the Middle East

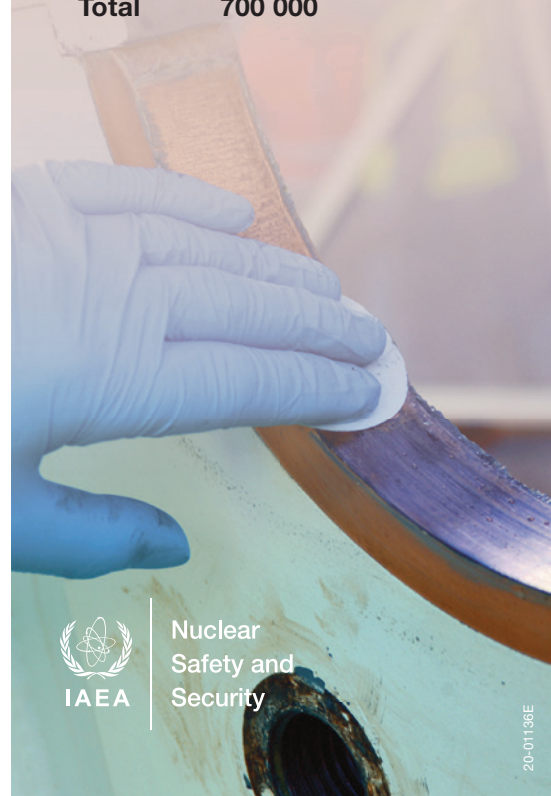
### EXPECTED RESULTS

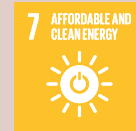
The project is expected to contribute to the enhancement of the preparedness and response arrangements and capabilities of beneficiary countries to port and maritime radiological emergencies within the Mediterranean basin, in order to be effective, coordinated and consistent with international safety standards. It will also generate effective arrangements to use regional and international assistance through a regional plan and the IAEA's Response and Assistance Network.

### TOTAL ESTIMATED BUDGET

*Budget (EUR) with 7% PSC included*

|              |                |
|--------------|----------------|
| Year 1       | 189 390        |
| Year 2       | 146 590        |
| Year 3       | 322 825        |
| Year 4       | 41 195         |
| <b>Total</b> | <b>700 000</b> |





## Establishing a virtual international school for radiation and nuclear safety regulations

### THE RATIONALE

Member States and their regulatory bodies are responsible for developing their own nuclear safety regulations. However, an increasing number of Member States are requesting IAEA support for developing, amending or expanding their national safety regulations to be consistent with IAEA safety standards. This may be due to the lack of a national safety infrastructure or to changes in the national practices, such as the introduction of new technologies using ionizing radiation sources, or the introduction/expansion of a nuclear power programme. It is also due, in part, to the recent revision of major IAEA safety standards.

### OBJECTIVE

In response to Member States' demands, virtual schools will be organized to assist Member States in drafting regulations in line with IAEA safety standards. This will address the different needs of Member States based on their level of knowledge and experience in developing regulations. As a result, it will optimize resources and ensure a consistent and well coordinated approach to maximize the benefits for Member States. The scope of the learning material includes a general module and five thematic modules for radiation safety, nuclear safety, transport safety, waste safety and emergency preparedness and response. The learning methodology comprises: i) preparatory work; ii) face-to-face phase with in-class lectures, drafting activities and exercises; iii) evaluation and feedback; and iv) community of practice.

This project aims to enhance and formalize the methodology, work programme and operational arrangements for the implementation of a school for drafting nuclear and radiation safety regulations, that the Agency has been organizing since 2010. The Virtual School will be offered as a regular service to all Member States in need of developing or revising national regulations related to all nuclear facilities and activities.

### PROJECT ACTIVITIES

- **Operating documentation:** Coordination and production of documents governing the operation of the School.
- **Multi-annual and modular programme:** Consultancy meetings to define and develop the School's programme, including detailed syllabus and modules addressing all aspects of safety which has to be regulated.
- **Training material:** To be produced and made available for the various modules of the School.
- **Organization of the first series of classes.**

### DURATION

Three years

### BENEFICIARY COUNTRIES

All Member States

### EXPECTED RESULTS

The virtual international school for radiation and nuclear safety regulations is envisaged to become a recognized mechanism to assist Member States in improving their national safety regulations. Additionally, it will replace the standard programme of the school of drafting safety regulations organized by the IAEA in the past.

### TOTAL ESTIMATED BUDGET

*Budget (EUR) with 7% PSC included*

|              |                |
|--------------|----------------|
| Year 1       | 160 500        |
| Year 2       | 214 000        |
| Year 3       | 267 500        |
| <b>Total</b> | <b>642 000</b> |







# EuCAS (The European and Central Asian Safety Network)

### THE RATIONALE

EuCAS will be implemented under the framework of the project: *“Enhancing Nuclear Safety and Security Infrastructure through the Establishment of Nuclear Safety Knowledge Management Programmes under the Global Nuclear Safety and Security Network”*, with a specific output for EuCAS.

### OBJECTIVE

The objective of the project is to provide direct support to regulatory bodies and to promote information sharing and experience exchange in the field of nuclear and radiation safety, under three key thematic areas:

- 1) Radioactive Waste Management, Decommissioning and Environmental Remediation;
- 2) Enhancing the National Regulatory Infrastructure needed for development of peaceful uses of nuclear technologies other than energy production;
- 3) Building competency in nuclear safety through the delivery of knowledge transfer.

### PROJECT ACTIVITIES

Under each of the above-mentioned thematic areas, 3–4 workshop/technical meetings will be implemented over the 3 year period. The below activities will be updated subject to the approval of the EuCAS Steering Committee based on the needs of Member States:

- Regional Experts’ meeting on Importance of Information Exchange with Neighbouring Countries of a Nuclear or Radiological Emergency
- Regional Experts’ meeting on Identifying Specific Priority Themes on Education and Training
- Workshop on Regulatory Supervision of Legacy Sites and Wastes from Recognition to Resolution under the EuCAS network
- Workshop on Regulation and Management of the existing facilities for Pre-disposal of Radioactive Waste decommissioning
- Meeting on “Technical Support Organizations (TSO) experiences to the Nuclear Regulator
- Prepare a questionnaire for each EuCAS member to identify the needs for remediation and decommissioning
- Workshop on the development of strategic documentation and legislation related to remediation and decommissioning
- Workshop Introduction on regulatory evaluation methodology
- Workshop on the regulatory approaches for approval process (licensing, periodic updates, etc.) for remediation and decommissioning of uranium sites
- Technical meeting on the development of training guidelines

### DURATION

Three years (2019–2021)

### BENEFICIARY COUNTRIES

EuCAS Member States

### EXPECTED RESULTS

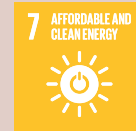
The project is expected to: 1) Enhance cooperation between national regulators especially at the regional level; 2) Maintain and transfer knowledge and expertise; 3) Strengthen regulatory bodies’ expertise; and 4) Tighten neighbourhood cooperation links, interactions, and extension with new EuCAS Member States.

### TOTAL ESTIMATED BUDGET

Budget (EUR) with 7% PSC included

|              |                |
|--------------|----------------|
| Year 1       | 72 000         |
| Year 2       | 133 800        |
| <b>Total</b> | <b>205 800</b> |





## Coordination Group for Uranium Legacy Sites (CGULS)

### THE RATIONALE

The international community has recognized the need to support Central Asian Member States in resolving uranium legacy challenges. The Coordination Group for Uranium Legacy Sites (CGULS) was created to facilitate cooperation and promote a systematic, integrated and coordinated approach to remediation of uranium legacy sites.

### OBJECTIVE

The objective of the CGULS is to promote cooperation amongst IAEA Member States affected by uranium legacy issues, national and international organizations involved in the management, remediation or regulatory oversight of uranium legacy sites by providing a forum for information exchange and provision of technical advice, and coordinating actions of the members of CGULS to maximize synergies and avoid duplication of effort.

### PROJECT ACTIVITIES

#### **Mission reports and/or recommendations pursuant to expert missions.**

Supporting specific technical aspects of the programmes of Member States and international organizations, upon-request.

**Peer reviews.** Providing, on the basis of international safety standards, independent assessments of the proposed remediation projects, upon-request.

**Annual coordination meetings.** Providing a regional coordinated platform for information and knowledge exchange and a mechanism to formulate shared strategic priorities, as required.

**Topical coordination meetings and workshops.** Addressing Member States' needs in specific areas, including development of national regulatory and strategic frameworks for remediation, safety assessment and the regulatory review of remediation plans.

**Expert training on methods used for site investigation and monitoring.** Building capacity of national counterparts to use modern equipment and techniques.

**Coordination of two research projects aligned with the CGULS outcome.** Providing further opportunities for capacity building in beneficiary Member States.

**Focal point for information exchange.** Maintenance of a website for the Coordination Group for Uranium Legacy Sites.

**Strategic Master Plan.** Periodically updating and disseminating the Strategic Master Plan– a combination of strategic approach with concrete technical and financial framework for its implementation.

### DURATION

Ongoing since 2012

### BENEFICIARY COUNTRIES

Member States in Central Asia that have to prepare, plan and implement the remediation of uranium legacy sites and post-remediation activities, and countries that are embarking upon remediation of uranium legacy sites

### EXPECTED RESULTS

The project will maintain a comprehensive overview of remediation and related activities in Central Asia performed by national and international organizations. It will also enhance technical coordination, optimize utilization of resources and support and promote the application of IAEA safety standards as well as internationally recognized best practices in remediation activities.

Further expected results include raising awareness of uranium legacy site issues with the international community and revising the key document for the coordinated remediation effort, the *Strategic Master Plan for environmental remediation of uranium legacy sites in Central Asia*. The IAEA will assist Member States to enhance strategic planning of programmes and projects for remediation and the subsequent long-term care of uranium legacy sites.

### TOTAL ESTIMATED BUDGET

Budget (EUR) with 7% PSC included

|              |                |
|--------------|----------------|
| Year 1       | 250 000        |
| Year 2       | 250 000        |
| <b>Total</b> | <b>500 000</b> |

