NEWSLETTER

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EDITORIAL

Dear Readers,

We are delighted to connect with you again in this summer edition of the European ALARA Network newsletter, bringing you insights and updates from the radiological protection community across Europe.
As always, we are committed to keeping you informed about the network's activities, key developments, and upcoming opportunities to engage with fellow professionals.

Our first feature covers Spain's INVEAT Challenge, highlighting the Spanish Nuclear Safety Council's (CSN) regulatory approach to licensing a major wave of high-tech medical equipment. You can learn more about this initiative on page 2.

We also present a synthesis of the 21st EAN Workshop, held in April 2025 in Petten, The Netherlands, which focused on the optimization of the transport of radioactive material. The event brought together stakeholders from across Europe to exchange best practices in optimizing transport processes, while ensuring high standards of radiological protection. Details of the key discussion and recommendations are presented on page 8.

Lastly, we are pleased to announce the dates for the 22nd EAN Workshop. This workshop will focus on the optimization of radiation protection in design for nuclear, accelerator and medical isotope installations. Full details of this upcoming event can be found on page 13.

We hope you enjoy reading this edition of our newsletter. We remain committed to keeping you informed and engaged with the network's activities!

We wish you a wonderful summer!

Best regards,
The Editorial Team.

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Spain's INVEAT Challenge: The CSN Regulatory Approach to Licensing High-Tech Medical Equipment

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Abstract: In 2021, Spain launched the ambitious Plan for Investment in High-Tech Health Equipment (Plan INVEAT), allocating nearly €800 million to upgrade the National Health System's diagnostic and therapeutic capabilities. A significant portion of this investment involved equipment utilising ionising radiation, presenting a substantial regulatory challenge for the Spanish Nuclear Safety Council (CSN). This communication details the multi-faceted approach adopted by the CSN's Operational Radiation Protection Deputy Direction (SRO) to manage the licensing and oversight demands of INVEAT, focusing on the strategies implemented, outcomes achieved, and key lessons learned, offering insights relevant to regulatory bodies managing large-scale technology implementation projects.

Introduction

In April 2021, the Government of Spain approved the Recovery, Transformation and Resilience Plan as part of the national strategy to address the impact of the COVID-19 pandemic and strengthen the country's economy. Within this framework, the Investment in High-Tech Healthcare Equipment Plan (INVEAT) emerged as a significant initiative for the Spanish National Health System (SNS). This plan, managed by the Ministry of Health in coordination with Spain's autonomous communities (CC.AA.), with a budget of 796.1 million euros, aimed to substantially modernize the technological infrastructure of public hospitals throughout Spain by replacing, upgrading, or newly installing advanced medical equipment that utilizes ionizing radiation for both diagnostic and therapeutic purposes. A key objective was to enhance the SNS's capacity to address health challenges, prevent future health threats, and ensure a universal, high-quality public health system.

The scale of this ambitious project presented an unprecedented challenge for Spain's Nuclear Safety Council (Consejo de Seguridad Nuclear, CSN), the regulatory body responsible for nuclear safety, radiation protection, and physical security. The CSN was tasked with evaluating and authorizing numerous radiation facilities within a compressed timeframe to meet the commitments established with the European Commission, which set September 2023 as the deadline for equipment installation and commissioning.
This article outlines the regulatory challenges faced by the CSN's Operational Radiation Protection Deputy Direction (SRO), the strategic approach implemented to address these challenges, the outcomes achieved, and the valuable lessons learned throughout the process. The experience demonstrates how a regulatory body can adapt its processes and develop innovative strategies to fulfil its mission effectively, even under significant time constraints and, without compromising on radiation safety standards.

The INVEAT Plan: Scope and Challenge

The INVEAT Plan was established with a substantial budget of 796.1 million euros, aimed at strengthening Spain's National Health System by modernizing its medical technology infrastructure. The plan focused on the expansion, replacement, or new installation of high-technology medical equipment across public hospitals throughout the country.
The INVEAT Plan primarily targeted four main categories of equipment that utilize ionizing radiation and require formal licensing:

- Linear particle accelerators (LINACs) for cancer radiotherapy
- High-dose-rate brachytherapy equipment (HDR) for targeted internal radiotherapy
- Hybrid SPECT-CT gamma cameras (Single Photon Emission Computed Tomography combined with Computed Tomography) for advanced diagnostic imaging
- Hybrid PET-CT scanners (Positron Emission Tomography combined with Computed Tomography) for metabolic and anatomical imaging

Additionally, the plan included other X-ray based diagnostic equipment such as computed tomography (CT) scanners, magnetic resonance imaging (MRI) equipment, and digital radiography systems. However, these devices fall under a

different regulatory category in Spain and do not require formal licensing through the CSN, but rather a simpler registration process.
The regulatory challenge was considerable: the CSN needed to license a total of 216 pieces of medical equipment requiring formal authorization, and this process had to be completed by September 2023 to comply with the timeline agreed upon between Spain's Government and the European Commission. This equipment was distributed as follows:

- 73 linear accelerators
- 24 high-dose-rate brachytherapy units
- 40 PET-CT scanners
- 79 SPECT-CT systems

This represents a significant expansion and modernization of Spain's medical radiation equipment infrastructure, with all equipment requiring regulatory oversight due to their use of ionizing radiation for diagnostic or therapeutic purposes. The equipment was destined for healthcare centres across 14 autonomous communities throughout Spain, requiring the processing of 137 authorization applications distributed among these regions. It should be noted that the CSN's direct involvement did not include equipment installations in Catalonia (33 units), the Basque Country (8 units), and the Balearic Islands (6 units), as these regions have their own authorized technical services operating under CSN supervision and control.
The primary challenge for the CSN lay in the sheer volume of equipment requiring regulatory oversight within a tight timeframe. Additionally, the process had to be coordinated with various stakeholders, including hospital facilities, technical units, autonomous communities, and equipment suppliers, all working under the pressure to meet the September 2023 deadline established by the European Commission.
The administrative authorization process for radiological installations in Spain consists of several phases, encompassing two primary regulatory functions:

1. Evaluation Phase: Assessing safety, radiation protection, and physical security aspects, culminating in a prior report to the authorizing Ministry or competent regional body before an operating or modification license is granted. This applies to second-category radioactive medical facilities housing LINACs, SPECT-CTs, PET-CTs, and HDR units.
2. Inspection Phase: Conducting pre-operational inspections once the facility is ready upon the licensee request. Following a satisfactory inspection confirming the installation can operate safely, the CSN issues a "notification for start-up operation". Crucially, clinical use of the equipment for patient diagnosis or treatment is prohibited until this notification is issued, although pre-clinical testing (acceptance, validation, calibration, QA) is permitted.

This complex regulatory process, when applied to such a large number of installations simultaneously, required careful planning and innovative approaches to ensure both efficiency and effectiveness.

CSN's Strategic Approach

To address the challenges posed by the INVEAT Plan, the CSN's Operational Radiation Protection Deputy Direction developed a comprehensive strategy. The approach had several key components, all designed to streamline processes while maintaining high standards of radiation protection, safety and security.

1. Development of Standardized Documentation Guides

The CSN identified early on that providing clear guidance to facility operators would be essential for efficient processing. The primary objective of these guides was to provide clear direction to licensees regarding the scope, content, and quality of documentation supporting their applications for new equipment, with the aim of guaranteeing quality and reducing the need for additional information requests during the licensing review process.

Therefore, the CSN developed standardized content and format guides for authorization applications for each type of equipment covered under the INVEAT Plan:

- Circular 02/2022: Format and standard content for medical electron linear accelerator applications
- Circular 03/2022: Documentation required for authorization of medical facilities with high-dose-rate brachytherapy equipment
- Circular 04/2022: Documentation required for authorization of medical facilities with hybrid PET-CT equipment
- Circular 07/2022: Documentation required for authorization of medical facilities with hybrid SPECT-CT equipment

These documents were made available on the CSN's institutional website[1] and were also distributed to stakeholders, including licensees, radiation protection services and technical units, professional societies, and competent authorities. Their purpose was to ensure that documentation supporting authorization applications was complete, clear and precise, thereby minimizing the need for additional information requests and optimizing evaluation time.

It is important to note that the development of these standardized documentation guides proved to be a complex and time-consuming task for the CSN. Creating these comprehensive guides required significant front-loaded effort and resources from the organization's technical staff. However, this initial investment represented a strategic balance: while it demanded considerable resources at the outset, it was deemed essential for preventing much larger downstream delays that would have occurred if each application had to be revised through multiple rounds of additional information requests. This approach exemplifies how regulatory bodies sometimes need to invest heavily in preparatory work to achieve a greater overall efficiency in the authorization process, especially when facing large-scale projects with strict deadlines.

2. Development of Internal Evaluation Guides

The SRO developed a comprehensive set of internal evaluation guides that proved essential to managing the high volume of authorization requests efficiently. These guides outlined specific criteria for each of the four facility types (LINACs, HDR, PET-CT, and SPECT-CT) and provided standardized templates for evaluation reports.

Rather than relying on a general authorization protocol, these detailed internal guides ensured consistency in the evaluation process across different technical staff members. Each guide incorporated specific technical parameters, safety requirements, and radiation protection considerations unique to the equipment type being evaluated. The standardized report templates helped streamline documentation, reducing the time required to prepare formal evaluation reports while maintaining thoroughness and technical quality.

In the standardized evaluation guides, four scenarios were established based on the type of application submitted by the licensee:

- Scenario 1: New facilities requesting an operating license, requiring complete adherence to the content of the CSN guide for the corresponding equipment type.
- Scenario 2: Increasing the number of devices with newly constructed dependencies in a radiological facility that already has similar equipment.
- Scenario 3: Replacement of equipment in a radiological facility requiring changes to the shielding of the exploration/treatment room.

[1] Documents are available at: https://shorturl.at/OSAR5

- Scenario 4: Replacement of equipment in a radiological facility not requiring changes to the shielding of the exploration/treatment room.

These defined scenarios allowed evaluations to focus specifically on the main object of the application by applying a graded approach consistent with IAEA GSR Part 3, Requirement 3, paragraph 2.3.1. As the project progressed, the criteria established in these guides were updated based on lessons learned and experience gained, to clarify, interpret, and reinforce the application of the graded approach.
The internal evaluation guides were complementary to the externally published documentation guides provided to applicants. While the external guides helped applicants prepare complete and standardized applications, the internal guides ensured that CSN staff evaluated these applications with consistent criteria and documentation practices. This symmetry between external guidance and internal evaluation procedures was a key factor in the efficiency achieved throughout the project.

3. Workforce Reinforcement Through Internal and External Expertise

With both external documentation guides and internal evaluation guides in place, the CSN was able to implement an effective workforce reinforcement strategy. The development of these detailed guides was particularly crucial as it made possible the integration of staff from different departments who might not have specialized expertise in medical facilities.
A key aspect of this strategy involved the temporary reassignment of expert staff from other departments within the CSN. Notably, experienced evaluators from the Industrial Facilities branch were temporarily assigned to the Medical Facilities branch to assist with the evaluation of INVEAT applications. These internal staff members brought valuable expertise in radiation protection principles and regulatory processes, which could be readily adapted to the medical context thanks to the comprehensive internal evaluation guides. This internal reinforcement provided not only additional evaluation capacity but also fostered knowledge sharing and standardization of practices across different branches of the organization.
In addition, the CSN conducted a tender process for external support resources to further enhance its evaluation capabilities during this period of extraordinary demand. These external collaborators worked alongside CSN staff, providing additional capacity while following the established CSN procedures and evaluation criteria. This external workforce approach was aimed to:

- Verify completeness of submitted documentation according to established requirements.
- Confirm alignment with radiation protection regulations.
- Provide initial review of documentation submitted by applicants.
- Identify aspects requiring additional information or clarification.

This independent review served as a preparatory step, allowing CSN's internal technical staff to focus their efforts more efficiently, without delegating the final regulatory decision-making authority vested in the CSN. The support from these external entities was largely deemed satisfactory and helpful in meeting evaluation timelines, providing additional capacity to handle the increased workload, ensuring that internal experts could focus on critical aspects of the evaluation process.

4. Strategic Prioritization and Planning

A critical element of the CSN's strategy was the prioritization of evaluations based on equipment type and authorization requirements. The CSN identified that the second quarter of 2023 would be particularly critical, as the mandatory safety and radiation protection reports for equipment requiring pre-commissioning inspection visits needed to be issued at least three months before the September 2023 deadline.
This advanced planning allowed facility operators sufficient time to complete construction work, equipment installation, acceptance testing, quality control procedures, service implementation, and staff training, as well as to address any requirements included in the technical specifications issued by the CSN.
To facilitate a smooth and gradual planning of pre-commissioning inspection visits, the Operational Radiation Protection Deputy Direction informed licensees, the Ministry of Health, and representatives of the Health Departments of the autonomous communities that they should submit their inspection requests to the CSN once they had completed equipment acceptance testing.

Results and Outcomes

The CSN's strategic approach yielded significant results in terms of processing efficiency and regulatory effectiveness.

Evaluation Phase Outcomes

Analysis of the evaluation phase showed that the CSN was able to meet the demanding timeline requirements of the INVEAT plan. A general reduction in review times was observed across all equipment types when compared to standard processing periods.

For all categories of equipment—linear accelerators, high-dose-rate brachytherapy units, PET-CT scanners, and SPECT-CT systems—the technical evaluation staff of the Operational Radiation Protection Sub-directorate worked diligently to process applications within the timeframes necessary to allow equipment installation and commissioning by the agreed deadline. This was achieved while maintaining the necessary thoroughness in safety and radiation protection analyses, with the standardized approaches implemented at the beginning of the project contributing to consistent processing across all application types.

It is worth emphasizing the extraordinary optimization effort made by the technical evaluation staff, struggling the meet the deadlines while avoiding any reduction in the quality of safety and radiation protection analysis.

Inspection Phase Outcomes

Between January and September 2023, the CSN conducted a total of 79 pre-commissioning inspections within the INVEAT Plan framework. More than 60% of inspection requests were addressed within 15 days of receipt, and another 20% within one month. Cases requiring more than one month typically occurred when licensees requested inspections before their facilities were fully ready to begin operations.

The CSN also optimized the time required for sending inspection reports, with more than 50% of reports being sent within five days of the inspection. The response from licensees was similarly satisfactory, with 60% returning the processed report within five days of receipt.

These results demonstrate that the timeframes for managing the evaluation and inspection phases prior to commissioning notification were minimized to the greatest extent possible, reaching what could be considered excellent levels of efficiency.

Lessons Learned and Future Applications

The INVEAT Plan experience yielded several valuable lessons for the CSN, which will inform future regulatory approaches:

1. Value of Standardized Documentation Guides

The development and dissemination of standardized documentation guides proved highly effective in streamlining the authorization process. Feedback from stakeholders regarding the utility of these documents was overwhelmingly positive. This success has led the CSN to plan the systematic development of documentation guides for different types of radiological installations, using a graded approach that prioritizes higher-risk facilities.

2. Effectiveness of Internal Evaluation Guides and Criteria

The creation of comprehensive internal evaluation guides with standardized assessment criteria and report templates proved invaluable for maintaining consistency and efficiency in the review process. These guides were particularly essential in enabling staff from different departments to contribute effectively to the evaluation of medical facilities. By codifying expertise into structured evaluation frameworks, the CSN was able to ensure uniform application of regulatory standards across all evaluations regardless of which technical staff member performed the review. The organization has now recognized these internal guides as a best practice to be extended to other regulatory areas.

3. Effectiveness of Workforce Reinforcement

The combined approach of utilizing internal expertise supplemented by external support proved to be an effective model for handling surges in regulatory demand. Importantly, this workforce reinforcement strategy was only successful because of the foundations established in the first two elements: the standardized documentation guides for applicants and the comprehensive internal evaluation guides. These tools provided the necessary structure and guidance that enabled staff from different departments and external collaborators to contribute effectively despite not having specialized expertise in medical facilities. This experience has demonstrated that with proper documented guidance and standardized evaluation criteria, additional workforce capacity can be effectively integrated into regulatory processes without compromising quality or independence.

4. Benefits of a Graded Approach

The scenario-based evaluation protocol demonstrated the value of applying a graded approach to regulatory oversight. By tailoring the depth and scope of evaluations to the specific characteristics and risks associated with different

types of facility modifications, the CSN was able to allocate its resources more efficiently while maintaining appropriate levels of safety oversight.

5. Importance of Strategic Planning and Prioritization

The CSN's strategic approach to prioritizing evaluations based on timeline requirements (particularly for facilities requiring pre-commissioning inspections) proved crucial to the project's success. This experience highlighted the importance of proactive planning and coordinated communication with stakeholders to manage complex regulatory projects effectively.

Conclusion

The INVEAT Plan presented an extraordinary challenge for Spain's Nuclear Safety Council, requiring the evaluation and authorization of a large number of advanced medical radiation facilities within a compressed timeframe. Through strategic planning, process optimization, and innovative approaches to regulatory oversight, the CSN successfully met this challenge while maintaining high standards of radiation protection and safety.

The experience gained from this project has provided valuable insights into regulatory efficiency and effectiveness, informing future approaches to similar challenges. The CSN's Operational Radiation Protection Deputy Direction has identified numerous improvement areas, and action on these will advance its regulatory efficiency and effectiveness.

The INVEAT Plan proved to be a highly demanding and challenging project for the CSN, requiring considerable effort, commitment, and cooperative work from all involved personnel. While it created impacts on the management of non-INVEAT authorization applications due to prioritization decisions made within the framework of a national strategy, it also served as a learning tool and an evaluator of the regulatory body's capabilities. The experience has been enriching, encouraging reflection and the search for better regulatory practices and work process optimization.

The success of this project demonstrates how regulatory bodies can adapt to meet extraordinary demands while fulfilling their fundamental mission of ensuring radiation safety and protection. The lessons learned will continue to inform the CSN's approach to regulatory oversight, contributing to the ongoing improvement of radiation protection practices in Spain and potentially offering valuable insights for regulatory bodies in other countries facing similar challenges.

Building on the experience and successful methodologies developed during the INVEAT Plan, the CSN is now implementing a similar strategic approach to face its latest major challenge: the authorization of 11 new protontherapy facilities over the next four years. Protontherapy represents an advanced form of radiation therapy that uses beams of protons to irradiate diseased tissue with greater precision and less damage to surrounding healthy tissue. The regulatory complexities of these sophisticated facilities are substantial, requiring careful evaluation of radiation protection measures, shielding requirements, and operational protocols. The standardized documentation guides, internal criteria and reporting guides, graded authorization protocols, and workforce reinforcement strategies refined during the INVEAT project will be invaluable in addressing this new wave of high-technology medical facilities, further strengthening Spain's position as a leader in advanced cancer treatment while maintaining the highest standards of radiation protection and safety.

Optimization of the transport of radioactive material: a synthesis of the 21st European ALARA Network workshop, 23 to 25 April 2025

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[2] Nuclear Protection Evaluation Center (CEPN), France
[3] NRG | Pallas (NRG), The Netherlands
[4] Ministry of Health and Food Safety (AGES), Austria
[5] The French School for Energy and Health Technology (CEA/INSTN), France
[6] International Atomic Energy Agency (IAEA)
[7] National Institute of Health (ISS), Italy
[8] Swiss Federal Office of Public Health (SFOPH), Switzerland
[9] Research Centre on Nuclear Energy (SCK CEN), Belgium

Introduction

Context

Many hundreds of radioactive packages are transported daily across the world via air, sea, rail and road. There are three main sectors which carry out transport of radioactive materials:

- Medical industry for transporting radiopharmaceuticals
- Nuclear industry for transporting activities related to the fuel cycle stages
- Non-nuclear industry transporting for example gamma radiography devices or sources used for research purposes

The European ALARA Network identified that it would be worthwhile involving the European community, and beyond, to discuss radiation protection practices across the different member states in a bid to share experiences and make improvements, given that doses can be substantial to those involved in the transport chain.

Objectives of the workshop

This workshop considered how well the ALARA principle is currently being implemented in Europe and elsewhere, with regards to transport of radioactive material. This was achieved by bringing relevant stakeholders together to share experiences of real transport radiation protection arrangements, including real life examples of improvements made and accident case histories. Working groups were used to come up with a number of recommendations that will be used to improve ALARA in transport.

Organisation

A programme committee inclusive of EAN members and non-EAN members was set up in mid-2024 to produce a workshop programme designed to achieve the objectives. The programme was divided in four themes:

1. International standards, regulatory and methodological guidance
2. Case studies
3. Incident, accident and emergency response
4. Transport of medical radiopharmaceutical sources

Presentations were given based on these subjects in the first half of the workshop. The second half of the workshop was given to the working groups, to come up with recommendations and then provide feedback to the rest of the workshop delegates.
The working groups discussed the following topics:

- Regulation : compliance with the international safety standards
- Radiation protection programme : typical contents, roles, responsibilities and services

The local planning of the workshop was kindly organised by NRG Pallas, who hosted the workshop at its facility in Petten and offered a tour of their facility on the final day of the workshop.

Results

Attendance and Contributions

There were 52 participants with representation from 14 countries and the IAEA, Table 1. As might be expected given the location, the highest number of participants were from The Netherlands, Belgium and France. Two participants delivered presentations remotely, from Australia and Japan. Participants ranged from regulators to transport companies to radiation protection trainers. There was representation also from radiopharmaceutical

producers and radiation protection experts. It was noted that for future transport workshops it would be useful to have better representation of transport regulators from across Europe.

Table 1. Number of representatives per country in EAN workshop.

Country	Number of participants
The Netherlands	14
Belgium	9
France	7
UK	5
Switzerland	3
Italy	3
Norway	2
Spain	2
Austria	1
Germany	1
Ireland	1
Czech Republic	1
IAEA	1
Australia (remote)	1
Japan (remote)	1

Sixteen presentations were delivered in the first half of the workshop, across the four themes given above. The presentations led to a good number of questions and healthy discussion amongst the participants. It was clear from the presentations that the ALARA approach varies quite widely from country to country and that transport should not be defined as just the physical movement of the source, it is a "cradle to grave" process which includes all who are involved in the transport chain. The majority of the presentations are available to view on the EAN website. Four working groups were formed on the second day, with two focussing on regulations and two focussing on the radiation protection programme. Each group was asked to put a presentation together with their findings and recommendations and present back to all on the last day.

Key themes

Throughout the workshop there were topics discussed a number of times that were linked to enhancing the ALARA application. It was noted that implementation of the below should lead to safer work practices and lower doses. The key themes included:

- Having a formal radiation protection programme and planning work properly (use of the ALARA book!)
- Having suitable training that explains the "do's and don'ts clearly"
- Use of the radiation protection principles time, distance and shielding
- Learning from example and use of the RELIR/OTHEA website for sharing real life incidents
- Carrying out independent audits of the radiation protection programme
- Remembering other health and safety risks should be considered

A key theme throughout the workshop was ensuring that an organisation has a strong safety culture, as this helps promote safer working. Figure 1 shows six aspects of the safety culture that should be considered and adopted in a workplace.

Figure 1. Safety culture diagram.

Recommendations

The working groups which focussed on regulations came up with three recommendations:

1. Timely revision and **review of the radiation protection programme**.
2. Having working groups or similar to **ensure information is passed along to the wider radiation protection community**. It was noted that the IAEA have historically set up transport working groups, but this was not widely known.
3. **Communication between operators and regulators could be improved**, it was suggested that network events between

operators and stakeholders should be organised.

The working groups which focussed on the radiation protection programme came up with three recommendations:

1. **Radiation protection training should be given to emergency responders**.
2. **Internal audits** of the radiation protection programme should be carried out.
3. **Encourage reporting of deviations**, to learn from accidents and incidents.

Although not strictly a recommendation, there was much discussion that radiation protection processes should be harmonised across Europe. This is highlighted by the fact that some radiation packages will travel through several countries before reaching its end destination, with individual countries having very different requirements for training, signage, documentation etc. This led on to discussion that training could be harmonised across Europe, as the level and detail of training differed greatly.

Conclusions

There was very positive feedback from the workshop, with most saying they found the working group discussions useful and insightful. The EAN hope that the above recommendations are shared widely, via this newsletter, and then implemented where possible, to ensure that doses to workers in the transport chain are kept ALARA.

Given the discussions around training requirements across Europe, the EAN plan to send a questionnaire out in the coming months to gather data on radiation protection training. The details will be summarised and shared in an upcoming newsletter.

SAVE THE DATE – UPCOMING 22ND EAN WORKSHOP

The 22nd EAN Workshop on the Optimization of Radiation Protection in DESIGN – focusing on Nuclear, Accelerator and Medical Isotope Installations will, be held in April 2026, in Dessel, Belgium.

This workshop focusses on the optimisation of radiation protection in the design of nuclear applications. There is a significant potential to avoid radiation doses and reduce costs by considering radiation protection early in the design phase. A correct design process will lead to the optimized protection of workers, the public and the environment, while fostering innovation.

As we are at a crossroads in the nuclear field where we see new developments of nuclear applications for energy production, medical applications and research, it is important to take stock of the experience gathered and to look how the ALARA principle can be applied practically in the design of new installations.

Among the new developments in nuclear facilities there is now a rise of Small Modular Reactors (SMRs). We have also seen the evolution of advanced reactor technologies, accelerators and next-generation facilities for medical applications, such as diagnostics and cancer treatment. All these developments help meet the demands of a cleaner, more sustainable future.
This workshop will bring together stakeholders from different fields to share experiences in implementing radiation protection in design and exchange ideas for further improvement. Whether we're building reactors for power generation, facilities for producing medical isotopes or research centres for cutting-edge innovations, our shared goal remains the same: to ensure the safety and well-being of people and the environment.

During the workshop we will:

1. Examine the radiation protection challenges and opportunities in designing **SMRs**, **advanced reactors**, **accelerators** and facilities for the **production of medical isotopes**.
2. Explore innovative strategies to embed the ALARA (As Low As Reasonably Achievable) principle into design processes, balancing technical feasibility, economic considerations and societal expectations.
3. Discuss case studies from new and existing installations, highlighting best practices, lessons learned and emerging solutions.
4. Foster collaboration among experts from diverse fields, including energy, healthcare and research, to ensure our efforts are aligned and impactful.

By the end of this workshop we will be equipped with actionable insights and be inspired by the possibilities ahead. Whether we are revolutionizing energy systems, advancing medical science or enabling future technologies, radiation protection and the ALARA principle remain a cornerstone of our progress.

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