

JRC Nuclear News

NEWSLETTER

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JRC side event at the Nuclear Energy Summit. From left to right, Rafael Mariano Grossi, Director General of the IAEA; Illiana Ivanona, Commissioner for Innovation and Research; Stephen Quest Director General of the JRC; Attila Steiner, State Secretary for Energy of Hungary, 20 March 2024

Welcome message

Bernard Magenhan

As we turn towards the second half of 2024 and welcome the Hungarian Presidency of the EU Council, it is my pleasure to share with you the second edition of the Joint Research Centre (JRC) Nuclear Newsletter. We focus this time on a series of events, which have called attention to nuclear activities these last few months and enabled the JRC to showcase its nuclear research.

We start with a focused article on a weeklong high-level events in March, which turned the spotlight on nuclear activities at EU level. In complement to these political proceedings, we dedicate a thorough analysis to the upcoming trends, challenges and opportunities impacting the nuclear field and we shed some light

on the Decommissioning and Waste management programme where the JRC has a significant involvement. Additional workshops and conferences have spanned this 1st semester of 2024, such as the Generation IV International Forum biannual meetings organised by the JRC in Brussels or the Research Ministers reception event hosted by Commissioner Ivanova.

There was also the Nuclear Security International Conference held by the International Atomic Energy Agency (IAEA) in Vienna with a notable contribution from the JRC or the workshop on Open Access to JRC nuclear infrastructures, taking stock of a valued programme enabling both research and the development of essential skills in the EU. Equally noteworthy was

the holding of the 1st General Assembly of the Industrial Alliance for Small Modular Reactors (SMR), structuring essential work for the successful deployment of SMRs in the EU. The JRC intends to play an important support role in this endeavour, contributing with expertise and assessment methodologies. Finally, this 2nd edition of the Nuclear News highlights some of our significant publications these past months and presents a few upcoming nuclear events of relevance for the readers.

I hope that you will welcome this newsletter with the same interest as the previous one and I again look forward to your valuable feedback. Thanking you for your continuous support, I wish you all a productive semester!

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Highlights from the Brussels Nuclear Week

Spotlight on nuclear research and technology

Ulla Engelmann

Brussels was bustling with activities the week of 18 to 22 March, as it acted as a host to a series of events focused on nuclear energy. From workshops to press visits and interviews, as well as high-level events like the **Nuclear Energy Summit** and the **JRC side event**, there was no shortage of opportunities to engage with key stakeholders and policy makers in the field.

1) Workshop “Putting Science into Standards for Molten Salt Reactor technologies”, 18-19 March 2024

Kicking off the week was the Workshop “Putting Science into Standards for Molten Salt Reactor technologies”, held on 18-19 March and jointly organised by JRC and CEN-CENELEC (European Committee for electrotechnical standardization). Attended by participants from research and industrial partners, R&D and standardisation experts, SME and policy makers, discussions revolved around accelerating the market uptake of Molten Salt Reactors, evaluating R&D maturity and identifying areas where standardisation could be beneficial.

2) Press event at JRC Geel, 19 March 2024

Leveraging the media attention generated by the Nuclear Energy Summit and the launch of the Industrial Alliance on SMRs, the JRC invited a selection of journalists to its research site in Geel, in order to highlight its supporting role in the development of SMR technology, as well as the safety and security of nuclear activities in general. On Tuesday, 19 March, 13 journalists from different newspapers and 11 countries were welcomed at

JRC Geel for an exclusive look into the facility. Following an overview of the site and its nuclear activities, they had the chance to visit the Geel Electron Linear Accelerator (GELINA) laboratory, the Reference Material Production Laboratory and the Nuclear Reference Material and Measurement Facility (METRO) and held interviews with JRC experts. This organised media visit generated more than 100 coverage in the media during the following days.

3) JRC side event “JRC activities for a safe and secure nuclear in Europe”, 20 March 2024

On 20 March 2024, JRC contributed to the Nuclear Energy Summit with the side event “JRC activities for a safe and secure nuclear in Europe”, which also served as the closing ceremony of the 60th Anniversary of JRC Nuclear Safety and Security.

The event took place in the Charlemagne building in Brussels, and was opened by high-level keynotes from JRC

Director General Stephen Quest, IAEA Director General Rafael Mariano Grossi, Research Commissioner Iliana Ivanova and State Secretary for Energy and Climate of Hungary Attila Steiner.

They emphasised the essential role of nuclear research in Europe, recognising the role nuclear energy can play as an autonomous source and efficiently in combating climate change. The event highlighted also the role of the JRC in nuclear science, research and technology, underlining the need for strong support to nuclear research to ensure a safe and secure future in Europe. The JRC is ready to face current and future challenges with ongoing and innovative research supporting all the Member States. As mentioned by IAEA Director General Grossi in his keynote speech, science for policy organisations, share a common mission in developing new technologies that require indispensable research, and in this effort, the role of JRC is truly fundamental.



JRC side event “JRC activities for a safe and secure nuclear in Europe”, 20 March 2024

Following the opening session, a panel discussion took place gathering high level speakers from policy circles, research stakeholders, industry and Member States. The following key needs to be addressed were identified:

- R&D challenges for sustainable nuclear energy development in the future
- Synergy between R&D programmes and industrial applications
- Supporting nuclear research activities from different angles at European level
- Strengthening Europe's position in research and training by creating regulatory and financing framework, where the JRC is playing a role
- Research infrastructure to support emerging technologies
- Growing need for expertise and skilled workforce, maintaining competences and skills
- Attracting the young generations towards nuclear science

4) Nuclear Energy Summit, 21 March 2024

The first ever Nuclear Energy Summit gathered 37 world leaders, alongside 300 CEOs, entrepreneurs, scientists and civil society representatives. They discussed the crucial role of nuclear in addressing global challenges, such as climate change, carbon emissions reduction, and energy security. They highlighted the need for collective efforts in financing, regulatory cooperation, technological innovation, maintenance of skills and workforce training.

Important statements from Charles Michel, President of the European Council, and Ursula von der Leyen, President of the European Commission were made during the event. President Michel emphasised the necessity of being defence-ready regarding energy security, and the need of an Energy Union, in which nuclear energy plays a crucial role, and SMRs could be decisive. He also stressed the importance of nuclear safety, with the IAEA playing an essential part. **President von der Leyen highlighted the role of nuclear power in achieving energy security**



Nuclear Energy Summit, 21 March 2024

and climate goals. She stressed its position as the second-largest source of low-emission energy and emphasised the importance of ensuring our competitiveness and reliable energy supply. She stated that renewable energy sources are complemented by nuclear power, pointing out the slow but steady decline in market share, currently at 9% globally and at 22% in the EU.

In the opening, statements were also made by the Prime Minister of Belgium, Alexander De Croo, and the Director General of the International Atomic Energy Agency, Rafael Mariano Grossi. They stressed the importance of accelerating nuclear energy, highlighted the need to collectively work on the plan for the future of energy and pointed out the importance of an agreed declaration on common actions to be implemented.

5) European Industrial Alliance on SMRs meeting, 22 March 2024

Finally, on Friday, 22 March, to conclude the nuclear week on a high note, the **European SMR Industrial Alliance was officially launched**. The meeting was co-chaired by Kadri Simson, Commissioner for Energy, Thierry Breton, Commissioner for Internal Market, and Iliana Ivanova, Commissioner for Innovation, Research, Culture, Education, and Youth and saw the participation of representatives from EU industry, research organisations, start-ups, nuclear safety regulators, training and education networks. The JRC, alongside other Commission services, will support the Alliance with technical expertise.

In order to reverse this trend, she outlined 4 key objectives ahead of us:

- 1. Securing new investments: Future of nuclear depends on industry delivering on time and within budget**
- 2. Supporting clean transition: electricity, but also heat and hydrogen production**
- 3. Life time extension of existing plants**
- 4. Innovation with SMRs**

Addressing the historical nuclear legacy of the JRC

The nuclear decommissioning and waste management programme

The Joint Research Center (JRC) has been established by the EURATOM Treaty to provide access to the peaceful uses of nuclear energy to the European citizens. Today the JRC activities cover a wide range of areas and after 60 years of European nuclear research, time has come to address the nuclear legacy composed of unused nuclear facilities at the four historical sites of Ispra (Italy), Karlsruhe (Germany), Geel (Belgium) and Petten (the Netherlands). Practical implementation has started at the Ispra site and activities are planned in the future at the three others when nuclear activities will be phased out and corresponding facilities will be shutdown.

The Nuclear Decommissioning and Waste Management Programme, started in 1999, benefits now from a dedicated legal basis¹ with an operational budget of EUR 348 million spanning over the 2022 -2027 Multiannual Financial Framework.

It includes in particular provisions combining decommissioning and waste management activities while initiating the discussions with the host Member States regarding a potential transfer of the nuclear liabilities in the case of mutual agreements in order to satisfy requirements stemming from point (f) of Article 5(1) and Article 7 of Directive 2011/70/Euratom.

In addition, the Programme also involves the creation of knowledge and the sharing of experience gained and lessons learnt under the Programme with regard to the nuclear decommissioning process that should be disseminated in the Union.

The programme is now mature with the provision of initial Decommissioning Plans for the four sites including for plants still in operation.

Details of achievements and perspectives for the programme in the medium to long term will be provided in the next JRC Newsletter.



Ispra Site Interim Storage Facility (ISF) - JRC Ispra



Ispra Site Interim Storage Facility (ISF) - JRC Ispra

¹ Council Regulation (Euratom) 2021/100 of 25 January 2021 establishing a dedicated financial programme for the decommissioning of nuclear facilities and the management of radioactive waste, and repealing Regulation (Euratom) No 1368/2013

Generation IV International Forum (GIF) Meetings

A successful Spring 2024 edition hosted in Brussels

As the Euratom implementing agent for the Generation IV International Forum (GIF), JRC hosted the 57th Policy Group and 51st Experts Group Meetings in Brussels, from 13 to 17 May 2024.

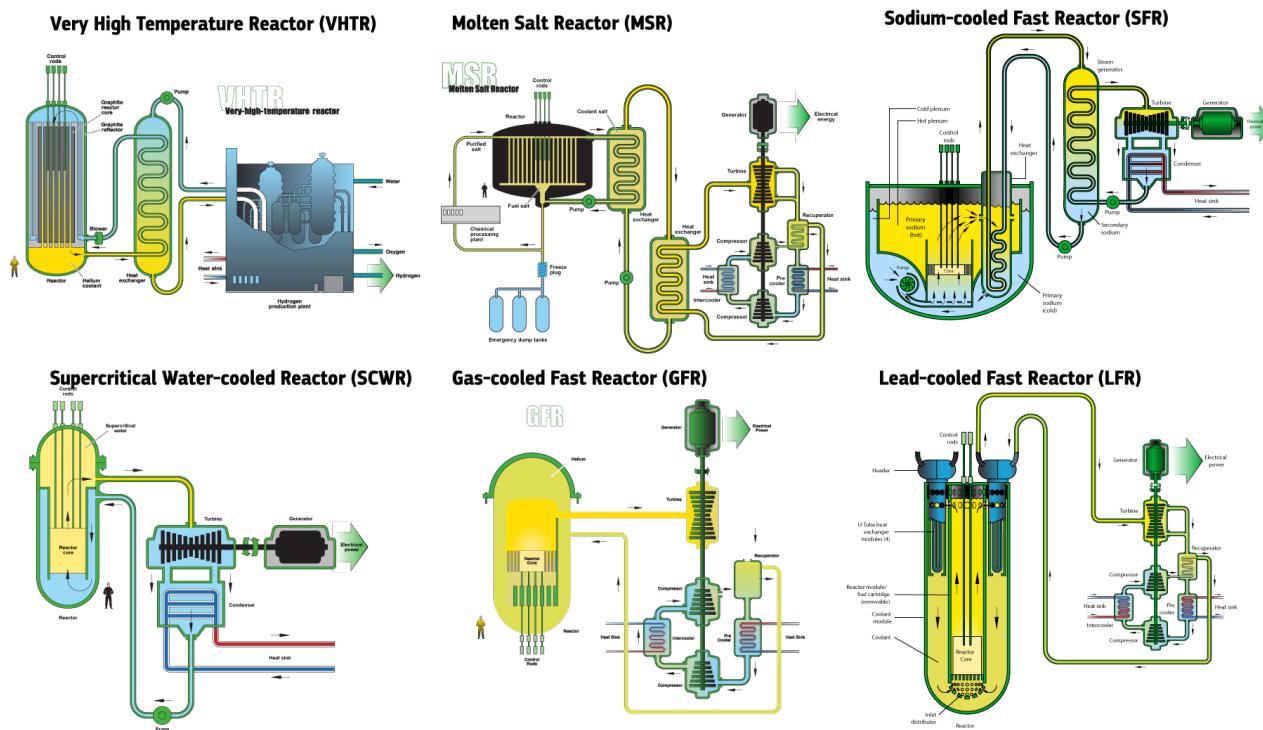
GIF was launched in 2001 as a research and development (R&D) international programme, when 10 of the forum's member countries signed the "Framework for International Collaboration on Research and Development of Generation IV Nuclear Energy Systems". GIF was created

proliferation resistance. The six reactor technologies selected by GIF for further R&D are: the gas-cooled fast reactor (GFR), the lead-cooled fast reactor (LFR), the molten salt reactor (MSR), the sodium-cooled fast reactor (SFR), the supercritical-water-cooled reactor (SCWR) and the very high-temperature reactor (VHTR).

In terms of membership, the GIF brings together 11 countries (Australia, Canada, China, France, Japan, Korea, Russia, South Africa, Switzerland, the

For its part, Euratom acceded to GIF in 2006, nominating the Joint Research Centre (JRC) as its "Implementing Agent" to carry out research in safety, and safeguards of Generation IV systems and to represent EU Member States with interest in this area.

Owing to a rotating organization of the biannual GIF meetings, Euratom, through the JRC, hosted a successful Spring GIF conference in Brussels, attended by 82 experts from 12 GIF members.



The six Generation IV Systems technologies

to research on the feasibility and performance of so-called generation IV nuclear systems. These are advanced concepts developed with the intent to meet eight technological goals linked to sustainability, economics, safety, and

United Kingdom and the United States), as well as Euratom to co-ordinate the R&D on these systems. Two additional members, (Argentina, Brazil), remain at the moment inactive.

The main objectives of this meeting were to advance in the deployment and research of innovative nuclear systems. The week started with 2 days of technical discussions, filled by interventions from Working Groups.

and Task forces, followed by the Expert Group (EG) meeting on the 3rd day and the Policy Group (PG) on the 4th.



JRC Acting DG Bernard Magenmann opened the 57th GIF Policy Group Meeting.

JRC Acting Director General, Bernard Magenmann, opened the 57th Policy Group meeting on 16 May, by highlighting the important momentum for the new nuclear technologies as a necessary tool to meet the global challenges we are facing, particularly reducing CO₂ emissions reduction and ensuring the security of energy supply. He also referred to the importance of

the European Industrial Alliance on SMR. Acting DG Magenmann finally stressed the significant research contributions provided by Euratom members (including JRC) to the GIF work.

JRC Director of Directorate G for Nuclear Safety and Security Director Engelmann presented the Euratom country report with the main



Ulla Engelmann, Director for Nuclear Safety and Security and M. Martín Ramos Deputy Head, Euratom Coordination Unit represented Euratom in the Policy Group

policy developments and Euratom contributions to GIF over the last 6 months. The PG, responsible for overall steering of GIF activities approved the revised Terms of Reference for Working Groups and Task Forces and

designated Mr. Sarrade from French Alternative Energies and Atomic Energy Commission (CEA) as new GIF Policy Group chair, from 1 January 2025.

On 15 May, the Experts Group meeting, which is composed by experts from the GIF members, reviewed the progress of cooperation and reports and made recommendations to the PG.

A number of Euratom and JRC scientists also participated in the technical discussions during the first two days. Two of the technical sessions, also known as "Common Days", were moderated by JRC representatives, while DG R&I also attended the GIF meetings as observer.

On the margin of the GIF meetings, an important side event took place on 15 May, enabling a discussion between the GIF leadership discussion and the European Sustainable Nuclear Energy Technology Platform (SNETP) representatives to explore possibilities for future collaboration and common interest issues.

Finally, on the last day of the Spring GIF meeting, participants were given the opportunity to visit the JRC labs in Geel. The group was given a tour of the GELINA lab (linear electron accelerator for neutron experiments), the METRO lab (metrological tools for nuclear safeguards) and the Reference Materials labs.



Generation IV International Forum (GIF) participants visiting the JRC labs in Geel, 17 May 2024

The future of nuclear technologies: trends, challenges and opportunities

Enhancing foresight capabilities

Applying foresight methodologies, the JRC study **Long-Term Horizon Scanning for Nuclear Technologies Yearly Report – 2023**

Yearly Report – 2023 identified 11 topics critical to the future of nuclear technology in the EU. They range from the resurgence of nuclear start-ups to the potential for nuclear technology to facilitate decarbonisation of hard-to-abate sectors and the integration of digital technologies into the nuclear field.



Long-Term Horizon Scanning for Nuclear Technologies Yearly Report - cover

The study also looked into potential threats and opportunities mid-term (2033) and longer-term (2053), and emphasised the need for an ongoing anticipatory approach to policy-making.

The nuclear industry is experiencing a renaissance with the rise of SMRs, leading to numerous start-ups using digital tools. Moreover, due to the current geopolitical situation, the topic of nuclear fuel strategic autonomy is a key element for achieving self-sufficient fuel production in Europe. The introduction of new technologies and design methods should also

help the nuclear industry to respond to the growing reliance on digital infrastructure.

To reach the objectives of the EU Green Deal and to meet the EU's climate change mitigation and energy-mix targets for 2030, nuclear energy could offer solutions to reduce emissions in industries that have traditionally been difficult to decarbonise, through for example clean hydrogen production. These industries include steel, cement, petrochemicals, aluminium, aviation, concrete, shipping, and trucking, collectively accounting for nearly 30% of global emissions.

In a separate study, the JRC elaborates on the potential of nuclear hydrogen in steelmaking, an industry responsible for around 5% of all CO₂ emissions in the EU. Hydrogen could be used in the production of steel, and high-temperature gas-cooled reactors (HTGRs) could co-generate hydrogen, electricity, and heat locally at the steel mill, improving efficiency and simplifying the required infrastructure. HTGRs have already been built in some European countries with new initiatives continuing to emerge, demonstrating the feasibility of the technology.

Nuclear technologies may also be integrated into the EU's circular economy model to address radioactive waste challenges. In its horizon scanning for nuclear technologies in the future, the first study identifies an opportunity for the EU to decide on a course of action and to become a relevant actor in shaping the role of nuclear energy in the space area.

Furthermore, the fast advancement of Artificial Intelligence (AI) technology raises safety concerns, which have led to efforts to try regulating and controlling its use. Historical frameworks such as the Euratom Treaty, which was instrumental in fostering the growth and collaboration around nuclear technology in Europe, can provide valuable precedents for developing cooperative approaches to contemporary challenges, such as the regulation and development of AI.

All the opportunities and challenges identified in the two studies require technology and talent for long term operation. Notably, the nuclear sector needs to attract young skilled experts, to maintain nuclear competences and skills, and ensure the deployment of innovative technologies for a safer, more secure and efficient use of nuclear energy.

In an era marked by rapid technological change and complex geopolitical dynamics, the importance of foresight in the context of nuclear technology cannot be overstated. By anticipating future trends and challenges, policymakers can craft strategies that not only secure energy independence and environmental sustainability but also position the EU as a leader in innovation.

This proactive approach enables the EU to harness the potential of nuclear technology to meet its climate objectives, drive economic growth, and ensure the safety and security of its citizens.

EU Research Ministers reception event

Showcasing JRC science and expertise

On 23 May in Brussels, following the COMPET Council, the JRC organised a special event attended by European Research Ministers and more than 200 policy makers, with the aim to showcase how JRC science and expertise contribute to inform policy.

Research Ministers were notably given an inside look at JRC's efforts to anticipate and prepare for current and foreseen geopolitical challenges. The event was opened by Commissioner Ivanova, the Belgian Presidency and JRC Acting Director General Bernard Magenhann.

At the Nuclear Safety and Security stand, they were informed on how the JRC's activities lead to promoting the safe and secure use of nuclear power and non-power applications across Europe.

The following key highlights were in particular focus:

- Development and maintenance of nuclear skills and knowledge;
- Training the next generation of scientists through open access to JRC nuclear research labs;
- Instructing front-line officers to detect and respond to illicit trafficking of nuclear or other radioactive materials at the European Nuclear Security Training Centre (EUSECTRA);
- JRC's collaboration with International Organisations to enhance global security.

Finally, Research Ministers were also able witness a live demonstration of a Mobile Laser Scanner, mounted on a backpack. This innovative technology helps nuclear inspectors in retrieving precise location information within nuclear facilities, as well as enhancing inspection and analysis processes.



Participants at the JRC Research Ministers reception event interacting with the touch screen monitor.



Director Ulla Engelmann, Acting DG Bernard Magenhann and Commissioner Iliana Ivanova at the JRC Research Ministers reception event, 23 May 2024

Nuclear Security International Conference

Shaping the future of nuclear security

The JRC participated in the **International Conference on Nuclear Security (ICONS 24): "Shaping the Future"**, held at the IAEA's Headquarters in Vienna, from 20 to 24 May 2024.

ICONS 2024 served as a global forum for discussing the future of nuclear security worldwide, providing opportunities for exchanging information, sharing best practices and fostering international co-operation. JRC scientists work together with international partners to strengthen the security of nuclear and radioactive materials. Together, they are committed to a safer world.

The JRC supported the European Commission's stand on nuclear safeguards and security activities and contributed to the following side events:

1. "Shaping the future of Nigeria's nuclear security regime: the impact on Nigeria and other Member States of collaborating with the Border Monitoring Working Group". This event, organised by the JRC on behalf of the Border Monitoring Working Group (BMWG), highlighted the significant impact of Nigeria's collaboration on nuclear security projects. The JRC, along with its partners of the BMWG, played a crucial role in coordinating international efforts to strengthen nuclear security in various regions of the world, including in Nigeria. This partnership has been instrumental in supporting Nigeria's journey towards CBRN risk mitigation and its inclusion as a Partner Country in the EU CBRN CoE.

2. "EU-IAEA Cooperation for Global Nuclear Security": Organised by the EU delegation in Vienna with JRC support, the side event emphasised the multifaceted impact of the EU/ IAEA Cooperation on Nuclear Security.



Margarida Goulart speaking on behalf of the JRC during the plenary panel "Managing the threats and benefits of emerging technologies"

3. "Plenary: Managing the threats and benefits of emerging technologies": The discussions highlighted the risks and potential benefits of emerging technologies in nuclear with an emphasis on digital technologies, AI, machine learning, advanced computing.

4. "Exploring the practical uses and potential threats of Artificial Intelligence": This event explored the emerging technologies and infrastructure for nuclear security prevention, detection and response.

5. "Forensic Analysis Plans – Interface between Crime Scene Investigators and Nuclear Forensics Laboratories": Organised on behalf of the Nuclear Forensics International Working Group (ITWG), the side event was planned as a mini-tabletop exercise where participants could play through a nuclear smuggling scenario considering law enforcement, analytical laboratory, and nuclear security elements during a simulated investigation.



EU booth at the ICONS exhibition, 20 to 24 May 2024

General Assembly of the Industrial Alliance for Small Modular Reactors

Structuring efforts towards SMR deployment in Europe

The first and constitutive General Assembly of the new European Industrial Alliance for Small Modular Reactors (SMR IA) was held on 29 and 30 May, after two years of thorough preparation by four European Commission DGs (ENER, GROW, R&I and JRC), as well as nucleareurope and SNETP.



It was set up to facilitate and support the demonstration and deployment of these new reactor types in the 2030s. These SMRs intend to present a number of technical, economic and strategic advantages over the current nuclear fleet.

Before and during the first General Assembly, Commissioners Simson, Ivanova and Breton expressed their expectations and support to the SMR IA amid an evolving political climate for nuclear energy.

JRC Director Ulla Engelmann chaired two sessions of the General Assembly where the architects of the alliance from the industry and the European Commission detailed its structure, governance and planned working methods thus setting the scene for the activities, timeline and expected outcomes. Out of more than 300 applicants, 277 alliance members were selected, representing 24 SMR designs and the entire European nuclear ecosystem, including members of the civil society. A Governing Board was successfully established as well as 8 collaborative Technical Working Groups (TWG), requiring strong commitment from all members. The TWGs on Tech-

nology and R&D&I, Supply chain, Skills and Financing will be launched in June 2024, while the ones on Industrial applications, Public engagement, Safety and Safeguards, and Fuel and Waste Management will start in October 2024. For several of the TWGs, the engagement of the JRC was explicitly requested.

On the second day, the TWG Chairs and Vice-Chairs presented the objectives of the 8 collaborative TWG in more detail to help members choose and prioritize their contributions. Several JRC staff members will support the SMR IA in the general secretariat and in different TWGs.

Although this auspicious General Assembly was a remarkable achievement in itself, it is only the start of work on a larger scale over the next few years. In particular, members will be developing SMR design-specific projects towards demonstration and deployment in the coming months and these will be supported by the TWGs. In that frame, the Governing Board will play a key role to coordinate all these tasks and to ensure the establishment of an efficient collaboration with other international or national initiatives in the field, while taking maximum benefit from past and ongoing SNETP activities.



Kai Mykkänen, Finnish Minister for Climate and the Environment, Kadri Simson Commissioner for Energy, and Massimo Garibba, Deputy Director-General of DG Energy of the European Commission

Workshop on “Open Access to JRC nuclear infrastructures”

A successfull programme to stimulate research and develop skills

From 19 to 20 June, the JRC hosted a workshop on “Open Access to its nuclear infrastructures” to highlight the successful cooperation with DG R&I around this pilot action funded by the Euratom programme, take stock of the Open Access programme’s achievements and look ahead towards continued and enhanced efforts in this area. The event gathered around 100 participants both online and in Brussels from the academia, the industry, research organisations and the European Commission.

Since 2020, the JRC has been working with DG-R&I on a pilot project designed to streamline access to its nuclear research infrastructures by the broader EU research community supported by specific funding from the Euratom programme. This initiative is a component of the larger JRC Open Access strategy launched in 2017, which aims to open 17 JRC research infrastructures (both nuclear and non-nuclear) to EU Member States and associated countries. The project’s specific goal is to provide complimentary access to the nuclear research facilities located in Karlsruhe (D), Geel (B), and Petten (NL), fostering an environment where unique scientific equipment is shared, innovation is stimulated, the research-industry gap is bridged, and knowledge dissemination and collaborative efforts throughout Europe are encouraged.

A notable impact of this program is provided by the educational and training opportunities it extends to younger generations of scientists and nuclear engineers, which contribute significantly to maintain a highly qualified nuclear workforce within the European Union.

Biannual calls for research proposals are announced on the JRC Science Hub, with a commitment to a transparent peer-re-

view process conducted by independent scientific panels. To date, this approach has resulted in the acceptance of 100 proposals from 17 Member States. Approximately 70% of these projects include students as well as early-career researchers.

In recognition of the progress achieved, a workshop was therefore organised to assess the pilot project’s milestones, showcase its successful outcomes and reflect on the lessons learnt. Some of the following key messages were highlighted during the event:

- The importance and value of the Open Access programme to the JRC nuclear research infrastructures was recognised both at European and national level for promoting open science, innovation and contributing to structure the scientific community.
- JRC research infrastructures play a vital role in enhancing and advancing knowledge, contributing to scientific excellence and developing innovative technologies while pooling unique resources. The research infrastructures also enable a strong engagement with the next generation of scientists.
- The education and training, as well as the capacity building component of the Open Access programme was specifically highlighted, playing a crucial role in the preservation and transfer of relevant knowledge, especially to young scientists.
- There were emphatic calls for perpetuating the current scheme of the Open Access programme with specific recommendations for lengthening the stays of researchers in the facilities and lightening the administrative burden surrounding the process.
- The need to perform more awareness raising to promote the assets offered by the Programme was also underlined, especially through outreach towards potential users in Members states’ research organisations, the industry and universities in order to attract young talents. Outreach towards policymakers to raise the overall visibility of JRC research infrastructures is also essential.
- Looking to the future, speakers emphasized the necessity to keep JRC nuclear infrastructures open and accessible with continuous funding for this programme and to establish close links with stakeholders, including start-ups who are increasingly engaged in the nuclear field.



Workshop on Open Access to JRC nuclear infrastructures, 19–20 June 2024



Competences for medical applications of nuclear science

Read | Following on the dynamic built by the initiative on medical applications of nuclear science launched by former Commissioner Mariya Gabriel at the beginning of 2023, the Joint Research Centre (JRC) gathered relevant stakeholders for a workshop on 24 October 2023 at the JRC site in Petten to discuss "Competencies for Medical Applications of Nuclear Science". The objective of this second workshop was to address the nuclear competences and skills required to sustain medical applications of nuclear science throughout their life cycle.



Research and Innovation for Sustainable Medical Radionuclide Supply in the European Union

Read | Building on the momentum of the previous stakeholder consultation workshops on nuclear medical applications initiated in 2023, this third and latest workshop in a series convened on 22 November 2023 at the Joint Research Centre (JRC) in Karlsruhe and delved into the critical domain of "Research and Innovation for Sustainable Medical Radionuclide Supply in the EU." The workshop focused on the research and innovation needs in order to ensure the sustained availability and innovation in the production of medical radionuclides, a cornerstone for the future of nuclear medicine within the EU.



ESARDA Connector: Issue 10

Read | The ESARDA Connector provides general information on the European Safeguards Research and Development Association (ESARDA) and its members, working groups activities, news, upcoming events and technical articles, while peer-reviewed scientific and technical articles relating to safeguards and verification are published in the ESARDA Bulletin



Nuclear Forensics Casework at the Joint Research Centre

Read | Illicit trafficking of nuclear and other radioactive material poses a serious threat to the global safety and security. The European Commission's Joint Research Centre (JRC) provides analytical support and develops improved methods to strengthen nuclear security at the level of competent national authorities and international organizations.



COMMISSION RECOMMENDATION (EU) 2024/214 of 10 January 2024 on guidelines setting out the methodology for data gathering and processing for the preparation of the annual report on the control of exports, brokering, technical assistance, transit and transfer of dual-use items pursuant to Regulation (EU) 2021/821 of the European Parliament and of the Council

Read | The Commission publishes the guidelines for the new data collection of EU dual-use licenses which will form the basis for the EC annual report about the implementation of dual-use export controls in the European Union



Long-Term Horizon Scanning for Nuclear Technologies - Yearly Report 2023

Read | This report provides an out-of-the-box analysis of the possible future of nuclear technology in the European Union, based on foresight methodologies and the Joint Research Centre's anticipatory capabilities. It discusses key trends such as the rise of nuclear start-ups, the use of nuclear technology for decarbonisation, and the integration of digital technologies in the nuclear sector. The report also projects potential threats and opportunities after 2033.



Nuclear Hydrogen for Steelmaking

Read | Nuclear reactors are mostly used to generate electricity without producing air pollution or carbon dioxide while operating. However, some reactor designs are also able to provide high-temperature process heat for industrial applications. In particular, high-temperature gas-cooled reactors (HTGRs) reach an outlet temperature in the range of 750 - 950°C thus opening a very significant and badly needed potential for this technology to decarbonize industry.



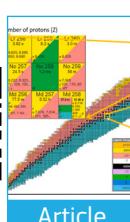
50 Years of uranium isotopic reference materials at JRC-Geel

Read | The history of uranium isotopic reference materials certified at JRC-Geel and provided to customers within the past about 50 years is reviewed, by presenting the methods for preparation and certification as well as most relevant applications for several examples of certified reference materials (CRMs). JRC-Geel offers a comprehensive set of state of the art uranium isotopic reference materials available for nuclear safety and security purposes but also much appreciated in the scientific community.



EU Contributions to Nuclear Safety and Security

Read | This factsheet showcases the European Union's contribution to projects that promote the peaceful use of the nuclear science and technology, particularly on Nuclear Safety & Security, in the context of the Tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which took place on 1-26 August 2022 in New York. The output is part of a series of four factsheets covering a selection of EU's contributions to the fields of Nuclear Safeguards, Nuclear Safety & Security, Strategic Trade Control of 'dual-use' items, and Non-power nuclear science applications.



Karlsruhe Nuclide Chart – a tradition in progress for nuclear data

Read | The Karlsruhe Nuclide Chart is a well-known nuclear data collection used in education and research institutions worldwide. This paper summarises its content from 1958, with data on 1517 experimentally observed nuclides, to the latest 2022/23 edition, with data on 4122 nuclides. The paper also provides an overview of the data content of the latest edition with emphasis on the data sources. The unique features of this nuclide chart are the compact presentation of the most essential and up-to-date nuclide data in small, 1.5 × 1.5 cm nuclide boxes and the availability in different printed formats.



Assessment of the Nuclear Risk in Europe - A case Study in the Almaraz NPP, Spain

Read | The elaboration of risk maps, as tools to identify and categorise the affected areas in terms of radiological impact to population, are very useful in Emergency Preparedness and Response Plans, as they allow to prioritise where the application of remediation techniques is necessary. The ANURE (Assessment of the NUclear Risk in Europe - A Case Study in the Almaraz Nuclear Power Plant, Spain) Project aims at developing a methodology to elaborate this kind of risk maps. The JRC and the Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (CIEMAT) led this project.



The nuclear research infrastructures open access scheme of the Joint Research Centre (JRC) at the European Commission – Contributions to education, training, mobility and scientific excellence

Read | In order to ensure nuclear safety and security in a great number of areas in the nuclear sector, a competent, well-trained workforce needs to be maintained and further developed. This paper explains how the Joint Research Centre (JRC) as a Directorate-General of the European Commission contributes to this task by providing training, education and access to nuclear laboratories through its JRC Open Access Programme.

S E P
24
2024

Hungarian Presidency event on Empowering Nuclear Workforce: A Workshop on Skills Management in the EU

On 24 September 2024, the Hungarian Presidency will organise a workshop on “Empowering Nuclear Workforce” at the Permanent Representation of Hungary to the EU with high-level participation.

Considering the rapidly evolving nuclear industry in the European Union a skilled and knowledgeable workforce is required to meet future challenges both for operating the existing nuclear fleets but also in relation to new build programmes or decommissioning activities. Faced with the issue of an ageing workforce and difficulties to attract young professionals in nuclear-related subjects, it is of strategic importance to maintain and further develop a high level of expertise and skills required for the nuclear-related sector in the EU.

This conference therefore aims to address critical aspects of skills management within the nuclear sector, focusing on developing, retaining, and optimizing talent to ensure a resilient workforce.

The key objectives are assessing the current landscape of nuclear skills and competencies in the European Union, identifying emerging trends and challenges in skills management within the nuclear sector, increasing the attractiveness of the nuclear

sector, exploring strategies for recruiting, training, and retaining a skilled workforce in the nuclear industry and highlighting best practices and innovative approaches to skills development and knowledge transfer.

The workshop will be divided into two sessions led by an academic panel on the one hand and an industry panel on the other. The first panel should explore the creation of a skills ecosystem while the second one will identify ways in which challenges in recruiting, training and retaining skilled workforce can be addressed.

The conference will provide an opportunity for collaboration, networking, and knowledge-sharing among stakeholders in order to address the skills challenges facing the nuclear industry and to ensure a skilled workforce capable of meeting the demands of the future.

By the conclusion of the event, participants will have gained insights into the latest trends, developments, and best practices in nuclear skills management within the European Union.

O C T
10
2024

Hungarian Presidency event on Sustainable Solutions for Radioactive Waste Management in the European Union

On 10 October 2024, the Hungarian Presidency will organise another nuclear event in the form of a workshop dedicated to radioactive waste management in the EU and the sustainable solutions to be found. This event will also count with high-level participation.

The European Union faces significant challenges in managing the safe disposal of nuclear waste, balancing environmental concerns with technological advancements and regulatory frameworks. With the growing interest in and possible construction of a number of Small Modular Reactors, waste management will become increasingly relevant for more Member States. This workshop will aim to bring together experts, researchers, policymakers, and industry professionals to address these challenges and explore innovative solutions for nuclear waste management in the EU.

The key objectives of this workshop will be addressing regulatory frameworks for effective nuclear waste

management and exploring the possibility to use one site by multiple member states, discussing the state of play and future trends in nuclear waste management within the European Union, highlighting technological advancements and best practices in nuclear waste treatment, storage, and disposal and finally exploring sustainable and environmentally friendly approaches to handling nuclear waste.

Divided into two panel sessions, the workshop will discuss the solution of joint repository of radioactive waste and delve into the question of reprocessing technologies.

The event will overall aim to give participants a deeper understanding of the challenges and opportunities in nuclear waste management in the European Union while engaging in the idea of optimizing permanent nuclear waste disposal.

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