

# 2025 ESARDA SAFEGUARDS SYMPOSIUM

47th ESARDA Annual Meeting

12.05.2025 - 16.05.2025

Handelsbeurs Antwerp - Belgium

# CALL FOR PAPERS

Submit your abstract for the 47th ESARDA Annual Meeting

Abstracts Due Date: **10th of January, 2025**

# Don't miss the opportunity to join this symposium!

Submit an abstract for the 47<sup>th</sup> ESARDA Annual Meeting in order to contribute to this important event during which experts, students and decision makers involved in non-proliferation and safeguards matters all over Europe and the world will meet.

**Please submit your abstract by the 10<sup>th</sup> of January, 2025 to be considered to be part of the next ESARDA Symposium.**

*The recent increased interest in nuclear power production and the many new advanced and small modular reactor with innovative fuel concepts being proposed* will require new safeguards approaches, creating new opportunities but also new challenges to safeguards and non-proliferation. Additionally, safeguards and non-proliferation challenges associated with the Long Term Operation of existing nuclear power plant fleets, the interim storage of used nuclear fuel and the final disposal of waste require due attention from all parties involved in nuclear safeguards, including the facility operators, the national and regional authorities, the inspectorates and the research community, to develop innovative solutions to increase safeguards effectiveness and efficiency.

*To discuss these topics and much more*, the European and international safeguards community will meet in **Antwerp, Belgium, from 12<sup>th</sup> till 16<sup>th</sup> of May, 2025** to exchange ideas on and discuss the latest research results on concepts, tools and technologies for safeguards, to report on in-field testing of new equipment and approaches, to share best practices on safeguards implementation and inspections, to analyze current safeguards analysis techniques, approaches and methodologies and to present on strategic trade control. The use of the latest digital technologies and the capacity building strategies through training and education will also be the subject of intense and thorough exchanges.

## Background

ESARDA is an association of European organizations formed to advance and harmonize research and development in the area of nuclear safeguards. It was established in 1969 as a forum for the exchange of information and ideas between nuclear facility operators, safeguards authorities and persons engaged in R&D.

The ESARDA network includes national regulatory authorities (carrying out the controls), technical support organizations, operators of nuclear facilities (those being controlled), and research centers and universities (carrying out the safeguards-related R&D), but also:

- The European Commission which represents the European Atomic Energy Community (EURATOM).
- Representatives from other partner organizations outside EU as well as regional or international bodies, amongst them the ENEN, IAEA, ABACC, AFCONE, APSN and INMM, which actively collaborate with ESARDA.



# Who should participate?

We encourage the following actors to submit an abstract and in doing so to actively contribute to further building up safeguards and non-proliferation awareness, innovation and good practices in Europe and Worldwide:

- National Nuclear Regulatory Bodies
- International and Regional organizations
- Technical Support Organizations
- Private and National Laboratories
- Academicians and Students
- Operators/licensees
- Designers/Vendors
- Stakeholders involved in the nuclear supply chain
- Holders of small quantities of nuclear material
- Politicians / ambassadors / diplomats involved in nuclear safeguards and non-proliferation
- Non-Governmental organizations

# Key Dates for the abstracts submission

**10<sup>th</sup> of January, 2025**

Abstracts submission deadline

**Beginning of March 2025**

Email Notification of Acceptance Sent

**End of March 2025**

Presentation changes and withdrawals deadline

**Beginning of April 2025**

Speakers Registration

**Mid of April 2025**

The finalized version of the ESARDA Symposium Program

**9<sup>th</sup> of May, 2025**

Final papers due

# How to Present at the 2025 ESARDA Safeguards Symposium:

*Submit a 350-word abstract with paper justification and a short biographical sketch by 10<sup>th</sup> of January, 2024.* Include any additional information that will be helpful in placing your proposed paper in the program, such as the order of any complementary papers.

All abstracts must be submitted for review by the ESARDA Symposium Technical Program Committee. ESARDA uses EasyChair. A link will for the submissions will be provided very soon.

Be sure to follow the instructions for online submission of abstracts.

Biographies and paper justifications must be included. Paper justifications are required to provide additional information for reviewers to judge the quality of the paper.

The abstract should provide sufficient information for a review by the ESARDA Symposium Technical Program Committee.

## There are three different ways of contributing:

1. **Oral presentations** which require abstracts and full papers. Contributions based on oral presentations will be grouped by the ESARDA Symposium Technical Program Committee in **oral sessions** of four to six presenters depending on the theme. Depending on the topic, an oral session can also be converted into a **panel session** where more emphasis will be made on discussions and exchanges with the other presenters and the audience.
2. **Poster presentations** which also require abstracts and full papers. Depending on the number of submissions, the topic content, and scheduling opportunities, some submitted abstracts may be selected for short presentation during poster sessions. Dedicated timeslots will be reserved for the poster presentations.
3. The ESARDA Symposium Technical Program Committee also welcomes the submission of abstracts for **dedicated panel sessions**. For each dedicated panel session, the convener of the panel submits an abstract and indicates the key speakers that she or he would like to invite. Upon acceptance by the ESARDA Symposium Technical Program Committee, the dedicated panel convener organizes the panel. The other participants of this type of panel do not need to submit a separate abstract but the convener of the dedicated panel commits to write a paper on the outcome of the discussions held during the panel.

**Please do not submit an abstract if you do not intend to provide a written paper by the due date.**

All final papers will be published in the online ESARDA Symposium Proceedings and must be submitted by 9<sup>th</sup> of May, 2025 with the exception of dedicated panel sessions related papers that could be submitted until 1<sup>st</sup> of July, 2025.

The proceedings will be published after the meeting and will be available for downloading in the ESARDA website.



## Please consider you can publish in the **International Journal of Nuclear Safeguards and Non-Proliferation**

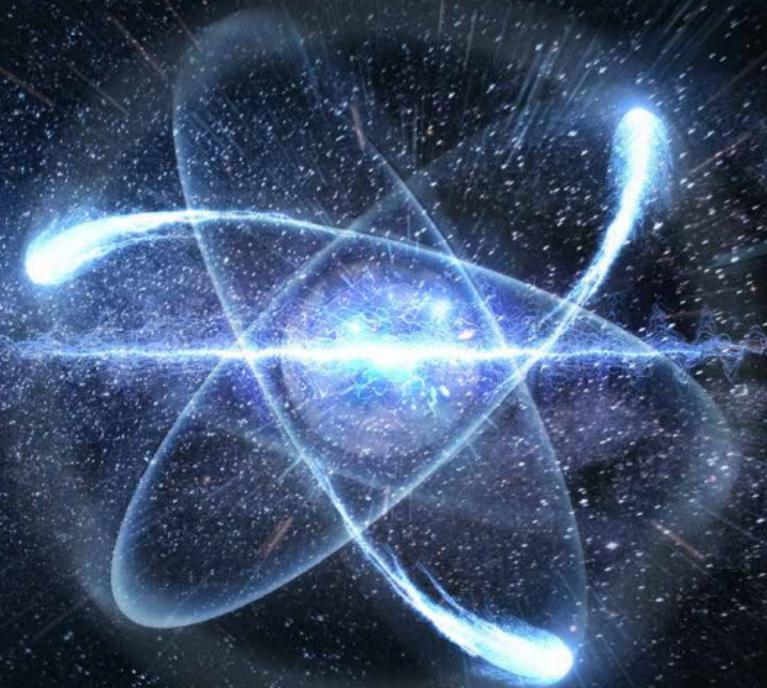
The ESARDA Bulletin (the International Journal of Nuclear Safeguards and Non-Proliferation) is the ESARDA academic peer-reviewed Open Access journal. The Bulletin adopts a rolling online publication policy and issues an annual volume including all the articles of the related year. Since 2020, the ESARDA Bulletin has been included in the Scopus citation database and is the only journal fully dedicated to the multidisciplinary area of nuclear safeguards. For ESARDA Symposium participants that are interested in having their contribution considered for publication in the Bulletin, there is the possibility to signal this intention upon abstract submission. In this case, the manuscript will have to adhere to the Bulletin Publication Policies and will undergo a double-blind peer-review process.

[https://esarда.jrc.ec.europa.eu/document/download/1ceb30ba-e931-4bbc-ab9b-0ebd33a1ee68\\_en?filename=ESARDA%20Bulletin%20Publication%20Policies.pdf](https://esarда.jrc.ec.europa.eu/document/download/1ceb30ba-e931-4bbc-ab9b-0ebd33a1ee68_en?filename=ESARDA%20Bulletin%20Publication%20Policies.pdf)

If cleared for publication, the manuscript will be published online as soon as the peer-review process ends and will be included in the 2025 Volume. If not accepted for the Journal, the manuscript will be published in the ESARDA Symposium Proceedings or in the ESARDA Connector.

# ESARDA BULLETIN

The International Journal of Nuclear Safeguards  
and Non-Proliferation



# Important information to be provided during the abstracts/papers process:

## Primary Presenter or Dedicated Panel Convener

Provide one primary presenter or dedicated panel convener. Data required: first name, last name, complete name of institution, full mailing address, phone and email. The primary presenter or the dedicated panel convener will be the author responsible for submitting the final paper.

## Co-Authors

A maximum of 14 co-authors are allowed. Data required for the co-authors: first name, last name, complete name of institution, institution city/state/country, and email.

## Presenter Biography

A 150-word biographical sketch is required to provide adequate information for the session chair to properly introduce the speaker. Include title, affiliation, relevant experience, academic background and significant accomplishments. Biographical sketches will not be published.

## Abstract Title

Provide the proposed title for your presentation. The format for the title should be title case where each major word in the title begins with a capital letter.

Example Title Format: "Presenting a Paper at the Annual Meeting"  
Do not type in all UPPERCASE letters.

## Abstract Text

Adhere to the following criteria. Deviation may delay or otherwise affect the acceptance of the abstract for presentation.

### The Abstract

- Should appear in one full paragraph without line breaks.
- Should not include references or bulleted lists.
- May be copied and pasted or uploaded from an existing document.

### Content

- Must contain a description of the work.
- Must describe the significance/impact of the work.
- May include background information.
- May provide a summary.
- Must not contain author data.

The abstract should provide sufficient information for the review by the ESARDA Symposium Technical Program Committee.



# Abstract topics

**EACH ABSTRACT MUST INDICATE THE MOST APPROPRIATE TOPIC AMONGST THE FOLLOWING OPTIONS:**

1. Improvement of key safeguards measurements, activities, tools and techniques
2. Enhancing safeguards and non-proliferation methodologies and approaches
3. Plant and facility specific safeguards techniques, inspections, operations, challenges
4. International developments, activities and initiatives
5. Synergies and interactions with other/related disciplines
6. Human resource development and Knowledge Management
7. Potential topics for dedicated panel sessions

# 1. Improvement of key safeguards measurements, activities, tools and techniques

## **Nuclear materials measurements (items, bulk, sample, particles):**

Neutron measurements, Gamma measurements, Hybrid K-Edge, COMPUCEA, Mass spectrometry, Chemical analysis, On-line/In-line measurements challenges for different type of materials, UF<sub>6</sub>, Fresh fuel (U, Mox, Minor actinides), In-reactor core fuel, Spent fuel, Reprocessing products, Post operational clean-out, Final storage containers, Swipe samples from the search for undeclared activities

## **Reference materials, standards, spikes for NDA, DA, particles:**

New materials, Improving stability, Use, Transport, Validation, Intercomparison of standard measurements

## **Containment/Surveillance and verification technologies:**

Sealing systems, Cameras/ surveillance and image review and processing tools, Laser based measurements e.g. for DIV, BTC..., Other innovative monitoring techniques (e.g. acoustic UWB, IR...), Smart sensors, Geospatial tagging,...

## **Process monitoring, sensor integration, remote operation:**

Mass/volume measurements, Near real time accounting, Secure data transmission, Encryption, Block chain, ...  
Internet of Things, Data fusion...

## **Use of open and all source information for safeguards analysis:**

World-wide and dark web, Satellite imagery, Strategic dual-use trade control, Trade data analysis, Procurement outreach, Voluntary reporting

## **The Innovative, Investigative Inspector:**

Ambient intelligence, Augmented reality, Neural networks, Self-localization, Virtual reality, Robotics

## **Potential for techniques developed for big data:**

Modern business analytics, Data visualization

## **Advanced tools and approaches for enhancing capabilities of safeguards analysts:**

Tools for the brains, Artificial intelligence, Machine learning, Collaborative platforms, Red-teaming approaches, Critical Thinking

## **Potential for other emerging and/or disruptive technologies:**

Drones, Additive manufacturing, Distributed ledger technology, Nanotechnology



## 2. Enhancing safeguards and non-proliferation methodologies and approaches

- Safeguards by Design
- State-Level Concept and State-Level Approaches
- Use and potential of State Specific Factors
- Acquisition/Diversion path analysis
- Use of Physical Model
- Proliferation resistance and safeguardability
- Safeguards for waste and waste management
- Role of modelling, simulation and statistics
- Use and potential of variety of safeguards inspections types
- State obligations regarding reporting
- Safeguards reporting tools/protocols for states (e.g. IAEA obligations)
- Quality management

## 3. Plant and facility specific safeguards techniques, inspections, operations, challenges

- Uranium mining and conversion
- Uranium enrichment facilities
- Deconversion facilities
- Fuel fabrication (U, MOX, Minor Actinide fuel for future reactor systems)
- Nuclear reactors (large power reactors, AMR/SMR, naval, floating reactors, research reactors...)
- Spent fuel storage facilities (wet, dry, storage containers...)
- Spent fuel reprocessing facilities
- Encapsulation plants and geological repositories
- Facilities under decommissioning
- Transport of nuclear materials between all fuel cycle steps
- Specific issues for small quantity protocol countries (amended and not amended)
- Specific issues under voluntary offer agreements
- Location outside facilities and CAM

## 4. International Developments, Activities and Initiatives

- Role of National and Regional Safeguards Systems
- Arms Control and Disarmament initiatives
- Importance of WMD free zones
- Role and contributions of FMCT, CTBT, UNSCR 1540 etc
- Contributions from and to (nuclear) centres of excellence/competence
- Existing world-wide proliferation concerns.

## 5. Synergies and interactions with other/related disciplines

- The 3S
- Nuclear forensics
- Nuclear safety and nuclear security
- Cybersecurity
- Strategic dual-use trade control
- Nuclear liability and insurance issues
- Combatting Proliferation networks and financing
- Earth observation monitoring/capabilities (satellites)
- Other (non-nuclear) non-proliferation treaties and regimes



## 6. Human resource development and Knowledge Management

- Safeguards and non-proliferation training and education activities, tools and approaches
- Role and contribution of academia and research centres
- Collaboration/interaction with non-governmental organizations
- Knowledge management approaches and implementation
- Dissemination of best practices and mutual/regional collaborations
- Access to specialized infrastructure and facilities/installations
- Enhanced visibility for the safeguards/non-proliferation activities
- Communication to all stakeholders including the broader public
- Knowledge development, transfer and retention within organisations

## 7. Potential topics for dedicated panel sessions

- Specific safeguards and non-proliferation opportunities and challenges for new reactor systems (SMR/AMR/MMR/GEN IV)
- Finnish & Belgian experiences on contributing to peaceful use of nuclear material during the entire facility lifecycle (SBD)
- Potential of and risks associated with Artificial Intelligence, digitalization and emerging technologies
- Safeguards and non-proliferation during times of increased geopolitical instabilities

**Further information will be later provided regarding:**

- The registration process and registration fees (reduced registration fees for students will be offered). All attendees of the ESARDA Symposium are required to pay the registration fee. The registration fee provides full participation in the conference including registration and conference materials, proceedings, morning/afternoon coffee breaks and lunches and the social event.
- The paper submission process.
- The guidelines regarding oral and moderated panel sessions, discussion panel sessions and the poster presentations.

# ESARDA SAFEGUARDS

SYMPOSIUM 2025 ANNUAL MEETING

**12.05.2025 - 16.05.2025**

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