

Symposium on International Safeguards 2022

Monday, 31 October 2022 - Friday, 4 November 2022

VIC

Scientific Programme

The Symposium themes will be aligned with the objectives listed on the conference main page: to reflect, to anticipate, and to inspire.

The 2022 Symposium will follow a similar format to 2018, emphasizing interaction and dialogue, the generation of new ideas, and the involvement of industry and experts from domains with emerging potential roles in safeguards.

Evolution of safeguards to date

The sessions under this theme will feature retrospectives on all aspects of safeguards, considering the evolutions and achievements that led to the safeguards of today, experience gained and lessons learned, and taking stock of challenges that remain. Topics of interest include:

Key events and insights from the past that have shaped the safeguards of today.

50 years of comprehensive safeguards agreements; the evolution of safeguards from facility-focus to State-as-a-whole, from the perspective of the IAEA (State evaluation, drawing of conclusions, effectiveness evaluation, reporting, etc.) as well as States (SSACs, reporting, cooperation with the IAEA, etc.)

25 years of additional protocols; progress and experience in concluding and implementing APs.

More than 15 years of modified Small Quantities Protocols (SQPs); the importance of amending or rescinding the original SQPs.

30 years of efforts to strengthen safeguards; lessons learned and what remains to be done 60 years of IAEA inspections; changes in inspections over the decades.

Advancements made in safeguards approaches, cooperation, technology, methods, tools and competencies.

Addressing contemporary challenges

The sessions under this theme will examine recent developments and challenges to safeguards implementation, reflecting on current state of affairs and exploring solutions. Topics of interest include:

Safeguards implementation during COVID-19; success stories of IAEA-State cooperation, changing work practices, and lessons learned for business continuity and organizational resiliency.

Addressing proliferation risks in a globalized world.

Addressing the four Vs of information (the volume, variety, velocity, and veracity of information) and keeping safeguards information secure.

Evaluating the absence of undeclared nuclear material and activities – through the lens of policy, practice, information, science and technology.

Verifying decommissioning activities, spent fuel transfer campaigns and long-term disposition of spent fuel and waste.

Anticipating workloads and increasing efficiency in safeguards implementation.

Identifying good practices and incremental enhancements to safeguards implementation and extending their application for mutual benefit.

Communicating effectively on safeguards; explaining the Agency's safeguards mission and reporting safeguards conclusions and trends.

Anticipating and preparing for a changing landscape

The sessions under this theme will look farther ahead, anticipating how the future landscape may look in the decades ahead, and considering how safeguards may need to adapt and continue to

evolve. Topics of interest include:

Future operating environment in 2050; scenarios for how the nuclear landscape may evolve in the next fifty years, in terms of stakeholders, technology, trade and the policy environment.

The most impactful drivers of change; the future of nuclear energy in meeting global energy demand, new types of nuclear fuel cycles and facilities (e.g. advanced reactors and SMRs), and nuclear industry operating models.

Transformative technological advancements such as artificial intelligence (e.g. smart devices), automation (autonomous vehicles) and ubiquitous robotics, all with significant impact on societies.

Possible risks arising from the non-nuclear technologies (e.g. additive manufacturing, quantum computing, the dark web).

Implications for safeguards concepts, approaches, technologies and competencies.

Leveraging innovations for safeguards applications

The sessions under this theme will build upon insights gained at the 2018 Symposium and 2017 & 2020 Emerging Technologies Workshops organized by the Department of Safeguards, and the research and workshops organized by the broader safeguards community, to bring promising advances into the safeguards realm. Topics of interest include:

Application of artificial intelligence (AI) and machine learning (ML) for safeguards surveillance information, object identification, processing and analysis, process monitoring and other safeguards applications.

Advancements in data science for improving capabilities for the analysis, integration and visualization of safeguards data from different sources and increasing 'signal to noise' ratio.

Leveraging multi-media, multi-lingual data for identifying safeguards relevant information.

Introduction of distributed ledger technology applications to e.g. transit matching, nuclear material accountancy, and spent fuel disposition.

Advancements in geospatial, space-borne and other sensors, and the coupling of AI/ML with these technologies for e.g. change detection.

The potential of leveraging improved connectivity, speed and bandwidth for data transmission.

The application of robotics and other intelligent automation technologies for safeguards.

Mechanisms for bringing innovation into practice in the safeguards community.

Engaging people and expanding partnerships

The sessions under this theme will explore ways to better collaborate in safeguards implementation and capacity building, engage and diversify our workforce, deploy the tools that are now part of our repertoire for virtual meetings and training, and extend and leverage our traditional and non-traditional partnerships to address safeguards needs. Topics of interest include:

Innovations in training and knowledge management.

Role of cognitive behavioural science in learning and analysis.

Diversity and inclusion and effects on organizational performance and safeguards culture.

Building States' safeguards capacity through training, assistance, peer-to-peer collaboration, and regional networks.

Contributions of Member State Support Programmes over the years, and the increasing role of traditional and non-traditional partners partnerships in the years come.

Verification approaches, methods and tools in different verification regimes; similarities and differences and what we might learn from them.

Intersections with other domains such as export controls and nuclear security.

Engaging the nuclear industry early in the design and planning phase ('safeguards by design').