

Symposium on International Safeguards

# Linking Strategy, Implementation and People

20–24 October 2014

Vienna, Austria



## PROGRAMME

IAEA-CN-220

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**Symposium on International Safeguards  
Linking Strategy,  
Implementation and People**

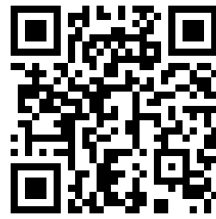
**20–24 October 2014  
Vienna, Austria**

**Programme**

Scan relevant QR to download  
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### Colophon

This book has been assembled from the abstract sources submitted by the contributing authors via the [Indico](#) conference management platform. Layout, editing, and customized  $\text{T}_{\text{E}}\text{X}$  &  $\text{L}_{\text{A}}\text{T}_{\text{E}}\text{X}$  macros used to typeset the book were developed by Dr. P. Knowles, LogrusData, Vienna, Austria.

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## Introduction

Since the 2010 Safeguards Symposium, the IAEA's Department of Safeguards has published [STR.375](#): the Long-Term Research and Development Plan, 2012–2023. The objective of the 2014 Symposium is to foster dialogue, exchange information and promote cooperation with IAEA stakeholders using this R&D plan to make progress towards achieving the Department's strategic objectives.

## Message from DDG-Safeguards, Tero Varjoranta



Dear partners and colleagues,

I would like to thank you all for participating in the twelfth Safeguards Symposium taking place at the IAEA here in Vienna.

Since assuming the post of Deputy Director General and Head of the Department of Safeguards one year ago, I have had many opportunities to listen to our partners inside and outside the house.

I have learned that there is a strong common desire to work closely together to meet the growing safeguards challenges posed by an increasingly changing world. In fact, such collaboration is vital to our success.

We see the Symposium as our window to the world — giving us the chance to reflect together on our strategies for implementing safeguards that are effective and efficient and linking with people to make it happen.

With over 300 papers due to be presented during the Symposium, there will be much to nourish the discussion. We have a great opportunity to exchange knowledge and experience from the best experts around the world in the field and improve our collective performance.

I can assure you that everyone in the Department of Safeguards is working hard to make the Symposium a successful event and we all look forward to welcoming you to Vienna.

Tero Varjoranta

Conference Website: [12th Symposium on International Safeguards](#)  
<http://www.iaea.org/events/symposium-on-international-safeguards-2014>

## Participation in an IAEA Scientific Meeting

Governments of Member States and those organizations whose activities are relevant to the meeting subject matter are invited to designate participants in the IAEA scientific conferences and symposia. In addition, the IAEA itself may invite a limited number of scientists as invited speakers. Only participants designated or invited in this way are entitled to present papers and take part in the discussions.

Scientists interested in participating in any of the IAEA meetings should request information from the Government authorities of their own countries, in most cases the Ministry of Foreign Affairs or national atomic energy authority.

## Conference Location

International Atomic Energy Agency (IAEA)

M-Building

**Vienna International Centre (VIC)**

1400 Vienna, Austria

Metro, U-Bahn: U1: "Kaisermühlen-VIC"

## Working Language & Resolutions

**Working Language:** English

**Resolutions:** No resolutions may be submitted for consideration on any subject; no votes will be taken.

## IAEA Publications

All IAEA publications may be ordered from the

Marketing and Sales Unit,

International Atomic Energy Agency,

PO Box 100, 1400 Vienna Austria

Fax: (+43 1) 2600-29302

[Feedback](#)

[www.iaea.org/Publications](http://www.iaea.org/Publications)

## Registration

Participants will be issued photo badges by the UN Security and Safety Service (UNSSS), at the Gate One entrance, on Sunday 19 October 2014, 16:00–18:00 or as of Monday 20 October 2014 throughout the week from 8:00–16:00. Please bring an official photo identification document. No registration fee is charged.

## Information for Participants

For speakers, session chairs, E-Poster presenters, etc, the [conference website](#) contains links to many helpful [guides](#):

[Guidance for Chairs](#)

[Guidance for Oral Presentations](#)

[Guidance for E-Posters](#)

[Guidance for Contribution Uploads](#)

[Practical Information](#)

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Touch screens located throughout the venue can be consulted for the daily programme as well as the schedule and location of symposium events. Slides and presentation materials can also be viewed once the presentations have been given.

## Presentations

Presenters should be aware that there are pre-session briefings; please see the guides above, and the floor maps to find your briefing rooms. The duration of oral presentations indicated in the programme already includes discussion time. Speakers are requested to prepare presentations as follows:

Oral: Fifteen (15) minutes presentation and five (5) minutes discussion (total time 20 minutes);

E-Poster: Two (2) minutes introduction followed by viewing and discussions at the E-Poster displays.

## E-Poster Awards

Prizes for E-Posters will be awarded by representatives from INMM and ESARDA on Wednesday and Thursday at 18:00 on the technical demonstration stage on the First Floor of the [M-Building](#) and on Friday during the closing plenary.

## Technical Demonstrations

Various demonstrations of safeguards-related technologies and techniques will be presented on the technical demonstration stage on the First Floor of the [M-Building](#) during the coffee breaks. Please see the detailed programme for the titles of each demonstration.

## Exhibits

Equipment and services, including commercial products will be exhibited in the C-Building, [Rotunda](#). Side-presentations will take place here at 13:30 where coffee will also be offered.

Displays from the Safeguards Member State Support Programme (MSSP), INMM and ESARDA, as well as universities, institutes and other organizations can be visited in the [M-](#) and [A-Buildings](#).

## Receptions

Participants are cordially invited to a Welcome Reception on Sunday 19 October 2014 from 16:30–18:00 in the C-Building, [Rotunda](#), as well as an Evening Reception on Tuesday 21 October 2014 from 18:00–20:00 in the [M-Building](#).

## Hosted Coffee Breaks

Hosted coffee breaks will be offered from Monday afternoon until Friday morning according to the following schedule:

10:30–11:00 (except Monday) M-Building, Ground Floor, [E-Poster Display](#) Area and on the First Floor, [Technical Demonstration Stage](#) Area.

13:30–14:00 (except Friday) C-Building, [Rotunda](#).

15:30–16:00 (except Friday) M-Building, Ground Floor, [E-Poster Display](#) Area and on the First Floor, [Technical Demonstration Stage](#) Area.

NB: On Monday, the coffee is from 16:00–16:30.

Coffee, tea, and snacks can be purchased from the [M-Building](#) cafeteria.

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## Conference Secretariat

### *IAEA Scientific Secretary:*

Subsequent correspondence on scientific matters should be sent to the Scientific Secretary of the symposium and correspondence on administrative matters to the IAEA Conference Services Section.

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Alejandro Rodriguez Coronado	IAEA
Klaas Van der Meer	ESARDA
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Kurt Stephan Vogt	IAEA
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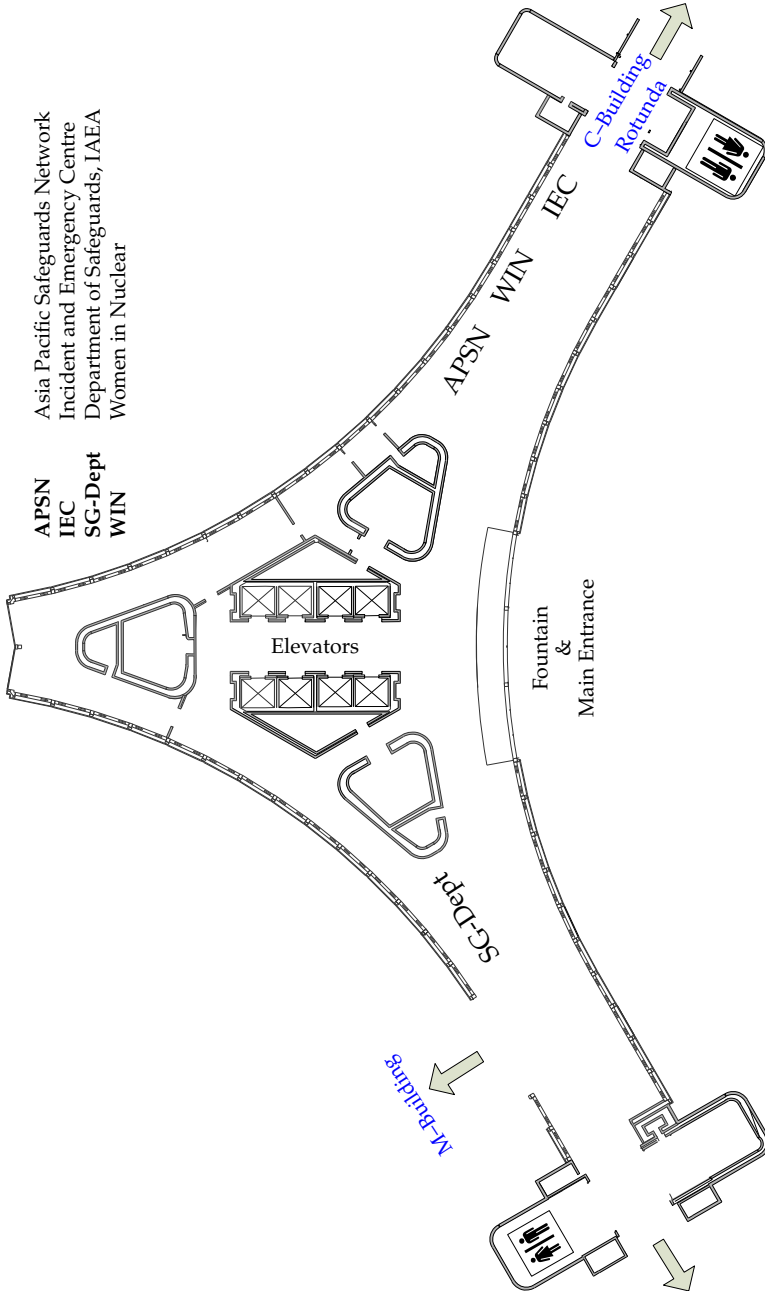
## Abbreviations

<b>ABACC</b>	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials
<b>APSN</b>	Asia Pacific Safeguards Network
<b>CTBTO</b>	Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization
<b>EC</b>	European Commission
<b>ECFA</b>	Egyptian Council for Foreign Affairs
<b>ESARDA</b>	European Safeguards Research and Development Association
<b>EU</b>	European Union
<b>IAEA</b>	International Atomic Energy Agency
<b>INMM</b>	Institute of Nuclear Materials Management
<b>JRC</b>	Joint Research Centre
<b>MSSP</b>	Member State Support Programmes
<b>OPCW</b>	Organisation for the Prohibition of Chemical Weapons
<b>SGAS</b>	Safeguards Analytical Services
<b>SGCP</b>	Safeguards Concepts and Planning
<b>SGIM</b>	Safeguards Information Management
<b>SGIS</b>	Safeguards Information and Communication Systems
<b>SGOA</b>	Safeguards Operations 'A'
<b>SGOB</b>	Safeguards Operations 'B'
<b>SGOC</b>	Safeguards Operations 'C'
<b>SGTS</b>	Safeguards Technical Support
<b>TechSec</b>	Technical Secretary
<b>UNODC</b>	United Nations Office on Drugs and Crime
<b>UNSSS</b>	UN Security and Safety Service
<b>VCDNP</b>	Vienna Center for Disarmament and Non-Proliferation
<b>VERTIC</b>	Verification Research, Training and Information Centre
<b>WIN</b>	Women in Nuclear
<b>WINS</b>	World Institute for Nuclear Security



**M0E 68:** E-Poster Preview Centre! Check and rehearse your E-Poster with the touch screen interface. Technical assistance will be available.

**M0E 67:** Symposium Secretariat.

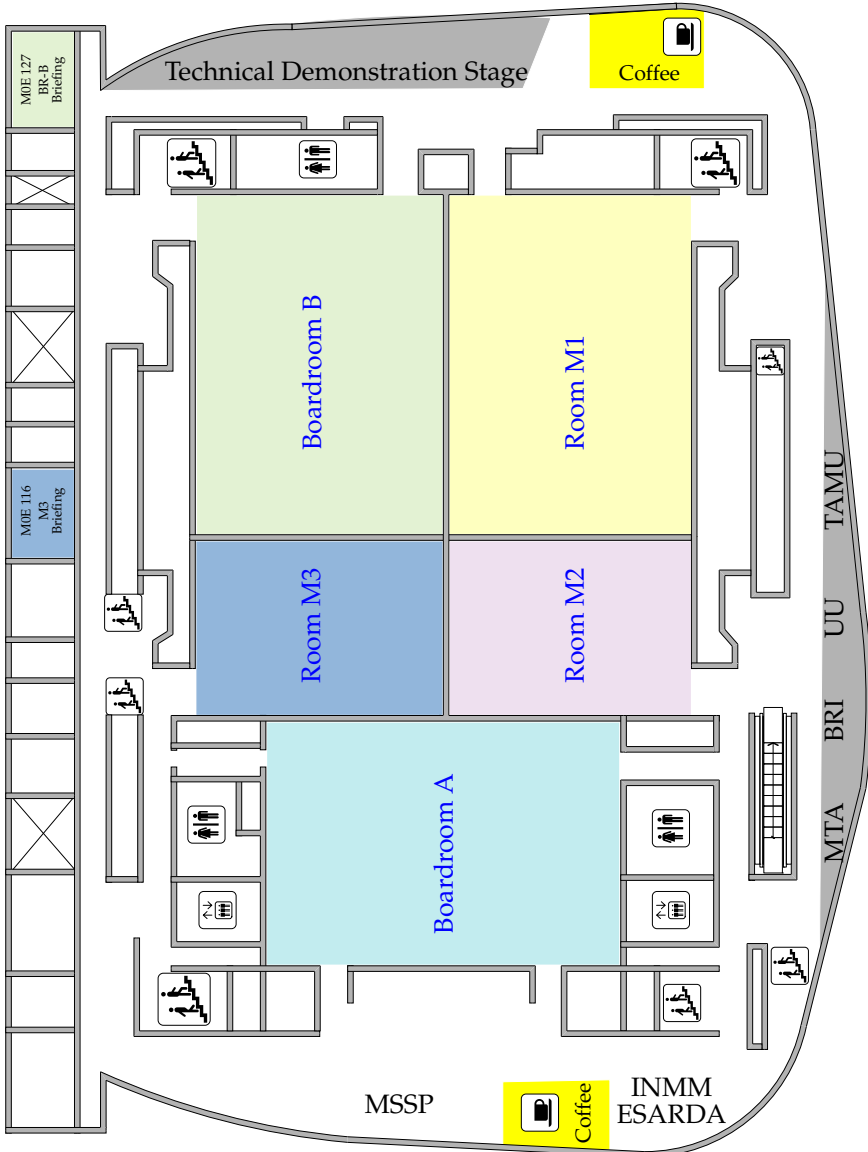




# M-Building, First Floor

**BRI** Beijing Research Institute of Uranium  
**ESARDA** European Safeguards Research and Development Association  
**INMM** Institute of Nuclear Materials Management  
**MTA** Hungarian Academy of Sciences

**MSSP** Member State Support Programmes  
**TAMU** Texas A&M University  
**UU** Uppsala University



Day Date	Monday 20 October 2014	Tuesday 21 October 2014	Wednesday 22 October 2014	Thursday 23 October 2014	Friday 24 October 2014
09:00 — 10:30	<p><b>Opening Plenary</b> 10:00–12:30</p> <p>Chair: T. Varjoranta TechSec: A. Hamilton</p> <p style="text-align: center;"><b>Boardroom A</b></p> <p>OP-01: T. Varjoranta (IAEA) OP-02: L. Satkowiak (INMM) OP-03: K. Van der Meer (ESARDA) OP-04: Y. Amano (IAEA) OP-05: V. Sucha (EU) OP-06: G. Berdennikov (Russian Fed.) OP-07: K. Mendelsohn (USA)</p>	<p>Parallel Sessions...</p> <p>Session 05 Session 04 Session 03 Session 02 Session 01</p>	<p>Parallel Sessions...</p> <p>Session 15 Session 14 Session 13 Session 12 Session 11</p>	<p>Parallel Sessions...</p> <p>Session 25 Session 24 Session 23 Session 22 Session 21</p>	<p>Parallel Sessions...</p> <p>Session 35 Session 34 Session 33 Session 32 Session 31</p>
11:00 — 12:30		<p>10:30–11:00 Coffee Break and Technical Demonstration</p> <p>...continued</p> <p>Session 05 Session 04 Session 03 Session 02 Session 01</p>	<p>...continued</p> <p>Session 15 Session 14 Session 13 Session 12 Session 11</p>	<p>...continued</p> <p>Session 25 Session 24 Session 23 Session 22 Session 21</p>	<p>...continued</p> <p>Session 35 Session 34 Session 33 Session 32 Session 31</p>
14:00 — 15:30	<p><b>Technical Plenary</b></p> <p>Chair: S. F. Chin TechSec: A. Catton</p> <p>TP-01: S. F. Chin TP-02: T. Varjoranta TP-03: J. Cooley TP-04: SG Division Directors</p>	<p>Parallel Sessions...</p> <p>Session 10 Session 09 Session 08 Session 07 Session 06</p>	<p>Parallel Sessions...</p> <p>Session 20 Session 19 Session 18 Session 17 Session 16</p>	<p>Parallel Sessions...</p> <p>Session 30 Session 29 Session 28 Session 27 Session 26</p>	<p><b>Closing Plenary</b></p> <p><b>Boardroom A</b></p> <p>CP-01: M. Whitaker K. Van der Meer CP-02: K. Owen-Whitred CP-03: T. Varjoranta Conference End 16:00</p>
16:00 — 17:30	<p>16:00–16:30 Coffee Break</p> <p><b>Technical Plenary (Continued)</b></p> <p>TP-05: Panel Discussion</p>	<p>15:30–16:00 Coffee Break and Technical Demonstration</p> <p>...continued</p> <p>Session 10 Session 09 Session 08 Session 07 Session 06</p>	<p>...continued</p> <p>Session 20 Session 19 Session 18 Session 17 Session 16</p>	<p>...continued</p> <p>Session 30 Session 29 Session 28 Session 27 Session 26</p>	
18:00 — 20:00		<p>Reception <b>M-Building</b></p>	<p>E-Poster Awards</p>	<p>E-Poster Awards</p>	



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## Conference Registration

**16:00–18:00** Vienna International Centre, Gate One

## Welcome Reception

**16:30–18:00** [C-Building, Rotunda](#)

**OP: Opening Plenary**

Chair: T. Varjoranta (IAEA)

TechSec: A. Hamilton (IAEA)

Boardroom A

**(10:00 – 12:30)**

Time	Id	Presenter		Title
10:00	OP-01	T. Varjoranta	IAEA	Opening Remarks
10:20	OP-02	L. Satkowiak	INMM	Welcome from INMM
10:25	OP-03	K. Van der Meer	ESARDA	Welcome from ESARDA
10:30	OP-04	Y. Amano	IAEA	Opening Statement from the IAEA Director General
10:50	OP-05	V. Šucha	EU	Keynote Address
11:10	OP-06	G. Berdennikov	Russian Fed.	Keynote Address
11:30	OP-07	K. Mendelsohn	USA	Keynote Address

**TP: Technical Plenary**

Chair: S. F. Chin (Singapore)

TechSec: A. Catton (IAEA)

Boardroom A

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:00	TP-01	S. F. Chin	Singapore	Welcome and Opening Remarks
14:10	TP-02	T. Varjoranta	IAEA	Keynote Address
14:30	TP-03	J. Cooley	IAEA	Strategic Planning and the Long-term R&D Plan
14:50	TP-04	SG Division Directors		Successes and Future Challenges: Short statements from each of the SG Division Directors (see listing for the Panel below).

16:00 Coffee

16:30	TP-05	Panel Discussion		Ensuring Non-Discrimination and Consistency in Safeguards Implementation
		G. Dyck	SGOA	
		V. Z. de Villiers	SGOB	
		H. Barroso	SGOC	
		J. Baute	SGIM	
		S. Zykov	SGTS	
		G. Voigt	SGAS	
		F. Moser	SGIS	
		J. Cooley	SGCP	

**S01: Evolving Safeguards Implementation**

Chair: W. McCarthy (UK), M. Rasweswe (South Africa)

TechSec: T. Renis (IAEA)

Boardroom A

**(09:00 – 12:30)**

Time	Id	Presenter	Title
09:10	S01-01	J. Cooley	IAEA Overview of the Development and Discussion on Evolving Safeguards Implementation
09:30	S01-02	P. Burton	Canada A Canadian Perspective on the IAEA's State-Level Concept
09:50	S01-03	N. Kozlova	Russian Fed. The IAEA Safeguards System in the XXI Century
10:10	S01-04	D. Trimble	USA IAEA's Implementation of the State-Level Concept
10:30	Coffee and Technical Demonstration by Virtual Heroes		
11:00	S01-05	Panel Discussion	Evolving Safeguards Implementation
		J. Cooley	IAEA
		N. Khlebnikov	Russian Fed.
		G. Terigi	Argentina
		H. Kumekawa	Japan
		K. Budlong	USA
		Sylvester	

**S02: Communication with State and Regional Authorities on State Declarations**

Chair: K. Owen-Whitred (Canada), P. Szymanski (EU)

Boardroom B

TechSec: A. Rialhe (IAEA)

(09:00 – 12:30)

Tue

Time	Id	Presenter		Title
09:10	S02-01	F. Queirolo	IAEA	21st Century Declarations
09:30	S02-02	A. Osokina	Russian Fed.	Information Interaction with IAEA on Nuclear Import and Export
09:50	S02-03	F. Sevini	EU	States' Reporting of Annex II Exports (AP) and the Significance for Safeguards Evaluation
10:10	S02-04	K. Gilligan	USA	Transit Matching for International Safeguards
10:30 Coffee and Technical Demonstration by Virtual Heroes				
11:00	S02-05	A. Rialhe	IAEA	Protocol Reporter Update: Scope, User's Requirements, Expectations, Collaborative Work
11:20	S02-06	E. Balter	IAEA	Digital Declarations: The Provision of Site Maps under INFCIRC/540 Article 2.a.(iii)
11:40	S02-07	G. Smith	Canada	Exploiting Spatial Data for Site Declarations
12:00	S02-08	S. Miller	IAEA	Technical Solution for Improved Safeguards/State Cooperation

**S03: Safeguards for Reprocessing and Pyroprocessing Facilities**

Chair: S. Johnson (USA), S.-H. Park (Korea, Rep. of)

Room M1

TechSec: M. Hori (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S03-01	S. Bryan	USA	On-Line Monitoring for Process Control and Safeguarding of Radiochemical Streams at Spent Fuel Reprocessing Plants
09:30	S03-02	Y. Lahogue	EU	Developments in the Deployment of Ultrasonic Bolt Seals at the Storage Ponds of a Large Reprocessing Plant
09:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S03-03	R. Plenteda	IAEA	Hardware and Software Upgrade for the Solution Measurement and Monitor System at Rokkasho Reprocessing Plant
	S03-04	M. Åberg Lindell	Sweden	Safeguarding Advanced Generation IV Reprocessing Facilities: Challenges, R&D Needs, and Development of Measurements
	S03-05	P. Richir	EU	Design and Implementation of Equipment for Enhanced Safeguards of a Plutonium Storage in a Reprocessing Plant
	S03-06	B. Cipiti	USA	Improving Materials Accountancy for Reprocessing using hiRX
	S03-07	N. Smith	USA	Application of Laser Induced Breakdown Spectroscopy to Electrochemical Process Monitoring of Molten Chloride Salts
	S03-08	F. Gao	IAEA	Safeguarding Pyroprocessing Related Facilities in the ROK
	S03-09	J. Cazalet	France	Safeguards Considerations for the Design of a Future Fast Neutron Sodium Cooled Reactor
10:30	Coffee and Technical Demonstration by Virtual Heroes			
11:00	S03-10	B. Cipiti	USA	Cost Effective Process Monitoring using UV-VIS-NIR Spectroscopy
11:20	S03-11	M. Hori	IAEA	Proliferation Potential and Safeguards Challenges of Pyroprocesses
11:40	S03-12	S.-H. Park	Korea, Rep. of	Development of a Safeguards Approach for Reference Engineering-Scale Pyroprocessing Facility
12:00	S03-13	C. Pereira	USA	Application of Microfluidic Techniques to Pyrochemical Salt Sampling and Analysis

**S04: Innovative Methods for Training**

Chair: A. Jraut (Morocco)

TechSec: S. Pickett (IAEA)

Room M2

(09:00 – 12:30)

Tue

Time	Id	Presenter		Title
09:10	S04-01	J. G. M. Gonçalves	EU	Virtual Reality Based Accurate Radioactive Source Representation and Dosimetry for Training Applications
09:30	S04-02	T. Patton	VCDNP	Employing 3D Virtual Reality and the Unity Game Engine to Support Nuclear Verification Research
09:50	S04-03	N. Y. Lee	Korea, Rep. of	Training Software for the Bulk Handling Facility
10:10	S04-04	I. Szőke	Norway	Human-Centred Computing for Assisting Nuclear Safeguards
10:30 Coffee and Technical Demonstration by Virtual Heroes				
11:00	S04-05	W. A. M. Janssens	EU	Advanced Safeguards Measurement, Monitoring and Modelling Laboratory (AS3ML)
11:20	S04-06	J. Tackentien	USA	Immersive Environment Development for Training: Opportunities for Cooperation, Coordination, and Cost Savings
11:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S04-07	R. Berndt	EU	Evolution of the Nuclear Safeguards Performance Laboratory PERLA on the Ispra Site of the Institute for Transuranium Elements
	S04-08	S. Bogdanov	Russian Fed.	Practical Results of the Creation of the Non-destructive Assay Measurement Training Laboratory at the Russian Methodological and Training Center
	S04-09	R. Chatelus	EU	Safeguards Export-Import Training: Adapting to Changes in the Department of Safeguards Over 6 Years of Experience
	S04-10	A. Vincze	Hungary	Developing Safeguards Training Material for Management and General Staff of Facilities
	S04-11	L. Holzleitner	EU	Construction of a NDA-Safeguards Training Facility at the ITU Karlsruhe



**S05: Assuring Quality in Safeguards Findings**

Chair: O. Peixoto (ABACC), C. Everton (Australia)

TechSec: A. Bruno (IAEA)

Room M3

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S05-01	C. Everton	Australia	Accountability and Transparency: Essential Underpinnings of Quality Safeguards
09:30	S05-02	A. Meyering	Germany	URENCO's Experiences in Safeguards Reporting and in Developing a Nuclear Material Accountancy System
09:50	S05-03	H. Nel	South Africa	Nuclear Material Information Quality Control for Safeguards Purposes in South Africa
10:10	S05-04	K. Robertson	Australia	Deriving, Communicating and Applying Safeguards Conclusions
10:30 Coffee and Technical Demonstration by Virtual Heroes				
11:00	S05-05	Y. Goto	Japan	Japanese Quality Assurance System Regarding the Provision of Material Accounting Reports and the Safeguards Relevant Information to the IAEA
11:20	S05-06	D. Hanks	USA	United States of America Nuclear Regulatory Commission's Approach to Inspections and Quality Control of Data
11:40	S05-07	P. Meylemans	EU	Verification of the Correctness and Completeness of Nuclear Operators' Declarations by Euratom
12:00	S05-08	S. Konecni	IAEA	The Department of Safeguards Quality Management System

**S06: Performance Management in Non-profit Organizations**

Chair: T. Findlay (Australia)

TechSec: S. Shawky (IAEA)

Boardroom A

(14:00 – 17:30)

Tue

Time	Id	Presenter		Title
14:10	S06-01	V. Z. de Villiers	IAEA	Strengthening Performance Management in the IAEA Department of Safeguards
14:30	S06-02	R. Howsley	WINS	Effective Strategy Implementation: Best Practice that Really Works
14:50	S06-03	Z. Stefanka	Hungary	Assessing and Promoting the Level of Safeguards Culture in Hungarian Nuclear Facilities
15:10	S06-04	T. Findlay	Australia	Nuclear Safeguards Culture
15:30	Coffee and Technical Demonstration: New Satellite-Based Video Technologies			
16:00	S06-05	Panel Discussion		Performance Management in Non-Profit Organizations
		V. Z. de Villiers	IAEA	
		K. Murakami	Japan	
		S. Dare-Doyen	OPCW	
		K. Owen-Whitred	Canada	
		P. Meylemans	EU	
		J. Dickson	UNODC	

**S07: New Trends in Commercial Satellite Imagery**

Chair: M. Hong (Korea, Rep. of), I. Niemeyer (Germany)

TechSec: M. Johnson (IAEA)

Boardroom B

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S07-01	M. Johnson	IAEA	New and Emerging Satellite Imaging Capabilities in Support of Safeguards
14:30	S07-02	N. Spyropoulos	Canada	UrtheCast: The System of Systems for Dynamic EO Monitoring Content
14:50	S07-03	J. Clark	USA	European Space Imaging & Skybox Imaging
15:10	S07-04	M. Hong	Korea, Rep. of	Alternative Data Source for Monitoring of Nuclear Activity: KOMPSAT Constellation
15:30	Coffee and Technical Demonstration: New Satellite-Based Video Technologies			
16:00	S07-05	J.-M. Lagrange	France	Identification of Nuclear Activities Using Satellite Imaging
16:20	S07-06	M. Canty	Germany	Change Detection with Polarimetric SAR Imagery for Nuclear Verification
16:40	S07-07	P. d'Angelo	Germany	High Resolution 3D Earth Observation Data Analysis for Safeguards Activities
17:00	S07-08	I. Niemeyer	Germany	Advances in the Processing of VHR Optical Imagery in Support of Safeguards Verification

**S08: State of the Art Destructive Analysis**

Chair: E. Kuhn (Germany), Y. Aregbe (EU)

TechSec: D. Amaraggi (IAEA)

Room M1

(14:00 – 17:30)

Tue

Time	Id	Presenter		Title
14:10	S08-01	S. Bulyha	IAEA	Implementation of Mass Spectrometry for Bulk Analysis of Environmental and Nuclear Material Inspection Samples
14:30	S08-02	M. Duerr	Germany	Activities at Forschungszentrum Jülich in Safeguards Analytical Techniques and Measurements
14:50	Two-minute E-Poster introductions followed by viewing of poster displays			Withdrawn
	S08-03			
	S08-04	A. Knott	IAEA	Production and Characterization of Monodisperse Reference Particles
	S08-05	E. Esbelin	France	Actinide L-line ED-XRF and Hybrid K-edge Densitometer Spectra Processing
	S08-06	D. Roudil	France	Feedback of EQRAIN Uranium and Plutonium Analysis Proficiency Tests for the Evaluation of Method Performance
	S08-07	A. Gorbunova	Russian Fed.	Characterization of Nuclear Materials Using Complex of Non-Destructive and Mass-Spectroscopy Methods of Measurements
	S08-08	C. Barinaga	USA	Towards a Fieldable Atomic Mass Spectrometer for Safeguards Applications: Sample Preparation and Ionization
	S08-09	I. Szalóki	Hungary	Chemical Characterization of Nuclear Materials: Development a New Combined X-Ray Fluorescence and Raman Spectrometer
15:30	Coffee and Technical Demonstration: New Satellite-Based Video Technologies			
16:00	S08-10	C. A. Pickett	USA	Stability of Working Reference Standards for Hybrid K-Edge Densitometer Quality Assurance
16:20	S08-11	D. Guo	China	Analysis of Uranium-Based Materials by Mass Spectrometric Methods
16:40	S08-12	A. Trinquier	Germany	$10^{13} \Omega$ Resistor Amplifiers in MC-TIMS for Precise and Accurate U Isotope Analysis
17:00	S08-13	C. Leibman	USA	Field Sample Preparation Method Development for Isotope Ratio Mass Spectrometry

**S09: Training and Education in Nuclear Non-proliferation and Safeguards**

Chair: C. Gariazzo (USA), E. Sokova (VCDNP)

Room M2

TechSec: A. Braunegger-Guelich (IAEA)

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S09-01	A. Braunegger-Guelich	IAEA	IAEA Support for Building-Up a Highly Skilled Workforce Necessary for an Effective State System of Accounting for and Control of Nuclear Material
14:30	S09-02	M. Senzaki	Japan	20 Years of Achievement and Future Challenge for International Capacity Building Regarding Safeguards and SSAC at Japan Atomic Energy Agency (JAEA)
14:50	S09-03	E. Sokova	VCDNP	Synergies between Science and Policy and the Use of New Teaching Tools in the Academic and Professional Development Programs
15:10	S09-04	W. A. M. Janssens	EU	Need for Strengthening Nuclear Non-Proliferation and Safeguards Education to Prepare the Next Generation of Experts
15:30	Coffee and Technical Demonstration: New Satellite-Based Video Technologies			
16:00	S09-05	D. Nikonov	IAEA	Interfacing Nuclear Security and Safeguards through Education and Support Centre Networks
16:20	S09-06	C. Gariazzo	USA	Nuclear Safeguards and Non-Proliferation Education at Texas A&M University
16:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S09-07	V. Kyrshchuk	Ukraine	Ukrainian National System of MC&A Training on Regular Basis at the George Kuzmych Training Center
	S09-08	S. Nilsuwankosit	Thailand	Research Projects at Chulalongkorn University for the Master Degree Programme in Nuclear Security and Safeguard
	S09-09	M. Scholz	USA	Next Generation Safeguards Initiative: Human Capital Development
	S09-10	R. Stevens	IAEA	Member State Outreach: Capitalizing on Synergies for Effective Implementation
	S09-11	S. Lestari	APSN	Promoting Safeguards Best Practice through the Asia-Pacific Safeguards Network (APSN)
	S09-12	J. Gerža	Czech Republic	Safeguards Support Provided by Dukovany NPP
	S09-13	S. Ticevic	IAEA	The Systematic Approach to Training: Analysis and Evaluation in the Department of Safeguards

**S10: Automation and Instrumentation Data Analysis in Safeguards Verification**

Chair: Z. Wang (China), A. Anichenko (CTBTO)

Room M3

TechSec: J. Regula (IAEA)

(14:00 – 17:30)

Tue

Time	Id	Presenter		Title
14:10	S10-01	C. Brunhuber	IAEA	Evolution of RAINSTORM
14:30	S10-02	A. Smejkal	EU	Joint Partnership: a New Software Development Paradigm
14:50	S10-03	C. Versino	EU	Evaluation of a Surveillance Review Software based on Automatic Image Summaries
15:10	S10-04	P. Santi	USA	The Development of Advanced Processing and Analysis Algorithms for Improved Neutron Multiplicity Measurements
15:30	Coffee and Technical Demonstration: New Satellite-Based Video Technologies			
16:00	S10-05	A. Pichan	Australia	Can Nuclear Installations and Research Centres Adopt Cloud Computing Platform?
16:20	S10-06	J. Longo	USA	Sustaining IAEA Neutron Coincidence Counting: Past, Present and Future
16:40	S10-07	E. Lyman	USA	Material Accounting Issues at the U.S. MOX Fuel Fabrication Facility
17:00	S10-08	F. Littmann	EU	Automated Image Acquisition System for the Verification of Copper-Brass Seal Images

**S11: Acquisition Path Analysis Methodology**

Chair: G. Stein (Germany), A. Vincze (Hungary)

TechSec: J. P. Morizot (IAEA)

Boardroom A

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S11-01	T. Renis	IAEA	Opening Remarks
09:30	S11-02	A. Nakao	IAEA	Acquisition Path Analysis as a Collaborative Activity
09:50	S11-03	A. Vincze	Hungary	Effect of State-Specific Factors on Acquisition Path Ranking
10:10	S11-04	C. Listner	Germany	Quantifying Detection Probabilities for Proliferation Activities in Undeclared Facilities
10:30	Coffee and Technical Demonstration: Generation and Analysis of Digitally Emulated Radiation Detector Signals (CAEN SpA)			
11:00	S11-05	K. Budlong Sylvester	USA	Developing State Level Approaches under the State Level Concept
11:20	S11-06	G. G. M. Cojazzi	EU	The Potential of Open Source Information in Supporting Acquisition Pathway Analysis to Design IAEA State Level Approaches
11:40	S11-07	Z. Varga	EU	Identification of Signatures to Detect Undeclared Nuclear Activities at the Front-end of the Fuel Cycle
12:00	S11-08	J. Crowley	USA	Computational Methods for Physical Model Information Management: Opening the Aperture

**S12: Preview of New IAEA Guidance: Safeguards Implementation Practice Guides**

Chair: N. Y. Lee (Korea, Rep. of)

Boardroom B

TechSec: C. Mathews (IAEA)

(09:00 – 12:30)

Time	Id	Presenter		Title
09:10	S12-01	C. Mathews	IAEA	IAEA's Safeguards Implementation Practices Guides
09:30	S12-02	C. Everton	Australia	Implementation Practices in the Asia-Pacific Related to Establishing State Safeguards Infrastructure
09:50	S12-03	E. Martikka	Finland	Implementation Practices of Finland in Facilitating IAEA Verification Activities
10:10	S12-04	R. Maxwell	Canada	Canada's Implementation Practices in Provision of Information to the IAEA
10:30	Coffee and Technical Demonstration: Generation and Analysis of Digitally Emulated Radiation Detector Signals (CAEN SpA)			
11:00	S12-05	Panel Discussion		Preview of New IAEA Guidance: Safeguards Implementation Practice Guides
		V. Cisar	IAEA	
		A. Jraut	Morocco	
		Y. Goto	Japan	
		O. Elkhamri	USA	
		G. Dahlin	Sweden	
		S. Shawky	IAEA	

Wed



**S13: State of the Art Environmental Sample Analysis**

Chair: G. Voigt (IAEA), J. Tushingham (UK)

Room M1

TechSec: S. Bulyha (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S13-01	Y. Aregbe	EU	Conformity Assessment in Nuclear Material and Environmental Sample Analysis
09:30	S13-02	R. Higgy	IAEA	Detection of Reprocessing Activities Using Environmental Sampling
09:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S13-03	A. Donard	France	Are Polyatomic Interferences, Cross Contamination, Mixing-Effect, etc., Obstacles for the Use of Laser Ablation-ICP-MS Coupling as an Operational Technique for Uranium Isotope Ratio Particle Analysis?
	S13-04	N. Dzigal	IAEA	Laser-Assisted Sampling Techniques in Combination with ICP-MS: A Novel Approach for Particle Analysis at the IAEA Environmental Samples Laboratory
	S13-05	A.-L. Fauré	France	Development of a Methodology to Detect Fluorine in Uranium Bearing Particle by SIMS
	S13-06	V. Khoroshilov	Russian Fed.	Increasing the Accuracy of EPMA of Microparticles Using Lower Energy Electron Beam and FIB Slicing
	S13-07	L. Sexton	USA	Field Testing of Unattended Environmental Sampling Devices and Analysis Results
	S13-08	Y. Stebelkov	Russian Fed.	Dating of Uranium Materials by Using Combination of ICP-MS and SIMS
	S13-09	J. Cliff	Australia	Novel Mass Spectrometric Techniques for the Rapid Characterization and Fingerprinting of Nuclear Fuel Materials
10:30	Coffee and Technical Demonstration: Generation and Analysis of Digitally Emulated Radiation Detector Signals (CAEN SpA)			
11:00	S13-10	U. Admon	Israel	Advancements in Particle Analysis Procedures and their Application to the Characterization of Reference Materials for Safeguards
11:20	S13-11	K. Fiola	Germany	VKTA Rossendorf: Laboratory for Environmental and Radionuclide Analysis
11:40	S13-12	Z. Macsik	IAEA	Validation of Neptune Plus MC-ICP-MS for Bulk Analysis of Environmental Swipe Samples
12:00	S13-13	I. Elantyevev	Russian Fed.	Improved Technique for the Determination of Uranium Minor Isotopes Concentrations in Microparticles by Using Secondary Ion Mass-Spectrometer in Multicollection Mode

**S14: Safeguards Needs at Geological Repositories and Encapsulation Facilities**

Chair: K. Van der Meer (ESARDA), L. Satkowiak (USA)

Room M2

TechSec: Y. Yudin (IAEA)

(09:00 – 12:30)

Time	Id	Presenter		Title
09:10	S14-01	O. Okko	Finland	Developing Safeguards for Final Disposal of Spent Nuclear Fuel in Finland
09:30	S14-02	Y. Yudin	IAEA	Safeguards by Design at the Encapsulation Plant in Finland
09:50	S14-03	V.-M. Ammala	Finland	Operator View on Safeguards Implementation for New Type of Facilities (Encapsulation Plant and Geological Repository)
10:10	S14-04	I. Niemeyer	Germany	Safeguarding Geological Repositories: R&D Contributions from the GER SP
10:30	Coffee and Technical Demonstration: Generation and Analysis of Digitally Emulated Radiation Detector Signals (CAEN SpA)			
11:00	S14-05	L. Hildingsson	Sweden	Safeguards Aspects Regarding a Geological Repository in Sweden
11:20	S14-06	S. Tobin	USA	Experimental and Analytical Plans for the Non-Destructive Assay System of the Swedish Encapsulation and Repository Facilities
11:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S14-07	S. Uchtmann	Germany	Radar Monitoring: Modelling of Undeclared Activities
	S14-08	R. Twogood	USA	Secure and Reliable Wireless Communications for Geological Repositories and Nuclear Facilities
	S14-09	R. Haddal	USA	Geological Repository Safeguards: Options for the Future
	S14-10	J. Altmann	Germany	Modelling Seismic Propagation at a Salt Dome: Signals at Potential Monitoring Sites
	S14-11	F. Poidevin	France	“Cigéo”: The French Industrial Project of Deep Geological Repository Developed by Andra
	S14-12	R. Plenteda	IAEA	Study on the Near Real Time (NRT) Impact of Safeguards Measures for the Encapsulation Plant in Finland

Wed

**S15: New Trends in the Application of Statistical Methodologies for Safeguards**

Chair: T. Burr (USA)

Room M3

TechSec: T. Krieger (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S15-01	C. Norman	IAEA	Outcome and Perspectives from the First IAEA International Technical Meeting on Statistical Methodologies for Safeguards
09:30	S15-02	J. Wuester	IAEA	IAEA Safeguards and GUM-based Measurement Uncertainty Estimation: a Reconciliation
09:50	S15-03	K. Martin	IAEA	The Analysis of Measurement Errors as Outlined in GUM and in the IAEA Statistical Methodologies for Safeguards: a Comparison
10:10	S15-04	T. Krieger	IAEA	Inspections Over Time: The Role of Information
10:30	Coffee and Technical Demonstration: Generation and Analysis of Digitally Emulated Radiation Detector Signals (CAEN SpA)			
11:00	S15-05	T. Shiba	France	Reactor Simulations for Safeguards with the MCNP Utility for Reactor Evolution Code
11:20	S15-06	C. G. Portaix	IAEA	A Computer Simulation to Assess the Nuclear Material Accountancy System of a MOX Fuel Fabrication Facility
11:40	S15-07	S. Richet	IAEA	Near Real-Time Accountancy at JNC-1

**S16: Potential Verification Roles**

Chair: J. Cooley (IAEA), G. Terigi (Argentina)

TechSec: W. J. Kim (IAEA)

Boardroom A

(14:00 – 17:30)

Time	Id	Presenter		Title
14:10	S16-01	T. E. Shea	USA	The Trilateral Initiative: IAEA Verification of Weapon-Origin Plutonium in the Russian Federation and the United States
14:30	S16-02	L. Rockwood	USA	The Trilateral Initiative: The Legal Framework
14:50	S16-03	R. Moul	VERTIC	Building a Simulated Environment for the Study of Multilateral Approaches to Nuclear Materials Verification
15:10	S16-04	L. Persson	EU	Consolidation of NM in the UK: Optimizing the Euratom Approach
15:30	Coffee and Technical Demonstration: Underwater Spectroscopy Measurement Using a New Hermetically Sealed Germanium Probe			
16:00	S16-05	R. Diaz	USA	United States Support Programme (USSP): Lessons Learned from the Management of Complex, Multi-Stakeholder Projects for International Safeguards
16:20	S16-06	A. Dougan	USA	Long Term R&D for Safeguards
16:40	S16-07	Y. Abushady	ECFA	Building-Up the Non-Proliferation Nuclear Trust in the Middle East
17:00	S16-08	H. Sokolski	USA	Is the IAEA's Safeguard Strategic Plan Sufficient?

Wed

**S17: Technology Foresight and Emerging Technologies I**

Chair: S. Abousahl (EU), N. Khlebnikov (Russian Fed.)

Boardroom B

TechSec: M. Laughter (IAEA)

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S17-01	N. Smith	USA	Development of Spectrophotometric Process Monitors for Aqueous Reprocessing Facilities
14:30	S17-02	D. Chernikova	Sweden	A New Approach to Environmentally Safe Unique Identification of Long-Term Stored Copper Canisters
14:50	S17-03	C. M. Kim	Korea, Rep. of	Modeling Nuclear Proliferation for the Purpose of Warning
15:10	S17-04	A. Hubert	France	Improvement of Bulk Analysis of Environmental Samples by Using a Multiple Collector ICP-MS
15:30	Coffee and Technical Demonstration: Underwater Spectroscopy Measurement Using a New Hermetically Sealed Germanium Probe			
16:00	S17-05	T. Martinik	Sweden	Characterization of Spent Nuclear Fuel with a Differential Die-Away Instrument
16:20	S17-06	M. Nangu	South Africa	<sup>232</sup> Th Mass Determination in a Uranium/Thorium Mixture for Safeguards Purposes
16:40	S17-07	A. Jussofie	Germany	Germany's Accelerated Exit from Nuclear Energy: Challenges and Perspectives with Regard to Safeguards
17:00	S17-08	P. Thompson	UK	The Development of New and Improved Capabilities Applicable to Safeguards

**S18: Challenges in Spent Fuel Verification**

Chair: S. Zykov (IAEA), S. Tobin (USA)

TechSec: I. Cherradi (IAEA)

Room M1

(14:00 – 17:30)

Time	Id	Presenter		Title
14:10	S18-01	R. Rossa	Belgium	A New Approach for the Application of the Self-Interrogation Neutron Resonance Densitometry (SINRD) to Spent Fuel Verifications
14:30	S18-02	Y. D. Lee	Korea, Rep. of	Status of LSDS Development for Isotopic Fissile Assay in Used Fuel
14:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S18-03	A. Borella	Belgium	Advances in the Development of a Spent Fuel Measurement Device in Belgian Nuclear Power Plants
	S18-04	P. Jansson	Sweden	Gamma Transport Calculations for Gamma Emission Tomography on Nuclear Fuel within the UGET Project
	S18-05	V. Ivanovs	Latvia	Performance Evaluation of New Generation CdZnTe Detectors for Safeguards Applications
	S18-06	G. Havrilla	USA	Initial hiRX Performance Characterization of Pu in Nuclear Spent Fuel Matrix
	S18-07	S. Jacobsson Svärd	Sweden	Gamma-Ray Emission Tomography: Modeling and Evaluation of Partial-Defect Testing Capabilities
	S18-08	A. LaFleur	USA	Experimental Assessment of a New Passive Neutron Multiplication Counter for Partial Defect Verification of LWR Fuel Assemblies
	S18-09	Y. G. Lee	IAEA	Development of "Fission Chamber Free" Fork Detector (FDET) for Safeguards Measures on LWR Spent Fuel Assemblies
15:30	Coffee and Technical Demonstration: Underwater Spectroscopy Measurement Using a New Hermetically Sealed Germanium Probe			
16:00	S18-10	Y. Kuno	Japan	Application of Passive Gamma-ray Spectroscopy for Special Nuclear Material Accountancy in Molten Core Material of Fukushima Dai-ichi Nuclear Power Plant
16:20	S18-11	S. Vaccaro	EU	Uncertainty Quantification of Fork Detector Measurements from Spent Fuel Loading Campaigns
16:40	S18-12	T. Honkamaa	Finland	A Prototype for Passive Gamma Emission Tomography
17:00	S18-13	K.-P. Ziock	USA	U and Pu Gamma-Ray Measurements of Spent Fuel Using a Gamma-Ray Mirror Band-Pass Filter

Wed

**S19: Advanced Technologies for Safeguards Communications**

Chair: F. Moser (IAEA)

TechSec: S. Miller (IAEA)

Room M2

(14:00 – 17:30)

Time	Id	Presenter		Title
14:10	S19-01	J. Garcia	Spain	Mobile Workforce, Mobile Technology, Mobile Threats
14:30	S19-02	M. S. Partee	IAEA	Secure Communications with Mobile Devices During In-Field Activities
14:50	S19-03	M. Gulay	OPCW	The Secure Information Exchange (SIX) Project at the OPCW
15:10	S19-04	J. Sample	Canada	Establishing and Advancing Electronic Nuclear Material Accounting Capabilities: A Canadian Perspective
15:30	Coffee and Technical Demonstration: Underwater Spectroscopy Measurement Using a New Hermetically Sealed Germanium Probe			
16:00	S19-05	A.-M. Eriksson Eklund	Sweden	The STAR System-A Computer Software for Accountancy and Control
16:20	S19-06	S. Negri Ferreira	Brazil	e-Gamma: Nuclear Material Accountancy and Control System in Brazil
16:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S19-07	M. Thomas	USA	Testing The Enhanced Data Authentication System (EDAS)
	S19-08	M. John	IAEA	Next Generation Surveillance System (NGSS): Field Implementation & Associated Developments
	S19-09	F. Nekoogar	USA	An Integrated Passive (Battery-Free) Seals-and-Tag for International Safeguards
	S19-10	L. Persson	EU	Use of Electronic Seals and Remote Data Transmission to Increase the Efficiency of Safeguards Applied in a Static Plutonium Store
	S19-11	S. Lee	Korea, Rep. of	Cyber Security Evaluation of the Wireless Communication for the Mobile Safeguard Systems in Nuclear Power Plants
	S19-12	E. Smith	USA	Front-End Electronics for Verification Measurements: Performance Evaluation and Viability of Advanced Tamper Indicating Measures
	S19-13	H. Smartt	USA	Current Research on Containment Technologies for Verification Activities: Advanced Tools for Maintaining Continuity of Knowledge

**S20: Frameworks for Monitoring the Quality of the Operator’s Measurement and Accounting Systems**

Chair: S. Iso (Japan), S. Ciccarello (EU)

TechSec: C. Norman (IAEA)

Room M3

(14:00 – 17:30)

Wed

Time	Id	Presenter		Title
14:10	S20-01	C. Norman	IAEA	Role and Successes of Trilateral Liaison Frameworks (IAEA-SSACs/RSACs- Nuclear Fuel Cycle Facility Operators) in Monitoring the Quality of the Operator’s Measurement and Accounting Systems
14:30	S20-02	R. Bencardino	EU	Ensuring Solid, Transparent and Scientifically Sound Material Balance Evaluation (MBE) Practice in the EC through Collaboration between Regulators, Operators and the Scientific Safeguards Community
14:50	S20-03	N. Sato	Japan	Technical Review of Operator’s Destructive Analyses at the Rokkasho Reprocessing Plant: Strengthening the Transparency of the Operator’s Measurement System
15:10	S20-04	J.-G. Decaillon	IAEA	Continuous Analytical Performances Monitoring at the On-Site Laboratory through Proficiency, Inter-Laboratory Testing and Inter-Comparison Analytical Methods
15:30	Coffee and Technical Demonstration: Underwater Spectroscopy Measurement Using a New Hermetically Sealed Germanium Probe			
16:00	S20-05	Panel Discussion		Frameworks for Monitoring the Quality of the Operator’s Measurement and Accounting Systems
		P. Buscaglia	IAEA	
		G. Af Ekenstam	IAEA	
		M. Keselica	IAEA	
		R. Binner	IAEA	
		S. Iso	Japan	
		R. Bencardino	EU	
		S. Fernandez Moreno	ABACC	



**S21: IAEA-State Cooperation I**

Chair: V. Z. de Villiers (IAEA)

TechSec: A. Monteith (IAEA)

Boardroom A

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S21-01	S. Abousahl	EU	The Nuclear Safeguards and Security Activities under Euratom Research and Training Programme
09:30	S21-02	H. Kumekawa	Japan	Cooperation in the Implementation of Safeguards at Fukushima Dai-ichi Site
09:50	S21-03	A. Muti	VERTIC	Engagement and Cooperation on IAEA Safeguards Additional Protocol: VERTIC Initiative and Methods
10:10	S21-04	K. Murakami	Japan	The Standing Advisory Group on Safeguards Implementation
10:30	Coffee and Technical Demonstration: Examples of Commercial Off-The-Shelf (COTS) Solutions Considered for SG Implementation			
11:00	S21-05	Panel Discussion		IAEA-State Cooperation
		M. Rasweswe	South Africa	
		M. S. Islam	Bangladesh	
		S. H. Kim	Korea, Rep.	
		C. Everton	Australia	
		M. Marzo	Brazil	

**S22: Equipment Security and Considerations for Joint Use**

Chair: H. Smartt (USA), P. Gutmann (New Zealand)

TechSec: C. Liguori (IAEA)

Boardroom B

(09:00 – 12:30)

Time	Id	Presenter		Title
09:10	S22-01	I. Naumann	IAEA	Security and Risk Analysis of Nuclear Safeguards Instruments Using Attack Trees
09:30	S22-02	G. Baldwin	USA	Authentication Approaches for Standoff Video Surveillance
09:50	S22-03	M. Coram	USA	Key Management Strategies for Safeguards Authentication and Encryption
10:10	S22-04	S. Rocchi	Italy	Use of Specialized Security Techniques to Enhance the Authenticity of Surveillance Data
10:30	Coffee and Technical Demonstration: Examples of Commercial Off-The-Shelf (COTS) Solutions Considered for SG Implementation			
11:00	S22-05	A. Schwier	Germany	The IAEA's Universal Instrument Token
11:20	S22-06	J. Stronkhorst	EU	The Security Plan for the Joint Euratom/IAEA Remote Monitoring Network
11:40	S22-07	T. Nagatani	Japan	IAEA's Contribution to Development of J-MOX Safeguards System

**S23: Technical Aspects of Information Collection and Analysis**

Chair: J. Oddou (France)

TechSec: W. Hammond (IAEA)

Room M1

(09:00 – 12:30)

Time	Id	Presenter		Title
09:10	S23-01	B. Wilson	IAEA	Advances in the Collection and Analysis of Large Volumes of Information on the Nuclear Fuel Cycle from Disparate Sources as a Verification Tool
09:30	S23-02	G. G. M. Cojazzi	EU	Tools for Trade Analysis and Open Source Information Monitoring for Non-proliferation
09:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S23-03	R. Schuler	IAEA	Technical Publications as Indicators for Nuclear Fuel Cycle Declarable Activities
	S23-04	F. Pabian	EU	Open Source Analysis in Support to Non-Proliferation and Verification Activities: Using the New Media to Derive Unknown New Information
	S23-05	T. Skoeld	IAEA	The Efficacy of Social Media as a Research Tool and Information Source for Safeguards Verification
	S23-06	M. Pericou-Cayère	France	Efficiency and Effectiveness in the Collection and Analysis of S&T Open Source Information
	S23-07	R. Chatelus	EU	Non-Proliferation Community, Do We Really Speak the Same Language?
	S23-08	H. Stefko	Austria	Information Management: Business Vulnerabilities:
	S23-09	S. Kittley	IAEA	Incident and Trafficking Database: New Systems for Reporting and Accessing State Information
10:30	Coffee and Technical Demonstration: Examples of Commercial Off-The-Shelf (COTS) Solutions Considered for SG Implementation			
11:00	S23-10	E. Marinova	IAEA	Analysis of Nuclear Relevant Information on International Procurement and Industrial Activities for Safeguards Purposes
11:20	S23-11	J. Khaled	IAEA	Collection, Analysis, and Dissemination of Open Source News and Analysis for Safeguards Implementation and Evaluation
11:40	S23-12	C. Versino	EU	Pattern Recognition by Humans and Machines
12:00	S23-13	J. Midwinter	UK	Enhancing Safeguards through Information Analysis: Business Analytics Tools

**S24: Noble Gas Measurements in Support of Nuclear Safeguards Implementation**

Chair: A. Ringbom (Sweden), J. S. E. Wieslander (CTBTO)

Room M2

TechSec: P. Saey (IAEA)

(09:00 – 12:30)

Time	Id	Presenter		Title
09:10	S24-01	A. Ringbom	Sweden	Environmental Low-Level Noble Gas Measurements for Nuclear Non-Proliferation Treaty Verification Purposes
09:30	S24-02	C. Schlosser	Germany	Krypton-85 Monitoring at BfS in Germany
09:50	S24-03	A. Ringbom	Sweden	Xenon Gas to Identify DPRK's Nuclear Tests
10:10	S24-04	R. Purtschert	Switzerland	Ar-37 in the Atmospheric and Sub-Soil Gases
10:30	Coffee and Technical Demonstration: Examples of Commercial Off-The-Shelf (COTS) Solutions Considered for SG Implementation			
11:00	S24-05	G. Wotawa	Austria	Source Determination and Localization by Atmospheric Transport Modelling
11:20	S24-06	J. S. E. Wieslander	CTBTO	Noble Gas Sampling and Detection Methods for On-Site Inspections in Support of CTBT
11:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S24-07	S. Hebel	Germany	Automated Sampling and Extraction of Krypton from Small Air Samples for Kr-85 Measurement Using Atom Trap Trace Analysis
	S24-08	M. Kohler	Germany	All-Optical Atom Trap Trace Analysis: Potential Use of 85Kr in Safeguards Activities
	S24-09	G. Wotawa	Austria	Source Location of Noble Gas Plumes
	S24-10	P. Saey	IAEA	Radioactive Emissions from Fission-Based Medical Isotope Production and Their Effect on Global Nuclear Explosion Detection
	S24-11	H. Berglund	Sweden	SAUNA: Equipment for Low Level Measurement of Radioactive Xenon
	S24-12	M. Auer	CTBTO	The International Monitoring System's Noble Gas Network

Thu

**S25: NDA Measurements I: Gamma Spectrometry**

Chair: P. Lemaire (France), T. Honkamaa (Finland)

Room M3

TechSec: S. Jung (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S25-01	R. Venkataraman	USA	Advanced Mathematical Methods for Gamma-Ray Based Nuclear Safeguards Measurements
09:30	S25-02	J. Dreyer	USA	Next Generation Germanium Systems for Safeguards Applications
09:50	S25-03	V. Danilenko	Russian Fed.	Yields of Gamma- and X-Ray Radiation of Alpha-Decays of 235U
10:10	S25-04	Z. Wang	China	The Distortion-Correction of Transmission-Reconstruction of SGS
10:30	Coffee and Technical Demonstration: Examples of Commercial Off-The-Shelf (COTS) Solutions Considered for SG Implementation			
11:00	S25-05	A. Muehleisen	EU	High-Quality Medium-Resolution Gamma-Ray Spectra from Certified Reference Uranium and Plutonium Materials
11:20	S25-06	A.-L. Weber	France	The Need to Support and Maintain Legacy Software: Ensuring Ongoing Support for the Isotopics Codes
11:40	S25-07	H. Zhang	China	The Measurement of Uranium Decay Daughters by NDA
12:00	S25-08	T. Ruther	EU	Recommendations for Determining Uranium Isotopic Composition by MGAU

**S26: Safeguards by Design**

Chair: C. Jorant (France), M. Scholz (USA)

TechSec: A. Hamilton (IAEA)

Boardroom A

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S26-01	S. Poirier	IAEA	IAEA Guidance for Safeguards Implementation in Facility Design and Construction
14:30	S26-02	T. Sampei	Japan	Current Status of J-MOX Safeguards Design and Future Prospects
14:50	S26-03	M. Hämäläinen	Finland	Safeguards by Design: Finnish Experiences and Views
15:10	S26-04	G. Pshakin	Russian Fed.	A Common Approach to Safeguards and Security by Design for Small Modular Reactors
15:30	Coffee and Technical Demonstration: Automated Chemical U/Pu Separation of Inspection Samples			
16:00	S26-05	F.-X. Briffod	France	A Transportable and Subsea SMR: Early Considerations on Safeguarding the Flexblue System
16:20	S26-06	A. Homer	UK	Safeguards by Design as Implemented by Sellafield Limited: Application to a New Nuclear Material Storage Facility
16:40	S26-07	F. Rossi	Italy	Application of the GIF PR&PP Methodology to a Fast Reactor System for a Diversion Scenario
17:00	S26-08	P. Sankaran Nair	India	An Approach to Safeguards by Design (SBD) for Fuel Cycle Facilities

Thu

**S27: NDA Measurements II: Gamma and Neutron**

Chair: A. Dougan (USA)

TechSec: M. Mayorov (IAEA)

Boardroom B

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S27-01	M. Ahmed	Egypt	Development of a Portable Tomographic Gamma Scanning System for Safeguards Application
14:30	S27-02	R. Berndt	EU	Neutron Counting and Gamma Spectrometry with MCA-527
14:50	S27-03	K. Amgarou	France	iPIX: A New Generation Gamma Imager for Rapid and Accurate Localization of Radioactive Hotspots
15:10	S27-04	K. Ianakiev	USA	High Count Rate Thermal Neutron Detectors and Electronics
15:30	Coffee and Technical Demonstration: Automated Chemical U/Pu Separation of Inspection Samples			
16:00	S27-05	M. Götsche	Germany	Neutron Multiplicity Counting for Future Verification Missions: Bias When the Sample Configuration Remains Unknown
16:20	S27-06	J. Zsigrai	EU	Measurement of the Pu Concentration of European MOX Pellets by Neutron Coincidence Counting
16:40	S27-07	E. Branger	Sweden	Towards Unattended Partial-Defect Verification of Irradiated Nuclear Fuel Assemblies Using the DCVD

**S28: Safeguards at Enrichment Facilities**

Chair: M. Marzo (Brazil), K. Murakami (Japan)

TechSec: A. Lebrun (IAEA)

Room M1

(14:00 – 17:30)

Time	Id	Presenter	Title
14:10	S28-01	R. Veldhof	The Netherlands - Overview of Conducted Field Trials at URENCO: An Operator Perspective
14:30	S28-02	K. Miller	USA - A Study of Candidate Non-Destructive Assay Methods for Unattended UF6 Cylinder Verification: Measurement Campaign Results
14:50	Two-minute E-Poster introductions followed by viewing of poster displays		
	S28-03	R. McElroy	USA - UF6 Cylinder Imaging by Fast Neutron Transmission Tomography
	S28-04	E. Smith	USA - An Unattended Verification Station for UF6 Cylinders: Development Status
	S28-05	S. Croft	USA - Uncertainty Quantification for Safeguards Measurements
	S28-06	M. Whitaker	USA - How the International Safeguards Regime can Benefit from Efforts to Enhance the Identification Method Used for UF6 Cylinders
	S28-07	J. Ely	IAEA - On-Line Enrichment Monitor (OLEM): Supporting Safeguards at Enrichment Facilities
	S28-08	L. Bai	China - The Design of Integration Device of Neutron and Gamma Ray for Measuring Uranium
15:30	Coffee and Technical Demonstration: Automated Chemical U/Pu Separation of Inspection Samples		
16:00	S28-09	L. Xuesheng	China - Development of an On-Line Uranium Enrichment Monitor
16:20	S28-10	I. I. Badawy Elsamawy	Egypt - Development of a Simple Non-Destructive Assay Technique for Verification of Nuclear Materials in Cylinders
16:40	S28-11	A. LaFleur	USA - Modified Truncated Multiplicity Analysis to Improve Verification of Uranium Fuel Cycle Materials
17:00	S28-12	N. Anheier	USA - A Laser-Based Method for On-site Analysis of UF6 and Environmental Samples at Enrichment Plants

Thu



**S29: IAEA-State Cooperation II**

Chair: G. Dyck (IAEA), L. Gerard (France)

Room M2

TechSec: S. Hambaryan (IAEA)

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S29-01	Y. Al Agbari	United Arab Emirates	The United Arab Emirates Engagement with the International Atomic Energy Agency on Safeguards and Additional Protocol Implementation
14:30	S29-02	P. Boshielo	South Africa	NECSA'S Need to Establish a Nuclear Forensics Specific NDA Facility for On-Site Categorization of Seized Nuclear Materials
14:50	S29-03	P. Sankaran Nair	India	Nuclear Material Accounting and Reporting Software for India
15:10	S29-04	I. A. El-Osery	Egypt	The Egyptian Nuclear Power Project and IAEA Technical Assistance in Supporting the Project and its Nuclear Safeguards
15:30	Coffee and Technical Demonstration: Automated Chemical U/Pu Separation of Inspection Samples			
16:00	S29-05	Y. Kawakubo	Japan	Studies on Enhancing Nuclear Transparency in the Asia-Pacific Region
16:20	S29-06	R. Zarate	Chile	Enhancing IAEA-Chile Cooperation
16:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S29-07	L. Abdulrasaq	Iraq	Sustainability of Safeguard System for Iraqi Facilities
	S29-08	S. Y. Jo	Korea, Rep. of	A New Step for "State-IAEA Cooperation" Based on the Enhanced Cooperation Program
	S29-09	J. Oruru	Nigeria	Creating Material Balance Area for Location Outside Facilities in Nigeria
	S29-10	A. Pawlak	Poland	The 50 Years of Safeguards and Non-Proliferation in Poland
	S29-11	M. Roumié	Lebanon	Safeguards Status in Lebanon as SQP Country and Reinforcement within a Nuclear Law
	S29-12	S. Khan	Pakistan	Safeguards in Pakistan: State-Agency Cooperation
	S29-13	J. Vaclav	Slovakia	Safeguards in Slovakia

**S30: Enhancing Safeguards Through Information Analysis**

Chair: J. Baute (IAEA), W. A. M. Janssens (EU)

TechSec: M. Ferguson (IAEA)

Room M3

**(14:00 – 17:30)**

Time	Id	Presenter		Title
14:10	S30-01	C. Gazze	IAEA	Enabling Collaborative Analysis: State Evaluation Groups, the Electronic State File, and Collaborative Analysis Tools
14:30	S30-02	G. Christopher	UK	Open Source Information in Support of Safeguards
14:50	S30-03	N. Gillard	UK	Open Source and Trade Data for Non-Proliferation: Challenges and Opportunities
15:10	S30-04	J. Idinger	IAEA	Extraction and Analysis of Information Related to Research & Development Declared Under an Additional Protocol
15:30	Coffee and Technical Demonstration: Automated Chemical U/Pu Separation of Inspection Samples			
16:00	S30-05	Panel Discussion		Enhancing Safeguards through Information Analysis: The Role of Information Analysis in the State Evaluation Process
		M. Ardhammar	IAEA	
		J. Baute	IAEA	
		W. A. M. Janssens	EU	
		G. Anzelon	USA	
		P.-M. Schot	IAEA	

Thu

**S31: Promoting the Interface Between Nuclear Safety, Security and Safeguards**

Chair: E. Martikka (Finland), S. Lestari (Indonesia)

Boardroom A

TechSec: J. R. Phillips (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S31-01	C. Jorant	France	Nuclear Security and Nuclear Safeguards; Differences, Commonalities and Synergies
09:30	S31-02	N. Y. Lee	Korea, Rep. of	Two Views on Nuclear Material Accounting and Control (NMAC)
09:50	S31-03	E. Susilowati	Indonesia	Exercising Synergy of Safeguards Safety and Security at Facility Level of the GA Siwabessy Multi-Purpose Reactor, Indonesia
10:10	S31-04	E. Haas	Germany	Proliferation Resistance and Safeguards by Design: The Safeguardability Assessment Tool Provided by the INPRO Collaborative Project "INPRO" (Proliferation Resistance and Safeguardability Assessment)
10:30	Coffee and Technical Demonstration: An Innovative Next-Generation Radioisotope Identification Device (RIID) Developed for the Mission Profiles of Safeguards and Nuclear Security			
11:00	S31-05	J. Whitlock	Canada	Status of the Gen-IV Proliferation Resistance and Physical Protection (PRPP) Evaluation Methodology
11:20	S31-06	S. Chirayath	USA	Containment and Surveillance and Physical Protection Updates for Proliferation Resistance Analysis Using PRAETOR
11:40	S31-07	A. Ivasechko	Belarus	Modern Approaches to the Establishment of National Geoinformation Systems as a Means of Combating Nuclear Terrorism and Illicit Trafficking of Radioactive Materials
12:00	S31-08	W. Nimfuehr	Austria	Information Management: Enhancing Information Discovery and Information Availability

**S32: NDA Measurements III: Neutron Measurements**

Chair: M. Swinhoe (USA), A.-L. Weber (France)

TechSec: T. Pochet (IAEA)

Boardroom B

(09:00 – 12:30)

Time	Id	Presenter	Title
09:10	S32-01	M. Boucher	Switzerland Performance of Boron-10 based Neutron Coincidence Counters
09:30	S32-02	J. Huszti	Hungary Development of a Pulse-Train Recorder for Safeguards
09:50	S32-03	R. McElroy	USA Application of 10B Lined Proportional Counters to Traditional Neutron Counting Applications in International Safeguards
	S32-04		Withdrawn
10:30	Coffee and Technical Demonstration: An Innovative Next-Generation Radioisotope Identification Device (RIID) Developed for the Mission Profiles of Safeguards and Nuclear Security		
11:00	S32-05	M. Newell	USA Development of the Single Chip Shift Register (SCSR) for Neutron Coincidence and Multiplicity Analysis
11:20	S32-06	H. Nakamura	Japan Development of Advanced MOX Holdup Measurement Technology for Improvement of MC&A and Safeguards
11:40	S32-07	M. Swinhoe	USA Fresh PWR Assembly Measurements with a New Fast Neutron Collar
12:00	S32-08	J. Newby	USA Position-Sensitive Organic Scintillation Detectors for Nuclear Material Accountancy

**S33: IAEA-State Cooperation III**

Chair: H. Barroso (IAEA), J. G. M. Gonçalves (EU)

Room M1

TechSec: I. Tsvetkov (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S33-01	P. Schwalbach	EU	Euratom Safeguards: Improving Safeguards by Cooperation in R&D and Implementation
09:30	S33-02	D. Lobach	Belarus	Development of System Regulating and Support for Nuclear Security in Belarus
09:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S33-03	I. Tsvetkov	IAEA	Verification of Spent Fuel Transfers in Germany — Linking Strategy, Implementation and People
	S33-04	J. G. M. Gonçalves	EU	The European Commission Cooperative Support Programme: Activities and Cooperation
	S33-05	A. Jraut	Morocco	Implementation of Safeguards at the Nuclear Studies Centre at La Maâmora
	S33-06	U. Mirsaidov	Tajikistan	Strategic Action Plan and Secure Environment in the Republic of Tajikistan
	S33-07	N. Nakamura	Japan	Japan's Experience on Cooperation with the IAEA
	S33-08	T. Zhantikin	Kazakhstan	Safeguards Implementation in Kazakhstan: Experience and Challenges
	S33-09	T. Korbmacher	Germany	URENCO: A Multinational Contribution to Non-Proliferation
	10:30	Coffee and Technical Demonstration: An Innovative Next-Generation Radioisotope Identification Device (RIID) Developed for the Mission Profiles of Safeguards and Nuclear Security		
11:00	S33-10	G. Daniel	France	French Additional Protocol: 10 Years of Implementation
11:20	S33-11	O. Fazly	Ukraine	Integrated Safeguards in Ukraine
11:40	S33-12	M. S. Islam	Bangladesh	Safeguards Practices and Future Challenges for Peaceful Use of Nuclear Energy in Bangladesh
12:00	S33-13	I. Popovici	Romania	Implementation of Safeguards for Romania National LOFs

**S34: Technology Foresight and Emerging Technologies II**

Chair: D. Chernikova (Sweden)

Room M2

TechSec: D. Finker (IAEA)

(09:00 – 12:30)

Time	Id	Presenter		Title
09:10	S34-01	D. Finker	IAEA	Evaluation of an Autonomous Navigation and Positioning System for IAEA-SG Inspectors
09:30	S34-02	D. Schmidt	Germany	Location Intelligence Solutions
09:50	S34-03	S. Chen	Canada	Development of Laser-Induced Breakdown Spectroscopy Technologies for Nuclear Safeguards and Forensic Applications
10:10	S34-04	H. Lemaire	France	Impact of the Pixel Pitch of the Timepix Chip Integrated to the GAMPIX Gamma Camera for Spectrometric and Imaging Performances
10:30	Coffee and Technical Demonstration: An Innovative Next-Generation Radioisotope Identification Device (RIID) Developed for the Mission Profiles of Safeguards and Nuclear Security			
11:00	S34-05	D. F. Mahon	UK	Cosmic-Ray Muon Tomography: Non-Destructive Assay of Illicit Nuclear Material within Shielded Containers
11:20	S34-06	M. Seya	Japan	IAEA-ISCN Development Programmes of Advanced Technologies of Nuclear Material
11:50	Two-minute E-Poster introductions followed by viewing of poster displays			
	S34-07	E. Berruyer	France	MultiSpectrometer: Wide Span and Quick Gamma Detection System
	S34-08	M. Fallot	France	SoLid: Innovative Antineutrino Detector for Nuclear Reactor Monitoring
	S34-09	T. Koeble	Germany	Mobile Techniques for Rapid Detection of Concealed Nuclear Material
	S34-10	A. Letourneau	France	Nuclear Reactor Monitoring with the Nucifer Neutrino Detector
	S34-11	J. Whichello	IAEA	Quest for Very Compact Antineutrino Detectors for Safeguarding Nuclear Reactors
	S34-12	E. Kovacs-Szeles	Hungary	Using LIBS Method in Safeguards
	S34-13			Withdrawn

**S35: Knowledge Management for Safeguards Organizations**

Chair: M. Rasweswe (South Africa)

Room M3

TechSec: S. Konecni (IAEA)

**(09:00 – 12:30)**

Time	Id	Presenter		Title
09:10	S35-01	M. Sbaffoni	IAEA	Nuclear Knowledge Management: the IAEA Approach
09:30	S35-02	I. Ogawa	Brazil	Knowledge Management Portal: A Simplified Model to Help Decision Makers
09:50	S35-03	J. Hudson	USA	A Model for Effective Governance of Knowledge Management: A Case Study at the U.S. Nuclear Regulatory Commission
10:10	S35-04	S. Konecni	IAEA	Knowledge Management in the IAEA Department of Safeguards
10:30	Coffee and Technical Demonstration: An Innovative Next-Generation Radioisotope Identification Device (RIID) Developed for the Mission Profiles of Safeguards and Nuclear Security			
11:00	S35-05	Panel Discussion		Knowledge Management for Safeguards Organizations
		M. Rasweswe	South Africa	
		A. Afghan	Pakistan	
		S. Konecni	IAEA	
		J. Martinez	IAEA	
		S. Iso	Japan	

**CP: Closing Plenary**

Chair: T. Varjoranta (IAEA)

Boardroom A

TechSec: A. Hamilton (IAEA)

**(14:00 – 16:00)**

Time	Id	Presenter		Title
14:00	CP-01	M. Whitaker	INMM	Closing Remarks and Awards
		K. Van der Meer	ESARDA	
14:20	CP-02	K. Owen-Whitred	Canada	Symposium Highlights
15:10	CP-03	T. Varjoranta	IAEA	Closing Statement

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