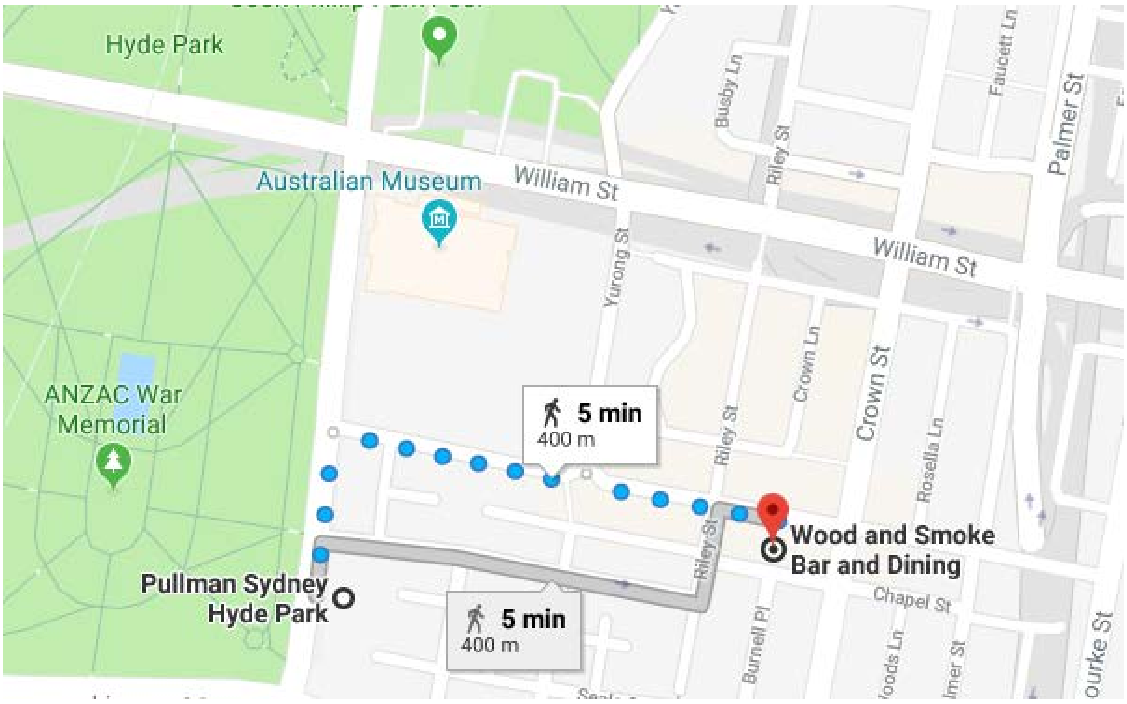
Workshop Program – Monday, 3rd December

3.00 pm	**Delegate Early Registration - Pullman Sydney Hyde Park**
4.45 pm	Delegates meet in the Lobby of the Pullman Sydney Hyde Park for the short walk to the WOSMIP VII Welcome Event Venue: Wood and Smoke Bar and Dining, 77 Stanley Street, Darlinghurst. 
5.00 pm	**WOSMIP VII Welcome Event sponsored by Provisional Technical Secretariat for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)**
CTBTO PREPARATORY COMMISSION	
7.00 pm	**Welcome Event Concludes** Evening at Leisure

Workshop Program – Tuesday, 4th December

8.00 am	**Delegate Registration – Level 1, Pullman Sydney Hyde Park**
	All Conference Sessions will be held in the Ibis Room on the 1st Floor
	Session 1: Welcome and Workshop Overviews *Chair: Judah Friese, Pacific Northwest National Laboratory*
9.00 am	**Welcome to WOSMIP VII** *Adrian Paterson, CEO, Australian Nuclear Science and Technology Organisation*
9.10 am	**WOSMIP VII Kick-off** *Emmy Hoffmann, Australian Nuclear Science and Technology Organisation*
9.20 am	**The History of WOSMIP** *Paul Saey, International Atomic Energy Agency*
9.35 am	**WOSMIP VII Overview** *Ted Bowyer, Pacific Northwest National Laboratory*
9.50 am	**Morning Tea in the Ibis Foyer - Sponsored by INVAP, S.E. and Group Photo**
	INVAP
10.35 am	**Updated Worldwide Background of CTBT Relevant Xenon Isotopes Based on IMS Data and Mobile Systems** *Tammy Taylor, Director, International Data Centre, Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization*
10.55 am	**Status of the Noble Gas capability at the CTBTO International Monitoring System** *Nikolaus Hermanspahn, Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization*
11.15 am	**How Can CTBTO NG Stations Be Impacted y Radioxenon Releases from an Isotope Production Facility** *Jonathan Baré, Preparatory Commission for the Comprehensive Nuclear-Test-Ban-Treaty Organization*
11.35 am	**An Overview of Global Atmospheric Radioxenon Background Simulation Studies** *Sylvia Generoso, Commissariat à l'Énergie Atomique et aux Énergies Alternatives*

11.55 am	**Investigation of the Radioxenon Background Trend at Noble Gas IMS Systems** *Christophe Gueibe, Belgian Nuclear Research Centre*
12.15 pm	**ATM Analysis Results on Radioxenons Detected in Japan by JAEA/NDC** *Yuichi Kijima, Japan Atomic Energy Agency*
12.35 pm	**Working Lunch and Introductions in Windows On The Park**
	Session 2: Background Sources *Chair: Martin Kalinowski, Preparatory Commission for the Comprehensive Nuclear-Test-Ban-Treaty Organization*
2.00 pm	**Observations of Radioxenon Emissions from BWRs Compared to Stack Data** *Anders Ringbom, Totalförsvarets Forskningsinstitut*
2.20 pm	**Research Reactor Contributions to Radioxenon Atmospheric Inventories** *Steven Biegalski, Georgia Institute of Technology*
2.40 pm	**Physical Characterization of filters from German and Sweden radiological monitoring networks with Ruthenium-106 from 2017** *Ian Hoffman, Health Canada*
3.00 pm	**European Monitoring of ^{106}Ru Airborne Concentrations in Fall 2017** *Olivier Masson, Institut de Radioprotection et de Sûreté Nucléaire*
3.20 pm	**Afternoon Tea in the Ibis Foyer - Sponsored by INVAP, S.E.**
	INVAP
3.50 pm	**Isotopic Ratios for Ru-103/Ru-106** *Jonathan Burnett, Pacific Northwest National Laboratory*
4:10 pm	**Using Machine Learning to Estimate Atmospheric Sources from the 2017 Ruthenium Detections across Europe** *Lee Glascoe, Lawrence Livermore National Laboratory*
4.30 pm	**Contribution of NPP Emissions to the Xe-133 Measurements at the Remote IMS Stations** *Jolanta Kusmierczyk-Michulec, Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization*

4.50 pm	**Roundtable Discussion – See Instructions on Page 15**
5.50 pm	**Poster Session with End of Day Drinks sponsored by Mirion Technologies (Canberra)**
MIRION TECHNOLOGIES CANBERRA	
7.30 pm	**Close of Day 1**

Workshop Program – Wednesday, 5th December

8.30 am	**Delegate Registration – Tea and Coffee on Arrival – Ibis Foyer**
	Session 3: Research to Reduce the Radioxenon Impact on the International Monitoring System *Chair: Johan Camps, Belgian Nuclear Research Centre*
9.00 am	**Welcome to Day 2** *Johan Camps, Belgian Nuclear Research Centre*
9.05 am	**Overview of the CRP** *Tom Hanlon, International Atomic Energy Agency*
9.25 am	**Sharing Experience on Mitigating Radioxenon Through Preparation of Design Studies for Three Civilian Nuclear Facilities** *Christophe Gueibe, Belgian Nuclear Research Centre*
9.45 am	**Development of Radioxenon Abatement System for the Fission Mo-99 Production Process** *Suseung Lee, Korea Atomic Energy Research Institute*
10.05 am	**Testing and Validation of a Radioxenon Trap System under the EU Council Decision VI Project: Results and Outcomes** *Dominique Moyaux, Institut National des Radioéléments*
10.25 am	**Verification and Validation of Atmospheric Transport Models for Nuclear Security with the UF Training Reactor** *Andreas Enqvist, University of Florida*
10.45 am	**Morning Tea in the Ibis Foyer sponsored by Scienta Sensor Systems**
scienta sensor systems	
	Session 4: Current Mo-99 Production Overview: Recent and Planned Activities at Isotope Production Facilities *Chair: Paul Saey, International Atomic Energy Agency*
11.15 am	**Radioisotopes Used in Nuclear Pharmacy and Nuclear Medicine Practice: Perspectives from the United States** *Neil Petry, Duke University*

11.35 am	**Mo-99 Production Overview** *Tom Hanlon, International Atomic Energy Agency*
11.50 am	**CNEA Update** *Eduardo Carranza, Comisión Nacional de Energía Atómica*
12.05 pm	**Radioisotope Production Updates in Jordan Research and Training Reactor** *Ahmad Malkawi, Jordan Atomic Energy Commission*
12.20 pm	**Status and Challenges of the IRE LEU Conversion Program** *Dominique Moyaux, Institut National des Radioéléments*
12.35 pm	**Update at Curium** *Luis Barbosa, Curium Pharma*
12.50 pm	**Working Lunch in Windows On The Park**
2.20 pm	**Update on Isotope Production Plans in Algeria** *Oualid Mahdaoui, Permanent Mission of Algeria to the United Nations and Other International Organisations in Vienna*
2.35 pm	**Xe-133 for Medicine and Industry** *Ira Goldman, Lantheus Medical Imaging*
2.55 pm	**Development of Fission Mo-99 Process and Facility for the New Research Reactor of Korea** *Suseung Lee, Korea Atomic Energy Research Institute*
3.10 pm	**Plans by NWMI** *Carolyn Haass, Northwest Medical Isotopes*
3.25 pm	**Afternoon Tea in the Ibis Foyer sponsored by Scienta Sensor Systems**
scienta sensor systems	
3.55 pm	**Roundtable Discussion – See Instructions on Page 15**
4.55 pm	**Update at Ensterna** *Yudiutomo Imardjoko, Ensterna*
5.10 pm	**Radioisotope Mo-99 Production from LEU In INUKI** *Bambang Herutomo, Indonesia Nuclear Technology and Services*

5.25 pm	**Argonne National Laboratory Support for Fission Mo-99 Production** *Alex Brown, Argonne National Laboratory*
5.45 pm	**Close of Day 2**
6.45 pm	Delegates to Meet in the Lobby of the Pullman Sydney Hyde Park for short walk to the Australian Museum, corner of College Street and William Street, Sydney.
7.00 pm	**Workshop Dinner – Australian Museum (Pre-registration Required), Corner of College Street and William Street, Sydney** **Sponsored by ANSTO, ARPANSA, ASNO, GeoScience Australia, and the Pacific Northwest National Laboratory**
Australian Government ANSTO Science. Ingenuity. Sustainability.	Australian Government Australian Radiation Protection and Nuclear Safety Agency arpansa
Australian Government Australian Safeguards and Non-Proliferation Office	
Australian Government Geoscience Australia	Pacific Northwest NATIONAL LABORATORY

Workshop Program – Thursday, 6th December

8.30 am	**Delegate Registration – Tea and Coffee on Arrival in the Ibis Foyer**
	Session 5: Stack Measurements *Chair: Ian Hoffman, Health Canada*
9.00 am	**Welcome and The STAX Project Overview** *Lori Metz, Pacific Northwest National Laboratory*
9.20 am	**Use of and Procedures for Sharing Stack Release Data Received by the Preparatory Commission for the Comprehensive Nuclear-Test-Ban-Treaty Organization** *Martin Kalinowski, Preparatory Commission for the Comprehensive Nuclear-Test-Ban-Treaty Organization*
9.40 am	**Xenon Release Source Term Estimation Based on Near-range Monitoring and Atmospheric Dispersion Modelling** *Johan Camps, Belgian Nuclear Research Centre*
10.00 am	**Radio-isotope Emissions from Canada's Chalk River Medical Isotope Production Facility** *Guy Jonkmans, Defence R&D Canada*
10.20 am	**How the UK National Data Centre utilises Stack monitoring data in support of the Comprehensive Nuclear Test-Ban Treaty** *Richard Britton, Atomic Weapons Establishment*
10.40 am	**Morning Tea in the Ibis Foyer Sponsored by ISTI**
	isti
11.10 am	**The STAX Project – Data Processing infrastructure** *Matthias Auer, Instrumental Software Technologies*
11.30 am	**CTBTO Platform for Handling Stack Release Data** *Abdelhakim Gheddou, Preparatory Commission for the Comprehensive Nuclear-Test-Ban-Treaty Organization*
11.50 am	**Investigating Noble Gas Emissions from Nuclear Facilities in Central Europe** *Andreas Bollhöfer, Bundesamt für Strahlenschutz*

12.10 pm	**Radioxenon and Radioargon Emission Signatures from Chalk River Laboratories** *Steven Biegalski, Georgia Institute of Technology*
12.30 pm	**Working Lunch in Windows On The Park – Discussion on the Use of Stack Data**
2.00 pm	**ANSTO Experience with the Stack Monitoring System** *Tom Loosz, Australian Nuclear Science and Technology Organisation*
2.20 pm	**Installation of STAX Monitoring System at IRE – Performances Evaluation** *Benöit Deconninck, Institut National des Radioéléments*
2.40 pm	**An Autonomous Spectroscopic Noble Gas Monitor with Continuous Operation and Analysis** *James Zickefoose, Mirion Technologies (Canberra)*
3.00 pm	**Tailored Designed Stack Monitor for the STAX Project** *Mariana Di Tada, INVAP S.E.*
3.20 pm	**Afternoon Tea in the Ibis Foyer sponsored by ISTI**
3.50 pm	**Simulating Xe-133 Concentrations at IMS Noble-Gas-Stations Using Stack Emission Data from Medical Isotope Production Facilities** *Andy Delcloo, Royal Meteorological Institute Of Belgium*
4.10 pm	**IPF Gaseous Effluent Stack Monitor Calibration With Customized Detection Geometries and Tailored Gas-like Sources** *Mariana Di Tada, INVAP S.E.*
4.30 pm	**Design of the 3rd ATM-Challenge 2019** *Christian Maurer, Zentralanstalt für Meteorologie und Geodynamik, Austria*
4.50 pm	**Roundtable Discussion – See Instructions on Page 15**
5.50 pm	**Announcement of the Wozzie Award**
6.10 pm	**Close of Day 3**

Workshop Program – Friday, 7th December

8.00 am	**Delegate Registration – Tea and Coffee on Arrival in the Ibis Foyer**
	Session 6: ANSTO *Chair: Emmy Hoffmann, Australian Nuclear Science and Technology Organisation*
8.30 am	**Welcome to Day 4**
8.35 am	**ANSTO ANM Facility** *Michael Druce, Australian Nuclear Science and Technology Organisation*
9.05 am	**ANM Mo-99 Active Ventilation System** *Stuart Brink, Australian Nuclear Science and Technology Organisation*
9.25 am	**Workshop Wrap Up**
10.00 am	**Morning Tea in the Ibis Foyer**
10.20 am	**Board coach and depart the Sydney Pullman Hyde Park by 10.30 am** *Please be sure to bring your passport & wear closed shoes.*
11.30 am	**Arrive at ANSTO**. Security check & bio-break
11.40 am	**ANSTO Overview Presentation**
11.50 am	**ANSTO Tour – Part 1** Split into groups for the tour of the ANSTO Nuclear Medicine facility: - Production & QC Labs - Production hot cells - STAX monitoring system
1.00 pm	**Working Lunch and Quiz**
2.00 pm	**ANSTO Tour – Part 2** - OPAL multi-purpose reactor - Australian Centre for Neutron Scattering
2.30 pm	**ANSTO Tour – Part 3 (Optional)** *Delegates not attending Part 3 will depart on a bus for return to Pullman Sydney Hyde Park at 2.30 pm. Delegates wishing to attend the extended tour will depart (additional $28 AUD cost for this tour to be paid on arrival at Symbio. Credit cards accepted at the Ticket office. Sunscreen and hat recommended).*
5.00 pm	**Delegates depart for return to Pullman Sydney Hyde Park**
6.30 pm	**Arrive at Pullman Sydney Hyde Park**

Conference Posters

1	Jonathan Baré	Impact of CRL shutdown on CTBTO North-American noble gas stations
2	Steven Bell	Radioactive Gas Metrology at NPL
3	Pierre Bourgouin	Evaluating different alternative sites for IMS stations
4	Jagoda Crawford	Radon-222 detection in outdoor air and applications in atmospheric transport and mixing studies
5	Christophe Gueibe	Physical experiments and modelling work on xenon capture
6	Bambang Herutomo	INUKI experience with stack monitoring
7	Ian Hoffman	Medical Isotope Production and Research Reactors and the Global Radioxenon Background
8	Miroslav Hyza	Radiological Monitoring of the Atmosphere Using an Autonomous Aerosol Sampler
9	Martin Kalinowski	What do we need to know to access how radioxenon emissions from nuclear power plants interfere with nuclear explosion monitoring?
10	Stanislav Kocvara	NGM-2000 Spectrometric Noble Gas Monitor with HPGe Detector
11	Jolanta Kusmierczyk-Michulec	Influence of emission time resolution on the Atmospheric Transport Modelling (ATM) results
12	Olivier Masson	European-scale detection of I-131 in early 2017
13	Lori Metz	Emissions Mitigation R&D for the US Government
14	Blake Orr	Summary of East Asia Regional National Data Centre Workshop 2018
15	Yves Pelletier	The Judge: A Statistical Validation Tool for Atmospheric Transport Modelling
16	Gary Perkins	Automated Gas Extraction System for the handling of radioactive waste gases from routine carbon-11 production
17	Eduardo Quintana	Chimney Emission Monitoring of RA-3 Research Reactor at EZEIZA Atomic Center
18	Kristin Shannon (Presented by Lori Metz)	Progress Toward an LEU Fuel Cycle for Domestic Radioisotope Production from Fission Fragments
19	Pouneh Tayyebi (Presented by Martin Kalinowski)	Can radioxenon emissions from nuclear research reactors interfere with nuclear explosion monitoring?
20	Momtaz Waheed	Current Status of Medical Radioisotope Production in Bangladesh
21	Matt Watrous	Radioactive Test Materials
22	Kassoum Yamba	On the usability of event zero time determinations using radioxenon isotopic activity ratios given the real atmospheric background observations

Instructions for Roundtable Discussions

Session 2 Round Table: Background

The International Monitoring System (IMS) continually monitors the world for radionuclides in the environment. This network involves both particulate and noble gas measurements. The IMS is a unique international capability and understanding detections in the network is an important aspect in a robust treaty verification regime.

As the detections in the IMS becomes more numerous, our understanding of these detections must also continue to grow. Questions to discuss at this round table involve where we think the state of the science for understanding environmental detections currently is and our future challenges.

Starting questions:

- What are the uses of Ru-106 in such large quantities as observed?
- Do we have a good enough understanding of radioactivity in the environment?
- Will nuclear reactor emissions be important to understand in the future?
- Looking to the future, what are future man-made sources that we may observe in the IMS?

Session 3 Round table: Xenon Abatement Research

The abatement of radioxenon releases is a well-known challenge, and this challenge has been successfully met for lowering emissions to the point where health and safety is not a concern. However, with the deployment of the International Monitoring System (IMS), even this safe level of radioxenon releases are causing routine detections. The current industrial methods for xenon abatement can be expensive to implement and not practical at some facilities. Questions to consider during this roundtable include: How can future research that lower the cost and difficulty of adding additional abatement impact the IMS? How can partnerships between communities help in understanding and solving this difficult issue? As new facilities for production that could release radioxenon are proposed and built, how can radioxenon abatement well below health and safety be implemented successfully?

Starting Questions:

- What is the need for new/better xenon absorption materials?
- What are the industrial limitations of low xenon emissions?
- How can the WOSMIP community be an advocate for continued work in xenon abatement?

Session 4 Round Table: Stack Monitoring

All facilities do routine monitoring of their emissions for regulatory purposes. This is robust and typically required by the regulating body in each country. In previous WOSMIP workshops, the use of emission data from the stack of nuclear facilities was proposed as a method to lower the impact on the International Monitoring system (IMS) by understanding civilian radioxenon sources in the environment. By knowing the source of radioactivity entering the environment, these sources can be subtracted from monitoring detections. This proposed method for limiting the impact on the IMS has generated scientific work in understanding how this could be implemented. Questions to consider include what type of data would be useful and how would it routinely be used in understanding detections? This round table discussion will begin with comments from experts involved in stack monitoring and their thoughts on the prospect of this being used for treaty monitoring.

Notes