T2.4-P20

WOSMIP VI: Harvesting results from intensified cooperation between the nuclear explosion monitoring and isotope production communities

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Workshop overview

- An overview on the International Monitoring System (IMS) measurements of the global radioxenon background was given.
- The challenges in understanding Treaty relevant signals against this background were explained and illustrated with the announced nuclear explosive tests of the Democratic Peoples Republic of Korea (DPRK).
- An overview of the issues unique to the medical isotope producer perspective was given.

Potential Xenon Source Terms

- A session on potential xenon source terms explored the broader range of potential sources of xenon isotope emission in addition to Mo-99 production from fission.
- Potential sources of radioxenon that were discussed included:
  - Production of isotopes other than Mo-99 at accelerator and research reactor facilities.
  - Nuclear power plants and research reactors, specifically next-generation nuclear reactors with potential for increased radioxenon releases.
  - Radioxenon that is used in medical and industrial settings.

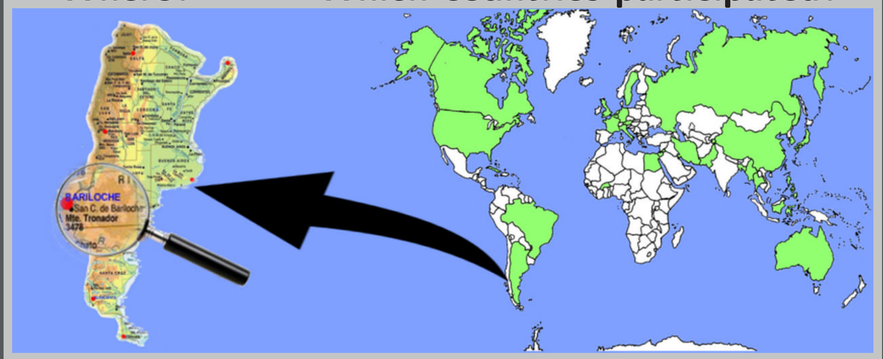
Future Trends of Major Radioxenon Sources

- A session overviewing current and future Mo-99 production featured recent and planned activities at isotope production facilities with updates from eight current or prospective medical isotope producers.
- A session focused on R&D efforts on emission control highlighted recent advances in radioxenon absorption technologies.

About the event

The sixth **Workshop On Signatures of Man-made Isotope Production (WOSMIP)** was held **November 28 through December 2, 2016, in Bariloche, Argentina**. **CTBTO**, **PNNL** and **INVAP** jointly organized the event, where **81 participants representing 27 countries** took part. More than 60 contributions, among oral presentations and posters, were submitted.

Where? Which countries participated?



What did we do?

- 9 sessions
- 3 round table discussions
- 3 working lunches
- 60+ contributions presented

Stack Emission Data

- Information and stack release data shared voluntarily by producers will help the community better characterize backgrounds.
- Source Term Analysis of Xenon (STAX) project was introduced. This project would develop methods, tools, and technology for the sharing of stack emissions release data to be used along with Atmospheric Transport Modelling (ATM) to quantify the effect of radioxenon releases on radioxenon background.
- Topics relating to sharing stack release data like data confidentiality were discussed.

Atmospheric Transport

- The Atmospheric Transport session focused on characterization of the impact of radioxenon emissions on the global background.
- ATM experts shared Challenges related to accurate modelling of radioxenon background concentrations such as:
  - The impact of radioxenon sources.
  - Seasonal variations in xenon background.
  - Uncertainty in source data.

- Results from the 2nd ATM Challenge to ascertain the agreement between modeled radioxenon concentrations and backgrounds measured by the IMS were shared.
- The results of this Challenge showed a strong correlation between the modeled and actual background, although the magnitude of the concentrations was more difficult to accurately calculate.

Concluding Remarks

- A number of positive outcomes from WOSMIP VI were noted which include:
  - Expansion of the workshop to include all relevant emission sources.
  - Sessions in which future trends of large sources and stack release data sharing were discussed.
  - Discussing how the uncertainty in ATM calculations can be quantified and reduced.
  - It was the first WOSMIP to be held outside of Europe.
  - This WOSMIP meeting increased communication and built awareness of issues relating to better understanding of the radioxenon background.
- Next WOSMIP should be held 18 months after WOSMIP VI, i.e. in mid-**2018**.