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Source Term Analysis of Xenon (STAX): 7 Years of Hardware and Software Lessons-Learned

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INTRODUCTION AND MAIN RESULTS

This presentation will overview the STAX project and provide hardware and software lessons learned from over the last 7 years.

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CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

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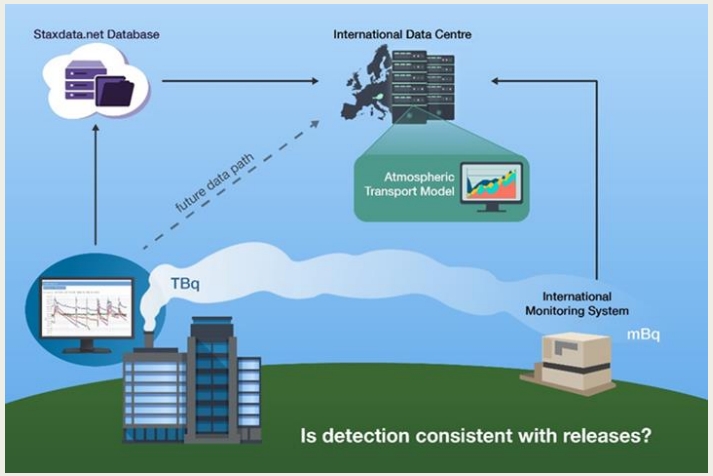
Introduction

The Source Term Analysis of Xenon (STAX) project is an international technical collaboration that has been installing stack monitors in partnering nuclear facilities and sharing stack effluent data with National Data Centers for use in better understanding Xe background sources detected by the International Monitoring System (IMS).

- Consists of voluntary partnerships with nuclear facilities
- Provides and installs commercially available stack monitoring systems in facilities
- Develops data sharing agreements with facilities and NDCs to control access to data
- Develops tools to view, access, and use the data



Methods/Data

The STAX project is now in its 7th year and during the course of the project has had many lessons learned about the setup and maintenance of the equipment, data acquisition, data transfer, and data analysis.

- Equipment installed in 6 facilities as well as data shared from existing equipment in other facilities. Installation at a 7th facility in progress.
- Documented equipment maintenance issues that occurred during the project, beyond routine maintenance, to track unplanned issues and how they were resolved.
- Information used to understand the long-term maintenance needs of the equipment and to better plan for future installations.

Example Results

Issue Type	Details	Lesson Learned
Location	System not in a temperature-controlled room so current draw on electrically powered chiller can run abnormally high	Install air conditioning unit on detector enclosure
	System not located in a clean environment so filter on detector enclosure can clog and cause detector to overheat	Clean filters at least once a week
	Possible electromagnetic interference from electrical panels nearby causing poor energy resolution in spectrum	Provide calibration files to the site operators
Hardware	Installed power disconnect switch for the sample flow pump to allow for easier lockout/tagout	Identify site specific equipment needs if possible, during equipment procurement
	Computers, data aggregator, UPS battery, and MCA components have all needed to be replaced on some of the systems	Have extra computer and/or potential other parts readily available
Software	Microsoft windows and other computer updates can shut down automatic data sending	Need to restart the instrument software to reestablish data flow
	AWS firewall only allows files sent from known IP addresses	Ensure one known IP address per facility

Conclusions

The STAX project plans to continue operating the equipment and learning about optimizing data collection and transfer for use in understanding backgrounds that may interfere with nuclear explosion monitoring. The project is interested in exploring additional voluntary partnerships.

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