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International Acceptance Test Phase 1

Thursday, 1 July 2021 11:45 (15 minutes)

Xenon International is a next generation radioxenon monitoring system that was developed at PNNL and being manufactured at Teledyne Brown Engineering (TBE) to strengthen nuclear test monitoring and has recently completed phase-1 testing for acceptance as a qualified system for the International Monitoring System (IMS). Xenon International processes samples every 6 hours generating over 2.5 cc of xenon gas that is counted in a beta-gamma coincidence detector for 12 hours resulting in unprecedented detection limits for radioxenon isotopes. Phase 1 testing was conducted at TBE and consisted of a PTS acceptance visit, radioxenon spikes processed on Xenon International, and 6 months of uninterrupted automated sampling and analysis. Radioxenon analysis data was automatically sent to the PTS after the finish of each count. Xenon International completed phase 1 testing with >98% uptime, and routinely detected never-before seen radioxenon isotopes in an IMS station including 125Xe, 127Xe, and 129mXe. This talk will discuss Xenon International performance during phase-1 testing and will discuss the impact of unexpected radioxenon isotopes on detection of treaty verification radioxenon radionuclides.

Promotional text

The work cited in this presentation fosters strengthening nuclear test monitoring though development of advanced radionuclide detection systems. Phase 1 testing also strengthens remote monitoring of nuclear explosion, data interpretation, and data availability of complex systems.

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