

Generation Radioxenon Systems - More Reliability, Better Sensitivity, and More Frequent Measurements

Measurement of radioxenon gas concentrations in the air is an important part of verification of underground nuclear explosions, and automated measurements have been ongoing for over ten years in the International Noble Gas Experiment (INGE). Lessons learned from system development and field measurements illustrate opportunities for improvement in the next generation systems in the area of increased sensitivity and reliability. The increased sensitivity is needed to allow better discrimination of radioxenon signals from medical isotope production facilities and nuclear power reactors from nuclear explosions. Increased reliability will help reduce operational and maintenance costs for these system which are often located in remote sites with limited accessibility. These increased capabilities are being implemented into the next generation system called Xenon International. Increased sensitivity will be achieved by increasing the collected xenon volume and also by increasing the sampling frequency. Improvements in gas processing technology and control system software will reduce power and other system consumables, and increase the system uptime and data availability. This paper will discuss the technical and operational requirements of this system along with the expected performance improvements.

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