

# Collaboration Between The Medical Isotope Production and Nuclear Explosion Monitoring Communities

T.W. Bowyer, J.I. Friese, L.A. Metz, I.M. Cameron  
Pacific Northwest National Laboratory, 902 Battelle Blvd, Richland, Washington 99353

## ABSTRACT

Ongoing communications between the isotope production and radionuclide monitoring communities at meetings such as the series of Workshops on Signatures of Medical and Industrial Isotope Production (WOSMIP) have been successfully conveying the challenges that effluents from medical isotope production present for nuclear explosion monitoring. In the fission-based  $^{99}\text{Mo}$  production process, radioactive noble gases including radioxenon isotopes are released into the atmosphere. Unlike reactors, gaseous signatures released during the production of medical isotopes are similar to a nuclear explosion because it involves irradiation of uranium followed by dissolution as soon as possible. Medical isotope production can then inadvertently create a radioxenon background that impedes nuclear explosion monitoring. In particular, this background causes challenges for verifying compliance with the Comprehensive Nuclear-Test-Ban Treaty (CTBT). The isotope production and nuclear explosion monitoring communities have been working together to better understand the isotopic and chemical signatures created through isotope production mechanisms. They are collaborating to determine ways to mitigate the effects of isotope production on the monitoring community while continuing to support efficient, reliable sources of isotopes for medical and industrial applications. Investigations are being conducted to establish potential technical solutions such as increased use of facility stack monitoring data and the examination of existing and future effluent containment systems.