

Detectability of the UNE Wigwam by radionuclide stations of today's IMS

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) bans all nuclear explosions, including those detonated underwater. To improve the understanding of the radionuclide signatures of such an event, and whether it would be detectable under the verification regime of the CTBT, the 1955 Wigwam underwater nuclear explosion has been modelled. Inventory calculations and atmospheric transport modelling have been performed to estimate the activity at the radionuclide stations of the International Monitoring System (IMS). This has utilized reported release values (0.92%) and meteorological data from the event. The research shows that there is a high probability that Wigwam would have been detectable at U.S. IMS stations at Wake Island (RN77) at 8.4 days, Guam (RN80) at 10.7 days and Sand Point, AK (RN71) at 13.7 days. At these locations, the majority of IMS relevant radionuclides were fission products, such that additional radionuclides from the seawater activation had largely decayed before reaching the stations. The presentation will describe the Wigwam event and data, the phenomenology of underwater nuclear explosions, and our plume projections of where Wigwam's radionuclides would have been measured by IMS stations, had they existed at the time.

Primary author: MILBRATH, Brian (Pacific Northwest National Laboratory)

Presenter: MILBRATH, Brian (Pacific Northwest National Laboratory)

Track Classification: Theme 2. Events and Nuclear Test Sites