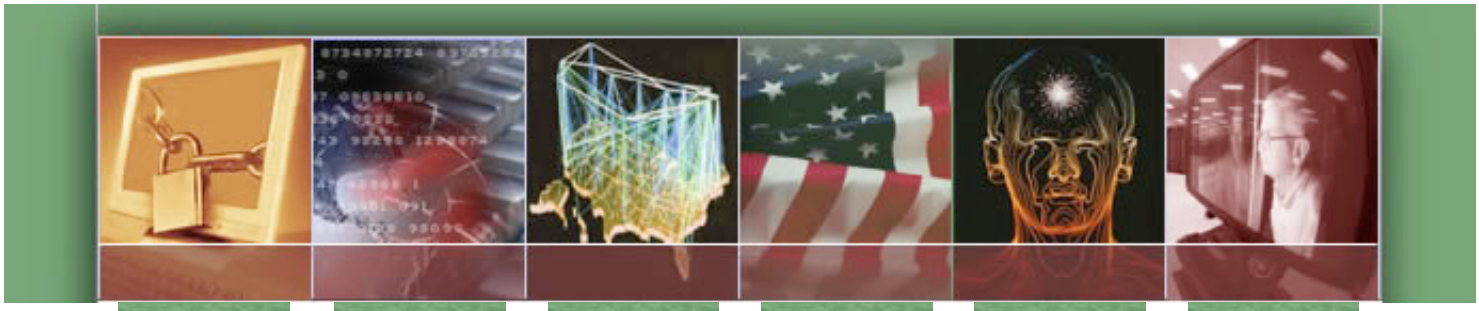


EPA Radiological Source Tracking and Monitoring (RadStraM)

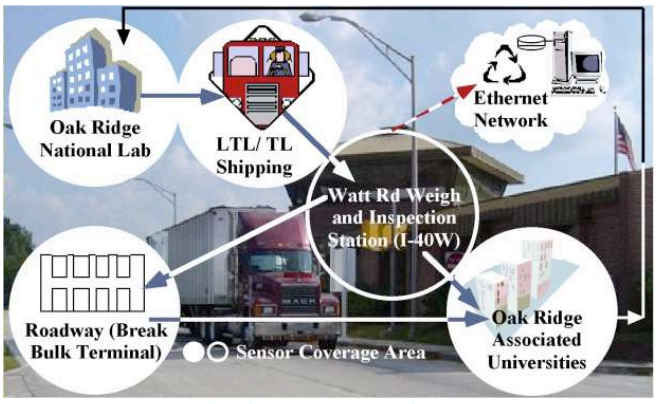
• Overview • Publications

Overview

The Environmental Protection Agency (EPA) Office of Air and Radiation and Department of Energy (DOE) Oak Ridge National Laboratory (ORNL) are investigating technologies that will assist in the improvement of the tracking and monitoring of high-level radiological sources while in commerce. This real-world testing of the EPA and DOE Radiological Source Tracking and Monitoring (RadSTraM) system addresses radiological and nuclear material tracking and monitoring in commerce and is part of a larger program entitled the Integrated Safety and Security Enforcement and Interdiction System (ISSEIS).

Fig. 1: RadStraM Packaging and Monitoring

The Nuclear Regulatory Commission (NRC) reports over 300 missing radioactive sealed sources a year. Missing sealed sources can pose a significant environmental and health risk through direct exposure, co-mingling in the metal recycling stream, use in contaminated consumer products, and use in terrorist activities. An effective tracking and monitoring system will help prevent inadvertent or illegal loss of radioactive sealed sources. There are a number of available technologies that are used for tagging items; however, there is very little information in the literature about technologies being tested in proximity to radioactive materials. Current candidate technologies include, (1) Satellite, (2) Radio Frequency Identification (Passive and Active), (3) Real-Time Location Systems (RTLS), and (4) Integrated Technology Solutions. Therefore, the primary goal of this project was to demonstrate the feasibility of a particular RTLS technology that combines wireless radio asset tracking and sensor monitoring technologies to track in commerce radioactive materials throughout the supply chain (both in transit and in storage).



The RadSTraM system provides for the earliest possible identification of radiological (in commerce) sources and the monitoring of these radiological sources as they proceed through the supply chain. To accomplish this, the following tasks have been completed and/or are being performed: Base-line data collection to establish nominal/off-nominal conditions, Puesdo-random(i.e., controlled) shipment testing, Data analysis, and Lessons learned reporting (e.g., radiation impact from Radio Frequency Identification [RFID] tags).

Preliminary pseudo-random testing results have been very positive. Once we have determined a

Fig. 2: Proof-of-Concept Shipping Routes

successful proof of concept for all phases, RadSTraM will ready for integration into selected commercial transportation supply chains, which include: (1) enforcement, (2) shippers, (3) carriers, and (4) homeland security.

Publications

- Sheldon, FT, Walker, RM, Abercrombie, RK, Cline, RL, Kopsick D, and Pantaleo, J 2005. "Tracking Radioactive Sources in Commerce," *Tracking Radioactive Sources in Commerce, Tucson, AZ USA, WM Symposia, Oak Ridge, TN USA, 02/27/2005-03/03/2005* (PDF).