

NRCREP - Comment: Enhancing Security during Transport of Radioactive Materials in Quantities of Concern

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To: <nrcprep@nrc.gov>
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Please find attached comment on "Enhancing Security during Transport of Radioactive Materials in Quantities of Concern."

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RE: Comment on NRC Development of a Technical Basis for Transportation of Radioactive Materials in Quantities of Concern

Enhancing Security during Transport of Radioactive Materials in Quantities of Concern

The Nuclear Regulatory Commission (NRC) is seeking public comment in order to develop a technical basis for new regulation concerning transport of medical, academic, and industrial radioactive materials in quantities of concern (RMQC) by NRC licensees. The goals of this effort include preventing theft and diversion; prompt detection, assessment, and reporting of incidents; prompt law enforcement response to incidents; and delivery confirmation.

These goals for the new regulation reflect the way in which transport of radioactive materials raises manifold safety and security issues -- from the safety of the personnel handling the shipment, to the integrity of the shipment in transit, to the safety of the public along the shipping route, to the ability of local authorities to respond effectively to incidents, to the confidence of national security authorities that radioactive material will not be diverted for use in a weapon of mass destruction, "dirty bomb," or even as a poison.

The NRC has divided its concerns into 7 categories of requirements for development of the technical basis of its new regulation. System Planning Corporation (SPC) would like to take this opportunity to address two categories of requirements: "planning and coordination" and "communications." Under "planning and coordination," the Commission asked for tracking as well as continuous and active monitoring of RMQC; under "communications" the Commission has a similar requirement for telematics monitoring as well as the requirement for multiple modes of communication not subject to the same interference.

System Planning Corporation of Arlington, VA, is a systems engineering firm with 38 years experience applying formal scientific analysis and system engineering methodology to the technology challenges of federal, state, and local government and commercial customers. SPC engineering produces world class radar physics products; our studies efforts include strategic assessments; and our technical support work for the Defense Advanced Research Projects Agency has spanned more than 30 years.

SPC's GlobalTrak® system for asset tracking and monitoring was developed in response to concern for the safety and security of containerized shipments coming into the U.S. An early version of the GlobalTrak system was awarded two trade lane tracking trips in the Department of Homeland Security's Operation Safe Commerce. In subsequent years, GlobalTrak has evolved to meet the sophisticated supply chains' needs of commercial shippers, third-party logistics providers, and carriers. GlobalTrak has been used to track and monitor shipping containers, truck trailers, rail cars, and barges on intermodal journeys in U.S. and international commerce.

GlobalTrak, combining its tracking and monitoring capabilities with the security seal and radiation detection capabilities of its technology partners, will address the NRC's desire to see effective tracking and monitoring of radioactive materials with redundant communications paths. GlobalTrak offers NRC a practical logistics management approach similar to that being adopted for high value and perishable cargoes such as pharmaceuticals and consumer electronics in order to achieve "end-to-end visibility" of those intermodal shipments.

GlobalTrak provides a highly reliable way of obtaining real-time location and condition data on shipments anywhere in the world. The GlobalTrak asset monitoring unit (AMU) contains GPS for location, a variable suite of sensors for security and condition, and the means to communicate this sensor data over either GSM cell or by ORBCOMM satellite. Multiple elements in a shipment can be tagged with a ZigBee wireless node to create a self-organizing LAN or mesh network that reports to the main unit.

The container/trailer door can be protected by an electronic seal (e-seal) provided by E.J. Brooks of Livingston, NJ, leading manufacturer of seals for international commerce and long-time supplier of seals for Department of Energy applications. Electronic seals also may be placed on individual packages within the shipment. The GlobalTrak AMU can monitor and report on the status of all the e-seals.

For transporting radioactive materials, the GlobalTrak AMU would be equipped with standard security sensors to alert for compromises to the e-seals, or changes in light or acoustic levels, or tampering with the AMU itself. Condition sensors would report excursions from customer-determined temperature, shock, or acceleration ranges. In this configuration, gamma radiation and neutron radiation detectors from RAE Systems of San Jose, CA, a global provider of radiation and chemical detection systems, would be included in the sensor suite. These detectors have programmable alarm thresholds based on variations in background radiation levels, and would provide alerts if thresholds were exceeded by accident or incident.

Regular, periodic location and sensor reports and sensor alerts are transmitted from the AMU to a network communications center called the Information Management Bureau (IMB). The IMB's secure, web-based graphical user interface allows stakeholders to easily access the data on their shipments. Shipping documents (bills of lading, HAZMAT classification, etc.) can be electronically associated with each shipment to create an envelope of shipment-related data

accessible to supply chain partners, as directed by the shipper; in the case of nuclear materials, this would be the NRC licensee. The IMB can direct system alerts to specific stakeholders according to configurable business rules, again, as directed by the shipper. The envelope of IMB shipment data and electronic documents can be conveniently exported into existing information systems. Because GlobalTrak relies on publicly available global communication networks, no additional infrastructure is required.

In conclusion, NRC's requirements for strong tracking and monitoring of RMQC transits and its desire to see robust communications maintained throughout the journey can be met by GlobalTrak and its technology partners.

The great concerns about shipments of radioactive materials are accidents and incidents, and diversion. Accidents and incidents create risk to the public, especially the first-responders, of radiation exposure. Diversion creates risk to the entire country of the misuse of radioactive materials for a weapon of mass destruction or "dirty bomb." With systems from GlobalTrak and its partners E.J. Brooks and RAE Systems on-board communicating at specified intervals and alerting for problems, shippers and authorities will know the location and condition of shipments. In the event of an accident, incident, or the diversion of a shipment, the shipper and the authorities will have an opportunity to respond in real time with concrete data about the status of the shipment.

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