An Open Source Quick Response System for Tracking Personnel and Resources

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A key element of EPA oversight during emergency responses is the tracking of personnel as they check in and out of the Incident Command Centers at the beginning and end of their daily shift. This has typically been done using paper sign-in sheets and requires significant manual effort to key personnel's names and arrival/departure times into a computer so that timekeepers can properly track labor hours and location. This is a critical aspect of Agency response activities, both so that the worker can be properly paid and so that the Agency can be reimbursed by FEMA for recoupable labor hours resulting from response activities, as well as for health and safety purposes (i.e., confirming the status of personnel). Recent hurricane seasons have necessitated the EPA to stand up multiple Incident Command Centers, making this paper-based process extremely complicated and time-consuming to implement.

As part of the Homeland Security Research Program's (HSRP's) ongoing collaborative efforts with the Department of Homeland Security (DHS) and other parts of EPA's Homeland Security Enterprise, a field test, the Underground Transportation Restoration (UTR) Operational Technology Demonstration (OTD), was performed in 2016 to assess techniques to rapidly decontaminate and return a subway back to normal operation following a biological agent (e.g., anthrax) release. Part of the OTD included assessing the total cost of different aspects of the response, so that multiple considerations, including sampling, decontamination, and waste management, could all be related back to time and material costs. To do this, it was necessary to track the movements of test personnel at each step of the process as they donned their personal protective equipment (PPE), entered into the contaminated zone, performed their tasks (e.g., sampling), exited from the contaminated zone, underwent personnel decontamination, and finally doffed their PPE. HSRP developed a system using commercial off-the-shelf components that consisted of webcams and open source software that uses quick response (QR) codes attached to personnel's PPE as a means for recognizing, recording, and sharing timestamped information. HSRP was able to use that information to perform a detailed cost analysis of the entire remediation process. From this prototype, an EPA-supported application was developed to serve as a cost-effective, customizable, and easily deployable solution capable of tracking people and assets in the field during emergency responses.

This presentation will provide a background on the tool, its methodology and capabilities, and highlight recent accomplishments.