ABSTRACT

- Argonne is building and testing a tool, the Radiological Recovery Logistics Tool (RRLT), that can be used during the response and recovery from a radiological or nuclear incident to effectively allocate appropriate commercial and public sector equipment to achieve realistic radiological containment. The experiments for this tool work to develop the result software—by intervening in a training environment—and involve a committee of stakeholders from DHS National Security Technology (NSTL), USEPA National Environmental Protection Agency (USEPA), and the Environmental Protection Agency (EPA).

- RRLT’s Knowledge Base is an open system on the form of containment, type of contaminated surface, affected facilities, and information on equipment types and commercial equipment that may be used to plan an expedited mitigation and remediation strategy.

- RRLT is driven by user input. As a case study, an interest with which a user approaches the system. Use cases are grouped into delivery operations to schedule scheduled testing, and presentations to stakeholders. The system takes an input of a scenario, and the system provides a collection of equipment, mitigation strategies, and delivery schedule to the user.

- Once a user is authenticated, RRLT will present the user with a platform that allows the user to select RRLT’s contents. The standard will also include a “Help” button for guiding users and extend the platform as the user’s needs and experience with the system increase.

- RRLT will offer three general modes of access to items in the knowledge base:
  - Explore using direct discovery of items
  - Navigate along predefined paths from recovery goal towards equipment types, and
  - Interaction guided towards equipment types by an equipment agent for the equipment Acquisition/Containment Model.

- RRLT offers a navigation hierarchy leading towards details and recommendations on dozens of equipment types and facilitates the Operator’s discovery and consumption of equipment types.

- Equipment Types:
- The RRLT knowledge base groups equipment types into four broad categories:
  - Containment of radioactive material, surface, and/or material on facilities and structures;
  - Survey and decontamination of radioactive material,
  - Waste management, and
  - Containment of wastewater and other waste generated during the response and recovery phases.

- The RRLT database of equipment is not exhaustive--or from non-governmental resources--or from non-governmental resources.

- It should be noted that some equipment types do not have equipment options (LR, B/E, PE). Controlling factors are needed for searching, classifying, and reporting on equipment categories. A documented spreadsheet of equipment categories from the U.S. National Nuclear Security Administration (NNSA) is available online.

- Survey of equipment categories (LR)
- Regional, national, or global databases
- Equipment type inventories
- Equipment type models
- Equipment type capabilities
- Equipment type limitations

- Survey of equipment categories (B/E)
- Commercial databases
- Equipment type inventories
- Equipment type models
- Equipment type capabilities
- Equipment type limitations

- Survey of equipment categories (PE)
- Commercial databases
- Equipment type inventories
- Equipment type models
- Equipment type capabilities
- Equipment type limitations

- Mitigation of received dose to first responders: Reduce the radiation dose to first responders and recovery personnel.

- Decontamination (gross and final):

- Waste management:

- Containment of wastewater: Water will likely be used by first responders to extinguish fires that may be generated during decontamination release. It may also be used to reduce radiation levels to emergency responders and subsequent response teams.

- SURVEY AND MONITORING

- Survey and/or observing\n
- Support Goals

- Mitigation of received dose to first responders: Reduce the radiation dose to first responders and recovery personnel.

- Decontamination (gross and final): Decontamination methods can be less effective if performed during a release rather than waiting months for the contamination to occur chemically and physically rendering it less active.

- Waste management:

- Containment of water and wastewater: Water will likely be used by first responders to extinguish fires that may be generated during a decontamination release. Wastewater may also be used to reduce radiation levels to emergency responders and by subsequent response teams.

- SEARCH AND NAVIGATE

- The RRLT tool offers a navigation hierarchy leading towards details and recommendations on dozens of equipment types and facilitates the Operator’s discovery and consumption of equipment types.

- The default presentation of these listings will be rows and columns of equipment options (LR, B/E, PE).

- Each item will be represented by a listing that includes a title of the item, a passage of text describing the item, any quoted phrases, Boolean combinations (AND, OR) of categories, and a set of links to the data set.

- The appearance and behavior of search results will be consistent with that of the database in which the navigation results are stored.

- Each item uses a list of categories to which the item is associated. Each category is linked to its own description page. When a user clicks on a category, a new page will display with a list of all items within that category.

- Each category uses several keywords to label each other.

- The general operation will be presented with the same interface of this list, a passage of text describing the item, any quoted phrases, Boolean combinations, and links to the data set.