



PROJECT ID:
604

An Integrated Navy Approach to Estimate Risk and Cleanup Goals for Radionuclides Associated with Buildings at Current and Former Navy Installations

The screenshot displays the RESRAD-BUILD software interface. It is divided into several panels: 'Case' (Title: Default Case for RESRAD-BUILD, Dose/Risk Library: FGR 13 Morbidity), 'Time Parameters' (Exposure Duration: 365 days, Indoor fraction: 0.5), 'Building Parameters' (Number of Rooms: 3, Deposition Velocity: 0.01 m/s, Resuspension Rate: 0.0000005 1/s), 'Radiological Units' (Activity: p, Ci; Dose: m, rem), 'Receptor Parameters' (Receptor #: 1, Room: 1, Time Fraction: 1, Breathing Rate: 18 m³/d, Ingestion Rate: 0.0001 m²/h, Location [m]: 3.08, 1.15, 1.71), 'Shielding Parameters' (Thickness: 0 cm, Density: 2.4 g/cc, Material: Concrete), and 'Source Parameters' (Source #: 1, Room: 1, Type/Dir: Volume, Z, Location [m]: 1.78, 1.21, 0.08). A 'Display' window on the right shows a 3D wireframe model of a building with a coordinate system (X, Y, Z) and a scale bar indicating 6 Meters. A 'Reset Scale' button is visible at the bottom of the display window.

The RESRAD-BUILD software calculates radiological dose and risk incorporating site-specific parameters that would result in realistically conservative cleanup goals for U.S. Navy sites.

(Graphic Credit: Kenda Neil)

OBJECTIVE

The purpose of this effort is to develop a Navy-wide approach for estimating risk and calculating cleanup goals for radiologically-impacted buildings.

PROBLEM STATEMENT

Past radiological activities have potentially impacted infrastructure (i.e., buildings) at installations Navy-wide. At Superfund sites, the Navy's approach differs from the U.S. Environmental Protection Agency's (EPA's) approach for assessing risks associated with radiologically impacted buildings and environmental media and establishing cleanup goals, which leads to delays in the schedule and increases in lifecycle costs when negotiating cleanup levels with the EPA.

DESCRIPTION

Currently, there are two prevailing sets of models for estimating risk

and dose from radiologically impacted infrastructure (e.g., buildings), which can lead to disparate cleanup goals. EPA's Building Preliminary Remediation Goals (BPRG) Calculator for radiological risk and Building Dose Compliance Concentration (BDCC) Calculator for radiological dose produce nonspecific and highly conservative risk estimates—often due to default assumptions not appropriate for Navy site conditions. This leads to unrealistically conservative remedial action levels. However, the Department of Energy's RESidual RADioactivity code for Buildings (RESRAD-BUILD) software calculates radiological dose and risk incorporating site-specific parameters that would result in realistically conservative cleanup goals for U.S. Navy sites. The approval and adoption of the RESRAD family of codes for deriving cleanup goals for Navy sites could speed cleanup negotiations and reduce programmatic lifecycle costs appreciably.



NAVY BENEFITS

Expected benefits from this project are as follows:

1. **Reduced Cleanup Costs.**
Analyzing Navy site data for more accurate radiological risk numbers for cleanup. These improved radiological risk number calculations provide a more scientific result and provides better understanding on what actions (or cleanup decisions) to implement (if any).
2. **Shorter Cleanup Timeframe.**
Providing project managers with better information and a set of case studies, which include approaches for conducting radiological risk assessments and estimating cleanup levels for buildings at Navy sites, will reduce project schedules and timeframes.
3. **Increased Fleet Readiness.**
Selecting a more sustainable remedy such as leaving a building in place to scan and clean enhances

sustainability. Also, this remedy selection reduces and/or prevents the generation of hazardous and non-hazardous waste from building debris, thereby resulting in less disruption of installation activities.

4. **Consistency in Approach.**
Applying a consistent approach for project managers to assess and evaluate cleanup buildings/sites will provide for a better understanding and acceptance by regulatory agencies.
5. **Applicable Approach.**
Although this project is focused on infrastructure (buildings), this new approach can be transitioned and applied to other radiologically-contaminated areas such as soils and landfills.

agencies and other environmental cleanup professionals. Any distribution to non-Navy entities will be submitted for approval through the appropriate public affairs office. Additional technology transition methods will be completed as follows:

- Provide radiological cleanup personnel with a set of case studies that provide an approach for conducting risk assessments and deriving appropriate cleanup levels.
- Project information will be used for any NAVFAC technology transfer initiatives such as the Remedial Innovative Technology Seminar (RITS) and training programs including CECOS and other courses. Additional presentations may be given at the annual RPM Training Event.

TRANSITION DESCRIPTION

The project team will disseminate the results of this project to both federal and targeted non-federal sectors and stakeholders such as regulatory

CONTACT

For more specific information about this project, contact the Principal Investigator at 805-982-6060.



ABOUT THE NESDI PROGRAM

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental research and development, demonstration and validation (6.4) program, sponsored by the Chief of Naval Operations, Energy and Environmental Readiness Division (OPNAV N45) and managed by the Naval Facilities Engineering Systems Command (NAVFAC) out of the Engineering and Expeditionary Warfare Center (EXWC) in Port Hueneme, CA.

The mission of the program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes, materials, and filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Fleet readiness and lethality. The program accomplishes this mission through the evaluation of cost-effective technologies, processes, materials and knowledge that enhance environmental readiness of naval shore activities and ensure they can be integrated into weapons system acquisition programs.

The program is the Navy's complement to the Department of Defense's Environmental Security Technology Certification Program which conducts demonstration and validation of technologies important to the tri-Services, U.S. Environmental Protection Agency and Department of Energy.

For more information, visit the NESDI program web site at www.navfac.navy.mil/nesdi or contact Ken Kaempffe, the NESDI Program Manager at 805-982-4893, DSN: 551-4893 or kenneth.c.kaempffe.civ@us.navy.mil.

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