Authorized Release of Non-Real Property Containing Residual Radioactive Materials

As nuclear facilities are decommissioned, the U.S. Department of Energy (DOE) is faced with the need to manage an increasing amount of material containing residual radioactive contamination. In the absence of national standards for releasing such materials for reuse or recycle, EVS has developed processes and tools that implement the authorized release of these materials while protecting the health and safety of the public and the environment.

PROBLEM/OPPORTUNITY

Within the next few decades, several million tons of materials will be removed from nuclear facilities across the DOE complex as a result of decontamination and decommissioning (D&D). These materials, which include scrap metals, concrete, together with large quantities of tools, equipment, and other items that are commonly recovered from site cleanup or D&D activities, constitute non-real property that warrants consideration for recycle.

The disposition alternatives other than burial as radioactive waste (such as reuse, recycle, or disposal at non-radioactive land fills) of some of these materials have been permitted under the current DOE policy, and EVS has helped in preparing a guidance handbook for DOE and in developing implementation protocols and tools to facilitate such releases. The handbook incorporates the assessment of human health and environmental risk as a key element in the authorized release process.

APPROACH

Over the past few years, EVS has taken a leading role in analyzing policies and issues and developing guidance for clearing radioactive scrap metals from regulatory control and releasing them for reuse and recycle. It has used a life-cycle assessment modeling approach to establish a basis for recycling radioactive metals. EVS has also helped DOE develop the Draft Handbook for Controlling Release for Reuse or Recycle of Property Containing Residual Radioactive Material. This handbook prescribes a process that includes characterization, disposition evaluation, cost-benefit analysis, authorization, and release. To further facilitate the release process, EVS has also developed a computerized management tool – P2Pro (RSM) – with protocols for implementing the handbook procedures. P2Pro follows the process prescribed by the handbook and incorporates databases on cost, dose, and technology to help DOE site project managers reach a reasonable decision regarding release of non-real

Scrap metals are actually resources for being recycled and reused.

property. Computer models developed by EVS (RESRAD, RESRAD-BUILD, RESRAD-RECYCLE, and TSD-DOSE) were used to analyze radiological health impacts on workers and members of the public involved in various activities associated with processing, release, and reuse of the materials.

RESULTS

The process described in the handbook has been used at DOE field offices to secure authorized release of materials. As an increasing number of DOE sites are undergoing the decommissioning process, opportunities are sought to control the mounting costs. The DOE authorized release process offers the most expedient process to achieve costs savings while protecting the environmental health and safety. The EVS staff is currently involved in several DOE sites including Mound and Argonne regarding the disposition of large amounts of materials from site decommissioning activities.

It is estimated that a successful DOE Complex-wide deployment of the handbook would result in savings of tens of millions of dollars.

EVS has also initiated new case studies for DOE field office implementation of the handbook. The subjects include the release of the steel magnet yoke at Argonne's cyclotron at Building 211 and the recent Accelerated Site Technology Deployment Program at Idaho National Engineering and Environmental Laboratory for demonstrating concrete release.

FUTURE

EVS's effort in evaluating risk-based strategies for disposition of radioactive materials by authorized release approach has formed the foundation of the policy position on recycling taken by the Nuclear Energy Agency within the Organization for Economic Cooperation and Development. An EVS staff member has led the National Council on Radiation Protection and Measurements scientific committee to develop a strategy on the disposition management of potentially radioactive scrap metals containing radioactive materials. EVS staff continue to contribute to the development of the national clearance standards for release of potentially radioactive materials.

COMMUNICATION OF RESULTS

EVS staff have authored more than 20 publications in journal articles, conference proceedings, and Argonne reports related to material disposition with regard to residual contamination. The authorized release handbook can be accessed through two DOE web sites: http://www.em.doe.gov/recyc and http://tis-nt.eh.doe.gov/oepa.

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