



Environment, Safety and Health Bulletin

DOE/EH-0697

2006-05

July 2006

Control and Release of Property

A Guide to Good Practices for the Control and Release of Property

Special Operations Reports are issued to initiate management actions in response to events whose subject matter represents significant Departmental safety concerns.

Environment, Safety and Health Alerts are issued to initiate immediate action on potentially significant safety issues.

Environment, Safety and Health Bulletins are issued to share information and recommend actions on potential safety issues.

Safety Advisories are issued to provide information to the DOE Complex on potentially significant safety or health issues.

Accountability Office and Inspector General reports, and several Freedom of Information Act requests regarding DOE control and release of property actions and programs. This Bulletin highlights important elements of Departmental requirements and guidance relevant to the control and release of property concerning these lessons learned.

BACKGROUND

DOE operates a variety of nuclear and radiological facilities (e.g., reactors, accelerators, weapons test facilities, and medical and research facilities). Some of these facilities are just being built or planned, and the requirements for radiological control should be integrated into that planning. Many others are aging and undergoing remediation and decommissioning. Decisions are being made on the appropriate disposition of materials generated or remaining from these restoration and cleanup projects. These decisions involve the evaluation of candidate disposition options (e.g., disposal of material compared to its release for reuse), and the determination

PURPOSE

This Environment, Safety and Health Bulletin discusses good practices for the control and release of property that may contain residual radioactive material. It is based on lessons learned from recent decisions on the disposition of materials associated with restoration and cleanup projects at Department of Energy (DOE) sites, Government

Key Points: Authorized limits for radiological control and release of property should not be an afterthought but should be integrated into life-cycle project planning such that radiation protection of the public and the environment, pollution prevention, and project management are addressed effectively. DOE programs and projects that use or manage radioactive material should address the management, control, and release of property early on in the planning phase of site operations, remediation, and restoration as part of Environmental Management Systems (EMSs) and Integrated Safety Management Systems (ISMSs).

Key elements of effective control and release of property programs include:

- Identifying early the need for authorized limits for controlling and releasing property;
- Applying DOE pollution prevention policies and guidance such that property is controlled and released in a manner that reduces or prevents the generation of new waste and pollutants, reduces the further release or spread of contamination, and reduces life-cycle costs;
- Keeping stakeholders appropriately informed of authorized limits and release processes;
- Developing, coordinating, and obtaining appropriate DOE approval for and documentation of authorized limits as soon as practical in the contractor's work planning and execution process through the site's EMS/ISMS; and
- Conducting self-assessments within the program, and implementing independent verification as part of DOE oversight activities, to ensure that control and release of property actions and programs are consistent with DOE requirements, approved authorized limits, and procedures.



of authorized limits for the control and release of personal (e.g., tools and equipment, pumps, plumbing supplies, generators, and other materials) and real (e.g., buildings, structures, land) property.

LESSONS LEARNED

Important Considerations for Release of Property

The following areas are highlighted based on recent property release actions and specific opportunities for improvement:

- **DOE has requirements and a process for the control and release of property that provide significant cost savings to the Department while maintaining public health and safety.** DOE's requirements and process are supported by Departmental guidance, tools, and technical assistance that facilitate the selection of an authorized limit for the property to be controlled or released. The process offers easy-to-use Surface Activity Guides (SAGs) as well as the flexibility to evaluate material-specific dose-based release options. Cost savings from the release of property through approved authorized limits range from several hundred thousand dollars to millions of dollars while maintaining public health and safety.
- **Independent verification should be an integral part of a site's program for the control and release of property.** Independent verification should be integrated into the planning and cleanup process and implemented in parallel with the final status surveys of the remediated property, rather than after the cleanup contractor has completed the remediation work and has closed down operations. It should be done by Federal or contractor elements that are independent of the contractor or DOE organization that developed the authorized limits for the property. Independent verification *is not* a substitute for routine contractor quality assurance.

The contractor or DOE organization that developed the authorized limits is accountable for the technical rationale for those limits and for controlling or releasing the property consistent with DOE requirements.
- **Site cleanup criteria (i.e., authorized limits) for release of real property need to be clearly defined, agreed upon, and documented.** Numerical criteria and associated protocols should be supported by analyses and documentation that demonstrate their credibility, acceptability, interpretation, and compliance with DOE radiation protection requirements.

- **Site restoration and cleanup actions and resulting control and release of property should be performed in a manner that reduces or prevents the generation of new wastes and pollutants.** The Department's guidance for implementing pollution prevention into EMSs should be considered when evaluating and selecting options for disposition of solid materials from site restoration and cleanup.
- **Options for the disposition of solid material should be evaluated in the context of the Department's pollution prevention policies and goals that include minimal waste generation and lowest life-cycle costs.** Accordingly, the evaluation of candidate material disposition options (e.g., release of personal property such as tools, equipment, generators, plumbing for unrestricted use or reuse compared with disposal of the material as waste) should consider, among other things: estimated cost savings; amount of wastes generated or remaining; methods for managing and disposing of the material as wastes; and the total life-cycle costs for each option being considered.
- **Options for the release of personal and real property should be integrated and made visible (e.g., shared with stakeholders and documented in plans) early on in the contractor's work planning and execution process.** A site's EMS/ISMS provides the framework for identifying, implementing, and evaluating options for disposition of material throughout the planning and implementation of the cleanup and restoration project.

IMPORTANT ELEMENTS OF DOE REQUIREMENTS AND GUIDANCE FOR CONTROL AND RELEASE OF PROPERTY

DOE's Requirements and Process for Control and Release of Property Apply to Decisions on Material Disposition

The Office of Environment, Safety and Health has developed a process and implementation guidance for DOE and contractor personnel who perform cleanup of property and who must determine the disposition of property under the requirements of [DOE Order 5400.5, Radiation Protection of the Public and the Environment](#) [1]. The process is described in [DOE G 441.XX, Implementation Guide for the Control and Release of Property with Residual Radioactive Material](#) [2].

Authorized Limits govern the releases of personal and real property. They are radionuclide concentrations or activity levels approved by DOE to permit the release of property from DOE control, consistent with DOE's radiation protection framework and standards for workers, the general public, and the environment.



Requirements for Authorized Limits

- ☑ Authorized limits for control and release of property shall be developed and implemented to meet applicable dose limits, dose constraints, and goals.
- ☑ Authorized limits shall be derived through application of the As Low As Reasonably Achievable (ALARA) process.
- ☑ Survey or characterization of the property must be consistent with protocols capable of demonstrating compliance with the approved authorized limits.
- ☑ Authorized limits must comply with other applicable U.S. Federal and state requirements.
- ☑ Appropriate public involvement and notification programs must be conducted.
- ☑ Independent verification of the data documenting the radiological condition of the property must be made prior to its release.
- ☑ Authorized limits must comply with DOE quality assurance requirements.
- ☑ Final documentation must be approved by DOE to demonstrate that all requirements and objectives have been met.

Dose Limits, Constraints, and Goals: *The Department's dose limit for protection of the public is 100 mrem/year from all sources and pathways. The dose constraint for any single source or pathway (which is applicable to property release) is 25 mrem/year. In the development of authorized limits, the goal should be to maintain doses from a release to a few mrem/year or less, and for personal property, the goal should be to control doses to 1 mrem/year or less.*

ALARA Process for Evaluation of Material Disposition Options

The control and release of property has its basis in the analysis of candidate material disposition options (e.g., release of property for reuse compared to disposal as waste) using the DOE ALARA process.

ALARA, as applied by DOE, is not a numerical level or limit, but rather a process that considers dose and health risk; estimated cost savings; amount of wastes generated or remaining; methods for managing and disposing of the material as wastes; total life-cycle costs; and public, political, cultural, ecological, and site-specific considerations for each candidate material disposition option being considered.

The *Implementation Guide for the Control and Release of Property with Residual Radioactive Material* [2] provides

guidance on these and other specific elements of the process for control and release of property, to include:

- ☑ Use scenarios;
- ☑ Evaluation of individual and collective dose;
- ☑ Site-specific factors;
- ☑ Specific applications for land, structures, and personal property;
- ☑ Use of SAGs and dose-based determinations of authorized limits;
- ☑ Radiological surveys and independent verification;
- ☑ Posting and property control;
- ☑ Organizational approvals; and
- ☑ Supporting models, tools, and guidance.

Site Cleanup Criteria Need to Be Clearly Defined

Numerical site cleanup criteria (i.e., authorized limits) for release of property should be well defined and should include enough description to permit their verification of compliance. For example:

- ☑ Do the numerical criteria represent a maximum or average value?
- ☑ Over what size of an area does the average value apply to?
- ☑ Does the single numerical criterion also apply to isolated hot spots that may be present on the site, or are there separate criteria for small areas?

Restoration Projects should be performed in a manner that reduces or prevents the generation of new waste and pollutants, and reduces the further release or spread of contamination.

Independent Verification Should Be an Integral Part of Site Restoration and Cleanup Projects

As part of their regulatory oversight, DOE site personnel should establish independent verification programs to confirm that survey and evaluation processes are in place and are being properly implemented, and that property released from DOE control meets authorized limits [3, 4, 5]. The DOE organization responsible for the release of property should verify the radiological condition of the property before its release. Results of the independent verification should be part of the permanent record of release. A well-implemented and documented independent verification program helps demonstrate that DOE property releases are credible and in compliance with authorized limits established for the property.



DOE Pollution Prevention Policy and Guidance Applies to Evaluations and Decisions on Disposition of Materials

Pollution prevention should be applied to all DOE activities. This includes stabilization, deactivation, and decommissioning; and legacy waste and contaminated site cleanup. It also includes evaluations and decisions on the disposition of materials generated or remaining from these activities.

Additional waste and pollutants can be generated in the process of conducting restoration and cleanup activities. Pollution prevention is applicable to the generation of secondary wastes and should be incorporated into remedial investigations, feasibility studies, design, and execution of all restoration and dismantlement projects.

Many pollution prevention techniques may not directly apply to wastes that were already generated and media that were already contaminated by previous practices. Therefore, it is important to clearly define areas and activities that could potentially contaminate property before, during, and after cleanup actions have taken place. Segregation and maintenance of clean material (e.g., both personal and real property) from radiological areas, and use of process knowledge for the material, will reduce the amount of property that might otherwise require decontamination, treatment, and disposal as waste. It also will simplify the evaluation, selection, and justification of authorized limits for the release of property.

Pollution Prevention is defined by DOE as the use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and wastes into land, water, and air. Pollution prevention incorporates waste minimization and includes recycling.

Options for the Disposition of Materials Should Be Integrated and Made Visible (i.e., shared with stakeholders and documented in plans) Early in the Contractor's Work Planning and Execution Process

A Department of Energy Acquisition Regulation (DEAR) (48 CFR 970.5223-1, *Integration of Environment, Safety and Health into Work Planning and Execution*) [6] states that contractors "shall ensure that management of environment, safety and health (ES&H) functions and activities becomes an integral but visible part of the contractor's work planning and execution processes." The regulation clarifies that safety includes pollution prevention and waste minimization. In addition, [DOE O 450.1](#) [7], *Environmental Protection Program*, has requirements for the systematic planning, integrated execution, and evaluation of pollution prevention.

The EMS required by DOE O 450.1 provides the framework that allows DOE elements to identify, implement, and evaluate pollution prevention and waste minimization opportunities. For example, as part of the life-cycle analysis of existing or changing operations or cleanup activities, pollution prevention opportunity assessments (PPOAs) provide a process for identifying opportunities to eliminate or reduce wastes and reuse or recycle excess materials [8]. This includes opportunities concerning the management of material, and evaluations and decisions on material disposition (e.g., disposal of property as waste or release of property for unrestricted use) before, during, and after cleanup actions take place.

REFERENCES

1. [DOE Order 5400.5](#), *Radiation Protection of the Public and the Environment*. DOE, 1990.
2. [DOE G 441.1-XX](#), *Implementation Guide for the Control and Release of Property with Residual Radioactive Material for Use with DOE 5400.5*, Radiation Protection of the Public and the Environment. DOE, 2002.
3. [DOE P 226.1](#), *Department of Energy Oversight Policy*. DOE, 2005.
4. [DOE O 226.1](#), *Implementation of Department of Energy Oversight Policy*. DOE, 2005.
5. [10 CFR 830.122](#), *Quality Assurance Criteria*, Subpart A to *Nuclear Safety Management*. DOE, 2000.
6. [48 CFR 970.5223-1](#), *Integration of Environment, Safety and Health into Work Planning and Execution*. Department of Energy Acquisition Regulations. DOE, 2002.
7. [DOE O 450.1](#), *Environmental Protection Program*. DOE, 2003.
8. [DOE G 450.1-5](#), *Implementation Guide for Integrating Pollution Prevention into Environmental Management Systems*. DOE, 2005.

The Office of Air, Water and Radiation Protection Policy and Guidance (EH-41) is available to provide technical assistance to DOE sites and programs regarding requirements, guidance, and modeling tools for the control and release of property containing residual radioactive material. Questions concerning this Bulletin should be directed to Stephen Domotor (EH-41) by telephone at 202-586-0871 or by e-mail at Stephen.Domotor@eh.doe.gov.



C. Russell H. Shearer
Acting Assistant Secretary
Environment, Safety and Health

