



Clearance of Real and Personal Property
Under DOE Radiation Protection Directive --
DOE Order 458.1
*Radiation Protection of the Public and the
Environment*

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Release & Clearance of Property Under DOE Order 458.1



- Presentation objectives:
 - summarize DOE O 458.1 property release & clearance requirements
 - identify any changes from DOE 5400.5
 - answer questions



Release & Clearance of Property Elements of DOE O 458.1



- General requirements
- Dose constraints
- Residual radioactive material
- Safeguarding institutional controls
- Process and historical knowledge
- Authorized Limits-requirements, application, approvals, revision
- Clearance of environmental restoration, deactivation, and decommissioning and other cleanup materials
- Radiological monitoring or surveys
- Documentation and verification
- Public notification of clearance of property



Release & Clearance of Property Under New DOE Order 458.1



- Must meet the dose limits under any plausible use of property and ALARA process requirements before the property is cleared



Dose Constraints

- Apply to property being cleared for any actual or likely future use:
 - 25 mrem (0.25 mSv) /yr above background for real property;
 - 1 mrem (0.01 mSv) /yr above background for personal property



Residual Radioactive Material



- For release or clearance of property:
 - It must be demonstrated not to contain residual radioactive material, or
 - It must be evaluated and appropriately monitored or surveyed & meet authorized limits.



Safeguarding Institutional Controls



- Before clearing real property, DOE must consider the need for the property (e.g., as a buffer zone) as part of the site's long-term institutional controls to ensure the safety of other DOE operations.
- Clearance of a property could increase the radiological risk from adjacent DOE properties maintained under long-term stewardship, by compromising the protection of the public from an adjacent DOE facility by the elimination of a buffer zone or other institutional control.
 - In such cases, it must be demonstrated that the property clearance action would not compromise the controls, increase the risk, or result in a potential noncompliance for the property under DOE O 458.1, DOE O 435.1, or other applicable statutes, regulations or orders.



Process and Historical Knowledge



May be used if:

- Sites establish a documented evaluation process, using a graded approach, for applying process and historical knowledge to determine if property potentially contains residual radioactive material.
- Release process includes written procedures
- Radiological monitoring or surveys supplement s any lack of process knowledge



Authorized Limits

- Must be established and approved for the clearance of any property containing or potentially containing residual radioactive material
- May be applied to property for which neither process knowledge nor measurement can establish the absence of residual radioactive material



Authorized Limits Must:

- Be developed in accordance with DOE O 458.1 ALARA requirements;
- Be based on the applicable dose constraint, supported by a complete exposure pathway analysis using appropriate methodologies, techniques, parameters and models that meet DOE quality assurance requirements under DOE O 414.1C, *Quality Assurance*;
- Be expressed in terms of concentration of radioactivity per unit surface area (e.g., dpm per 100 cm²), radioactivity per unit mass (e.g., pCi per gram) or volume (e.g., pCi per ml), total radioactivity, or DOE controls and restrictions, if applicable;



Authorized Limits Must:



- Explicitly state any restrictions or conditions on future use of the property;
- Include written notification of applicable Federal, state, or local regulatory agencies, or tribal governments;
- Be approved in accordance with the DOE O 458.1 approval section.



Authorized Limits for Personal Property Must:



- Consider internal recycle or reuse of metal material or equipment
- Be based on expected annual quantity of property to be cleared or
- Be based on expected total amount of property cleared over the life of the project for specific remedial action or decontamination and decommissioning projects



Applications for Approval of Authorized Limits



- Applications must contain:
 - Description of the property.
 - Specific limits proposed for each radionuclide or group of radionuclides and/or external radiation exposure, surrogate metrics, or conditions used to limit radionuclides.
 - Potential collective dose to the exposed population and the potential dose to a member of the public most likely to receive the highest dose for both: actual or likely future use, and plausible future use of the property.
 - ALARA cost-benefit assessments conducted under paragraph 4.d. of O 458.1 for the proposed clearance action to include, at a minimum, the effect of the proposed and alternative limits considered, and of not clearing the property.



Applications for Approval of Authorized Limits (cont'd)



- Description of the procedures and radiological monitoring or surveys to be used to demonstrate compliance with proposed limits.
- Identification of any restrictions or conditions on the future use of the property upon which the proposed limits are based, and the means by which the restrictions or conditions will be implemented and maintained.
- Evidence of notification of applicable Federal, State or local regulatory agencies or Tribal governments.
- An estimated date for when the property will be cleared and an estimate of when the property will leave DOE control.



Approvals of Authorized Limits



- Must be in writing
- Field Element Manager (FEM) approves:
 - Use of pre-approved Authorized Limits
 - Real property Authorized Limits
 - Personal property-up to 1 mrem dose plus other conditions
- Cognizant Secretarial Officer approves:
 - Authorized Limits for property to be excluded from 10 CFR 835 provisions



Revision of Authorized Limits



- Process for a necessary increase or decrease in authorized limits for all or part of the property
- Documentation, application & approvals generally the same, plus must meet certain additional criteria:
 - clear and present risk
 - environmental harm
 - unreasonable cost
 - overly conservative assumptions
 - new information indicates insufficient protectiveness



Pre-approved Authorized Limits



- Used instead of developing specific authorized limits; Order also provides for the development of new pre-approved limits
- Pre-approved limits included are:
 - radium-226 (or thorium 230) soil concentrations
 - radium 228 (or thorium-232) soil concentrations
 - surface guidelines in G 441.1-xx (until replaced)
 - previously approved authorized limits



Clearance of Materials from Environmental Restoration, Deactivation & Decommissioning, CERCLA and Other Cleanup



- Can demonstrate compliance with O 458.1 using documentation from the CERCLA process
- Approved CERCLA remediation criteria may be considered equivalent to Authorized Limit if
 - FEM makes that determination and,
 - documentation and approval is as would be an authorized limit
- If Field Element is using CERCLA analysis and documentation in lieu of DOE O 458.1-specific analysis and documentation for clearance of property with residual radioactivity Field Element needs:
 - FEM certification to CSO
 - Relevant CERCLA documentation & any additional information to CSO, cc: HS-1



Radiological Monitoring or Surveys



- All monitoring or surveys performed to support clearance of property must:
 - Use methodologies such as MARSSIM or MARSAME or other DOE-approved methodologies,
 - Meet measurement or data quality objectives (i.e., MQOs or DQOs)
 - Use DOE-approved sampling and analysis techniques, and
 - Include an evaluation of non-uniformly distributed residual radioactive material, if applicable.
- Instrumentation must be capable of detecting and quantifying residual radioactive material, consistent with the applicable Authorized Limits.



Documentation and Verification



- Documentation of property clearance & Authorized Limits must be made available to the public
- FEM is responsible for oversight of clearance and Independent Verification (IV)
- IV must use a graded approach commensurate with the scope of the clearance action as determined by the FEM who is accountable for ensuring adequacy of clearance process and procedures
- Minimum IV activities are specified in Order for personal and real property



Public Notification of Clearance of Property



- FEM is responsible for effective site public notification & communications program
- Site property clearance information must be summarized in the Annual Site Environmental Report (ASER)
- FEM must make clearance documentation available to the public & to the property recipient, as appropriate



Final Clearance Documentation



- Clearance of property must be documented
- Documentation content or mechanism may be tailored to the need, situation, and type of property being cleared
- Documentation must show that property being sold or otherwise cleared from DOE radiological control:
 - Meets all DOE radiological protection requirements,
 - Is not required to be controlled for national security reasons, and
 - Meets DOE property control requirements.



Final Note



- In general DOE O 458.1 provides a more detailed explanation of DOE expectations for control and clearance of property that are consistent with previous requirements and guidance.
- The added detail ensures that clearance process and programs that comply with the Order will satisfy the improvements called for in the Secretarial memoranda of January 19, 2001 that indicated:
 - “There is a need to improve radiation monitoring, independent verification, and record keeping and reporting. We must also better engage the public in our decision making and help them better understand our release practices.”



Personal Property Clearance Examples



- Soil and debris w/HTD
- PCB capacitors
- Residually contaminated water
- Lubricating oil
- PCB dielectric fluid
- Lithium hydroxide monohydrate drums
- River soil & sediments
- Septic tank & contents
- HF and CaF₂ byproduct
- Roofing waste
- 25-ton locomotive
- Gravel with residual radioactivity
- Soil and debris
- Vegetation & tree wood
- Concrete rubble & soil
- ZnBr₂ for recycle



Questions or Comments?

Thank you !