ENTOF EXERCISE OF ANIA	<b>EACTOR</b> Enterprise Assessments	Number: EA CRAD 34-01 Revision: 0 Effective Date: November 9, 2020
Excess Real Property Dispositioning Practices Criteria and Review Approach Document		
Authorization and Approval	Kevin G. Kilp Acting Director, Office of Nuclear Engineering and Safety Basis Assessments EA-34	Jimmy Shane Dyke Lead, Jimmy S. Dyke, Nuclear Engineer EA-34
	Date: November 9, 2020	Date: November 9, 2020

## **1.0 PURPOSE**

The mission of the U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments (EA-30) is to assess the effectiveness of safety and emergency management systems and practices used by line and contractor organizations and to provide clear, concise, rigorous, and independent evaluation reports of performance in protecting workers, the public, and the environment from the hazards associated with DOE activities.

In addition to the general independent oversight requirements and responsibilities specified in DOE Order 227.1A, *Independent Oversight Program*, this criteria and review approach document (CRAD), in part, fulfills the responsibility assigned to EA in (reference source document) to (paraphrase responsibility or requirement).

The CRADs are available to DOE line and contractor assessment personnel to aid them in developing effective DOE oversight, contractor self-assessment, and corrective action processes. The current revision of EA's CRADs are available at <a href="http://www.energy.gov/ea/criteria-and-review-approach-documents">http://www.energy.gov/ea/criteria-and-review-approach-documents</a>.

### 2.0 APPLICABILITY

This CRAD is approved for use by assessment teams within the Office of Environment, Safety and Health Assessments, EA-30. This CRAD applies to reviews associated with characterization and decommissioning processes in support of disposition of excess real property as defined by DOE O 430.1C, *Real Property Asset Management*, and DOE O 458.1, *Radiation Protection of the Public and the Environment*. This CRAD addresses the directive requirements, processes, and practices used for characterizing, decommissioning, and certifying excess real property for final disposition. This CRAD does not address disposal of hazardous materials removed in support of final disposition.

### **3.0 FEEDBACK**

Comments and suggestions for improvements on this CRAD can be directed to the Director, Office of Environment, Safety and Health Assessments, at (301) 903-5392.

### 4.0 CRITERIA AND REVIEW APPROACH

The review will focus on the implementation of characterization and decommissioning practices to ensure excess real property meets approved authorized limits for disposition. The review will evaluate the effectiveness of both the contractor and field office programs in managing and maintaining characterization and decommissioning performance. The review will evaluate the following:

- Technical adequacy of Policy, Directives, and Official Programmatic Office guidance (past and current)
- Compliance with governing requirements documents and the adequacy of procedure and practice implementation
- Adequacy of characterization practices to properly identify radiological hazards form, quantity, and location that require remediation
- Adequacy of decommissioning practices and fulfillment of required end state conditions to disposition excess real property
- Quality Assurance (QA) and Oversight

The following provides a set of criteria and typical activities with representative lines of inquiry to assess implementation of practices identified as part of a decommissioning process. All engineered features (active and passive) and administrative controls may be considered during this review as long as they are being relied upon to provide a basis and support final disposition of the excess real property. The following objectives and associated criteria are designed to be used separately based on the needs of the specific appraisal.

## **OBJECTIVES**

This CRAD is organized into criteria and lines of inquiry applicable to each area as follows:

- Technical Adequacy of Policy and Directives
- Technical Adequacy of Safety Basis and Hazard Controls
- Real Property Characterization
- Decommissioning Process Implementation
- Final Certification and Traceability to Meet Disposition Requirements
- Quality Assurance and Oversight

**DP.1:** Policy, directives and guidance governing disposition of contaminated excess real property are technically adequate to assure characterization and decommissioning of hazards and institutional controls (if required) are properly documented and communicated.

### Criteria:

- 1. Directive requirements for decommissioning processes are clearly articulated, and adequately address and control identified hazards.
- 2. Roles, Responsibilities, Accountabilities, and Authorities within the directives, and implementing procedures related to for decommissioning processes are clearly identified, up-to-date, and understood by the implementing personnel.
- 3. Safety basis documentation for the decommissioning activities have been established, is compliant with 10 CFR 830, Subpart B safe harbor methodology, and establish the hazard controls which ensure adequate protection of the workers, public, and the environment. (10 CFR 830.202.b)
- 4. Directives and procedures are consistent across the various governing documents, incorporate up to date references, and clearly define applicability, and regulatory interfaces and authorities.
- 5. High level directives requirements are flowed down to consistent guidance documents and procedures that are implemented in the field.
- 6. Appropriate feedback and change control processes are implemented to ensure requirements are modified in response to operating experience and changing conditions, and changes are implemented in the field in a timely manner.

### Additional Considerations

- Based on operating experience do the existing directives adequately address identified hazards?
- Based upon historical records, are all known or suspected hazardous areas required to be remediated prior to transfer?
- Are the roles, responsibilities, authorities and accountabilities within the regulations, directives, and implementing procedures for decommissioning processes clearly identified, up-to-date, and implemented as written?
- Are requirements consistent across the existing directives?
- Is there an adequate regulatory interface between the requirements governing clearance of real property and land transfer?
- Are references within the directives up to date?
- Was the Hazard Category 3 facility properly assessed and downgraded to a less than Hazard Category 3?
- Are regulatory interfaces clearly defined and are requirements implemented consistently in the field?
- Are directives requirements adequately flowed into consistent guidance documents and implementing procedures?
- Are directives and procedural requirements consistently implemented and followed in the field?

- Are institutional controls and deed restrictions appropriately used to protect the public from residual risks?
- Are feedback and change control processes effectively implemented?
- Are any changes in directives requirements currently under development? If yes, what are the anticipated focus areas, and what are the anticipated schedules for the changes?

# DP.3: Radioactive materials shall be characterized using direct or indirect methods, and programs and procedures are in place and adequately implemented to ensure that the characterization is documented in sufficient detail to ensure safe management and compliance with the goals for dispositioning of excess real property.

### Criteria:

- 1. The facility has established processes that assure radioactive material are properly identified and characterized. (DOE O 458.1 Section 4.k(8))
- 2. The facility has established process knowledge processes that assure areas suspected of containing radioactive materials are identified for remediation. (DOE O 458.1 Section 4.k(5))
- 3. Processes incorporate appropriate levels of measurement, analysis, and documentation. Measurement and analysis is conducted using established and effective calibration, instrument maintenance, and measurement quality control processes. (DOE O 458.1 Section 4.k(8))
- 4. Measurement techniques are appropriate for isotopes of concern, considering the expected isotopes resulting from decay since original generation. (DOE O 458.1 Section 4.k(8))
- 5. Data quality objectives processes are used for identifying characterization parameters and acceptable uncertainty in characterization data. Measurement and analysis procedures clearly define acceptance criteria and response actions for non-conforming results. (DOE O 458.1 Section 4.k(8))
- 6. Characterization, at a minimum, includes the following information: (DOE O 458.1 Section 4.k)
  - Radiological characteristics and locations within excess real property;
  - Historical and anecdotal information on prior land use,
  - Identification of areas contaminated during the Manhattan project, or other times when record keeping did not meet current expectations,

### Additional Considerations

- Do characterization programs take into account decay and ingrowth of radionuclides?
- Are appropriate data quality objectives and limitations identified in the sampling and analysis plans, procedures, and measurement documentation?
- Are calibration and measurement quality control processes adequately implemented and documented for all test equipment?
- Are processes effectively implemented to assure anomalies in measurements are identified and analyzed?
- Are scaling factors used to determine concentrations or activity based on indirect measurements fully supported by documented analysis?
- When historic process information or acceptable knowledge (AK) is used as a basis to determine characterization, are adequate quality assurance (QA) verification or measurement processes used to identify anomalies?
- Are assumptions and potential variables associated with "Acceptable Knowledge" or "Process Knowledge" determinations evaluated to assure unanalyzed hazards or conditions that would violate data quality objectives are prevented?
- Are change control processes implemented for modification in the characterization procedures and/or measurement and test equipment?

- Are personnel involved with characterization appropriately trained and authorized to perform their assigned responsibilities?
- Are laboratories and measurement systems used for characterization properly accredited and do they use traceable reference standards for measurements?
- Are the radioactive hazards managed in a manner that protects facility workers, co-located workers, the public, and the environment?
- Was the real property cleared under DOE O 5400.5 or DOE O 458.1? If DOE O 5400.5 was used, was a gap analysis with DOE O 458.1 completed prior to the land conveyance?

# **DP.4:** Programs and procedures are in place and adequately implemented to ensure that decommissioning practices are properly implemented to ensure authorized limits are being met to allow disposition of excess real property.

### Criteria:

- 1. Were Authorized Limits (ALs) and/or Pre-authorized ALs appropriately established and approved consistent with DOE O 458.1 Section 4.k(6), and did they provide reasonable assurance that dose constraints and as low as reasonably achievable (ALARA) requirements (per DOE O 458.1 Section 4.d) would be met?
- 2. Was the site radiological clearance program formally established and documented, including operational awareness, process and historical knowledge reports/historical site assessments, D&D or remedial action plans, characterization plans and reports, clearance survey plans and reports, radiological survey instrumentation calibration and use procedures, survey and sampling procedures including data quality objectives, analytical techniques, etc.? (DOE O 458.1 Section 4.k)
- 3. Was an Independent Verification (IV) Program appropriately established and documented, including all necessary plans, procedures, and qualifications of IV personnel and reporting expectations? (DOE O 458.1 Section 4.k(9))
- 4. Facilities maintain historical records to define areas of concern, and anticipated hazards in those areas. (DOE O 458.1 Section 4.k(3))
- 5. Facilities adequately implement processes to ensure the quantity and characteristics of radiological contamination are known and documented. (DOE O 458.1 Section 4.k(5))

### Additional Considerations:

- What was the process followed to conduct the cleanup/remediation activities? (Is there a formal description documented in a work package, procedures, contract addendum, etc.)
- What radiological clearance requirements were in place at the time of the real property clearance and conveyance activities?
- How was the historical knowledge used to define the cleanup/remediation activities and survey methodology?
- How was the historical knowledge used to define the areas where cleanup/remediation activities are appropriate?
- What radiological survey equipment and methodology was used to characterize radioactive material locations?
- Was the radiological survey appropriate for the expected isotopes of concern based upon historical knowledge and radioactive decay?
- What survey equipment calibration records are available to support the integrity of survey measurements?
- What methodology was used to use survey results to evaluate compliance with authorized limits?
- Were DOE approved authorized limits or pre-authorized limits for release, consistent with DOE O 5400.5 or DOE O 458.1 used as the cleanup standard?

- What documentation was prepared to govern the extent, conduct and verification of radiological release surveys used to demonstrate that all cleanup standards and survey requirements had been met?
- What was the acceptance criteria to declare a grid area or the whole area sufficiently clean for release?

# DP.5: Quality assurance practices and processes are implemented in a manner that ensures programs and procedures are in place and adequately implemented to ensure that remediation and decommissioning practices are properly implemented to ensure authorized limits are being met to allow disposition of excess real property

### Criteria:

- 1. Activities that may affect DOE nuclear facilities disposition of contaminated excess real property are conducted in accordance with a DOE-approved quality assurance program meeting the quality assurance criteria specified in 10 Code of Federal Regulations (CFR) 830.122. (10 CFR 830.121)
- 2. Appropriate consensus standards, such as ASME NQA-1, Quality Assurance Requirements for Nuclear Facility Applications, and other applicable quality or management system requirements are clearly identified, integrated, and implemented for nuclear-related work activities associated with disposition of contaminated excess real property. (10 CFR 830.121 and DOE Order 414. ID, Quality Assurance).
- 3. Requirements are established for procurement and verification of items and services in support of disposition of contaminated excess real property. (10 CFR 830.122 Criterion 7)
- 4. Processes are established and implemented that ensure that approved suppliers continue to provide acceptable items and services in support of disposition of contaminated excess real property. (10 CFR 830.122 Criterion 7)
- 5. Work processes that affect the decontamination, decommissioning, and disposition of excess real property are identified and controlled. (10 CFR 830.122 Criterion 5)

### Additional Considerations:

- Has work been planned and performed in accordance with applicable drawings and specifications?
- Have qualified quality assurance personnel been involved in the preparation of work plans and packages for decontamination, decommissioning, and disposition of contaminated excess real property?
- Do work packages include appropriate hold points for inspections and/or tests and sampling during the decontamination process?
- Are personnel performing inspections appropriately qualified?
- Do personnel performing inspections understand acceptance criteria for the release of previously contaminated property?
- Are inspections sufficiently detailed to identify emergent conditions requiring corrective activities to address unknown or unexpected conditions?
- Are procurement processes defined within the site/facility quality assurance program and are provisions included for supplier qualification, receipt inspection, and document management?
- Are components and services procured in support of the decontamination and decommissioning process obtained in accordance with the site/facility quality assurance program?
- Are critical or important acceptance parameters and other requirements, such as inspection/test equipment or qualified inspection/test personnel, specified in processes and procedures governing disposition of contaminated excess real property?

• Have quality assurance assessments been performed? Did the assessments include evaluation of quality of plans, processes and procedures governing the disposition of contaminated excess real property

# **DP.6:** Programs and procedures are in place and adequately implemented to ensure that Federal oversight programs are effective in evaluating performance of decommission process to meet requirements for disposition of excess real property.

### Criteria:

- 1. DOE line management has established and implemented effective oversight processes that evaluate the adequacy and effectiveness of the contractor's decommissioning processes. (DOE O 226.1B)
- 2. DOE line management maintains sufficient technical capability and knowledge of site and contractor activities to make informed decisions about hazards, risks, and resource allocation; provide direction to contractors; and evaluate contractor performance. (DOE O 226.1B)
- 3. Federal Site Office Oversight processes are tailored according to the effectiveness of contractor assurance systems, the hazards at the site/activity, and the degree of risk, giving additional emphasis to potentially high consequence decommissioning activities.\_(DOE O 226.1B and DOE O 458.1 Section 4.k(9))
- 4. Facility Representatives provide effective routine operational awareness to determine that the contractor is operating DOE facilities in a safe manner.

### Additional Consideration:

- Does the DOE field element oversight program include written plans and schedules for planned assessments, focus areas for operational oversight, and reviews of the contractor's self-assessment of decommissioning activities?
- How was the federal and contractor oversight involved in the cleanup efforts? How often was oversight conducted? Was it documented?
- Were any issues documented as a result of federal or contractor oversight?
- If issues were identified from oversight activities were they formally documented and associated corrective actions formally documented and verified?
- Does the DOE field element have an effective issues management process that is capable of categorizing findings based on risk and priority; ensuring relevant line management findings are effectively communicated to the contractor; ensuring that problems are elevated and effectively corrected in a timely manner; and lessons learned are disseminated to address extent of condition issues?
- What verification and DOE oversight activities were conducted during the cleanup and during final status radiological surveys to verify areas met acceptance criteria for being declared clean? How were they documented?

### **REVIEW APPROACH**

#### <u>Record Review:</u> Contractor Documents

- Decommissioning Project Plan
- Decommissioning Project QA Plan
- Historical Records Used by the Decommissioning Project to Define Project Scope
- Authorized Limits (ALs) and/or Pre-authorized ALs applications for Real Property
- Site radiological clearance program including operational awareness, process and historical knowledge reports/historical site assessments, D&D or remedial action plans, characterization

plans and reports, clearance survey plans and reports, radiological survey instrumentation calibration and use procedures, survey and sampling procedures including data quality objectives, analytical techniques, etc.

- Site Independent Verification (IV) Program including plans, procedures, qualifications of IV personnel and reports
- Documentation of results from self-assessments
- Documentation of any issues, non-conformances, causal analysis, and corrective actions related to the decommissioning project
- Organizational charts showing all levels of staff involved in the decommissioning project
- Work planning and control policies and procedures
- Job Hazard Analysis procedures

#### DOE Headquarters and Field Element Documents

- Site Office organization chart
- Oversight Program implementing plans, procedures, and instructions/guidance, (including subordinate program and activity requirements documents, readiness reviews, contract performance evaluations, self-assessments, and issues management programs)
- Examples of recent documents communicating the results of field element oversight results concerning decommissioning projects (e.g., periodic reports from the Facility Representative and/or subject matter expert (SME) walk-downs and reviews, issues, and findings transmitted to the contractor)
- List of corrective actions implemented by the contractor as a result of field element oversight of the contractor's management of the decommissioning activities
- Lists of deficiencies, findings, observations, etc. associated with the decommissioning project
- Copy of last two Site Office or support center oversight assessments involving the contractor's management of decommissioning activities
- Currently implemented decommissioning policies, directives, and supporting documents
- Currently implemented decommissioning guidance
- Planned revisions to any document in the system of directives associated with decommissioning of excess real property
- Documentation of results from Federal site office or DOE-HQ program office assessments

### Interviews

Personnel that may be interviewed include those responsible for decommissioning activity and release of real property oversight and supervision, SMEs, and implementing staff. The specific personnel interviewed will vary depending on the facility type or activities assessed. The following is a generic list of typical interview requests:

- Site Office SME for decommissioning activities
- Facility Representatives
- Decommissioning Personnel
- Health Physics Personnel
- Waste Management Personnel
- Transportation Personnel
- Non-destructive assay personnel
- Training Personnel
- Quality Assurance management and staff
- Work planning and control managers and work planners

### Observations

Selected work activities (e.g., characterization measurements, QA measurement, visual inspections and assays, etc.) may be observed in addition to performing facility/building/property walkdowns and inspections.

- Facility, building, laboratory, and property walkdowns and reviews
- D&D project and work planning activities
- Radioactive material characterization activities including non-destructive assay
- Soil excavation, surveys, remediation, waste handling, and packaging activities
- Remediation and stabilization of decommissioned facility/area
- Oversight of decommissioning activities