Challenges in the Management of Potentially Contaminated Scrap Metal

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Background

- DOE/NNSA has over a dozen facilities that routinely handle radioactive material as part of normal operations and/or cleanup activities
- As the “footprint” of the DOE complex of facilities is reduced, thousands of tons of scrap metal has and will be generated. This material has considerable value.
- Most material is associated with radioactive material processing and handling operations.
- Most material is *not* contaminated, but *suspect* for contamination
- The main challenge is establishing and maintaining public confidence in radiological clearance programs

- Management Objectives
  - –Reuse of Facilities.
  - –Reuse of Equipment (electrical equipment, cabinets, etc. ...to minimize waste disposal.)
  - –Recycling (unrestricted release) of Scrap Metal and miscellaneous material to minimize waste disposal.
  - –Resource conservation (e.g., reduce energy consumption and air emissions associated with primary metal production activities).
  - –Recovery of prior investment

- Current Policy
  - While U.S. regulations provide for a risk based determination of suitability to release materials from radiological control, for DOE programs:
    - Unrestricted release of volumetrically contaminated metals by DOE has been prohibited since February 2000.
    - Unrestricted release of scrap metal managed in a radiation area as defined by 10 CFR 835, Occupational Radiation Protection has been temporarily suspended since July 13, 2000.
- Why?
  - Decentralized management of radiological control
  - Inconsistent standards for program performance
  - Massiveness of DOE infrastructure reduction projects and plans
  - Lack of public/industry confidence

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The Path Forward – A Systematic Approach

1. Establish consistent, agency-wide benchmarks for site clearance program performance:
2. Clearly define areas and limit activities that have the potential to contaminate property
3. Provide for independent verification of clearance activities
4. Improve reporting and record keeping associated with the release of property

- Establishment of Performance Benchmarks
  - Selection of instrumentation
  - Calibration procedures/processes
  - Survey instrument management and control practices
  - Data collection/management techniques and practices
  - Use of trend analyses
  - Quality assurance procedures and practices
  - Consistent processes and definitions used for communicating the results of characterization/survey activities – e.g., “green tag” means unrestricted release *only*.

- Clearly define areas and activities that have the potential to contaminate property
  - Revisit work practices. Minimize zones and areas in which radiation work is permitted.
  - Limit amount of tools, materials and equipment in radiation areas. Limit prolonged storage of items in these areas.
  - Redefine the extend of radiation areas based on empirical data.
  - Formalize the use of process knowledge to delineate radiation work areas and for use in material/facility characterization exercises.

- Provide for independent verification of site radiological clearance program activities.
  - Independent verification must be independent of the contractor operating the site radiological clearance program to eliminate any real or perceived conflicts of interest.
  - Verification system must consider technical and administrative requirements.
  - Program must be based on a sound and peer reviewed statistical approach such as ANSI Z1.4-2003, "Sampling Procedure and Tables for Inspection by Attributes."

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- Improve record keeping and reporting associated with the release of property
  - Clearance and release events must be traceable
  - Recipients of materials and equipment must be formally advised of the origin of the items they are receiving through transfer or sale.
  - Quantities and types of materials and equipment released must be made available to the public on a periodic basis (e.g., annually)

- Putting it Altogether – 7 Step Process for clearance of materials from radiological control:

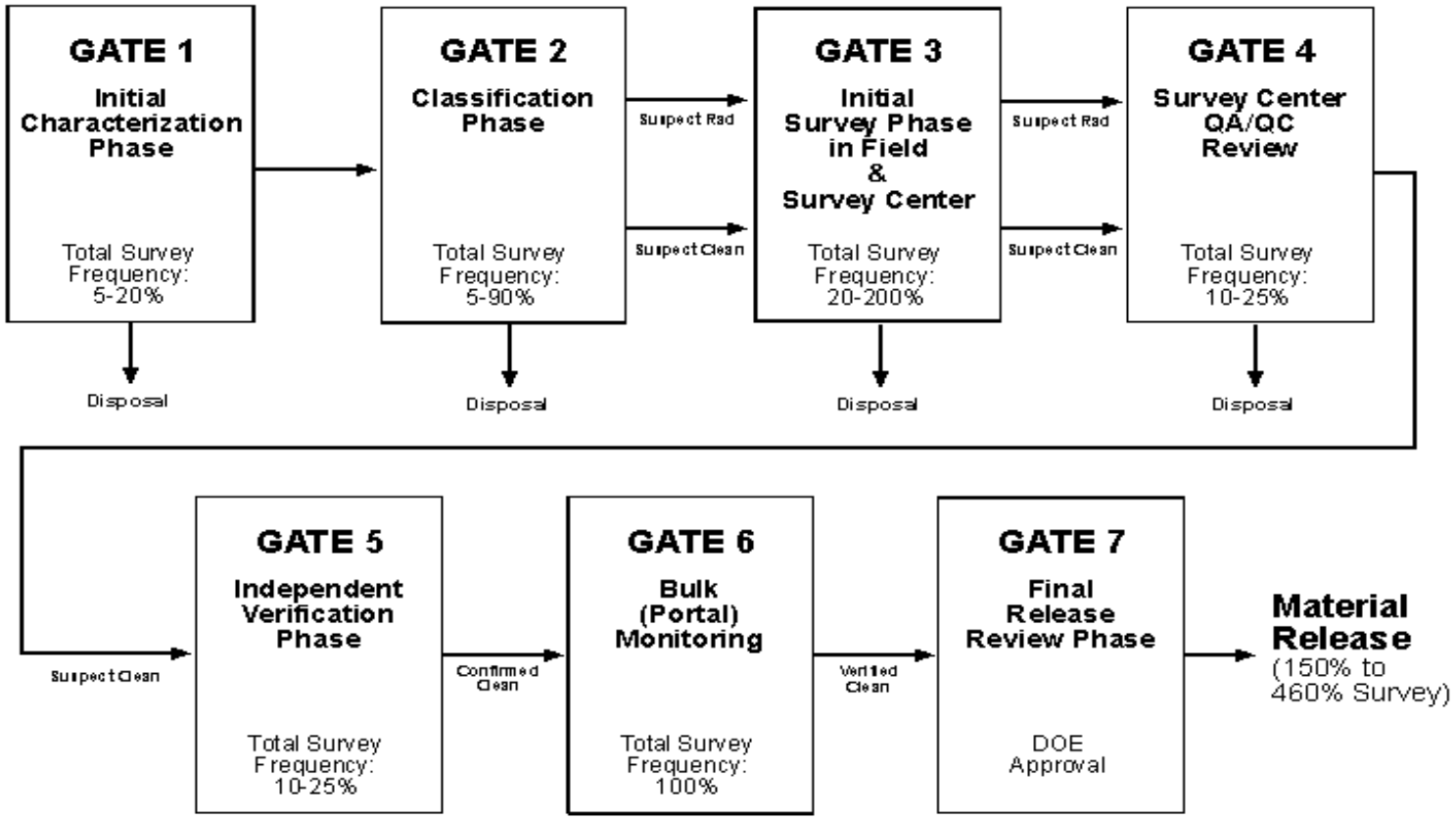

Figure 1. Impacted Scrap Metal Release Protocol Process Flow

- Benefits
  - Formalizes the application of process knowledge in the clearance process
  - Establishes a graded approach to clearance processing ensuring resources are allocated to those items most at risk for contamination
  - Based on sound statistical approach. Reproducible results.
  - Incorporates Independent Verification increasing clearance program integrity and reliability
  - Audit trail of each release event is created and archived.
  - System considers all aspects of radiological clearance
    - Technical
    - Administrative
    - Public Confidence

- Summary
  - The major challenge in managing potentially contaminated materials and equipment is earning and maintaining public confidence.
  - Public confidence relies not only on technical competence but on perception of competence and public interest.
  - Application of sound scientific methods are essential to establish the basis for confidence, but are insufficient by themselves
  - “Professional antagonism” of a truly independent verification program readily builds public confidence in clearance programs
  - Record keeping and transparency of operations is essential to maintaining public confidence.