INVESTMENT RECOVERY PORTSMOUTH

Investment Recovery and Recycling at PORTS

SSAB Waste Disposition Subcommittee

May 10, 2011

Regulatory Drivers

- Pollution Prevention Act of 1990

  …The Congress hereby declares ***pollution that cannot be prevented should be recycled in an environmentally safe manner***, disposal or other release into the environment should be employed only as a last resort…

- Executive Order 13514

  …***Diverting at least 50% of construction and demolition materials and debris by the end of fiscal year 2015***…

- Department of Energy Order 450.1A

  …***protect environmental resources, minimize lifecycle cost of DOE programs,*** and ***maximize operational sustainability*** *by* ***diverting materials suitable for reuse and recycling from landfills*** thereby minimizing the economic and environmental impacts of waste disposal and long term monitoring and surveillance…

Investment Recovery Roles and Responsibilities

- **DOE**
  - Provide direction, over site, support, and policy guidance
  - Ensure the best economic interest of Government while supporting the community

- **Asset Recovery Integrated Project Team (IPT)**
  - Maintain list of opportunities
  - Review Economic Analyses
  - Inform and involve stakeholders
  - Oversee execution
  - Assess performance and document results

- **Fluor B&W PORTS (FBP)**
  - Primary interface with SODI / Community Reuse Organization
  - Screen potential opportunities
  - Integrate with D&D process
  - Provide industry outreach
  - Complete economic analysis
  - Implement decision (execute material clearance operations)

- **SODI**
  - Re-sale / Re-use / Recycle
  - Reindustrialization
  - Economic Development

Investment Recovery and Recycling Goals

- Maximize the recovery of the government's large investment in Gaseous Diffusion Facilities
- Reduce, to the extent practicable, costs to the government for D&D, waste disposal, and long term care of wastes
- Apply savings to fund portions of D&D efforts
- Support job creation and economic development to the extent practical

Investment Recovery – Guiding Principles

- Recycle / Reuse of Equipment and Scrap when:
  - Determined to be in the economic best interests of the Government
  - Meets DOE's policies and requirements guiding recycle/reuse
  - End user identified – beforehand – to the extent possible
  - Minimal disruption to D&D schedule and critical path

Investment Recovery Process

1. Compile list of prioritized recycle opportunities
2. Gain approval on disposition pathway for opportunities
3. Complete Cost Benefit Analysis of opportunities
4. Offer / Gain acceptance from SODI for opportunities
5. Revise project schedule and cost (where applicable)
6. Segregate material in advance of demolition (to the extent feasible)
7. Release materials according to DOE guidelines
8. Transfer ownership to SODI or other entity

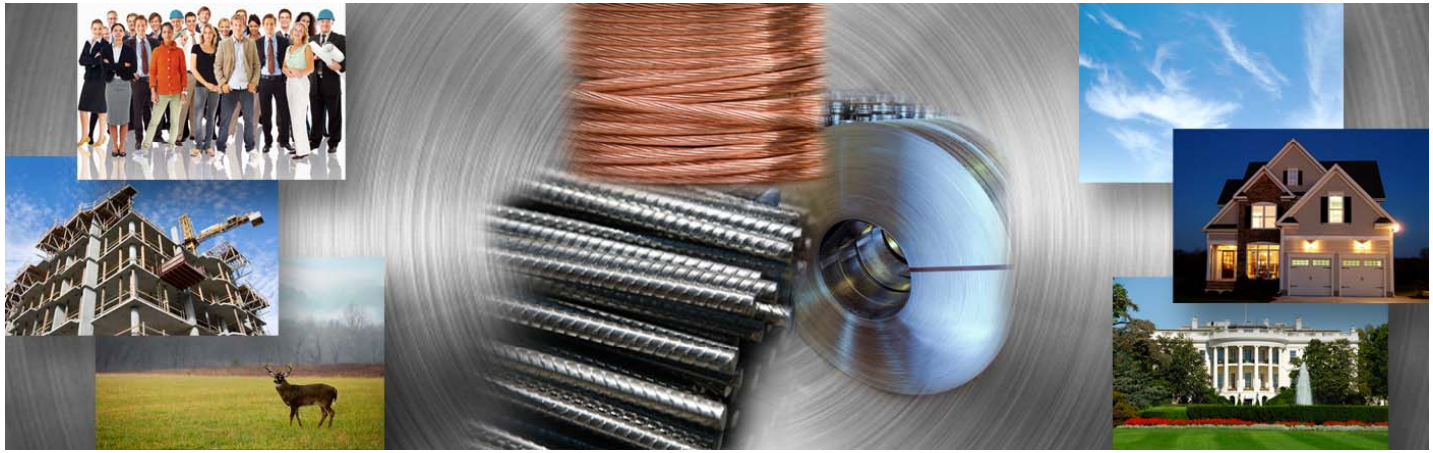
D&D Integration

- Ensure regulatory strategy and decision documents support investment recovery
- Evaluate impact to D&D as part of opportunity analysis
- Integrate approved investment recovery opportunities into D&D
    - Scope
    - Schedule

Economic Analysis

Provides a consistent and structured approach for making defensible decisions regarding the recovery of D&D materials based on demonstrated economic benefit to the government.

Economics



- *Waste Stream Based Cost Analysis of Recycle Opportunities considering:*
  - *Benefits*
    - *Market Scrap Value*
    - *Equipment Reuse / Resale*
    - *Cost Avoidance*
      - *Additional packaging / transportation*
      - *On or Off-site disposal*
  - *Costs*
    - *Segregation*
    - *Decontamination / Radiological Clearance*
  - *Other Considerations (Non-Economic)*
    - *Disposal Cell Volume*
    - *Impact to D&D sequence / schedule*

Recent Investment Recovery (Recycling) Successes at PORTS

- 18 transformers - ~ $1.4M of $1.8M received to date
- Transformer oil – 270,000 gallons recycled- ~ $180K
- East X-533 metal pile – 2.4 M lbs. recycled - ~ $1 M
- West X-533 metal pile – 5.4 M lbs. – Estimated Fair Market Value $3M

Materials Clearance

- Understand and apply metals suspension and metals moratorium requirements
- All materials offered for recycle must be rigorously reviewed, radiological surveyed and free released for recycle
- No hazardous materials or wastes may be present (i.e., Asbestos Containing Material (ACM), and Polychlorinated Biphenyls (PCBs)
- Materials from radiological areas will be processed according to 10 CFR 835 and will comply with DOE Order 458.1
- Consequences of being wrong and releasing contaminated material is severe. <u>We must be 100% right with every decision.</u>

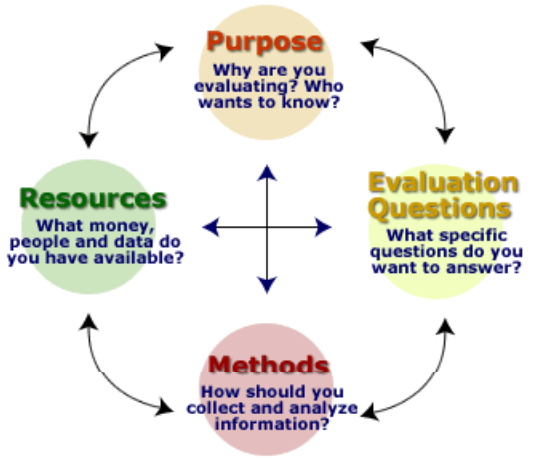
List of Future Opportunities / Types

Six Categories – Each have unique considerations

1. Outside Radiological Area – Readily accessible in advance of demolition
   - Not Subject to Metal Moratorium or Suspension
2. Outside Radiological Area – Must be removed as part of demolition
   - Example: Structural Steel, other equipment
   - Not Subject to Metal Moratorium or Suspension
3. Inside Radiological Area – minimal or some expectation of contamination – Readily accessible in advance of demolition
   - Example: Copper cable; motor controls
   - Moratorium and/or Suspension may apply
4. Inside Radiological Area – minimal or some expectation of contamination – Must be removed as part of demolition
   - Example: Structural Steel from Process Buildings
   - Moratorium and/or Suspension may apply
5. Inside Radiological Area – highly contaminated – can be segmented in advance of demolition
   - Example: Condensers and Compressors
   - Moratorium and/or Suspension may apply
6. Inside Radiological Area – highly contaminated – must be removed with demolition
   - Example: Structural Steel other equipment
   - Moratorium and/or Suspension may apply

Update of Previous Investment Recovery/Recycling Initiatives

- SSAB recommended in May 2010 that an engineering evaluation be conducted for constructing a metal melter
- DOE responded in September 2010 that various alternatives for metal disposition would be evaluated, including melting
- Melter option was further evaluated



Why Melting Looked Promising

- Ingots could potentially be re-manufactured for use in nuclear industry or sold in the future
- Creates local jobs
- Reduces onsite disposal cell size or reduces transportation for offsite disposal

Challenges of Melting

- Capital intensive with high operating costs (to build, house, power and feed)
- Estimated three-year minimum lead time from start of design to startup.
- Would have impact on D&D requirements (size reduction and sorting) and sequence.
  - Staging
  - Clean-cutting of metal
  - Smaller dimensions/more cutting
- Must be managed for criticality concerns before, during and after melting (concentration of U^{235} in slag)
- Potential increase of exposure to workers
- Melting is not a scrap metal suspension compliant approach
  - Will produce volumetrically-contaminated ingots

Preliminary Melting Evaluation

- Likely not the best option for copper, steel beams, and other steel items
- Process equipment would make better feed material for melter from an engineering perspective
- However, preliminary analysis indicates that it would cost approximately $270M to build a melter, which does not include operating, housing, and feeding costs
- If $270M applied to all process equipment, motors, and piping this would be approximately $900/cubic yard for construction only. This is a best case cost estimate, because it is unlikely that X-326 equipment (due to Tc-99) or any motors would be melted.
- Best case melting scenario give $900/cubic yard processing cost. This is approximately 90x sanitary landfill cost and 30-50x cost of on-site disposal.