International Radioactive Metals Acceptance Guidelines

Revision 8

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- [ ] New
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- [ ] Rewrite
- [ ] Cancellation

Reason for Cancelation: _____

Table of Contents

1. RADIOACTIVE METALS MANAGEMENT

1.1. Purpose and Scope

This document provides Radioactive Metals Acceptance Guidelines (RMAG) for Energy*Solutions*, Services, Inc. (ES) Tennessee-based Commercial Waste Processing (CWP) facility at Bear Creek. The RMAG provides minimum requirements that international customers must meet to ship metal to this facility.

ES currently has two options by which it can receive and process/recycle metal from international customers. The first option is a general license and the second is a specific license, as defined below.

- Radiological acceptance criteria provided in Table 1.
- Special waste types requiring prior ES evaluation and approval before shipping listed in Table 2 – Waste Requiring Prior Approval and Possibly Special Pricing.
- Components, Materials, and Wastes with Special Restrictions per: 10 CFR 110.8 listed in Attachment 7.2, Table 3**.**
- Specific packaging guidelines defined in Attachment 7.1.
- Examples of incinerable material, compactable material, and metals for recycle material can be found in Attachment 7.3, Table 4 (this table simply lists the most common of each category of material.
- Additional restrictions beyond those discussed in the RMAG apply to materials listed in Attachment 7.2, Table 3; Components, Materials, and Wastes with Special Restrictions per 10 CFR 110.8, List of Nuclear Facilities and Equipment under NRC Export Licensing Authority.

Radioactive metal that does not meet the RMAG may be accepted after evaluation of data **PRIOR** to the shipment of metal to the ES facilities. The radioactive waste received at ES that does not meet the RMAG and has not been evaluated and approved by ES may be subject to additional processing surcharges and/or returned at the generator's expense.

All metal must be shipped in accordance with TS-R-1, International Atomic Energy Agency (IAEA): Regulations for the Safe Transport of Radioactive Material.

Each generator must have authorization from their regulator to accept returned material, processed or unprocessed, prior to shipping to the Bear Creek Facility. Each generator who ships metal to ES for processing must have a valid contract mechanism in place that includes a Return of Material clause as prescribed by ES' Tennessee Radioactive Materials licenses.

Each generator who ships radioactive waste to ES for processing must have a valid contract mechanism in place that includes a Return of Material clause as prescribed by E*S*' Tennessee Radioactive Materials licenses. Each generator must have authorization from their regulator to accept returned radioactive waste, processed or unprocessed, prior to shipping to the ES facilities.

1.2 OOWAG Expiration

OOWAG approvals generally expire one year after approval and will need to be re-evaluated by both the customer and OOWAG Committee after one year.

1.3 ES Facility Information

ES Facilities	*Main Office*
Energy*Solutions* Services, Inc. Bear Creek Operations (BCO) 1560 Bear Creek Road Oak Ridge, TN 37830	Phone Number.: 865-481-0222 Customer Service: 865-220-1230 Customer Service Fax: 865-220-1612
Energy*Solutions* Services, Inc. Gallaher Road Facility (GRF) 628 Gallaher Road Kingston, TN 37763	Phone Number: 865-481-0222 Customer Service: 865-220-1230 Customer Service Fax: 865-220-1612

2. REFERENCES AND FORMS

2.1. References

None

2.2. Forms (can be found at http://www.energysolutions.com/)

2.2.1. WAG-502-F1, Shipment Summary Form-International

2.2.2. WAG-502-F3, Nonstandard Material Approval - International

3. SHIPPING, PACKAGING, AND DOCUMENTATION REQUIREMENTS

3.1. A completed Shipment Summary Form (WAG-502-F1) shall accompany all shipments.

3.2. A valid Category 2 Tennessee Radioactive Materials License-for-Delivery unless ES acts as a broker on behalf of the generator.

3.3. DOE/NRC Form 741 for quantities of Special Nuclear Material (SNM) exceeding 0.49 grams per shipment or Source Material exceeding 0.99 kilograms per shipment (10 CFR 70.4 and 10 CFR 40.4– Definitions).

3.4. Test documentation and/or certification for any package requiring such paper work as set forth in either IAEA (international standards) or 49 CFR (American Standards) must accompany shipment including such packages (e.g., Type A Package).

3.5. When metals are imported for recycling under a General License (as specified in 10 CFR 110.20 – General license information), specific care must be taken to minimize non-recyclable material used for shoring or contamination control.

4. RADIOACTIVE METALS ACCEPTANCE GUIDELINES

NOTE

See Table 2 for waste that requires advance approval from ES prior to shipment. Contact your Sales Director or Account Executive regarding advance approval and receipt schedules.

4.1. Resource Material accepted for recycling

4.1.1. Bulk Metals Recycling

a. Bulk metals (pipe, pumps, valves, tools, file cabinets, etc.) may be melted for recycling. Carbon steel and stainless steel are the preferred alloys for recycling.

b. Metal pieces larger than 4.88 meters x 2.44 meters x 2.44 meters (16 ft x 8 ft x 8 ft) require approval prior to shipping.

c. Metal piece in excess of 9,080 kilograms (20,000 pounds) per single piece require approval prior to shipping.

d. The following metals are specifically excluded from import: (incidental quantities of the metals listed below may be accepted on a case-by-case basis and MUST be approved prior to shipment)

Not Candidates for Melting
Non-ferrous metals such as brass, bronze, aluminum, cadmium, copper, Inconel, monel, nickel, and chromium
Molybdenum
Uranium metals
Tantalum
Tungsten
Zirconium
Titanium
Magnesium thorium
Metals exceeding 20 mR/hr contact
Metals coated with asbestos
Lead
Galvanized metal with zinc weight percentage >1% of the galvanized metal weight
Stellite
Tin
Oil or solvent contaminated metals
Crushed metal items that contain nonmetallic materials
Alloys with melting points above 1649 degrees C
Bulk metals containing >2% incinerable by weight (e.g. wire insulation, paint, other coatings)
Metal items containing/coated with 50 ppm or greater levels of PCBs must have coating removed

4.1.2. Lead (Pb)

a. Lead bricks, sheets, and shapes that have not been deformed, melted, or significantly gouged are accepted for recycling and beneficial reuse. All other lead shapes or items will be evaluated on a case-by-case basis. Lead shot, wool and blankets are not accepted for recycle.

b. Lead shall be packaged separately from non-lead materials. The lead package must be labeled as Lead.

c. Lead-encased metal shapes (LEMS) are accepted for removal of the encasing material and survey and recycling. All LEMS are considered OOW and require approval prior to shipment.

d. Where possible schematic diagrams should be provided for all LEMS prior to shipping. Each LEM shall be marked so it can be linked to the provided diagram(s).

4.1.3. Large Components for Recycling

ES will evaluate all large components >18,100 kgs (> 39,900 pounds) and will not fit into a standard ISO freight container) for receipt on a case-by-case basis for surface preparation and recycling. Specific examples of large components include heat exchangers, steam generators, low pressure turbines, tanks, closed vessels, and reactor pressure vessels.

4.2. Stored or Residual EnergySolutions

All potentially hazardous stored or residual energy present in any waste for processing, and especially equipment that has not been disassembled, must be identified. Systems, components, or equipment, including batteries which have energy must be relieved, drained, disconnected, restrained, and otherwise rendered deactivated and stable. Hazardous energy items shall be marked as "deactivated" or be marked "Danger- hazardous energy" if hazardous energy has not been addressed.

Potential stored energy would include electrical, mechanical, pneumatic (air), hydraulic, steam, gravity, etc. Examples include springs, static eliminators, capacitors, batteries, elevated movable machine parts, hydraulic systems, pressurized liquid/gas systems, cylinders, etc.

Information such as technical manuals, drawings, or manufacturer information related to equipment with stored or residual energy must be provided to ES OOW for evaluation prior to the shipment of waste or equipment with stored or potential energy. Any removal, disabling, or by-passing of a barrier or safety device intended to protect individuals from stored or residual energy shall be identified.

If the potential energy cannot be released by the customer, then a Special Quote shall be required prior to receipt of the waste or equipment.

4.3. Metals Expressly Prohibited from Import

Metals contaminated with Beryllium and Polychlorinated Biphenyls (PCB) are expressly prohibited from import, as well as wastes defined in 40 CFR 261 as Resource Conservation and Recovery Act (RCRA), and wastes defined in U. S. Code: Title 15 Chapter 53 - Toxic Substances Control.

5. RADIOLOGICAL GUIDANCE

Radiological acceptance criteria are defined in Table 1, Radiological Acceptance Criteria – SI Units. Levels of radiation and radionuclide concentrations exceeding those detailed in Table 1 may be accepted on a case-by-case basis, but MUST be approved prior to shipment. (WAG-502-F3, Nonstandard Material Approval – International).

Table 1. Radiological Acceptance Criteria – SI Units

A. RADIATION AND CONTAMINATION LEVEL OF WASTE		
Waste Type	**Contact Dose Rate with Waste**	**Contamination, Fixed or Removable (Bq/cm^2)**
Metal for Recycling through Melting	≤ 200 µSv/hr	≤8 β–γ ≤1 α
Dry, Active Wastes for Processing	≤1000 µSv/hr	Not Applicable
Lead for Casting	≤ 50 µSv/hr	0.1 α for Uranium and daughters, 0.08 α for transuranics and Thorium, and less than 4 β–γ

B. RADIONUCLIDE CONCENTRATION	
Radionuclide concentration per package shall not exceed the following limits without prior evaluation and approval.	
Metals for Recycle	**Limiting Values**
All Nuclides	≤ 5000 Bq/gm
Co-60	≤ 40 Bq/gm
Cs-137	≤ 5000 Bq/gm
Ni-63	≤ 5000 Bq/gm
C-14	≤ 1000 Bq/gm
H-3	≤ 1000 Bq/gm
Sr-90	≤ 35 Bq/gm
Pu-241	≤ 800 Bq/gm
Total Transuranics (sum of Am-241, Pu-238. Pu-239. Cm-243. Cm-244)	≤ 20 Bq/gm
Special Nuclear Material	≤ 0.49 grams
Source Material	≤ 0.99 kgs

6. WASTES REQUIRING PRIOR APPROVAL

The items listed in Table 2 require advance approval from ES prior to shipment. Additionally, these items shall be specifically identified on the Shipment Summary Form (WAG-502-F1), which is to be included with the shipment. Contact your account executive regarding advanced approval and receipt schedules. If the following material is shipped to ES without prior approval, it will be subject to waste processing surcharges or returned at the generator's expense.

Table 2 – Waste Requiring Prior Approval and Possibly Special Pricing Consideration

Ref. Section	Requirement
General	Non-radiological hazards shall be identified
General	Due to the non-routine nature of the types of wastes generated during decommissioning projects, ES reserves the right to review for approval radioactive metals for recycle that originate from decommissioning projects
General	All cask/OOW shipments (minimum of 3 days prior to arrival of shipment)
General	Wooden or fiber outer containers and poly-wrapped flatbed loads
General	Shipments requiring specialty container or dunnage returns
All	Waste that does not meet the ES WAG or requires expedited processing
4.1.1.b	Metal pieces larger than 16 ft. × 8 ft. × 8 ft.(4.88 meters x 2.44 meters x 2.44 meters) per individual piece or combination of integral pieces
4.1.1.c	Metal pieces heavier than 20,000 lbs. (9,080 kilograms) per single piece
4..1.1.d	Bulk Metals that require special evaluation
4.1.2	Lead, LEMS
4.1.3	Large Components

7. ATTACHMENTS

7.1. Specific Metal Packaging and Shipping Guidelines

7.2. Table 3 — Components, Materials, and Wastes with Special Restrictions per: 10 CFR 110 Import/Export Evaluations for Applicability of Appendices

7.3. Table 4 — Examples of Metal Melt Material

Attachment 7.1, Specific Metal Packaging and Shipping Guidelines

All metals shipped to ES, shall be delivered in qualified containers per IAEA standards and 49 CFR standards. As a minimum, containers shall meet IP-1 standards. Deviations shall require prior written approval from ES.

Any equipment not shipped in its original or intended configuration should be noted on manifest additional notes page or the OOW form. An example would be a compactor or baler that was normally operated in a vertical configuration and now being shipped in a horizontal configuration possibly creating additional pressure applied to certain components.

Attachment 7.2, Table 3. Components, Materials, and Wastes with Special Restrictions per: 10 CFR 110.8, List of Nuclear Facilities and Equipment under NRC Export Licensing Authority

App.	Description
A	Nuclear Reactor Equipment
B	Gas Centrifuge Enrichment Plant Components
C	Gaseous Diffusion Enrichment Plant Assemblies and Components
D	Aerodynamic Enrichment Plant Equipment and Components
E	Chemical Exchange or Ion Exchange Enrichment Plant Equipment and Components
F	Laser-Based Enrichment Plant Equipment and Components
G	Plasma Separation Enrichment Plant Equipment and Components
H	Electromagnetic Enrichment Plant Equipment and Components
I	Reprocessing Plant Components
J	Uranium Conversion Plant Equipment and Plutonium Conversion Plant Equipment
K	Equipment and Components for the Production of Heavy Water, deuterium, and Deuterium Compounds
M	Categorization of Nuclear Material
N	Lithium Isotope Separation Facilities, Plants, and Equipment
O	Fuel Element Fabrication Plant Equipment and Components

NOTE: See 10 CFR 110 for details

Attachment 7.3, Table 4. Examples of Metals for Recycle

Tanks and Components
Piping
Valves
Empty Waste Drums
Light gauge Metals
Welding rods
Metal cans
Metal mop buckets
Heavy Gauge Tools
Tools

NOTE: Call your ES Technical Representative for questions regarding metals not listed on this table