

## ENGINEERING CALCULATIONS AND ANALYSIS REPORT

ECAR No.:	241	ECAR Rev. No.:	0	Project File No.:	Date
Title: Hazard Classification Document for the TRA-622 Cold Waste Handling Facility					

1.	Index Codes	Building/Type: <u>TRA-622</u>	SSC ID: _____	Site Area: <u>TRA</u>	
2.	Quality Level:	_____			
3.	Objective/Purpose (required element):	This EDF performs a hazard categorization for the TRA-622 Cold Waste Handling Facility in accordance with INL procedures.			
4.	Conclusions/Recommendations (brief summary):	There is no radioactive material in the TRA-622 Cold Waste Handling Facility. Waste materials are surveyed prior to being taken to the facility and redirected elsewhere if radioactivity is detected. Therefore, the facility is categorized as an "Other" facility.			
5.	Review (R) and Approval (A) and Acceptance (Ac) Signatures: (Review and Approval are required. See <i>Obtain Evidence of Reviews, Approvals, and Acceptance</i> in LWP-10200, "Calculations and Analysis," for definitions of terms and significance of signatures.)				
	R/A	Typed Name/Organization	Signature	Date	
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<i>Doc Control</i>		<i>Laura Smith</i>	<i>Laura Smith</i>	5/14/08	

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<b>6. Additional Distribution:</b> (Name and Mail Stop)	<b>Document Control:</b>
<b>7. Scope and Brief Description:</b>  Perform calculations to compare the TRA-622 potential source term to the DOE-STD-1027-92 threshold quantity values and 40 CFR 302.4 reportable quantities in order to categorize the facility according to LWP-18101.	
<b>8. Design Inputs and sources (required elements):</b> For example, a. Quality level source: b. NPH category and source (Performance Category per DOE-STD-1020 and/or Seismic Design Category per ANSI/ANS 2.26): c. Load scenarios and Acceptance Criteria:	
<b>9. Results of literature searches or other applicable background data (e.g., drawings, field inspections, requirements, conversations) (required element):</b>  TRA-EDF-99013, "TRA-604, -611, -612A, -622, -641, -648, -654, -662, -663, -664, -703, -753, -760, and -764 Radiological Source Term Determinations," Revision 0, March 2000.	
<b>10. Assumptions (required element):</b> None	
<b>11. Identification of computer calculations (required elements):</b> a. Computer type: Dell Optiplex GX620 b. Computer program name and revision: Excel c. Inputs (may refer to an appendix): Above referenced EDF d. Outputs (may refer to an appendix): Table 1 of document e. Evidence of, or reference to, computer program verification: N/A f. Bases supporting application of the computer program to the specific physical problem: None	
<b>12. Body of the calculations and analysis, discussion of any computational modeling (may refer to an appendix):</b>  See following pages	
<b>13. Recommendations:</b>  Remove the TRA-622 Cold Waste Handling Facility from LWP-18005	
<b>14. PE Stamp:</b> N/A	
<b>15. References:</b>  See following pages	
<b>16. Appendixes (including calculations):</b>  Copy of Special Form certification for the sealed source contained in the <i>Niton XLi 800 Series Alloy Analyzer</i>	

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### 1. Introduction

This document presents the results of a Hazard Categorization for the Reactor Technology Complex (RTC) Cold Waste Handling Facility, TRA-622. The facility categorization is based on radiological inventory associated with the facility. The evaluation is necessary in order to determine the need for further safety analysis in accordance with NS-18101,<sup>1</sup> "INL Safety Analysis Process," and compliance with and enforceability under Subpart B of 10 CFR 830.

### 2. Facility Description

TRA-622 is a 1,339 ft<sup>2</sup> masonry building activated in 1952. The facility has one floor. The facility houses a cold waste counting operation and processing of non-hazardous wastes. TRA-622 adjoins the TRA-616 Cafeteria through a common concrete block wall on the north side of TRA-616. TRA-622 was originally built as a warehouse for TRA operations, and currently provides an area to process cold (non-radioactive) waste awaiting shipment out of RTC.

A dry-pipe fire suppression system provides protection for both TRA-616 and TRA-622. The sprinkler system is supplied by a system riser located in an attached riser building located on the east side of the building. The building's sprinkler heads are ordinary temperature (165°), 1/2-in, orifice.

### 3. HAZARD IDENTIFICATION AND ANALYSIS

The hazard categorization process is performed to determine the level of safety analysis, the safety basis documentation, and the level of review and approval required to support operations of the facility. Hazard categorization as required by 10 CFR 830 is performed using the methodology described in DOE Standard DOE-STD-1027-92.<sup>2</sup> The hazard categorization is performed by making a direct comparison of the radioactive material inventory within the facility or activity to the Hazard Category 2 and 3 TQVs listed in DOE-STD-1027-92. The facility is further categorized per NS-18102<sup>3</sup> by comparing quantities of radioactive material inventory to the reportable quantities (RQs) in Appendix B of 40 CFR 302.4.<sup>4</sup>

If the radioactive material inventory of the facility does not exceed the threshold quantities for Hazard Category 3 or above, it is categorized as a "radiological facility" for the purpose of safety analysis. However, if the radioactive material inventory of the facility also does not exceed the criteria in Appendix B of 40 CFR 302.4, it is then further designated as an "other facility" for the purpose of safety analysis.

DOE-STD-1027-92 allows certain exclusions from a facility's radioactive material inventory when determining the hazard categorization of a facility or activity.

- A. Sealed radioactive sources that are engineered to pass the Special Form testing specified by the Department of Transportation (DOT) in 49 CFR 173.469 or testing specified by ANSI N43.6, "Sealed Radioactive Sources, Categorization,"<sup>5</sup> may be excluded from summation of a facility's radioactive inventory.
- B. Hazardous materials used in exempted, commercially available products, should not be considered part of a facility's inventory. These materials are described in 10 CFR 30 Parts 30.11-30.19 and include timepieces, illumination devices, thermostats, electron tubes, microwave receiver tubes, etc.

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- C. Material contained in DOT Type B shipping containers (with or without overpack) may also be excluded from summation of a facility's radioactive inventory if the Certificates of Compliance are kept current and the materials stored are authorized by the Certificate.

The TRA-622 Cold Waste Handling Facility does not exclude any radioactive materials from inventory.

**3.1. Hazard Evaluation**

No radioactive materials are used or stored in the TRA-622 Cold Waste Handling Facility. Routine surveys for radioactive materials are conducted on waste prior to transfer to TRA-622. If radioactive materials are detected, the waste is redirected to a facility that is appropriate for the handling of radioactive materials.

In TRA-EDF-99013,<sup>6</sup> the quantities of radioactive material that could possibly enter the TRA-622 facility were estimated. The estimate is based on surveys of contaminated green scrub clothing that would normally be sent elsewhere. It was estimated that the facility could hold at least 30 full bags of these contaminated scrubs. The following table presents the estimated radioactive source term quantities due to storage of the contaminated clothing, and compares them to the DOE-STD-1027-92 Hazard Category 3 threshold quantities values (TQVs) and the 40 CFR 302.4 reportable quantities (RQs), and calculates the sum-of-ratios for each.

**Table 1. TRA-622 Cold Waste Handling Facility potential radioactive material**

Nuclide	Quantity (Ci)	HC3 TQV (Ci)	HC3 Ratio	RQs (Ci)	Ratio
Co-60	3.2E-06	2.8E+02	1.1E-08	1.0E+01	3.2E-07
Cs-137	2.4E-07	6.0E+01	4.0E-09	1.0E+00	2.4E-07
Sr-90	4.5E-09	1.6E+01	2.8E-10	1.0E-01	4.5E-08
Gd-153	2.2E-09	1.0E+03	2.2E-12	1.0E+01	2.2E-10
Eu-152	7.2E-09	2.0E+02	3.6E-11	1.0E+01	7.2E-10
Eu-154	7.2E-09	2.0E+02	3.6E-11	1.0E+01	7.2E-10
Eu-155	4.5E-09	9.4E+02	4.8E-12	1.0E+01	4.5E-10
Ir-192	1.3E-09	9.4E+02	1.4E-12	1.0E+01	1.3E-10
Sum of Ratios=			1.6E-08	Sum of Ratios=	6.1E-07

On the basis of the potential source term shown in Table 1, the quantity of any radioactive materials entering the TRA-622 Cold Waste Handling Facility is very small and will be administratively limited to less than the reportable quantities (RQs) of isotopes specified in Appendix B of 40 CFR 302.

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### 4. Conclusion

The radioactive materials that could enter the TRA-622 facility are only small quantities that are well below the RQs in Appendix B of 40 CFR 302. The facility is therefore categorized as an "Other" facility. A safety analysis is not required for compliance with and enforceability under Subpart B, "Safety Basis Requirements," of 10 CFR 830, in accordance with NS-18101. Materials that come into the facility shall be monitored to ensure the facility radioactive material inventory remains below the 40 CFR 302 sum-of-ratios value of one.

### 5. References

1. NS-18101, "INL Safety Analysis Process."
2. DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports," U.S. Department of Energy, December 1992 (including Change 1, September 1997).
3. NS-18102, "INL Facility Hazard Categorization Process."
4. Title 40 of the Code of Federal Regulations Part 302, "Protection of Environment, Designation, Reportable Quantities, and Notification," Office of Federal Register.
5. ANSI N43.6, "Sealed Radioactive Sources, Categorization," 1997.
6. TRA-EDF-99013, "TRA-604, -611, -612A, -622, -641, -648, -654, -662, -663, -664, -703, -753, -760, and -764 Radiological Source Term Determinations," Revision 0, March 2000.