



**Department of Energy**

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**FEB 21 2006**

Mr. James P. Bearzi, Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6303

Subject: Supplementary Comment of the U.S. Department of Energy and Washington TRU Solutions LLC, Regarding the New Mexico Environment Department's Intent to Issue a Permit Pursuant to Public Notice 05-16

Dear Mr. Bearzi:

Enclosed is one additional comment on the draft Permit issued by the New Mexico Environment Department (NMED) on November 23, 2005. This comment is intended to supplement Permittees' January 17, 2006, comments.

With this supplemental comment the Permittees identify the CNS 10-160B shipping cask as another mechanism by which prohibited items could be returned to the generator/storage sites or other off-site facility.

Along with the supplemental comment the Permittees have also included the revised CNS 10-160 B Certificate of Compliance and Safety Evaluation Report.

If questions arise, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in cursive script that reads "David C. Moody".

David C. Moody  
Manager

Enclosure

cc: w/enclosure  
T. Hughes, NMED \*ED  
C. Noble, NMED ED  
C. Padilla, NMED ED  
J. Kieling, NMED ED  
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CBFO M&RC

\*ED denotes electronic distribution

**Supplementary Comment of the U.S. Department of Energy and Washington TRU Solutions, LLC, Regarding the NMED's Intent to Approve a Class 3 Permit Modification Request Pursuant to Public Notice 05-16**

**Introduction**

On November 23, 2005, the New Mexico Environment Department (NMED) issued Public Notice No. 05-16 stating that it intends to approve a Class 3 modification to the Hazardous Waste Facility Permit (HWFP) for the Waste Isolation Pilot Plant (WIPP), EPA ID No. NM4890139088. NMED also issued a Fact Sheet setting out the basis for the draft Permit. On January 17, 2006, the Permittees submitted written comments to NMED regarding the November 23, 2005 draft Permit and associated Fact Sheet. This comment is intended to supplement Permittees' January 17, 2006 comments.

**Background**

In issuing the draft Permit, NMED disapproved the Permittees' proposal to perform confirmation activities at the WIPP. NMED stated as follows:

"The Permittees have not adequately explained how they will return or otherwise transport off-site any shipments that contain a nonconforming waste." November 23, 2005, Fact Sheet, page 7 of 9.

NMED's disapproval of the Permittees' proposal to perform confirmation activities at the WIPP also stated:

"The Permittees' statement that if non-compliant waste is detected during waste confirmation activities at WIPP, the Permittees will return the entire shipment or the nonconforming portion of the shipment to a generator or another off-site facility does not provide the procedural detail necessary for NMED to approve waste confirmation at WIPP at this time." November 23, 2005, Fact Sheet, page 7 of 9.

The Permittees January 17, 2006 comments explained three options for return of prohibited items discovered during confirmation activities at the WIPP. The first option was:

"The current NRC Certificates of Compliance (CofCs) for TRUPACT-II and HalfPACT can allow shipment of certain prohibited items and the Permittees note that the requirements for compliance with the current NRC CofCs for TRUPACT-II and HalfPACT are not impacted by the PMR. For example, a liquid prohibited from disposal by Permit Condition II.C.3.a. of the WIPP HWFP may be shippable in compliance with the current CofCs." January 17, 2006, Permittees' Comments, page 2

With this supplemental comment, the Permittees identify the CNS 10-160B shipping cask as one of the shipping packages that could be used for return of prohibited items to generator sites or other off-site facilities, in addition to TRUPACT-II and HalfPACT. The NRC CofC for the CNS 10-160B was revised on December 9, 2005 to provide for the transportation of transuranic (TRU) waste (see Attachment A). The application to revise the CNS 10-160B CofC to allow shipment of TRU waste was submitted on October 26, 2005 and approved by the Nuclear Regulatory Commission (NRC) on December 9, 2005 (44 days).

Permittees' previous comments included a figure depicting a flowchart of procedural steps for return of prohibited items (January 17, 2005, Permittees' Comments, page 3, Figure 1). Figure 1 below is an updated flow chart of how current NRC CofCs for TRUPACT-II, HalfPACT and CNS 10-160B could be used to return prohibited items.

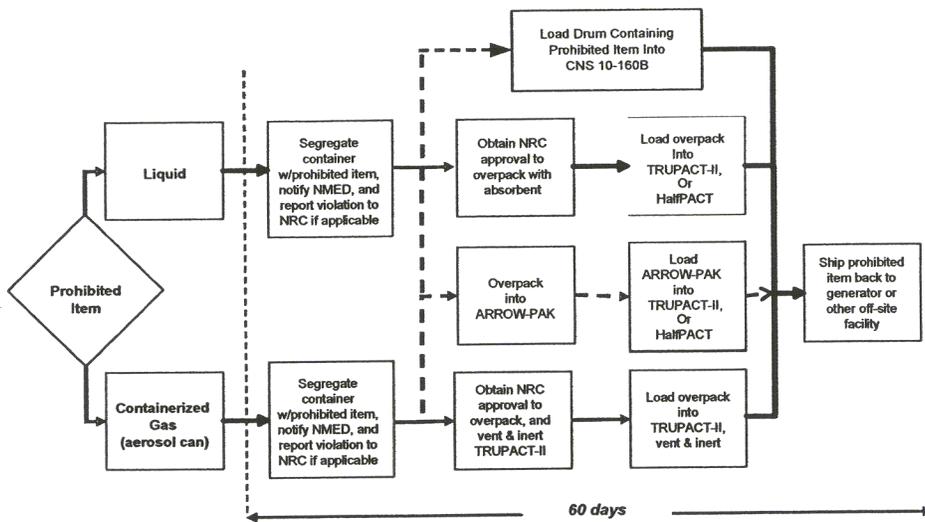


Figure 1– Flow Chart of Procedural Steps for Return of Prohibited Items

**Attachment A**

**NRC Certificate of Compliance No. 9204  
Packaging Model No. CNS 10-160B**

**CERTIFICATE OF COMPLIANCE  
FOR RADIOACTIVE MATERIAL PACKAGES**

1.	a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
	9204	11	71-9204	USA/9204/B(U)-85	1 OF	5

2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
- b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

- a. ISSUED TO (Name and Address)  
Duratek  
140 Stoneridge Drive  
Columbia, SC 29210
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION  
Chem-Nuclear Systems, LLC, application dated  
March 22, 2000, as supplemented.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

- (1) Model No.: CNS 10-160B
- (2) Description

A cylindrical carbon steel and lead shielded shipping cask, designed to transport radioactive waste material. The cask is transported in the upright position and is equipped with steel encased, rigid polyurethane foam impact limiters on the top and bottom. The package has approximate dimensions, shielding, and weight as follows:

Cask height	88 inches
Cask outer diameter	78-1/2 inches
Cask cavity height	77 inches
Cask cavity diameter	68 inches
Overall package height, with impact limiters	130 inches
Overall package diameter, with impact limiters	102 inches
Lead shielding thickness	1-7/8 inches
Gross weight	
(packaging and contents)	72,000 lbs
Maximum total weight of contents, shoring, secondary containers, and optional shield insert	14,500 lbs

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5.(a)(2) Description (Continued)

The cask body consists of a 1-1/8-inch thick carbon steel (ASME SA516 or SA537) inner shell, a 1-7/8-inch thick lead gamma shield, and a 2-inch thick carbon steel outer shell (ASME SA516). The inner and outer shells are welded to a 5-1/2-inch thick carbon steel bottom plate. The cask cavity has an optional 11-gage stainless steel liner. A 12-gage stainless steel thermal shield surrounds the cask outer shell in the region between the impact limiters. The impact limiters are secured to each other around the cask by eight ratchet binders.

The cask lid is a 5-1/2-inch thick carbon steel plate, and has a 31-inch diameter opening equipped with a secondary lid. The primary lid is sealed with a double silicone O-ring and 24 equally spaced 1-3/4-inch diameter bolts. The secondary lid is 46 inches in diameter, is centered within the primary lid, and is sealed to the primary lid by a double silicone O-ring and 12 equally spaced 1-3/4-inch diameter bolts. The space between the double O-ring seals is provided with a test port for leak testing the primary and secondary lid seals.

The optional cask drain and vent ports are sealed with a plug and an O-ring seal.

The package is equipped with four tie-down lugs welded to the cask outer shell. Two lifting lugs and two redundant lifting lugs are removed during transport. The lid is equipped with three lifting lugs which are covered by the top impact limiter and rain cover during transport.

An optional carbon steel shield insert may be used within the cask cavity.

(3) Drawings

The packaging is constructed and assembled in accordance with Chem-Nuclear Systems Drawing No. C-110-D-29003-010, Sheets 1 through 5, Rev. 12.

An optional shield insert is constructed in accordance with Chem-Nuclear Systems Drawing No. C-119-B-0018, Rev. 2.

(b) Contents

(1) Type and form of material

(i) Byproduct, source, and special nuclear material in the form of solids, dewatered resins or process solids, or solidified waste, contained within secondary containers. Explosives, corrosives, non-radioactive pyrophorics, and compressed gases are prohibited. Pyrophoric radionuclides may be present only in residual amounts less than 1 weight percent. The total amount of potentially volatile organic compounds present in the headspace of a secondary container is restricted to 500 parts per million; or

(ii) Radioactive material in the form of activated reactor components.

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5.(b) (2) Maximum quantity of material per package

Type B quantity of radioactive material, not to exceed 3,000 times a Type A quantity. Decay heat not to exceed 100 watts. Total weight of contents, shoring, secondary containers, and optional shield insert not to exceed 14,500 pounds. Contents may include fissile material contaminants provided the mass limits of 10 CFR 71.15, are not exceeded. Plutonium content not to exceed 0.74 TBq (20 curies).

6. Except for close fitting contents, shoring must be placed between the secondary containers or activated components and the cask cavity to prevent movement during accident conditions of transport.
7. The cask primary lid must be secured by 24, and the secondary lid by 12, 1-3/4"-8UNC x 5-3/8" long hex cap screws with a flat washer, torqued to 300 ft-lbs  $\pm$  30 ft-lbs (lubricated). The optional drain and vent port plugs must be torqued to 20  $\pm$  2 ft-lbs.
8. Lift lugs must be removed from the cask body prior to transport.
9. In addition to the requirements of Subpart G of 10 CFR Part 71:
  - (a) Each packaging must meet the Acceptance Tests and Maintenance Program of Chapter 8 of the application; and
  - (b) The package must be prepared for shipment and operated in accordance with the Operating Procedures of Chapter 7 of the application; and
  - (c) The primary lid, secondary lid, and the optional vent and drain seals must be replaced with new seals if inspection shows any defects or every 12 months, whichever occurs first.
10. The package must be leak tested as follows:
  - (a) Prior to each shipment, the package must be leak-tested in accordance with Section 8.2.2.2 of the application. For contents that meet the definition of low specific activity material or surface contaminated objects in 10 CFR 71.4, and also meet the exemption standard for low specific activity material and surface contaminated objects in 10 CFR 71.14(b)(3)(I), the pre-shipment leak-test is not required.
  - (b) The packaging containment system must be leak tested in accordance with Section 8.1.3 of the application prior to first use of any packaging, after the third use, within the twelve month period prior to each use, and after seal replacement.

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11. (a) For any package containing water and/or organic substances which could radiolytically generate combustible gases, a determination must be made by tests and measurements or by analysis of a representative package that the following criteria are met over a period of time that is twice the expected shipment time:

- (1) The hydrogen generated must be limited to a molar quantity that would be no more than 5% by volume (or equivalent limits for other inflammable gases) of the secondary container gas void if present at STP (i.e., no more than 0.063 g-moles/ft<sup>3</sup> at 14.7 psia and 70°F); or
- (2) The secondary container and cask cavity must be inerted with a diluent to assure that oxygen is limited to 5% by volume in those portions of the package which could have hydrogen greater than 5%.

For any package delivered to a carrier for transport, the secondary container must be prepared for shipment in the same manner in which determination for gas generation is made. Shipment period begins when the package is prepared (sealed) and must be completed within twice the expected shipment time.

(b) For any package containing materials with a radioactivity concentration not exceeding that for low specific activity material; and shipped within 10 days of preparation, or within 10 days after venting of drums or other secondary containers; the determination in (a) above need not be made, and the time restriction in (a) above does not apply.

(c) For any package containing TRU the following additional conditions apply:

- (1) Waste content codes and classification, physical form, chemical properties, chemical compatibility, gas distribution, and pressure buildup, container and contents configuration, isotopic characterization and fissile content, must be determined and limited in accordance with Appendix 4.10.2 of the application;
- (2) Each waste container must not exceed the decay heat limits in Section 10 of the applicable site specific appendix to Appendix 4.10.2, or must satisfy the requirements of Attachment B, "Methodology for Determination of Decay Heats and Hydrogen Gas Generation Rates for Transuranic Content Codes," for each site specific appendix to Appendix 4.10.2 as listed below:

Appendix 4.10.2.1 Compliance Methodology for TRU Waste From Battelle Columbus Laboratories,

Appendix 4.10.2.2 Compliance Methodology for TRU Waste From Missouri University Research Reactor,

Appendix 4.10.2.3 Compliance Methodology for TRU Waste Form Energy Technology Engineering Center,

Appendix 4.10.2.4 Compliance Methodology for TRU Waste From Lawrence Livermore National Laboratory,

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Appendix 4.10.2.5 Compliance Methodology for TRU Waste From Idaho National Engineering and Environmental Laboratory;

- (3) One or more filter vents must be installed in the drum payload container. Filter vents must meet the minimum specifications in Section 8, "Payload Container and Contents Configuration" of the applicable site specific appendix to Appendix 4.10.2; and
- (4) The payload containers authorized for shipment of TRU in the Model No. CNS 10-160B are the 30-gallon and the 55-gallon drum. Up to ten payload containers of TRU waste may be packaged in the cask.

- 12. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
- 13. Revision No. 10 of this certificate may be used until December 9, 2006.
- 14. Expiration date: October 31, 2010.

REFERENCES

Chem-Nuclear Systems, LLC, application dated March 22, 2000.

Supplements dated May 10 and November 7, 2000; and January 5 and April 13, 2001.

Duratek supplements dated April 23 and July 24, 2001, June 14, 2002, August 20, 2004, and March 7, April 8, October 26, December 2 and 7, 2005.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Robert A. Nelson, Chief  
Licensing Section  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Date: 12/9/05



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT  
Docket No. 71-9204  
Model No. CNS 10-160B Package  
Certificate of Compliance No. 9204  
Revision No. 11

## SUMMARY

By application dated October 26, 2005, as supplemented December 2 and 7, 2005, Duratek requested an amendment to Certificate of Compliance (CoC) No. 9204, Revision No. 10, for the Model No. CNS 10-160B package. The amendment requested for the approval of a site-specific "10-day controlled-shipment" from Battle Columbus Laboratories. Appendix 4.10.2 of the Safety Analysis Report (SAR) contains the necessary changes for this amendment request.

Based on the statements and representations in the application, the staff agrees that the changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

### Appendix 4.10.2

The applicant modified the text of this Appendix so that the specification of shipping period (number of days from sealing of the cask at the loading facility until opening of the cask at unloading facility) be solely addressed in Attachment C. Prior to this modification, a shipping period of 60 days was specified throughout this Appendix while its Attachment C already mentioned that a shorter, site-specific shipping period could be developed and included in the appropriate site-specific sub tier appendix. The proposed modifications do not affect the intended generality of Appendix 4.10.2.

### Sub Tier Appendix 4.10.2.1

The applicant included a new Attachment C, where a site-specific shipping period of 10 days is proposed for shipments originating from the Battelle Columbus Laboratories Decommissioning Project (BCLDP) waste site. The shipping period encompasses loading, transport, and unloading times. This "controlled shipment" option is based on more stringent administration controls; otherwise, the original 60-day shipping option is still available. In addition, controlled shipments should only be approved if the route distance between shipping site and receiving site is less than or equal to 2283 miles.

Under "controlled-shipment," the loading time (time between the sealing of the inner vessel (IV) of the packaging and the departure of the package from the site) must be accomplished within 24 hours. If this time limit is not achieved, the package must be vented for a time at least equal to the amount of time the IV was sealed before the closure process is restarted. A transport time (time between the departure of the package from the site and its arrival at the receiving site) of 8 days is proposed, based on an analysis of the average truck speed and the distances between several DOE sites and the WIPP site, and relying on the establishment of administrative controls to guarantee fast responses. Once the package has arrived at the

receiving site, the unloading time (time between receiving the package and starting to unload) must not be exceed 24 hours.

The applicant addresses several expected factors (such as vehicle inspections, fueling, meals, driver relief, and state inspections) and potential factors (such as adverse weather, vehicle accidents, mechanical problems, driver illness) that may adversely challenge the 8-days transport period that is being proposed. It is imperative that appropriate administrative controls be established to guarantee successful shipments. The applicant proposes the use of DOE TRU waste transportation protocol for controlled shipments in addition to the TRANSCOM system used by DOE TRU waste transporters which provides continuous tracking of the shipment during transport.

Based on the proposed "10-day controlled-shipment," a new set of hydrogen gas generation rate and thermal characteristics are required from the BCLDP content codes prior to loading for transportation as shown in Table 1.

Table 1: Allowable Limits (10-day controlled-shipment)

Content Code	Hydrogen Gas Generation Limit per Drum (mol/s)	Dose $\leq$ 0.012 watt.year		Dose $>$ 0.012 watt.year	
		Decay Heat Limit per Drum (watts)	Decay Heat Limit per Cask (watts)	Decay Heat Limit per Drum (watts)	Decay Heat Limit per Cask (watts)
<b>BC 121A</b>	6.848E-8	0.164	1.64	0.482	2.26 <sup>a</sup>
<b>BC 121B</b>	9.691E-8	0.277	2.26 <sup>a</sup>	0.814	2.26 <sup>a</sup>
<b>BC 312A</b>	5.431E-8	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>	— <sup>b</sup>
<b>BC 314B</b>	5.431E-8	1.142	11.42	1.142	11.42
<b>BC 321A</b>	5.431E-8	0.197	1.97	0.402	2.26 <sup>a</sup>
<b>BC 321B</b>	5.431E-8	0.371	3.71	0.417	4.17
<b>BC 322B</b>	5.431E-8	34.27	100.0	34.27	100.0

<sup>a</sup> constrained by total decay heat that will comply with design pressure limit.

<sup>b</sup> no decay heat limits due to unknown G value; compliance must be demonstrated by measurement of hydrogen generation rate per Section 4 of Attachment B.

The original limits based on 60-day shipping period (and shown in Table 10-1A of the application) still apply, in case the "10-day controlled-shipment" is not an option.

The staff independently reproduced/verified most of the results presented by the applicant and agrees with the proposed new hydrogen generation rate and decay heat limits under controlled shipment.

No other changes were made to any other parts of the SAR.

**CONDITIONS**

Condition No. 13 was added to the certificate to authorize use of the previous revision of the certificate for a period of approximately one year.

**CONCLUSION**

The Certificate of Compliance has been revised to reference Revision No. 20 of the SAR with the associated changes. The changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9204, Revision No. 11  
on December 9, 2005.