



COLUMBIANA HI TECH LLC

Nuclear Manufacturing Excellence

71-9291

July 25, 2006

DWO-06-029

Bill Brach, Director
Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Cc: Director, Document Control Desk, SFPO (without attachments)

Re: Certificate of Compliance No. 9291 Rev 5 for the Model No. Liqui-Rad (LR)
Transport Unit Package. (copy attached)

Mr. Brach,

Columbiana Hi Tech, LLC would like to request a renewal of the above noted Certificate of Compliance.

A consolidated SAR was submitted as a previous licensing action to upgrade the approval to a -96 status. This approval was received on March 3, 2006 (C of C Rev 5). No changes have been made to the package since this submittal and approval.

Should you have any questions concerning this request, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink, appearing to read 'DWO'.

Donald W. Olson
President
Columbiana Hi Tech

UNISSO1



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 3, 2006

Mr. Donald W. Olson
President
Columbiana Hi Tech, LLC
1802 Fairfax Road
Greensboro, N.C. 27407

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9291 FOR THE MODEL NO.
LIQUI-RAD (LR) TRANSPORT UNIT PACKAGE

Dear Mr. Olson:

As requested by your application dated August 5, 2005, as supplemented February 17, 2006, enclosed is Certificate of Compliance No. 9291, Revision No. 5, for the Model No. Liqui-Rad (LR) Transport Unit Package. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's Safety Evaluation Report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471. Registered Users may request by letter to remove their names from the Registered Users List.

If you have any questions regarding this certificate, please contact me or Shawn Williams of my staff at (301) 415-8500.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Nelson", followed by a long horizontal flourish.

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

Docket No. 71-9291
TAC No. L23883

Enclosures: 1. Certificate of Compliance
No. 9291, Rev. No. 5
2. Safety Evaluation Report
3. Registered Users List

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy
RAMCERTS
Registered Users

CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES

1.	a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
	9291	5	71-9291	USA/9291/B(U)F-96	1 OF	3

2. PREAMBLE

- 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."
- 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

- | | |
|--|--|
| <ol style="list-style-type: none"> ISSUED TO (<i>Name and Address</i>)
Columbiana Hi Tech, LLC
1802 Fairfax Road
Greensboro, NC 27407 | <ol style="list-style-type: none"> TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Columbiana Hi Tech, LLC, consolidated application
dated February 17, 2006. |
|--|--|

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

- Model No.: Liqui-Rad (LR) Transport Unit Package
- Description

The LR Package is designed to transport Type B quantities of fissile uranyl nitrate solutions. The package uses thermal and impact limiting systems to protect the containment vessel and prevent the contents from being released. The primary structural components of the LR packaging consist of a stainless steel containment vessel, a carbon steel outer vessel and a carbon steel framing system. The containment vessel is built in accordance with ASME Pressure Vessel Code (Section VIII, Division 1) but does not require an ASME stamp. Double O-ring seals on the containment vessel's primary and secondary lids provide a leak tight seal which is leak testable. A closed-cell phenolic foam or polyurethane foam surrounds the top and bottom head area of the containment vessel and ceramic fiber blanket and board insulation are used in the sidewalls and outer lid for thermal insulation and impact absorption. The maximum volume of the contents is limited to 230 gallons which maintains a minimum ullage of 33 gallons.

The LR is a cylindrical package set in a rectangular angle frame. The dimensions of the package are approximately 56"(l) x 56"(w) x 73"(h). The maximum weight of the package is 5692 pounds. The outer vessel is constructed of 10 gauge carbon steel. The containment vessel is constructed of 1/4 inch stainless steel with 1/4 inch thick flanged and dished heads. The containment vessel is rated at 50 psig pressure. Closed-cell phenolic or polyurethane foam and ceramic fiber insulation are sandwiched between the containment vessel and the package's outer shell.

The package is designed to be leak-tight (maximum allowable leakrate of 1×10^{-7} ref-cm³/sec). The containment vessel is closed using a double O-ring and is secured by sixteen 5/8 inch stainless steel studs. The outer lid is closed with four 5/8 inch

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

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5.(a)(2) Continued

stainless steel bolts and nuts. The package is also equipped with plastic plugs to vent any gases that may be generated by the insulation during a fire event. All valves and fittings are provided within sealed enclosures to contain any leakage during valve failure.

(3) Drawings

The packaging is constructed and assembled in accordance with Columbiana Hi Tech Drawing Nos. LR-SAR, Sheets 1 through 4, Rev. 7.

5.(b) Contents

(1) Type and form of material

Low enriched Uranyl Nitrate solutions with the specifications shown in Table 1 below. The uranium concentration must be less than or equal to 125 gU/liter with an enrichment less than or equal to 5.0 wt% U-235. Non-fissile chemical impurities may be present up to the chemical impurity specification in Table 1. Additionally, fissile isotopes are also limited to the quantities in Table 1.

(2) Maximum quantity of material per package

230 gallons of Uranyl Nitrate solution with limits as shown in table 1.

ITEM	SPECIFICATION
Solution Density	≤ 1.17 g/cc
Chemical Impurities	≤ 1500 μ g/gU
Nitric Acid Normality	0.1-0.7
Uranium Concentration	≤ 125 gU/l
U-232	$\leq 2.0E-03$ μ g/gU
U-234	$\leq 2.0E+03$ μ g/gU
U-235	≤ 0.05 g/gU (12 pounds maximum quantity of U-235 per LR)
U-236	$\leq 2.5E+04$ μ g/gU
U-238	remainder of uranium
Pu/Np Alpha Activity	≤ 93 Bq/gU
Gamma Emitters	0.515E-01 Ci

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

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5. (c) Criticality Safety Index 0.0
6. In addition to the requirements of Subpart G of 10 CFR Part 71:
- (a) The package must be prepared for shipment and operated in accordance with the Operating Procedures in Chapter 7 of the application.
 - (b) Each packaging must be acceptance tested and maintained in accordance with the Acceptance Tests and Maintenance Program in Chapter 8 of the application.
7. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
8. Packagings may be marked with Package Identification Number USA/9291/B(U)F-85 until March 31, 2007, and must be marked with Package Identification Number USA/9291/B(U)F-96 after March 31, 2007.
9. Transport by air of fissile material is not authorized.
10. Revision No. 4 of this certificate may be used until March 31, 2007.
11. Expiration date: October 31, 2006

Columbiana Hi Tech, LLC, consolidated application dated February 17, 2006

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 March 3, 2006



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT

Docket No. 71-9291
Model No. Liqui-Rad (LR) Transport Unit Package
Certificate of Compliance No. 9291
Revision No. 5

SUMMARY

By letter dated August 5, 2005, Columbiana Hi Tech, LLC, (CHT) requested a minor change to the drawings and "-96" designation to Certificate of Compliance (CoC) No. 9291 for the Model No. Liqui-Rad (LR) Transport Unit Package. Staff requested additional information (RAI) dated November 7, 2005. CHT submitted a response to the RAI on February 17, 2006.

EVALUATION

By letter dated August 5, 2005, CHT requested "-96" designation to CoC 9291 for the Model No. Liqui-Rad (LR) Transport Unit Package. This application included revised pages to the Safety Analysis Report (SAR) that included minor editorial changes and revisions to meet the current regulation requirements that became effective on October 1, 2004 (69 FR 3698). A minor drawing revision was requested to make the Manual Vent Enclosure (MVE) optional. The MVE does not provide containment and the option of installing a MVE does not affect the package's ability to meet the requirements of 10 CFR Part 71.

In response to the staff's RAI, the applicant submitted a consolidated application on February 17, 2006. Staff reviewed the documents submitted in the consolidated application and concluded that the application incorporated the changes to the SAR that were previously referenced in the CoC.

Containment

The final rule, Issue No. 3, adopted changes to the A_1 and A_2 values, with the exception of two radionuclides. CHT updated the containment analysis in Chapter 4 of the SAR to incorporate the revised A_2 values. In general, the A_2 values increased. This caused the calculated allowable leakage rate to increase. The staff reviewed the revised mixture A_2 calculations presented in Table 4-2 and concluded that they were performed correctly. The staff then verified that the previously approved methodology of Section 4.2.1 and Section 4.3.2 was utilized to determine the packages allowable leakage rate for normal conditions of transport and hypothetical accident conditions, respectively. The staff found that the allowable leakage rate was conservative because it used the unrevised information presented in Tables 4-3 and 4-4 and was therefore acceptable.

The post fabrication leakage rate remained unchanged at leaktight conditions, but the periodic and pre-shipment leakage tests were increased to 1×10^{-3} ref-cc/sec, which is justified by the information presented in Chapter 4.

The applicant requested that the MVE be optional. The MVE includes a valve on the outer lid to vent the annulus before removing the outer lid. This valve, the annulus, and outer lid are not part of the containment boundary and thus have no affect upon the containment evaluation.

The staff finds that the package, as revised, meets the containment requirements of 10 CFR Part 71 and the containment criteria of ANSI N 14.5-1997.

Evaluation for a "-96" Designation

The amendment also requested a "-96" designation in the package identification number, as specified in 10 CFR 71.19(e). In the February 17, 2006, application, CHT addressed the 19 issues considered in the rulemaking process that resulted in the revised rule (69 FR 3698). The applicant discussed the impacts and effects that each issue of the revised regulations would have on the transportation package and related impacts on the Certificate of Compliance. Based on the statements and representations in the application, the staff concluded that the design has been adequately described and meets the requirements of 10 CFR Part 71 for a "-96" approval.

The following changes were made to the Certificate:

Condition No. 1.d. was revised to reflect the new "-96" package identification number.

Condition No. 3.b. has been revised to reflect the consolidated application submittal.

Condition No. 5(a)(1) has been revised to reflect the new name of the package. The Model No. Eco-Pak Liqui-Rad (LR) Transport Unit Package was requested to be changed to Model No. Liqui-Rad (LR) Transport Unit Package.

Condition No. 5(a)(2) was revised to correct the reference to ASME Pressure Vessel Code as Section VIII, Division 1. In the previous CoC, it was incorrectly referenced as Section VII. The words "or polyurethane foam" was also added in the description consistent with the materials authorized in the SAR.

Condition No. 5(a)(3) was revised to correct the revision number of Drawing No. LR-SAR, Sheets 1, 2, and 3 to Revision No. 7. This editorial change was made so that all four sheets of Drawing No. LR-SAR, have the same revision number.

Condition No. 5(c) was revised to delete the wording "Minimum transport index to be shown on label for nuclear criticality control."

Condition No. 8 of the certificate allows a package to be marked with the previous package identification number, USA/9291/B(U)F-85, until March 31, 2007. This is to allow time to replace the packaging nameplate that shows the revised package identification number, USA/9291/B(U)F-96.

The applicant indicated in the February 17, 2006, response to RAI No. 1-2, that 10 CFR 71.55(f), which addresses packaging design requirements for packages transporting fissile material by air, are not applicable to this package. Therefore, for clarity, Condition No. 9 of the CoC was added to specify that transport by air of fissile material is not authorized.

Condition No. 10 was added to authorize use of the previous revision of the certificate for a period of approximately 1 year.

The Reference Section has been revised to include the consolidated application. All previous supplements have been removed.

As a consequence of the inclusion of the new Condition Nos. 8, 9, and 10, the previous Condition No. 8 was renumbered to Condition No. 11.

CONCLUSION

For the reasons stated in this Safety Evaluation Report, the staff concludes that the proposed changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9291, Revision No. 5 on
March 3, 2006.

REGISTERED USERS OF CERTIFICATE OF COMPLIANCE NO. 9291

Mr. John Bossone
Columbiana HI TECH, LLC
1802 Fairfax Road
Greensboro, NC 27407

Mr. Robert S. Freeman
Framatome ANP, Inc.
1724 Mount Athos Road
PO Box 11646
Lynchburg, VA 24506-1646

Ms. B. Marie Moore
Nuclear Fuel Services, Inc.
PO Box 337, MS 123
Erwin, TN 37650

Mr. James M. Shuler
U. S. Department of Energy
EM-24/CLV-1081
1000 Independence Ave., S. W.
Washington, DC 20585-2040

Don Olson

From: "MONTGOMERY, Richard" <Richard.Montgomery@areva.com>
To: "Don Olson" <dolson@chtnuclear.com>; "Rod Felts" <rfelts@chtnuclear.com>
Sent: Friday, July 14, 2006 3:58 PM
Subject: Liqui-Rad

Don, Rod,

Note that the LR SAR expires on October 31, 2006. You will need to request a renewal and indicate that a consolidated SAR was submitted as a previous licensing action to upgrade the approval to a -96 status. I like to give the NRC at least a 6-month window.

Richard D. Montgomery, Advisory Engineer
Nuclear Criticality Safety & Shipping Containers
AREVA NP Inc.

P.O. Box 11646

Lynchburg, VA 24506-1646

Office: 434-832-5172

Fax: 434-832-5060

Mobile: 434-221-8340

Note: Effective March 15, 2006, my email address will change to: richard.montgomery@areva.com

SHAWN WILLIAMS
301-415-8500

QU/ET

7/16/2006