



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

August 31, 2011

OFFICE OF THE  
COMMISSIONER

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

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9291, REV. NO. 7 FOR MODEL  
NUMBER LIQUI-RAD (LR) TRANSPORT UNIT PACKAGE (TAC NO. L24556)

Dear Mr. Olson:

As requested by your application dated August 5, 2011, enclosed is Certificate of Compliance No. 9291, Revision No. 7, for your 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 17.17 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 at (301) 492-3297 or Joseph Borowsky of my staff at (301) 492-3563.

Sincerely,

Michael D. Waters, Chief  
Licensing Branch  
Division of Spent Fuel Storage and Transportation  
Office of Nuclear Materials Safety  
and Safeguards

Docket No. 71-9291  
TAC No. L24556

Enclosures: 1. Certificate of Compliance  
No. 9291, Rev. No. 7  
2. Safety Evaluation Report  
3. Registered Users List

cc w/encls 1 & 2: R. Boyle, Department of Transportation  
J. Schuler, Department of Energy  
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
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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*)  
Columbiana Hi Tech, LLC  
1802 Fairfax Road  
Greensboro, NC 27407
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION  
Columbiana Hi Tech, LLC, consolidated application  
dated February 17, 2006, 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.: Liqui-Rad (LR) Transport Unit Package
  - (2) 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.

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5.(a)(2) Continued

The package is designed to be leak-tight (maximum allowable leakrate of  $1 \times 10^{-7}$  ref-cm<sup>3</sup>/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 twelve 5/8 inch stainless steel studs and the Manual Vent Enclosure (MVE) lid is secured with four 5/8 inch 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.

Table 1

ITEM	SPECIFICATION
Solution Density	$\leq 1.17$ g/cc
Chemical Impurities	$\leq 1500$ $\mu$ g/gU
Nitric Acid Normality	0.1 - 0.7
Uranium Concentration	$\leq 125$ gU/l
U-232	$\leq 2.0E-03$ $\mu$ g/gU
U-234	$\leq 2.0E+03$ $\mu$ g/gU
U-235	$\leq 0.05$ g/gU (12 pounds maximum quantity of U-235 per LR)
U-236	$\leq 2.5E+04$ $\mu$ g/gU
U-238	remainder of uranium

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Pu/Np Alpha Activity	≤93 Bq/gU
Gamma Emitters	0.515E-01 Ci

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 must be marked with Package Identification Number USA/9291/B(U)F-96.
9. Transport by air of fissile material is not authorized.
10. Revision No. 6 of this certificate may be used until August 31, 2012.
11. Expiration date: October 31, 2016.

REFERENCES

Columbiana Hi Tech, LLC, consolidated application dated February 17, 2006.  
Supplements dated: July 25, 2006 and August 5, 2011.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Michael D. Waters, Chief  
Licensing Branch  
Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety  
and Safeguards

Date: August 31, 2011



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SAFETY EVALUATION REPORT

Docket No. 71-9291  
Model No. Liqui-Rad (LR) Transport Unit Package  
Certificate of Compliance No. 9291  
Revision No. 7

**SUMMARY**

By application dated August 5, 2011, Columbiana Hi Tech, LLC (Columbiana) requested renewal of Certificate of Compliance No. 9291, for its Model No. Liqui-Rad (LR) Transport Unit package. Columbiana made its request in a timely manner. The certificate has been renewed for a five year term.

**EVALUATION**

By application dated August 5, 2011, Columbiana requested renewal of Certificate of Compliance No. 9291, for its Model No. Liqui-Rad (LR) Transport Unit package. Columbiana has not requested any changes to the package design or authorized contents as part of the current renewal. The staff reviewed the documents referenced in the certificate and determined that the documentation was available and complete. The staff also reviewed the operating and maintenance procedures for the package and found them to be adequate.

The following changes have been made to the Certificate:

Condition 5.(a)(2) was revised in order to more accurately reflect the securing mechanism of the outer lid and MVE lid.

Condition 5(b)(2) included an editorial change to capitalize the Table 1 text.

Condition 8 was revised to reflect the current package identification number.

Condition 10 was revised to authorize the use of the previous revision of the certificate for a period of approximately one year.

Condition 11 was revised to reflect the new expiration date, October 31, 2016, of the certificate.

The References section was revised to include the Columbiana Hi Tech, LLC, August 5, 2011, request for renewal.

**CONCLUSION**

The certificate has been renewed for a five year term that expires on October 31, 2016. This change does 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. 7 on August 31, 2011.