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

July 17, 2014

Mr. Robert E. Hypes
Vice-President, Special Projects
Columbiana Hi Tech, LLC
1802 Fairfax Road
Greensboro, North Carolina 27407

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

Dear Mr. Hypes:

As requested by your letter dated August 27, 2013, as supplemented on February 5, 2014; and June 6, 2014; Columbiana Hi Tech, LLC, requested a revision to Certificate of Compliance (CoC) No. 9291 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.

Columbiana Hi Tech, LLC, is registered as the certificate holder for this package. This 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 10 CFR 71.17, "General license: NRC-approved package," and 49 CFR 173.471, "Requirements for U.S. Nuclear Regulatory Commission approved packages."

If you have any questions regarding this certificate, please contact me or Norma Garcia Santos of my staff at (301) 287-9185.

Sincerely,

/RA/
Timothy Lupold, Acting Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9291
TAC No. L24783

Enclosures:
1. Certificate of Compliance No. 9291, Rev. No. 9
2. Safety Evaluation Report
3. Registered Users List
4. Editorial Changes

Upon removal of Enclosure 3, this document is uncontrolled.

cc w/encls. 1&2: R. Boyle, U.S. Department of Transportation
J. Shuler, U.S. Department of Energy c/o L.T. Gelder

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SAFETY EVALUATION REPORT

Docket No. 71-9291
Model No. Liqui-Rad Transport Unit Package
Certificate of Compliance No. 9291
Revision No. 9

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SAFETY EVALUATION REPORT

Docket No. 71-9291
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SUMMARY

By application dated August 27, 2013, as supplemented on February 5, 2014, and June 6, 2014, Columbiana Hi Tech, LLC, (the applicant) requested an amendment to Certificate of Compliance (CoC) No. 9291 for the Model No. Liqui-Rad (LR) Transport Unit Package. Columbiana Hi Tech, LLC, requested changes to the containment boundary definition and making the "Draw Pipe" an optional component of the LR Transport Unit Package. The applicant indicates the reason for making the draw pipe an optional component is due to vibrations affecting the structural integrity of the draw pipe during normal conditions of transport.

NRC staff reviewed the application using the guidance in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representation in the application, as supplemented, and the conditions listed below, the staff agrees that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

1.0 GENERAL INFORMATION

1.1 Package Description

The LR is a cylindrical package set in a rectangular angle frame. The dimensions of the package are approximately 56-inch long, 56-inch wide, and 73-inch high. The maximum weight of the package is 5,692 pounds. The maximum volume of the contents is limited to 230 gallons, which maintains a minimum ullage of 33 gallons.

The LR package is designed to transport Type B quantities of fissile uranyl nitrate solutions as described in Section 1, "General Information," of the safety analysis report. The package uses thermal and impact limiting systems to protect the containment vessel and prevent the contents from being released.

The receiver uses a draw pipe to remove the contents from the package. Currently, the draw pipe is part of the package during transport. The applicant requested to adjust the draw pipe length to alleviate potential failure of the draw pipe in the heat affected zone immediately below the weld, which is susceptible to the NCT vibration conditions and tests. The current draw pipe extends from the primary lid to 3/8 ± 1/8-inch from the bottom of the vessel. The proposed length of the draw pipe can vary from 1/8-inch minimum below the primary lid, up to ¼-inch clearance from the bottom of the containment vessel. The applicant also indicates in the licensing action request (i.e., amendment request) that the draw pipe is optional in the revised design.

In terms of the package, the applicant revised the safety analysis report (SAR) as follows:

Package Component	Safety Analysis Report Section	Revision
Containment boundary	Glossary of terms…	Revised to add a definition for the secondary/upper wall, add a definition for the secondary/upper lid flange, change secondary lid to secondary/upper lid, and modify the definition of the containment boundary.
	Figure 4.1	Figure 4.1 of the SAR was revised to clearly mark the “containment boundary” and the “containment vessel.”
Draw pipe	Appendix 1.3, sheet 1 of 4	Removed redundant draw pipe to vessel gap.
	Appendix 1.3, sheet 3 of 4	Revised the draw pipe length requirements.

1.2 Drawings

The applicant revised Appendix 1.3.1, Drawing No. LR-SAR, (sheets 1 through 4) to reflect the changes made to the draw pipe length. Condition number 5(a)(3) of Ceriticate of Compliance No. 9291 was revised accordingly.

1.3 Evaluation Findings

Based on review of the statements and representations in the application, the staff concludes that the applicant has adequately described the package and provided basis for the package evaluation as required by 10 CFR 71.33.

2.0 STRUCTURAL

2.1 Description of Structural Design

The primary structural components of the LR packaging consist of a stainless steel containment vessel, a carbon steel outer vessel and a carbon steel angle frame. A comprehensive discussion on the package design is provided in Section 1.2 of the SAR.

2.2 Normal Conditions of Transport

Operating experience has shown that the schedule 80 draw pipe that penetrates the primary lid is susceptible to failure immediately below the lid-to-pipe weld as a result of vibrations during normal conditions of transport. This portion of the pipe is within the containment boundary. As a result, the draw pipe is not a safety related component and can vary in length from 1/8-inch minimum below the primary lid, up to ¼-inch from the bottom of the containment vessel. The staff agrees that no fatigue or other structural evaluations are required for the welded connection between the draw pipe and the primary lid. The applicant revised the operating instructions of Section 7 of the SAR for removing the contents, to account for the possibility of a broken or shorter draw pipe.

2.3 Hypothetical Accident Conditions

In the modified design, the length of the draw pipe is variable. However, the proposed maximum length provides the same clearance to the bottom of the vessel as the previous design. Since the weight of the previously tested configuration is slightly higher than the revised configuration and the tested draw pipe length is the maximum, the staff agrees with the conclusion by the application that no additional drop testing is necessary.

2.4 Evaluation Findings

Based on review of the statements and representations in the application, the staff concludes that the structural design has been adequately described and evaluated and that the package has adequate structural integrity to meet the requirements of 10 CFR Part 71.

3.0 CONTAINMENT

3.1 Description of Containment System

The package is designed to be leak-tight (maximum allowable leakrate of 1×10^{-7} ref-cm^3/sec). The certificate holder is proposing to revise the definition of the containment boundary in order to clarify the components considered part of the containment boundary. The applicant revised the containment boundary of the packaging for the LR Transport Unit as the “containment vessel, studding outlet, the primary lid inner seal and bolts, primary lid (excluding the portion inside the secondary/upper wall), secondary/upper wall, and the secondary/upper lid inner sealand bolts, and secondary/upper lid.” The applicant submitted revised pages to the safety analysis report to reflect the proposed definition of containment boundary and revised Figure 4.1 to delineate the difference between the containment boundary and the containment vessel. The applicant also revised the “Glossary of Terms” in the safety analysis report to include definitions of the components of the containment boundary.

3.2 Evaluation Findings

Based on review of the statements and representations in the application, the staff concludes that the containment design has been adequately described and evaluated and that the package design meets the containment requirements of 10 CFR Part 71.

4.0 OPERATING PROCEDURES

The applicant updated the unloading procedures of the LR in Section 7.2 of the application to include a recommendation for using a draw pipe with smaller diameter to empty the contents of the package in case of damage to the draw pipe at the time of receipt. Also, the applicant mentioned actions that the receiver should follow if the draw pipe "is suspected to be damaged."

Based on review of the statements and representations in the application, the staff concludes that the operating procedures meet the requirements of 10 CFR Part 71 and that these procedures are adequate to assure the package will be operated in a manner consistent with its evaluation for approval.

5.0 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

The applicant updated Section 8.2, "Maintenance Programs," to add a step for performing annual inspections of the draw pipe-to-primary lid weld and the draw pipe itself for cracks and to repair, if necessary. This update is in alignment with the revision to Chapter 7 of the SAR.

Based on review of the statements and representations in the application, the staff concludes that the acceptance tests for the packaging meet the requirements of 10 CFR Part 71 and that the maintenance program is adequate to assure package performance during its service life.

CONDITIONS

The following changes were made to the certificate:

Condition number 5(a)(3) of Ceriticate of Compliance No. 9291 was revised as follows:

> *The packaging is constructed and assembled in accordance with Columbiana Hi Tech Drawing Nos. LR-SAR, sheets 1 through 4, Rev. 9.*

The references section has been updated to include this request.

CONCLUSION

Based on the statements and representations contained in the application, as supplemented, and the conditions listed above, the staff concludes that the design has been adequately described and evaluated, and the Model No. Liqui-Rad Transport Unit Package meets the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9291 for the Model No. Liqui-Rad Transport Unit Package, Revision No. 9, on July 17, 2014.