

January 29, 2004

Mr. W. E. Stilwell  
Westinghouse Electric Company  
P.O. Drawer R  
Columbia, SC 29250

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9274 FOR THE MODEL NO. ABB-2901  
PACKAGE

Dear Mr. Stilwell:

As requested by your application dated May 15, 2003, as supplemented November 21, 2003, enclosed is Certificate of Compliance No. 9274, Revision No. 7, for the Model No. ABB-2901 package. This certificate supersedes, in its entirety, Certificate of Compliance No. 9274, Revision No. 6, dated September, 2002. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's Safety Evaluation Report is also enclosed.

Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.12 or 49 CFR 173.471. 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.

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

Sincerely,

/RA/  
John D. Monninger, Chief  
Licensing Section  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Docket No. 71-9274  
TAC No. L23611

Enclosures: 1. Certificate of Compliance  
No. 9274, Rev. No. 7  
2. Safety Evaluation Report

cc w/encl: R. Boyle, Department of Transportation  
J. Shuler, Department of Energy  
RAMCERTS  
Registered Users

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DATE	01/ 26 /04		01/ 28/04		01/29/04	

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**SAFETY EVALUATION REPORT**  
**Model No. ABB-2901 Package**  
**Certificate of Compliance No. 9274**  
**Revision No. 7**

## **SUMMARY**

By application dated May 15, 2003, as supplemented November 21, 2003, Westinghouse Electric Company, LLC, requested an amendment to Certificate of Compliance No. 9274, for the Model No. ABB-2901 package. Westinghouse requested changes to the closure system of the outer drum to include three retention clamps to ensure the lid cannot become separated from the drum body under accident conditions. Westinghouse provided a consolidated application for the package that included updated packaging drawings that show the retention clamps, as well as updated package operations, acceptance tests, and maintenance program.

The Certificate of Compliance has been amended as requested. These changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

## **BACKGROUND**

On June 20, 2002, NRC issued a Confirmatory Action Letter (02-08-002) to Westinghouse Electric Company, LLC, regarding a possible deficiency in the design of drum closures for certain packages, including the ABB-2901 design. The deficiency could cause separation of the drum lid from the drum body under 30-foot drop tests performed at shallow angles. To correct this possible deficiency, Westinghouse designed retention clamps that engage the drum body upper chime and the drum lid. The retention clamps are used in addition to the typical drum closure devices consisting of a closure ring and bolt.

## **EVALUATION**

### **Packaging Drawings**

Revised packaging drawings were included in the consolidated application. The new drawings were Westinghouse Electric Company, LLC, Drawing Nos. 10004E01, Rev. 2; 10004E2, Sheets 1 and 2, Rev. 2; and 10004E03, Rev. 2. The packaging drawings were revised to include the following:

- Drawing numbers were changed, and minor editorial changes were made.
- Retention clamps were added, including materials of construction and bolt torque.
- Torque values were included for the containment system closure bolts and the drum ring closure bolt.

## **Structural**

The applicant provided an evaluation of the modified package design. To demonstrate the effectiveness of the retention clamps, the applicant performed a 30-foot free drop and puncture test of a single full-scale specimen of the ABB-2901. The package weight was 660 pounds, which is the maximum gross weight for the ABB-2901 design.

For the test specimen, three retention clamps were positioned at approximately equally spaced locations around the circumference of the lid. The package specimen was subjected to a 30-foot free drop, impacting the unyielding target at an angle of approximately 17.5 degrees from horizontal. The impact point was on the closure ring directly opposite from the ring closure bolt. This orientation had been identified as the worst case with respect to possible lid separation. The package was then subjected to a single puncture test. The orientation was selected so that the puncture bar would impact the ring closure bolt with a prying action, that is, with the puncture bar impacting with an upward force on the closure ring bolt.

As a result of the tests, the closure ring and lid became slightly separated from the drum body. A lid separation of approximately one inch was observed around approximately 20 inches of circumferential length. The drum lid remained securely attached to the drum body. The applicant judged that this small separation was not significant and would not result in a significant reduction in the effectiveness of the package.

Based on the results of these tests the applicant concluded that the three retention clamps installed around the drum closure will ensure that the lid does not separate from the drum body under hypothetical accident conditions. The staff agrees that the package, with the modified closure that includes three retention clamps, meets the structural requirements of 10 CFR Part 71.

## **Package Operations**

The applicant provided updated package operations in Chapter 7.0 of the application. The updated operations included instructions for installing the three retention clamps. The applicant also revised the package operations to specify the packaging components that are inspected prior to each shipment and to include torque values for the containment system nuts and the drum closure ring bolt.

## **Acceptance Tests and Maintenance Program**

The applicant provided updated acceptance tests and maintenance program for the package. Section 8.1 of the application was revised to clarify that the packaging is fabricated in accordance with the drawings referenced in the Certificate of Compliance. The maintenance program in Section 8.2 of the application was revised to specify that periodic inspections of selected packages are performed. Packagings are typically selected based on age. The periodic inspections include the packaging internal components, such as insulating material, welds, and hardboard and plywood components. The inspections include visual inspections as well as dimension checks. The staff agrees that the updated acceptance tests and maintenance program are adequate.

## **CONCLUSIONS**

The Certificate of Compliance has been amended as requested by the applicant. The packaging description was revised to describe the drum closure, including the retention clamps. The certificate references the consolidated application and the updated packaging drawings that show the retention clamp design and three retention clamps installed. These changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9274,  
Revision No. 7, on January 29, 2004.