

**SAFETY EVALUATION REPORT**  
**Docket No. 71-9251**  
**Model No. BW-2901 Package**  
**Certificate of Compliance No. 9251**  
**Revision No. 12**

## **SUMMARY**

By application dated October 8, 2002, as supplemented April 17, 2003, Framatome ANP, Inc., (Framatome) requested an amendment to Certificate of Compliance No. 9251 for the Model No. BW-2901 package. Framatome requested changes to the closure system of the outer drum to include three lid clamps to ensure the lid cannot become separated from the drum body under accident conditions. Framatome provided a consolidated application for the package that included an updated packaging drawing with the lid clamps, as well as updated package operating procedures 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 (02-08-001) to Framatome regarding a possible deficiency in the design of drum closures for certain packages, including the BW-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, Framatome designed lid clamps that engage the drum body upper chime and the drum lid. The lid clamps are used in addition to the typical drum closure devices consisting of a closure ring and bolt.

## **EVALUATION**

### **Structural**

The applicant provided an evaluation of the modified package design. To demonstrate the effectiveness of the lid clamps, the applicant performed drop tests of two specimens of the BW-2901.

For the first specimen, three lid clamps were positioned at approximately equally spaced locations around the circumference of the lid. The lid clamps were installed by tightening the clamp until the two pieces of the clamp engaged. No significant torque was applied. 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.

A second package specimen was also tested. The second specimen included a single lid clamp installed at a position approximately 90 degrees from the closure ring bolt, and directly opposite from the free-drop impact point. Again, this was selected as the worst case location with respect to lid separation.

The first test specimen showed no signs of lid separation after the 30-foot drop test. The lid clamps remained engaged and were not damaged as a result of the test. The second specimen, with the single lid clamp, showed a small area of separation of the lid. Based on this, the testing with this specimen did not continue, and the use of a single clamp was not pursued.

The first specimen was then subjected to three puncture tests. For each puncture test, the package impacted the puncture pin on the drum closure ring. The first test impacted at the closure bolt, the second at the point where the closure ring was least engaged due to the drop test, and the third onto the lid clamp. The drum closure ring, bolt, and lid clamps remained undamaged and secured following the three puncture tests.

Based on the results of these tests the applicant concluded that the three lid 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 lid clamps, meets the structural requirements of 10 CFR Part 71.

### **Operating Procedures**

The applicant provided updated operating procedures for the package. The updated procedures included instructions for installing at least three lid clamps. Minor administrative and editorial changes were also made.

The applicant also requested that the annual replacement of the inner container gasket be deleted. The condition of the gasket will be visually inspected prior to each shipment, and the gasket will be replaced if it is degraded. The gasket is a durable (silicone rubber) full face gasket. The safety function of the gasket is limited, since the package does not contain greater than a Type A quantity of radioactive material and the criticality safety of the package under accident conditions does not rely on the gasket to prevent water leakage. The staff agrees that the updated operating procedures, including the revised gasket replacement conditions, are adequate.

### **Acceptance Tests and Maintenance Program**

The applicant provided an updated maintenance program for the package. The maintenance program specifies that prior to each shipment the drum and closure components are inspected. In addition, periodic inspections of sample packages are performed. The periodic inspections include the packaging internal components, such as insulating material, internal welds, and hardboard rings. The inspections include visual inspections as well as dimension checks. The staff agrees that the updated maintenance program is 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 lid clamps. The certificate references the updated packaging drawing that shows the lid clamp design and three lid clamps installed. Condition No. 8(c) of the certificate has been amended to eliminate the annual gasket replacement and to specify that the gasket is replaced if it is damaged, defective, or degraded. 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. 9251,  
Revision No. 12, on May 16, 2003.