10 CFR 71.95 REPORT EVALUATION FORM

Docket Nos.:	71-9337 and 71-9338
Package Model Nos.:	3979A and 3977A
Report Submitted By:	Matthew R. Sanford, Missouri University Research Reactor
Report Date:	April 30, 2018
Report ADAMS Accession No.:	ML18122A067

Review the incoming report to determine if additional Commission or staff action is warranted. The review should consider whether the report identifies a generic defect or problem with the package design and the safety significance of the issue. Note that a high safety significance represents a potential for significant radiation exposure, medium safety significance represents a potential for some moderate radiation exposure, and low safety significance represents little or no potential for radiation exposure.

1. The report identifies:

__ Significant reduction in the effectiveness of a package during use;
__ Defect with a safety significance;
✓ Shipment in which conditions of the approval were not observed.

2. What is the safety significance? ___ High ___ Medium ✓ Low

3. Summary of the report:

On May 9, 2017, the Missouri University Research Reactor (MURR) discovered that Loctite 270, a material for attaching and securing threaded lid studs to the shipping keg body (container), appeared to have been used past its expiration date. A date of "1/2017" was printed on the end of the Loctite 270 tube. Subsequent investigation of Material Specification Sheets and the Loctite tube indicated that this was the expiration date. Upon discovery of this nonconformance, MURR initiated an investigation on May 10, 2017 which ascertained that the expired Loctite 270 had been used when repairing studs on Safkeg-HS No. 0008 and Safkeg-LS No. 0006.

After inspecting the container, MURR usually conducts repairs when one (1) or more of the studs is found to be damaged. In the case of both the Safkeg-LS and -HS containers, MURR repaired one (1) of the eight (8) studs used to secure the lid to the container body. Upon further investigation, MURR determined that Safkeg-LS No. 0006 was repaired with the expired Loctite on February 15, 2017, and that Safkeg-HS No. 0008 was repaired with the same expired Loctite on March 22, 2017. For both Safkeg-LS No. 0006 and Safkeg-HS No. 0008, only one (1) damaged stud was replaced using the expired Loctite. Subsequent investigation determined that, after the nonconforming repair, Safkeg-HS No. 0008 was used to ship irradiated Ir-192 metal to Alpha-Omega Services in Vinton, LA on April 4 (30,891 GBq) and April 18, 2017 (28,172 GBq). In addition, Safkeg-HS No. 0008 was used to ship irradiated Ir-192 metal to Mallinckrodt Medical, BV in Petten, The Netherlands on May 3, 2017 (34,673 GBq). Additionally, it was determined that Safkeg-LS No. 0006 was used to ship Po-210 (843 GBq) contained in bismuth metal on May 10, 2017.

These are routine shipments from MURR for isotopes that are used for both medical and industrial uses. The Safkeg-LS No. 0006 shipping container was prepared for shipment on May 9, 2017, and was in transit by the time the investigation determined that it was one of the affected shipping containers. In addition, the Safkeg-HS No. 0008 was with a customer at the time of this discovery.

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4. Corrective actions taken by the licensee:

MURR attempted to procure a new batch of Loctite 270. However, MURR discovered that Loctite 270 was a British model number and was not available in the United States. MURR identified Loctite 263 as a suitable substitute for Loctite 270; however, Loctite 263 is not specified in the safety analysis report for either shipping container. After confirming with the manufacturer that Loctite 263 and Loctite 270 are essentially the same item, MURR issued a materials specification deviation to allow for the substitution of Loctite 263 (which is available in the U.S.). MURR documented this deviation in DEV 17-11 which was issued on May 11, 2017. Subsequent to this deviation, MURR requested Croft Associates Limited (holder of both certificates of compliance), to amend the safety analysis reports for both the Safkeg-LS and Safkeg-HS shipping containers to allow the use of Loctite 263.

In addition, MURR removed both Safkeg-HS No. 0008 and Safkeg-LS No. 0006 from service upon their return prior to repairing the packages with the conforming Loctite 263. MURR removed, cleaned, and re-installed all eight (8) studs on both the HS and LS shipping containers using the conforming Loctite 263 to ensure that all closure studs met the requirements of the respective safety analysis reports and certificates of compliance. Both shipping containers were repaired with the conforming Loctite 263 and returned to service on June 1, 2017. Additionally, MURR entered this event into their Corrective Action Program (CAP) as CAP No. 17- 0069 to document the use of the nonconforming Loctite 270 and any corrective actions taken with regards to this event.

5. Staff comments:

The eight keg closure studs ensure that the cork, which surrounds the containment vessel and acts as an impact limiter for the containment vessel, remains in place during shipment. Since only one of the eight studs on both the Safkeg-HS and Safkeg-LS package was affected, staff has reasonable assurance that sufficient redundancy existed to ensure that the cork would remain in place during transit and perform its function of protecting the containment vessel

6. Staff conclusion:

✓ The report does NOT identify generic design or license/certificate issues that warrant additional Commission or staff action. This report is considered closed.

__ There is a need to take additional action. Provide a summary of the bases and recommended actions:

10 CFR 71.95 REPORT EVALUATION FORM, DOCUMENT DATE: June 7, 2018

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