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

SAFETY EVALUATION REPORT
U.S. Department of Energy
Docket No. 71-5797
Model No. Inner HFIR Unirradiated Fuel Element Shipping Container, and Outer HFIR Unirradiated Fuel Element Shipping Container

SUMMARY

The High Flux Isotope Reactor (HFIR) Unirradiated Fuel Element Shipping Container is a Type B(U)F package, with contents described as U_3O_8 -Al cermet, enriched up to 95% in U^{235}, and clad in aluminum.

After identifying nonconformances of the "as-built" Tie Down Band (TDB) hardware configuration and components with respect to the licensing drawings referenced in the Certificate of Compliance (CoC) No. 5797, Rev. 22 (Docket 71-5797), the Department of Energy (DOE), by letter dated April 8, 2022, requested the authorization to continue shipments to the HFIR reactor in order to avoid significant impacts to reactor operations.

The package loading procedure refers to the Tie-Down Band as an optional accessory, i.e., a "shoring ring", provided with the HFIR Shipping Container, to either shore or tie down the package on the transport vehicle. The TDB is not a packaging component, i.e., it is not a structural part of the package and, as such, is not credited for safety.

The applicant is issuing a nonconformance report on the "as-built" TDB, is revising Drawing M-20978-EL-008E, Rev. C, is drafting a 71.95 report, and is preparing an amendment request that will be submitted within the next few months along with a CoC renewal request.

The "as-built" configuration of the TDB, although not compliant with the SAR drawings, has no adverse impact on the safety of the package: therefore, it does not affect the package's ability to meet all requirements in the regulations. Thus, the staff agrees on the continued use of the package for shipments to the HFIR reactor.

Based on the statements and representations in the application, the staff finds that the applicant's request for continued shipments with the "as built" configuration of the TDBs does not affect the ability of the Model No. Inner HFIR Unirradiated Fuel Element Shipping Container, and Outer HFIR Unirradiated Fuel Element Shipping Container package to meet the requirements of 10 CFR Part 71.

EVALUATION

On March 25, 2022, the applicant identified nonconformances of the "as-built" Tie Down Band (TDB) hardware configuration and components with respect to the licensing drawing, M-20978-EL-008E, Rev. C, Shipping Container for Unirradiated Out/In HFIR Element Details:

- A ¾ -inch shackle with a welded pin was found to be an “as built” 7/16 -inch shackle; a 1-inch shackle had an “as built” size of 5/8- inch.
- The orientation of the shackles is incorrect on the drawing while it is correct on the “as-built” configuration but does not conform to the drawing.
- The thickness of the TDB end tabs is ½ inch, whereas it is ¼ inch on the “as-built” TDB.

The applicant stated that the TDB is not a structural part of the package and is not a credited safety component: as such, the HFIR package design meets the requirements of 10 CFR Part 71 without the TDB.

However, the applicant recognized that, because the TDB is shown on three drawings referenced in the CoC (M-20978-EL-002E, Rev E; M-20978-EL-003E, Rev F, and M-20978-EL-008E, Rev. C), it can be construed that the conditions of approval in the CoC were not observed in making the shipments.

The applicant also noted that the “as-built” configuration of the TDB, although not compliant with the drawings, has a 32-year history of safe shipments with the HFIR Shipping Containers and that the working load limits of the “as built” shackle is still appropriate for the transportation of the containers. As such, failure of the “as-built” TDB will not affect the package’s ability to meet all the requirements in the regulations.

The staff finds that this request to use the “as-built” TBD for shipments of the HFIR Shipping Containers has no adverse impact on public health and safety.

Based on the discussion above, the staff found the applicant’s request for continued shipments using the “as built” TBDs does not affect the ability of the Model No. HFIR Unirradiated Fuel Element Shipping Container, and Outer HFIR Unirradiated Fuel Element Shipping Container package to meet 10 CFR Part 71 requirements.

CONDITIONS

(1) Authorization is for an unlimited number of shipments of fresh fuel to the High Flux Isotope Reactor to support continued operations.

(2) The package may be used with the “as-built” configuration of the Tie Down Band with its design shown on licensing drawings (M-20978-EL-008E, Rev. C, M-20978-EL-002E, Rev. E, M-20978-EL-003E, Rev. F, as referenced in Condition Nos. 5(a)(3)(i) and 5(a)(3)(ii) of the CoC.

(3) All other conditions of CoC No. 5797 shall remain the same.

(4) This authorization shall expire on January 31, 2023.

CONCLUSIONS

Based on the statements and representations in the letter dated April 8, 2022, the staff agrees that the use by DOE of the Model No. Unirradiated Fuel Element Shipping Container, and Outer HFIR Unirradiated Fuel Element Shipping Container package meets the requirements of 10 CFR Part 71, subject to the conditions listed above.

Issued on April 15, 2022.