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

December 23, 2019

SAFETY EVALUATION REPORT

Docket No. 71-9330
Model No. ATR-FFSC Package
Certificate of Compliance No. 9330
Revision No. 14

SUMMARY

By letter dated June 25, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19184A173), the Department of Energy (DOE or the applicant) requested an amendment of the Certificate of Compliance (CoC) No. 9330 for the Model No. ATR-FFSC package.

The applicant requested removing common names and descriptions of Small Quantity Payload types from the CoC. The applicant requested that the CoC be amended based on the letter request and in lieu of a revision to the Safety Analysis Report (SAR).

The submittal was evaluated against the regulatory standards in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 71, including the general standards for all packages, standards for fissile material packages, and performance standards under normal conditions of transport and hypothetical accident conditions.

The certificate has been amended based on the statements and representations in the application. The staff agrees that the changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

EVALUATION

In the last revision of the SAR (Revision 14, ADAMS Accession No. ML17170A283), a small quantity payload was defined as a class of research and development plate-type fuels with U-235 as the fissile isotope, with a bounding U-235 loading up to 400 g, and U-235 enrichment up to 94%. Applicable fuel types included RINSC fuel elements, AFIP elements, U-Mo foils, DDEs, MIT loose fuel element plates, MURR loose fuel element plates, Cobra loose fuel element plates, and the FUTURE-HFIR loose plates.

The applicant is requesting that a small quantity payload be defined in the CoC to include only the details necessary for criticality safety, and not depend on common names or specific item descriptions (e.g., RINSC fuel elements, GRR-1 fuel elements) in cases where such details are unnecessary. The applicant revised SAR Section 1.2.2.4 to more clearly define the criticality characteristics of the small quantity payloads by adding an exclusion from the payload of beryllium, carbon, deuterium, or materials with a hydrogen density greater than water. This exclusion ensures that the reactivity of the payload will not be greater than was evaluated in the SAR. Explicit exclusion of reactivity-enhancing materials is added to the discussion to ensure that all small quantity payloads are bounded by the criticality evaluation in (SAR Section 6.11).

Changes have been made to the descriptions of the following fuel types (i.e., specificity removed):

1. RINSC fuel elements
2. GRR-1 fuel elements
3. ATR Full-size plate In Flux Trap Position (AFIP) elements
4. U-Mo foils
5. Design Demonstration Elements (DDEs) and similar test elements
6. MIT, COBRA or MURR loose fuel element plates, and
7. FUTURE-HFIR loose plates

Based on the statements and representations in the application, and the conditions listed in the CoC, the staff concludes that the ATR-FFSC package will continue to meet the requirements of 10 CFR Part 71 with the proposed changes to the CoC.

CONDITIONS

The following changes are included in Revision No. 14 to Certificate of Compliance No. 9330:

Condition No. 5(b)(1) was revised in many places to remove reference to seven fuel types. The description of the small quantity payload was revised to read as follows:

> "*The Small Quantity Payload must be in the form of unirradiated foils, fuel plates or fuel elements and miscellaneous non-fueled associated components. The Small Quantity Payload must not include beryllium, carbon, deuterium, or materials with a hydrogen density greater than that of water, except as specified in 6. The Small Quantity Payload must be contained within the Small Quantity Payload Fuel Handling Enclosure, as specified in 5(a)(3), except the RINSC fuel element must be contained within the RINSC Fuel Handling Enclosure, as specified in 5(a)(3).*"

The following paragraphs were deleted:

1. Unirradiated RINSC fuel element
2. Unirradiated GRR-1 fuel element
3. AFIP fuel element
4. U-Mo Foils
5. DDEs and similar test elements
6. MIT and MURR loose fuel element plates
7. Paragraph beginning: "The approximate mass of U-235 per each MURR fuel plate ..."
8. COBRA loose fuel element plates

Condition No. 11 authorizes the use of Revision No. 13 of this certificate for approximately one year.

In addition, Revision 15 of the SAR and the June 2019 application have been added to the references section of this certificate.

CONCLUSION

Based on the statements and representations in the application, and the conditions listed above, the staff concludes that the Model No. ATR-FFSC package design has been adequately described and evaluated and that 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. 9330, Revision No. 14, for the Model No. ATR-FFSC.