



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

December 19, 2022

MEMORANDUM TO: Carrie Safford, Deputy Director
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

FROM: Pierre Saverot, Project Manager
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF DECEMBER 13, 2022, MEETING WITH
FRAMATOME REGARDING THE UPCOMING REVISION
REQUEST FOR THE MODEL NO. TN-B1 TRANSPORTATION
PACKAGE (DOCKET NO. 71-9372)

Background

On December 13, 2022, an Observation Public Meeting was held by teleconference between the United States (U.S.) Nuclear Regulatory Commission (NRC) staff and representatives from Framatome to discuss the technical approach of an upcoming revision request for the Model No. TN-B1 package.

This Observation Public Meeting was noticed on November 9, 2022 (Agencywide Documents Access and Management System {ADAMS} Accession No. ML22313A142). The attendance list and the presentation slides are provided as Enclosure Nos. 1 and 2, respectively.

Discussion

The revision request for the Model No. TN-B1 package will seek increasing allowable enrichments above 5 weight percent (wt.%) of uranium-235 (^{235}U) for ATRIUM 11x11 fuel assemblies and also include loose fuel rod configurations above 5 wt.% ^{235}U for 11x11 and 17x17 Type 3 fuel assemblies for boiling water reactors and pressurized water reactors, respectively. The applicant will request to increase the maximum enrichment up to 8.0 wt.% ^{235}U , within high assay low enriched limits.

Framatome explained that their material will conform to the new ASTM standard being developed for uranium hexafluoride (UF_6) for both enriched commercial grade uranium and enriched slightly contaminated uranium with trace quantities limits, with no anticipated effect on the criticality evaluations due to the fact that their results are well bounded.

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Framatome explained that, while there is no gadolinium requirement for loose rods, a 5 wt.% enriched ^{235}U ATRIUM fuel assembly requires 12 gadolinium oxide (Gd_2O_3) rods (Gd_2O_3 rods), while 21 Gd_2O_3 rods will be required for an 8 wt.% ^{235}U enriched fuel. The criticality evaluation (performed with SCALE version 6.2.4) will follow the same methodology than the one used for the already approved Model No. MAP 12-13 package to determine optimum moderation, but the analysis will account now for 10.2 kilograms (kg) of polyethylene.

The staff asked if Framatome was using sensitivity/uncertainty (S/U) tools to identify applicable experiments for their modeling. Framatome responded that criticality benchmark experiments are selected first based on engineering judgment and only then S/U tools are being used to assess, with a quantifiable metric, the similarity of the application and critical experiment models. The staff asked also if the applicant had determined how much the critical experiments have changed and that such information should be in the validation basis.

Draft results of the criticality evaluation with various enrichment levels from 5.8 to 8 wt.% enriched ^{235}U show a criticality safety index (CSI) less than or equal to 3.3 for ATRIUM 11x11 fuel assemblies, which works well for road transportation: the transport is right at the weight limit with 15 packages on a truck. Framatome does not anticipate any significant changes to the thermal, containment, or shielding analyses due to the very small increases in decay heat and radiation for the new contents and the fact that the fuel rod cladding remains the containment boundary.

The revision will also request to implement the changes authorized for two shipments by a letter authorization dated February 11, 2022, (ML22035A040). The latter allows the use of synthetic rubber, in addition to natural rubber, for the inner container support frame, as well as the option of natural or synthetic rubber for the vibro-isolating components, which can now be either round or square. Framatome noted that their size and quantities may vary depending on the vibration performance factors of the rubber material.

Framatome anticipates a submittal at the end of January 2023 for a certificate of compliance (CoC) to be issued in 2024. The staff noted that, in view of the current workload, the technical review will not begin before the Summer of 2023. Framatome acknowledged the timeline and said there was no such shipment of 8 wt.% enriched ^{235}U fuel assemblies contemplated in 2024.

No regulatory commitments were made during this meeting.

Docket No. 71-9372
EPID L-2022-LLA-0093

Enclosures:

1. Meeting Attendees
2. Presentation Slides

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DOCUMENT DATE: DECEMBER 19, 2022

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