

**From:** [Pierre Saverot](#)  
**To:** [TATE Timothy \(Framatome\)](#)  
**Cc:** [FLANAGAN Bryan \(Framatome\)](#); [MANNING Calvin \(Framatome\)](#)  
**Subject:** Request for Additional Information for the review of the Model No. TN-B1 package  
**Date:** Wednesday, November 1, 2023 7:19:00 PM

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Mr. Timothy J. Tate, Manager  
Environmental, Health, Safety and Licensing  
Framatome, Inc.  
2101 Horn Rapids Road  
Richland, WA 99354

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9372, REVISION NO. 5, FOR THE MODEL NO. TN-B1 PACKAGE

Dear Timothy Tate:

By letter dated January 31, 2023, (ADAMS Accession NO. ML23031A216), you submitted an amendment request for the Model No. TN-B1 package to support Framatome's advancement to enrichments greater than 5 weight percent (wt.%) 235U.

The staff has determined that further information is needed to complete its technical review. The information requested is listed below. We request you provide this information by December 8, 2023.

Please reference Docket No. 71-9372 and EPID L-2022-LLA-0093 in future correspondence related to this licensing action.

If you have any questions regarding this matter, please contact me at 301-415-7505.

Sincerely

Pierre Saverot  
Project Manager  
Storage and Transportation Licensing Branch  
Division of Fuel Management

Encl: RAI

**RAI: Provide a detailed justification of extending the area of applicability to 8.0 wt% U-235 or revise the validation using critical experiments that provide a suitable area of applicability for the system.**

Title 10 of the Code of Federal Regulations (10 CFR) 71.59(a) requires, in part, that a fissile material package must be controlled by either the shipper or the carrier during transport to assure that an array of such packages remains subcritical. Section 2.4.6, equation 35, of

NUREG-6698, "Guide for Validation of Nuclear Criticality Safety Computational Methodology," states that the Upper Subcriticality Limit (USL) is determined by the equation:

$$USL = K_L - \Delta_{sm} - \Delta_{AOA}$$

where  $K_L$  is the weighted single-sided tolerance limit,  $\Delta_{sm}$  is the margin of subcriticality, and  $\Delta_{AOA}$  is an additional margin of subcriticality that may be necessary as a result of extensions to the area of applicability.

Table 2.3, "Physical Parameters for Areas of Applicability," of Section 2.4.6 of NUREG-6698 states that for U-235 isotopic composition between 5-10 wt.% the allowable extrapolation range is  $\pm 2.5$  wt.%. However, Chapter 5 of NUREG-6698 states that in general, if the extrapolation is larger than 10 percent from the validation data, then the validation should be revised to include additional critical experiments to enhance the area of applicability.

In the application dated January 2023, (ADAMS Accession NO. ML23031A216), Section 6.13.11 the applicant states that for their USL calculation,  $\Delta_{AOA} = 0$ , because extensions are not made to the area of applicability. In Section 6.13.10.1, Table 6-156 of the application, "Comparison of critical benchmark experiment properties to TN-B1 with PWR rods", the critical benchmark experiments are chosen to contain a U-235 enrichment (wt.%  $^{235}\text{U}/\text{U}$ ) between 2.35 – 6.9 wt.% U-235 while the TN-B1 package is being evaluated for 8.0 wt.% U-235. The extrapolation in this case is greater than 10%.

The applicant should either include additional experiments to extend the range of applicability or provide additional justification for extending the range of applicability to 8.0 wt.%.

This information is needed to ensure that the package design meets the criticality safety criteria of 10 CFR 71.59 for fissile material package arrays.