



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

August 10, 2021

Mr. Gary Peters, Director  
Licensing and Regulatory Affairs  
Framatome Inc.  
3315 Old Forest Road  
Lynchburg, VA 24501

SUBJECT: SEPTEMBER 13, 2021, REGULATORY AUDIT PLAN FOR FRAMATOME INC.  
TOPICAL REPORT, ANP-10353P, REVISION 0, "INCREASED ENRICHMENT  
FOR PWRs" (EPID L-2021-TOP-0004)

Dear Mr. Peters:

By letter dated January 29, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21035A074), Framatome, Inc. (Framatome) submitted Topical Report (TR) ANP-10353P, Revision 0, "Increased Enrichment for [Pressurized Water Reactors] PWRs" (ADAMS Package No. ML21035A073), to the U.S. Nuclear Regulatory Commission (NRC) for review and approval for licensing applications. Framatome states in part that ANP-10353P, Revision 0, addresses the codes and methods used to perform neutronics analyses, thermal hydraulic analyses, non-loss-of-coolant accident (LOCA) analyses, small-break and large-break LOCA analyses, and thermal-mechanical fuel evaluations with respect to applicability to fuel with enrichment greater than 5 weight-percent Uranium-235.

The NRC staff technical review of this TR is ongoing. The NRC staff will perform a virtual regulatory audit on September 13, 2021. The NRC staff determined that this regulatory audit is needed in order to facilitate the review. Enclosed for your information is a copy of the audit plan the NRC staff will follow.

Please contact Ngola Otto at 301-415-6695 or via e-mail at [Ngola.Otto@nrc.gov](mailto:Ngola.Otto@nrc.gov) with any questions you may have regarding this letter.

Sincerely,

*/RA/*

Dennis C. Morey, Chief  
Licensing Projects Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 99902041

Enclosure: Audit Plan (Non-Proprietary)

**REGULATORY AUDIT PLAN FOR FRAMATOME INC.**  
**TOPICAL REPORT ANP-10353P, REVISION 0,**  
**“INCREASED ENRICHMENT FOR PWRs”**  
**PROJECT NO. 728**  
**EPID: L-2021-TOP-0004**

## **1.0 BACKGROUND**

By letter dated January 29, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21035A074), Framatome, Inc. (Framatome) submitted Topical Report (TR) ANP-10353P, Revision 0, “Increased Enrichment for [Pressurized Water Reactors] PWRs” (ADAMS Package No. ML21035A073), to the U.S. Nuclear Regulatory Commission (NRC) for review and approval for licensing applications. ANP-10353P, Revision 0, seeks to expand the range of applicability of a variety of TRs to higher than 5 weight-percent Uranium-235. The TRs referenced in ANP-10353P include those in areas such as neutronics, thermal hydraulics, mechanical, non-loss-of-coolant accident (LOCA) and LOCA models, and decay heat models. ANP-10353P provides additional analysis and justification where necessary to show that current codes and methods can reliably model fuel behavior at increased enrichments in PWRs.

## **2.0 REGULATORY AUDIT BASES**

Regulatory guidance for the review of fuel system materials and designs and adherence to Title 10 of the *Code of Federal Regulations*, Appendix A to Part 50, General Design Criteria (GDC)-10, “Reactor Design,” GDC-11, “Reactor Inherent Protection,” and GDC-13, “Instrumentation and Control,” is provided in NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants” (SRP), Section 4.3, “Nuclear Design.” In accordance with SRP Section 4.3, the objectives of the nuclear designs safety review is to provide reasonable assurance that: (1) acceptable fuel designs limits are not exceeded, (2) limiting power distributions are not exceeded, and (3) analytical methods should be representative of the state of the art, and the experiments used to validate the analytical methods should be adequate representations of fuel designs in the reactor and encompass a sufficient range of variables and operating conditions.

## **3.0 REGULATORY AUDIT SCOPE**

The NRC staff will conduct a one-day audit online. This one-day audit will include a technical discussion pertaining to potential request for additional information questions. The topics of discussion are included below in Section 4.0.

## **4.0 INFORMATION NEEDS**

The NRC staff would like Framatome to make available the appropriate engineer(s) with intimate knowledge of the codes and methods referenced in ANP-10353P to address any comprehension questions by the NRC staff.

### **Major Discussion Topics**

1. Adequacy of the coverage for the critical benchmark experiments over the range of increase enrichment.

2. Uncertainties related to depletion and local peaking uncertainties.
3. Detector behavior, uncertainties, and biases.
4. How various neutronic parameters respond to fuel of higher enrichments in the ARITA and AREA methodologies.
5. Small-break LOCA evaluation model input values.
6. Decay heat modeling.

## **5.0 TEAM ASSIGNMENTS**

Brandon Wise, Technical Reviewer (NRR/DSS/SFNB)  
Kevin Heller, Technical Reviewer (NRR/DSS/SFNB)  
Paul Clifford, Technical Reviewer (NRR/DSS)  
Ngola Otto, Project Manager (NRR/DORL/LLPB)

## **6.0 LOGISTICS**

Audit date: September 13, 2021

The audit will be held virtually.

## **7.0 DELIVERABLES**

A regulatory audit summary will be provided within 90 days of the completion of the audit.

SUBJECT: SEPTEMBER 13, 2021, REGULATORY AUDIT PLAN FOR FRAMATOME INC.  
TOPICAL REPORT, ANP-103539, REVISION 0, "INCREASED ENRICHMENT  
FOR PWRs" (EPID L-2021-TOP-0004) DATED AUGUST 10, 2021

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**ADAMS Accession No.: ML21217A101 (Audit Plan)**

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