



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

December 13, 2021

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

FROM: Ngola Otto, Project Manager */RA/*  
Licensing Projects Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF NOVEMBER 10, 2021, CLOSED MEETING  
BETWEEN FRAMATOME INC. AND THE U.S. NUCLEAR  
REGULATORY COMMISSION ON UPDATE FOR FRAMATOME  
PROTECT CHROMIUM-COATED CLADDING TEST PLAN

On November 10, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff held a closed teleconference meeting via WebEx with representatives from Framatome Inc. (Framatome). The purpose of the meeting was for the NRC staff and Framatome representatives to discuss the status of chromium-coated (Cr-coated) cladding testing. The meeting was noticed on October 28, 2021, and is available in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML21302A023.

At the meeting, Framatome representatives provided an update of testing status for PROtect Cr-coated cladding. This update included a presentation on the background, irradiated testing program, material properties and tests, component behavior, critical heat flux (CHF), reactivity insertion accident, loss-of-coolant accident (LOCA), summary, and next steps. During the meeting, Framatome representatives noted NRC staff's comments, addressed NRC questions, and requested feedback on additional topics for future discussions. The NRC staff's feedback on future discussion topics of interest are provided below.

In regard to LOCA, the NRC staff is interested in information related to 1) cladding swelling and rupture test results and modeling approaches, 2) the potential for local Cr-coating delamination at the site of high cladding strain or rupture, 3) cladding rewet behavior, 4) cladding oxidation, 5) hydrogen pickup, and 6) other cladding properties relevant to LOCA (e.g., emissivity). Regarding CHF, the NRC staff would be interested in more discussion of any available empirical data supporting qualitative insights regarding the influence of the Cr-coating. Additionally, the NRC staff is interested in further discussions about how the proposed licensing pathway will account for the unavailability of complete lead assembly data until after the submittal.

CONTACT: Ngola Otto, NRR/DORL  
301-415-6695

Enclosure

A list of the attendees is enclosed. The Framatome presentation materials, including this meeting summary, can be found at ADAMS Package Accession No. ML21312A004.

Docket No. 99902041

Enclosure: As stated

## List of Attendees

Closed Meeting with Framatome Inc. and the Nuclear Regulatory Commission (NRC) on  
Framatome PROtect Chromium-Coated Cladding Test Plan

December 10, 2021  
8:30 am – 12:00 pm

<u>NAME</u>	<u>ORGANIZATION</u>
Matthieu Aumand	Framatome (Framatome)
Buck Barner	Framatome
Morris Byram	Framatome
Matt Devan	Framatome
Lisa Gerken	Framatome
Brian Haibach	Framatome
Christina Jones	Framatome
John Klingenfus	Framatome
Ronda Lane	Framatome
Evrard Lacroix	Framatome
Will Maxson	Framatome
Kiran Nimishakavi	Framatome
Brian Painter	Framatome
Jeff Reed	Framatome
Elmar Schweitzer	Framatome
Jacki Stevens	Framatome
Claire Verdon	Framatome
Michelle Bales	NRC (U.S. Nuclear Regulatory Commission (NRC))
Mark Blumberg	NRC
Kristy Bucholtz	NRC
James Corson	NRC
Jeremy Dean	NRC

<b><u>NAME</u></b>	<b><u>ORGANIZATION</u></b>
Elijah Dickson	NRC
Joseph Donoghue	NRC
Scott Krepel	NRC
John Lehning	NRC
Robert Lukes	NRC
Joseph Messina	NRC
Dennis Morey	NRC
Ngola Otto	NRC
Mathew Panicker	NRC
April Pulvirenti	NRC
Ashley Smith	NRC
Brandon Wise	NRC
Michael Wentzel	NRC

SUBJECT: SUMMARY OF NOVEMBER 10, 2021, CLOSED MEETING BETWEEN  
FRAMATOME INC. AND THE U.S. NUCLEAR REGULATORY COMMISSION ON  
UPDATE FOR FRAMATOME PROTECT CHROMIUM-COATED CLADDING  
TEST PLAN DATED: DECEMBER 13, 2021

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JLehning, NRR	
JDonoghue, NRR	

**EXTERNAL DISTRIBUTION:**

Morris.Byram@framatome.com

**ADAMS Accession Nos:**

- ML21312A004 (Package)**
- ML21342A008 (Summary)**
- ML21302A023 (Notice)**
- ML21312A005 (Proprietary Presentation)**
- ML21312A006 (Nonproprietary Presentation)**
- ML21312A406 (Affidavit)**

**\*via email**

OFFICE	NRR/DORL/LLPB/PM*	NRR/DORL/LLPB/LA*	NRR/DORL/LLPB/BC*	NRR/DORL/LLPB/PM*
NAME	NOtto	DHarrison	DMorey	NOtto
DATE	12/8/2021	12/8/2021	12/8/2021	12/13/2021

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