



*Pre-Submittal Teleconference  
for LOCA Analyses Supporting  
Millstone Power Station, Unit 2  
Upgrade to AREVA Standard CE14  
HTP Fuel Assembly*

*June 22, 2015*



## **Agenda**

- 1) Background on fuel product upgrade at Millstone Power Station Unit 2 (MPS2)**
- 2) Licensing overview for fuel product upgrade**
- 3) License Amendments for LOCA Analyses**
  - Small Break Loss of Coolant Accident (SBLOCA)
  - Large Break Loss of Coolant Accident (LBLOCA)
- 4) Licensing timeline/schedule**
- 5) Future Dominion/NRC interactions**



## ***Background on Fuel Product Upgrade***

- **Kickoff meeting with NRC was July 17, 2013 (ADAMS ML13207A259)**
- **Goal is to implement the change for Cycle 25 (Spring 2017)**
- **Upgrade fuel product is called the AREVA Standard CE14 HTP Fuel Assembly**
- **Upgrades to the current MPS2 fuel product:**
  - M5<sup>®</sup> cladding
  - Advanced fuel rod geometry
  - Zircaloy-4 MONOBLOC<sup>™</sup> guide tubes



## **Licensing Overview**

- **Dominion identified 2 required submittals:**
  - M5<sup>®</sup> LAR and Exemption Request
    - Exemption Request approved on May 12, 2015
    - Amendment approved on May 18, 2015
  - LAR to add RLBLOCA topical report to MPS2 TS 6.9.1.8 (list of analytical methods used to determine COLR limits)
- **Statement made to NRC in a Dominion letter dated November 1, 2012 regarding SBLOCA:**
  - A reanalysis of the SBLOCA event will be submitted within one year of NRC approval of Supplement 1 to the AREVA SBLOCA methodology
  - NRC reiterated in Sleicher-Rouse Closure Evaluation dated July 18, 2013
- **To address above statement, SBLOCA LAR will upgrade EM to Supplement 1 of EMF-2328(P)(A)**



## ***SBLOCA Analysis***

- **Analysis completed using EMF-2328(P)(A) including Supplement 1**
  - Analysis conforms to draft NRC safety evaluation
  - Change to TS 6.9.1.8 will add “Supplement 1” to Reference 5
  - 5) EMF-2328(P)(A), “PWR Small Break LOCA Evaluation Model S-RELAP5 Based,” Framatome ANP.
  - LAR will omit revision number and vendor names to avoid confusion
  - Dominion plans to submit LAR in July 2015 (more schedule discussion later)
  - Dominion seeks NRC feedback on referencing the draft SE



## ***SBLOCA Analysis***

- **Analysis of Record (AOR) presented in the LAR was performed for fuel product with M5 cladding**
  - Assessment performed for full core of the fuel product with Zr-4 cladding to develop PCT for comparison to the AOR (fuel product with M5 cladding)
  - PCT difference will be maintained as a 10 CFR 50.46 “estimate” until fuel product with Zr-4 cladding is non-limiting
  - Addressing the fuel product with Zr-4 cladding explicitly supports implementation of the LAR with SBLOCA EM Supplement 1 soon after NRC approval
    - No need to wait for fuel product with M5 cladding introduction in 2017
  - Dominion prefers this approach as the AOR represents the M5 clad fuel configuration that will be used for compliance with 50.46c
  - Dominion seeks NRC feedback on this approach



## ***SBLOCA Analysis***

- **SBLOCA LAR will incorporate Supplement 1 of EMF-92-116(P)(A)**
  - RODEX used to develop fuel rod inputs for SBLOCA analysis
  - Change to TS 6.9.1.8 will add “Supplement 1” to Reference 16
  - 16) EMF-92-116(P)(A) Revision 0, “Generic Mechanical Design Criteria for PWR Fuel Designs,” Siemens Power Corporation.
  - LAR will remove the revision number and omit vendor names to avoid confusion



## **LBLOCA Analysis**

- **Analysis completed using EMF-2103(P) Revision 3**
  - Analysis is in progress and is being performed in accordance with the submitted EM as modified by the AREVA RAI responses
  - AREVA engineering products for MPS2 will be completed after affirmation from NRC that RAI responses from January 2015 are acceptable
  - LAR will be submitted after review of the draft NRC SE to ensure conformance
  - Analysis does not apply to the fuel product with Zr-4 cladding. Implementation of the LAR will be requested for the Spring 2017 refueling outage with first use of the fuel product with M5 cladding
  - Fuel product with Zr-4 cladding will be addressed for mixed cores
  - Dominion seeks NRC feedback on referencing the draft SE in the LAR



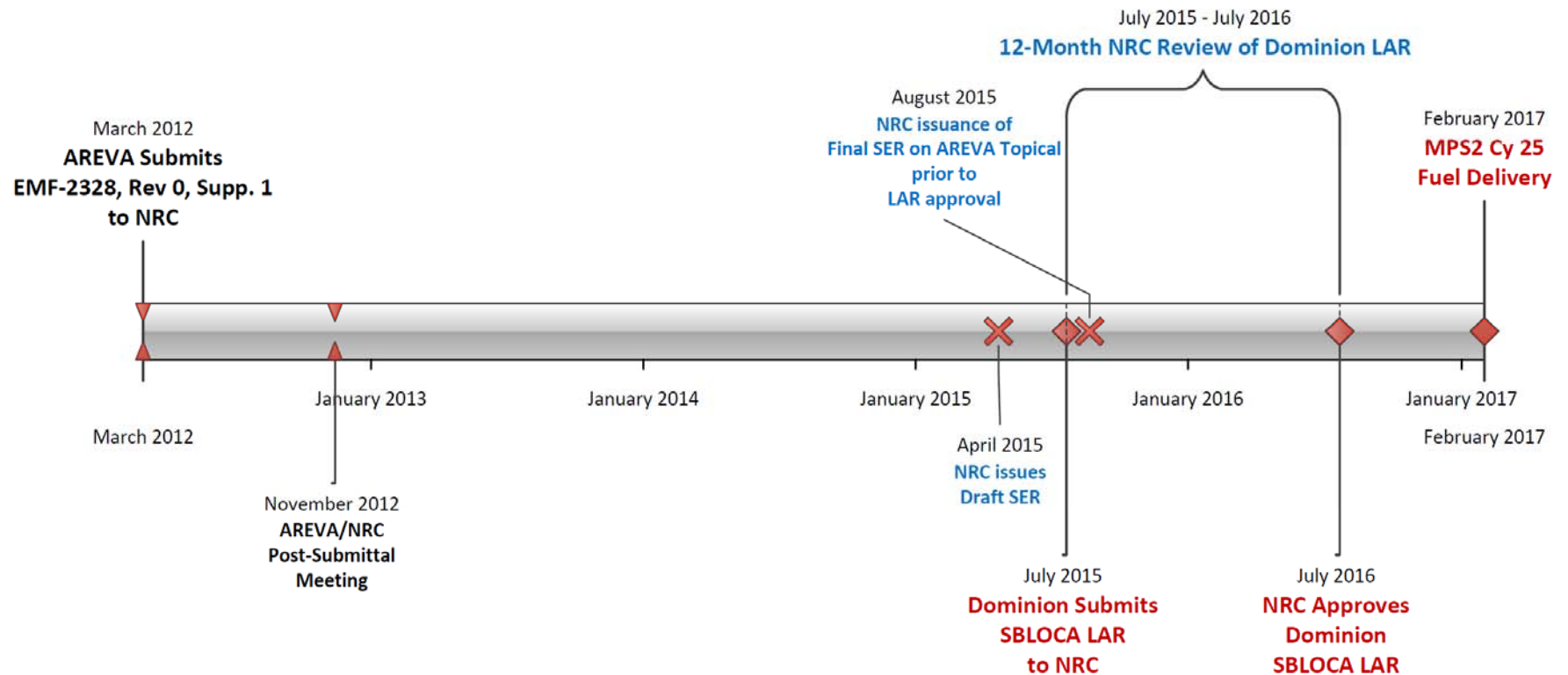


## ***Licensing timeline/schedule***

- **Need LOCA Analysis LARs approved by October 2016**
- **Supports M5 Cladding for Cycle 25 (Spring 2017)**
- **SBLOCA schedule has delayed 10 months from the initial project schedule presented in July 2013**
  - Planned submittal date still allows for 12 month NRC review of the LAR
- **LBLOCA schedule has delayed at least 6 months from the initial project schedule presented in July 2013**
  - Planned submittal date still allows for 12 month NRC review of the LAR with minimal schedule float

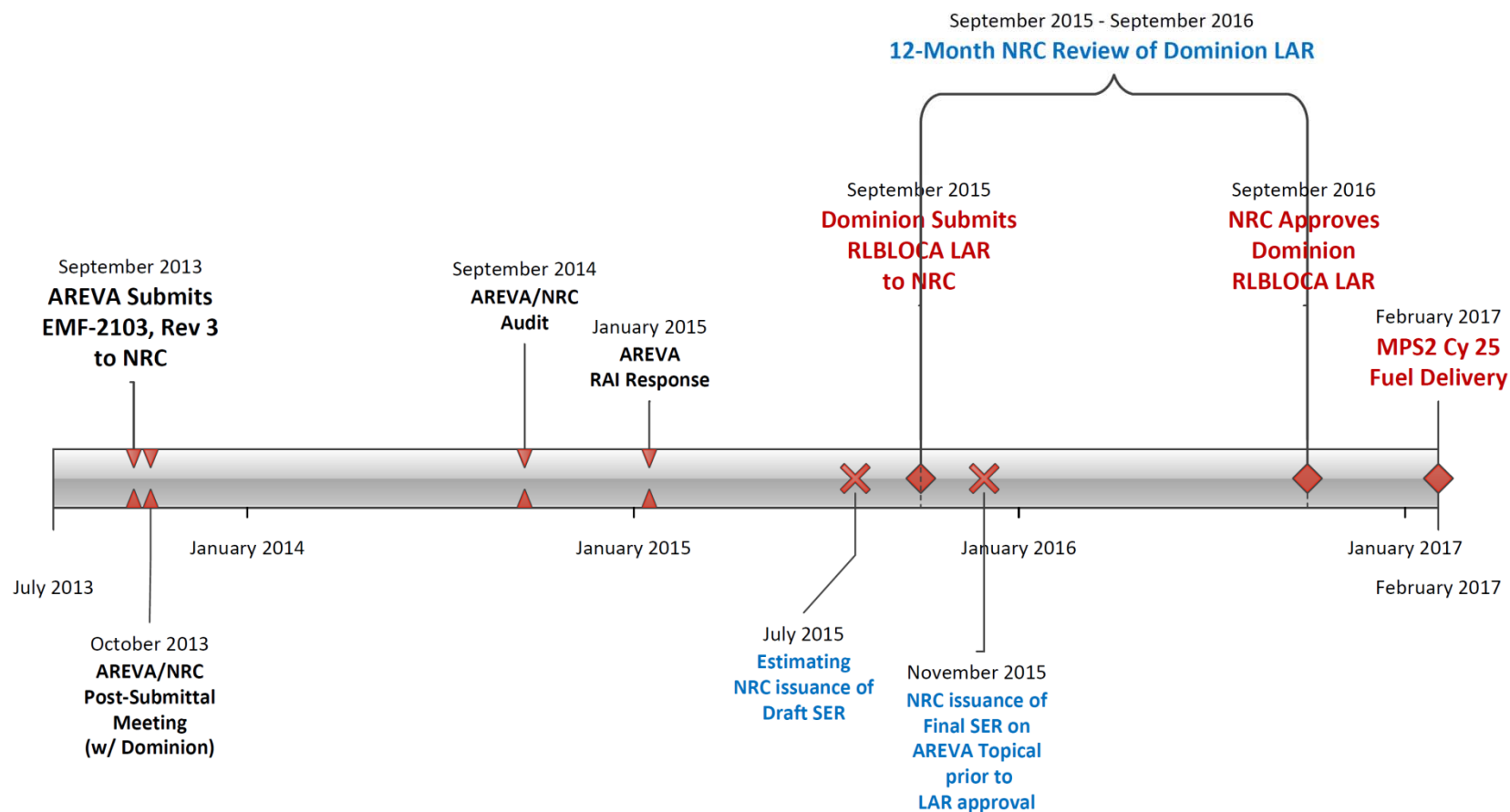


## *SBLOCA Licensing timeline/schedule*





## *LBLOCA Licensing timeline/schedule*





## ***Future Dominion/NRC Interactions***

- **Implementation of the fuel product upgrade at MPS2 for Cycle 25 in Spring 2017 relies on the schedule presented**
- **LAR with SBLOCA analysis to be submitted in July 2015 with reference to draft SE**
- **LAR with LBLOCA analysis to be submitted in September 2015 with reference to draft SE**
  - **Schedule depends on NRC agreement with AREVA RAI responses**
    - **Potential re-work of AREVA engineering products for MPS2**



# Discussion



## **Acronym List**

- **AOR**                      **Analysis of Record**
- **CFR**                      **Code of Federal Regulations**
- **COLR**                    **Core Operating Limits Report**
- **EM**                        **Evaluation Model**
- **HTP**                      **High Thermal Performance**
- **LAR**                      **License Amendment Request**
- **LBLOCA**                **Large Break Loss of Coolant Accident**
- **LOCA**                    **Loss of Coolant Accident**
- **MPS2**                    **Millstone Power Station, Unit 2**
- **RAI**                        **Request for Additional Information**
- **RLBLOCA**              **Realistic Large Break Loss of Coolant Accident**
- **SBLOCA**                **Small Break Loss of Coolant Accident**
- **SE**                        **Safety Evaluation**
- **TS**                        **Technical Specifications**