Plant Hatch Potential EPU Pilot Approach (2nd Tabletop)*

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**SNC has not received approval to proceed with the EPU for Plant Hatch, only the engineering work, licensing, and procurement scoping of long lead items to enable EPU*

Overview

- Purpose
- Overview of Plant Hatch Uprate with MELLLA+
- Why is Bundling EPU/MELLLA+ Important?
- Burnup Thresholds for Addressing FFRD
- Approach for Implementing RG-1.183 Rev. 2 (DG-1425)
- Discuss Need for Pilot Exception Approach for Linked Submittals
- Discuss Need for Pilot Exemption Approach

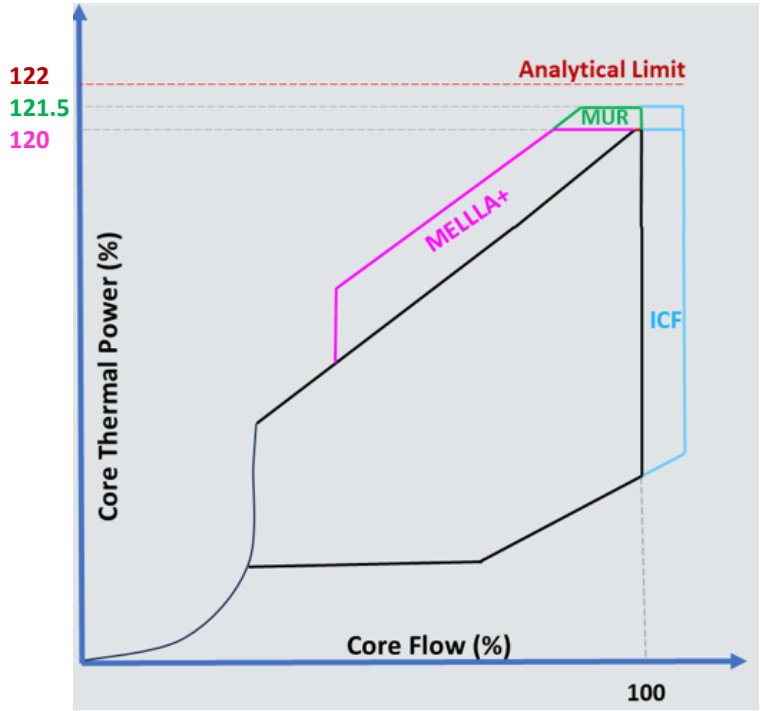
Purpose

- **Purpose:** To communicate SNCs strategy and invite discussion associated with key technical elements of potential upcoming EPU submittals with considerations for:

  - Treatment of in-process draft rule-making items (exemptions, exceptions, etc.)
  - Minimizing regulatory review durations through a maximization of efficiency gained from bundling/combining historically “sequential” submittals
  - Continuous improvement of the safety, reliability, and overall performance of SNC’s fleet of commercial power plants

Overview of Plant Hatch Uprate with MELLLA+

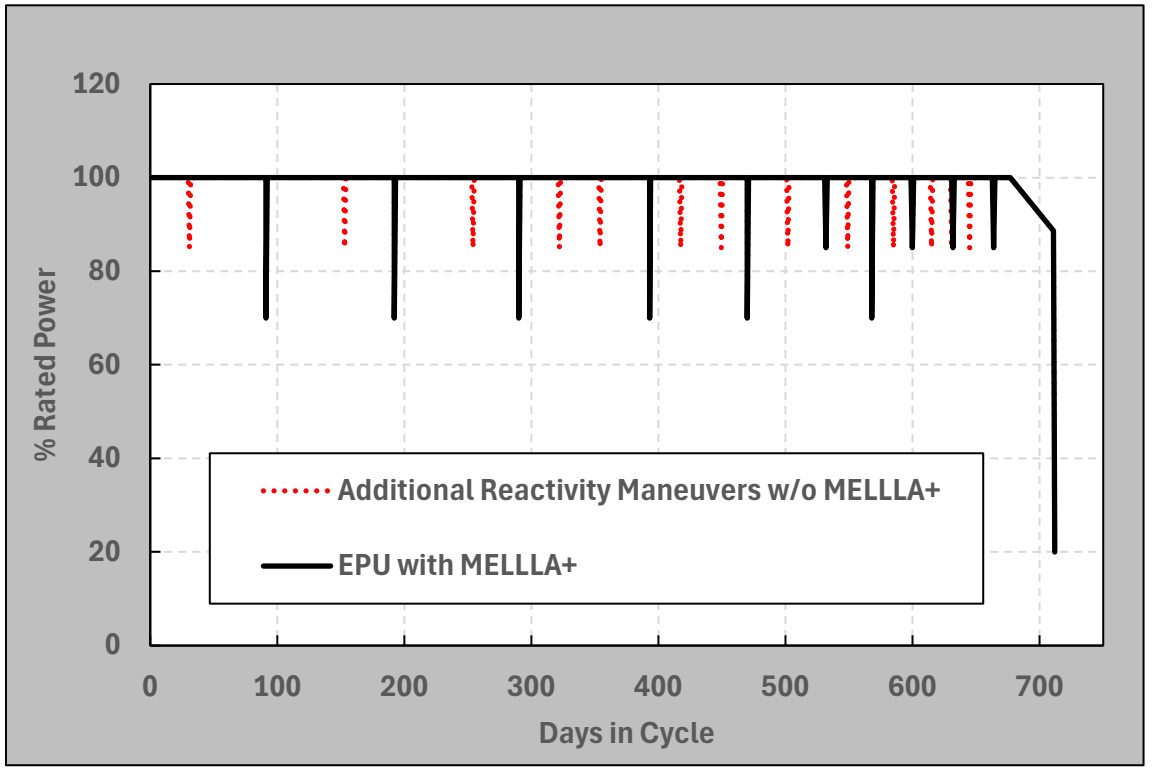
- Continuation from 1st Pilot Workshop (ML25210A425)
- Edwin I. Hatch (HNP-Units 1 and 2) plans to uprate from the current licensed thermal power (CLTP) of 2804 MWth to 121.5% of original licensed thermal power (OLTP) or 2960MWth
- No fuel design change/transition is planned for the HNP uprate. HNP will continue to use their current GNF3 fuel product and analyze in accordance with approved methods.
- Uprate will include implementation of MELLLA+ with improved stability monitoring (DSS-CD) and will **preserve** the previous approval for Thermal Power Optimization (TPO) Margin Uncertainty Recapture (MUR)



Power (MWth)	Basis (%)	Reference/(Year)
2436	OLTP	ML012920523, ML19269E991 (1974, 1978)
2558	SPU(5)	ML013020073 (1995)
2763	EPU(8)	ML013030084, ML20155C657 (1998)
2804	TPO/MUR(1.5)	ML032691360 (2003)

Why is Bundling EPU/MELLLA+ Important?

- The MELLLA+ domain **improves safety and fuel reliability** by minimizing operator impact through improving operational flexibility and reducing reactivity management maneuvers upon EPU implementation



Example showing potential reduction in reactivity maneuvers

Are there any unique aspects of a combined EPU/MELLLA+ submittal that need to be included/addressed as compared to two independent submittals?

Why is Bundling EPU/MELLLA+ Important?

- In addition to improving safety, bundling EPU w/MELLLA+ has the potential to reduce the implementation of plant uprates by **years** versus a sequential submittal strategy

	Nine Mile Unit 2	Peach Bottom
EPU	31	23
MELLLA+	22	18
MUR		9
Review Time (months)	53	50
Implementation Time (months)	76	62

Figure taken from ML25210A425

*A combined submittal approach with a 12-month review duration could reduce the time to accomplish an EPU **by over 3 years** per site (avg(53+50) – 12m) = 39m just in review savings alone!*

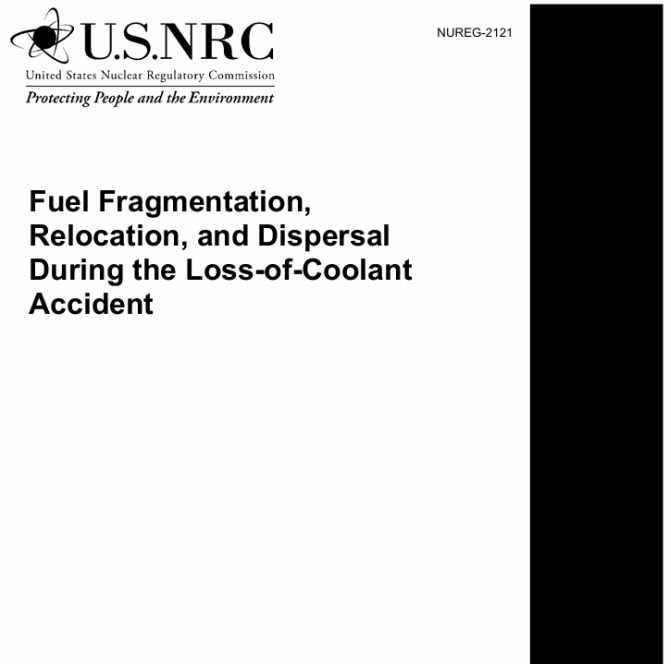
- Combined LAR streamlines NRC resource use and supports similar future industry submissions
- Combined LAR makes site implementation of physical mods and procedure updates more efficient, especially in areas affected by both EPU and MELLLA+.

Burnup Threshold for Addressing FFRD

- SECY-15-0148 (ML15230A200) concluded that research and analyses provide reasonable assurance that no imminent safety concern exists with operating reactors associated with FFRD phenomena.
  - NUREG-2121 provides research basis for findings in SECY-15-0148

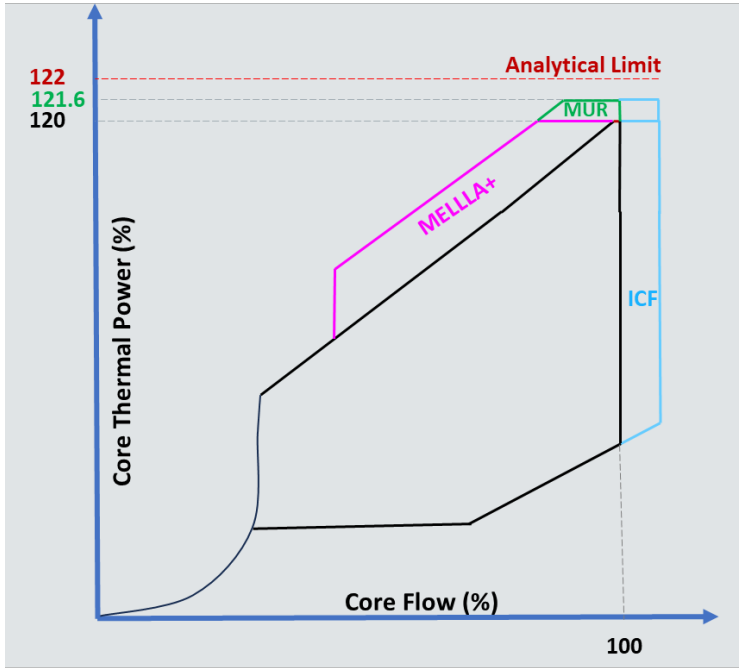
- SECY-15-0148 conclusions covered operation up to and including 62 GWD/MTU rod-average burnup and 122% OLTP (BWRs) analytical power level.

- *"Therefore, plants operating in accordance with or plants uprating within the boundaries of the 2015 fuel design limits (rod-average burnup ≤ 62 GWD/MTU and analytical power level ≤ 122% of original licensed power) are not required to address FFRD phenomena in their licensing basis."*



Burnup Threshold for Addressing FFRD

- HNP EPU will align on a percentage power basis with plants already in operation
  - Peach Bottom 2, 3
    - ✓121.6% OLTP
    - ✓MELLLA+
    - ✓TPO (MUR)
    - ✓Peak Rod Average BU ≤ 62 GWD/MTU



- **Burnup Threshold for Addressing FFRD Conclusions**
  - Plants utilizing existing/in-operation fuel-clad systems
  - Plants with power levels < 122% OLTP
  - Plants with Peak Rod Average BU ≤ 62 GWD/MTU

If plants are within/comply with the above thresholds, then the conclusions of SECY-15-0148 apply and operational/design considerations for not addressing FFRD remain applicable.

Approach for Implementing RG-1.183 Rev. 2 (DG-1425)

- As mentioned previously:
  - NRC provided significant effort and needed advances in dose consequence analysis guidance (ML24005A102, ML24066A177, ML24304A864) planned for RG-1.183 Rev. 2 (DG-1425).
  - Utilities seeking uprates for BWRs would benefit from the improved realism of the dose methods communicated in the updated guidance
    - Credit for Suppression Pool Scrubbing
    - Modeling guidance for pathway specific source terms (i.e. steamline leakage)

- To enable uprate of HNP, SNC will utilize RG-1.183 Rev. 2 (DG-1425)

Approach for Implementing RG-1.183 Rev. 2 (DG-1425)

- SNC will accomplish this as follows:
  - Linked submittal (to EPU) for approval of an Alternative Source Term (AST) utilizing RG-1.183 Rev. 2 (DG-1425)
  - Licensing Precedent circa 2010:
    - Turkey Point 3 and 4: EPU (ML103560169, October 2010)

FPL has submitted PTN LAR 196, Alternative Source Term and Conforming Amendment, dated June 25, 2009 (ADAMS Accession No. ML092050277), to adopt the alternative source term (AST) as allowed by 10 CFR 50.67. The changes proposed in AST LAR 196 as supplemented or modified by FPL's responses to NRC Requests for Additional Information (RAIs) are assumed in the EPU analyses and evaluations contained herein. Therefore, approval of this EPU LAR submittal is contingent upon the approval of the AST LAR.

    - Turkey Point 3 and 4 AST: (ML092050277, June 2009)
      - May require exception/revision to LIC-109
      - **Revision to LIC-109 would provide improved efficiency for entire industry (preferred)**

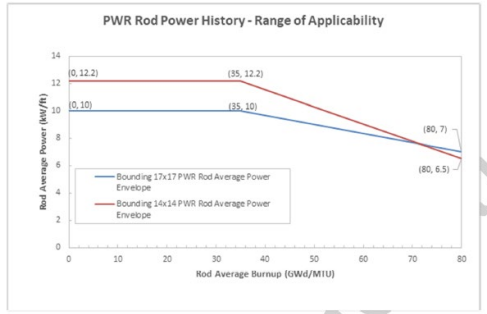


Figure 1. Maximum allowable power operating envelope for PWR steady-state release fractions

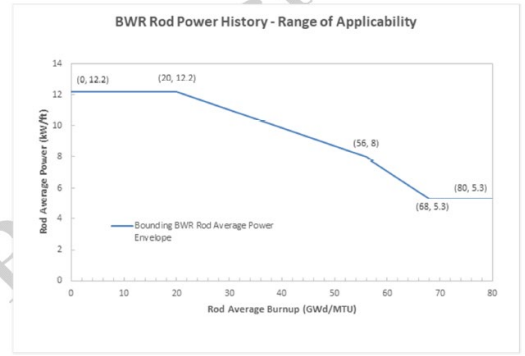


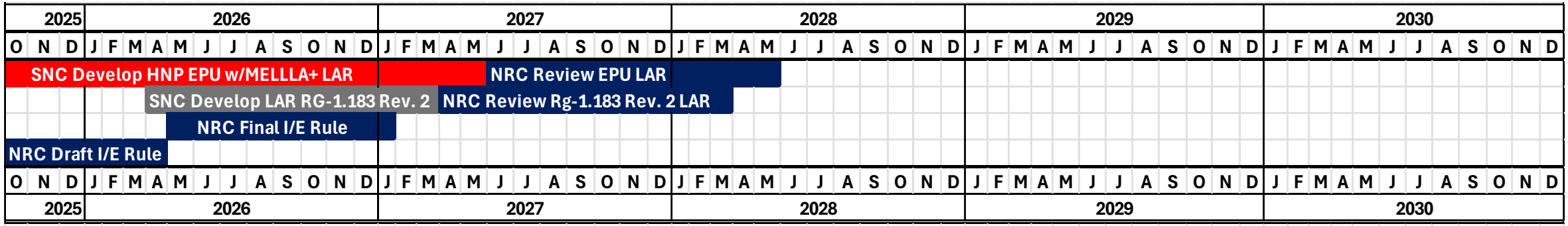
Figure 2. Maximum allowable power operating envelope for BWR steady-state release fractions

(DG-1425 Fig. 1-2): Includes expanded application envelope which enables Rev. 2 to be used with all vendor modern fuel types as-is

Approach for Implementing RG-1.183 Rev. 2 (DG-1425)

- SNC will follow DG-1425 guidance and acceptance criteria
  - For reasons stated above the 10 CFR 50.46 LOCA with FFRD analysis (new analysis in DG-1425) will not be performed
    - Burnup and operational/fuel thresholds for addressing FFRD are not exceeded
    - NRC acknowledges the MHA-LOCA source term bounds the LOCA with FFRD source term (ML21197A067)
    - TID source term will continue to be used for EQ
      - Consistent with recent workshop interactions (9/2025) with the staff on continued use of TID source term for EQ
      - **Industry acknowledges significant effort by the staff in the last year to improve regulatory durability and efficiency in this area**
    - Submittal package format will closely follow Vogtle RG-1.183 Rev. 1 AST (ML25190A545) with any additional considerations communicated in staff presentation ML25021A204
  - Will need exemption to §50.67 if I/E rule package is delayed

Approach for Implementing RG-1.183 Rev. 2 (DG-1425)



Note 1: Integrated project schedule is close to completion. Updates will be provided during monthly meetings with SNC Licensing

Note 2: Dates are preliminary. SNC has approval to begin engineering, licensing, and early procurement work

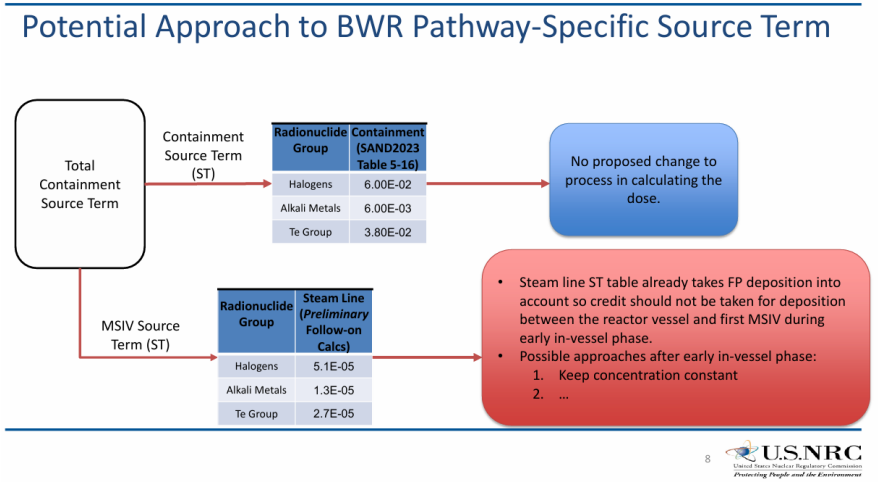
Note 3: Draft and Final I/E Rule includes updates to RG-1.183 Rev. 2

Schedule is <u>DRAFT,</u> formal submittal and implementation dates will be communicated by SNC Licensing

Discuss Need for Pilot Exception Approach for Linked Submittals

- LIC-109
  - SNC believes including AST Rev. 2 with the EPU LAR would result in a significant increase in complexity for the EPU LAR
  - Review approach currently in progress for Vogtle 1 and 2 EPU should be used.
  - Due to schedule constraints and longer lead key task predecessors (i.e. loading patterns for ORIGEN depletion calculations) linked submittals should be allowed for this:
    - BWRs need the improved modeling and realisms in the new guidance to enable EPUs
    - It is expected significant changes to DG-1425 will be communicated in 2Q26 when the rule becomes available for comment
    - To reduce risk and cost of re-work, utilities should not begin LAR analysis work until the public comment period
    - Prior to LIC-109 this was allowed (maybe it still is?)

Discussions on how this approach can be achieved



3.1 Acceptance Review Criteria

The following sections highlight key elements that should be contained in an RLA and potential issues that should be addressed during the acceptance review. The PMs and technical staff should make the following determinations with regard to the RLA. Failure of an RLA to meet one or more of the following criteria is indicative of an unacceptable application. However, the criteria are not all-inclusive or absolute, and NRC staff's discretion and judgement should be used in the process. Application of the criteria should not replace sound technical and regulatory judgement. The list of criteria are divided into groups by which reviewer (PM or technical staff) would likely be utilizing them.

Discuss Need for Pilot Exemption Approach

- Exemption for §50.67 (b)(2)(iii)
  - To be consistent with proposed criteria in Tables 7 and 8 of DG-1425 an exemption to §50.67 (b)(2)(iii) will be needed (if the rule is not implemented by the time of planned submittals) as the criteria in the current rule is different from the criteria in the draft guidance
  - Industry could submit an exemption request for approval of the "Risk-Informed Performance Based Control Room Design Criteria", but the foundational technical basis and justification for this criteria is based on work performed by the staff:
    - White Paper on a Graded, Risk-Informed and Performance-based framework (ML24212A254)
    - Assessment of Health Effects (ML23027A059)
    - Positive feedback when presented to ACRS (12/2024)

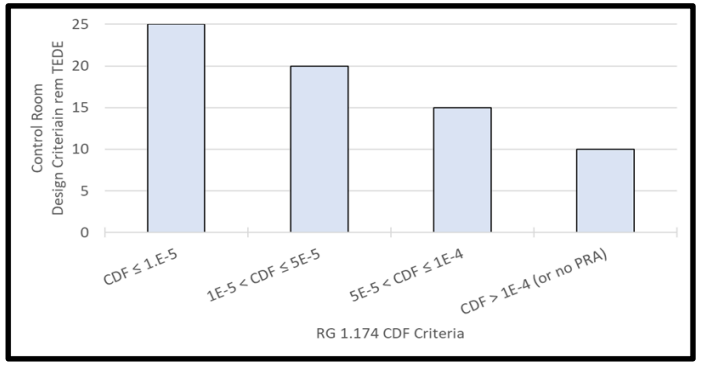


Table 8. Guidelines for Control Room Location Based on a Graded, Risk-Informed, and Performance-Based Framework

Overall CDF	Graded Control Room Design Criteria (rem-TEDE)
CDF ≤ 1.E-5	25
1E-5 < CDF ≤ 5E-5	20
5E-5 < CDF ≤ 1E-4	15
CDF > 1E-4; or licensee not adopting the graded framework to determine acceptance criteria	10

Additional Items and Contingencies

- What if any contingencies can be implemented to offset any future obstacles such as those encountered in October/November
  - Plans for HNP are “strongly” tied to the progression of the I/E rule

- Are there additional things we can do? (LIC-112)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