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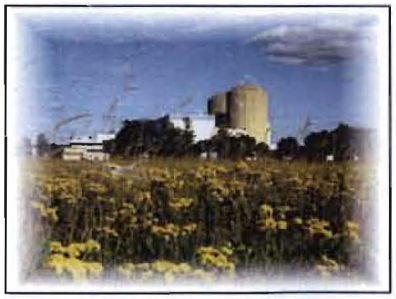
MELLA+ LAR

Maximum Extended Load Line Limit Analysis Plus



Monticello Nuclear Generating Plant

December 15, 2009

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Attendees

Al Williams	Project Manager – EPU & MELLLA+
Steve Hammer	Project Manager
Lynne Gunderson	Projects Licensing Manager
Doug Blair	Licensing Support
Ralph Hayes	Licensing Support
Juswald Vedovi	GE-Hitachi Nuclear Energy
Mike Lalor	GE-Hitachi Nuclear Energy

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Agenda

- Meeting Purpose
- Background
- Overview of MELLLA+
- Regulatory Discussion
- LAR Overview
- TS Changes
- Schedule
- Discussion

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Meeting Purpose

- Common understanding of the proposed scope of the MELLLA+ LAR
- Discuss Schedule
- Concurrent review with EPU

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Background

BWR Operation

- Maintain reactivity balance to accommodate fuel burn-up
  - Control Rod Movements
  - Core Flow Adjustments – preferred method
- EPU decreases available core flow window at rated power
  - Without M+ >99% core flow required to operate at uprated power
  - M+ justifies >80% core flow to operate at uprated power

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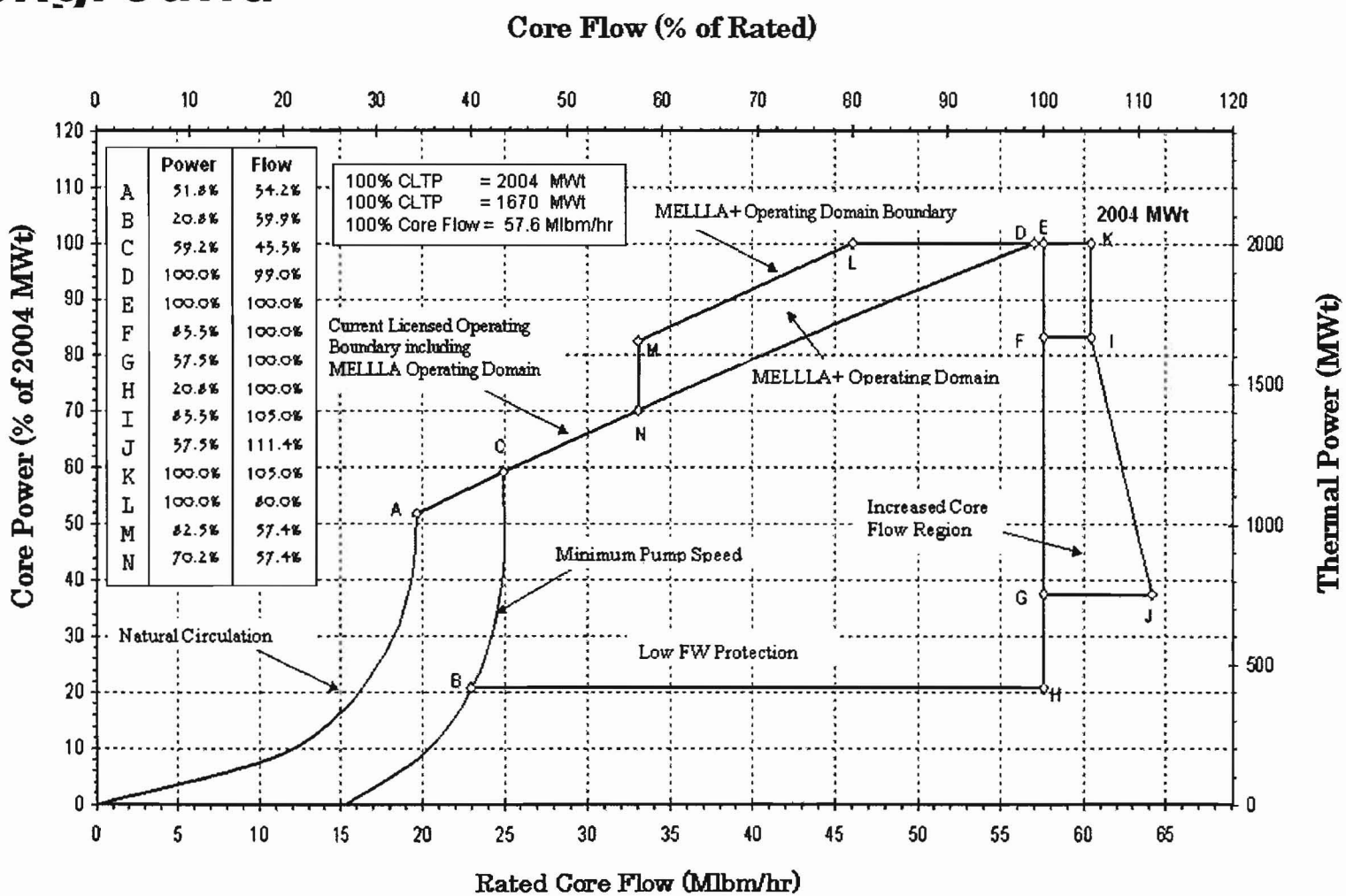
Background



	Power	Flow
A	51.8%	54.2%
B	20.8%	59.9%
C	59.2%	45.5%
D	100.0%	99.0%
E	100.0%	100.0%
F	85.5%	100.0%
G	57.5%	100.0%
H	20.8%	100.0%
I	85.5%	105.0%
J	57.5%	111.4%
K	100.0%	105.0%
L	100.0%	80.0%
M	82.5%	57.4%
N	70.2%	57.4%

Background (cont'd)

Benefits of Adopting MELLLA+

- Improved Operational Flexibility
  - Increased Core Flow Range at Rated Power
  - Decrease in Rod Pattern Changes to Compensate for Fuel Burnup
- Safer Operation with Fewer Control Rod Manipulations
  - Minimizes likelihood of fuel failures
  - Reduces the likelihood of accidents initiated by reactor maneuvers

Overview of MELLLA+

Expands Operating Domain

- Allows operation at 2004 MWt with >80% core flow
- Changes stability solution
  - Current stability solution
    - Option III
  - Proposed stability solution
    - Detect and Suppress Solution – Confirmation Density (DSS-CD)

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Regulatory Discussion

LTR Compliance to Support Request

- MELLLA+: primary topical for MELLLA+
- DSS-CD: topical for change in stability solution required for MELLLA+
- TRACG: topical supporting use for DSS-CD
- Methods LTR: topical for application of GEH methods for expanded operating domains (EPU & MELLLA+)

Regulatory Discussion (cont'd)

M+ LAR Use of Safety Evaluations for Topicals

- Compliance with applicable limitations
- Taking no exceptions to LTR requirements

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Regulatory Discussion (cont'd)

- MELLLA+ SAR
  - Core, Fuel Performance and Thermal Limits evaluation in SAR and with core reload evaluations supporting COLR consistent with SER for LTR
  - No significant effect on:
    - Reactor Coolant System
    - Engineered Safety Features
    - Electrical Power and Auxiliary Systems
    - Power Conversion Systems
    - Radwaste Systems and Radiation Sources
    - Design Basis Accidents and Events

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Regulatory Discussion (cont'd)

- MELLLA+ SAR
  - ATWS Event Evaluated with Significant Margin to acceptance criteria
    - Response to Core Instability Event acceptable
    - Monticello EOP actions effectively mitigate
  - Stability
    - DSS-CD would replace Option III as stability solution
    - Automated Backup Stability Protection (BSP) would provide backup solution

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Regulatory Discussion (cont'd)

- Probabilistic Risk Assessment
  - Core Damage Frequency increase of 7.36E-08/yr
  - Large Early Release Frequency increase of 1.62E-08/yr
  - Both within Region III range of Regulatory Guide 1.174
- TSTF-493

LAR Overview

License Amendment Request Outline

- Enclosure 1
  - Standard Content
- Attachments to Enclosure 1
  1. Technical Specification Markup
  2. Technical Specification Bases Mark-up for information
  3. Re-typed TS pages
  4. MELLLA+ Safety Analysis Report (M+SAR) Proprietary
  5. Affidavit supporting proprietary M+SAR
  6. MELLLA+ Safety Analysis Report (M+SAR) Non-Proprietary
  7. Monticello MELLLA+ Risk Assessment

Proposed TS Changes

- TS 3.3.1.1, "RPS Instrumentation ACTIONS"
  - ACTION I Addresses OPRM Inoperability:
    - Backup Stability Protection (BSP)
      - Implement Manual BSP Regions AND
      - Implement Automated BSP
      - Implement Reporting Requirements
  - ACTION J Addresses inability to Implement ACTION I:
      - Implement Manual BSP Regions AND
      - Reduce Operation to below the BSP Boundary

Proposed TS Changes (cont'd)

- TS SR 3.3.1.1.16 OPRM not bypassed
  - Delete unnecessary surveillance requirement
- TS Table 3.3.1.1-1 APRM STP-High
  - Change APRM STP Function 2.b Allowable Value
  - Add note (d) for OPRM Function 2.f inoperable
- TS Table 3.3.1.1-1 OPRM Upscale
  - Add note (h) for OPRM Function 2.f implementation

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Proposed TS Changes (cont'd)

- TS LCO 3.4.1, "Recirculation Loops Operating"
  - Prohibit SLO in M+ Domain
- TS LCO 3.4.3, "Safety/Relief Valves (S/RVs)"
  - Restrict number of inoperable S/RV in M+ Domain
- Update associated TS Bases

Proposed TS Changes (cont'd)

- TS 5.6.3, "Core Operating Limits Report (COLR)"
  - –Add DSS-CD requirements for the COLR
  - –Update analytical methods references
- TS 5.6.5, "Reporting Requirements"
  - –Add OPRM OOS reporting requirements

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Schedule

- Proposed submittal date of January 2010
- Request 12-month review

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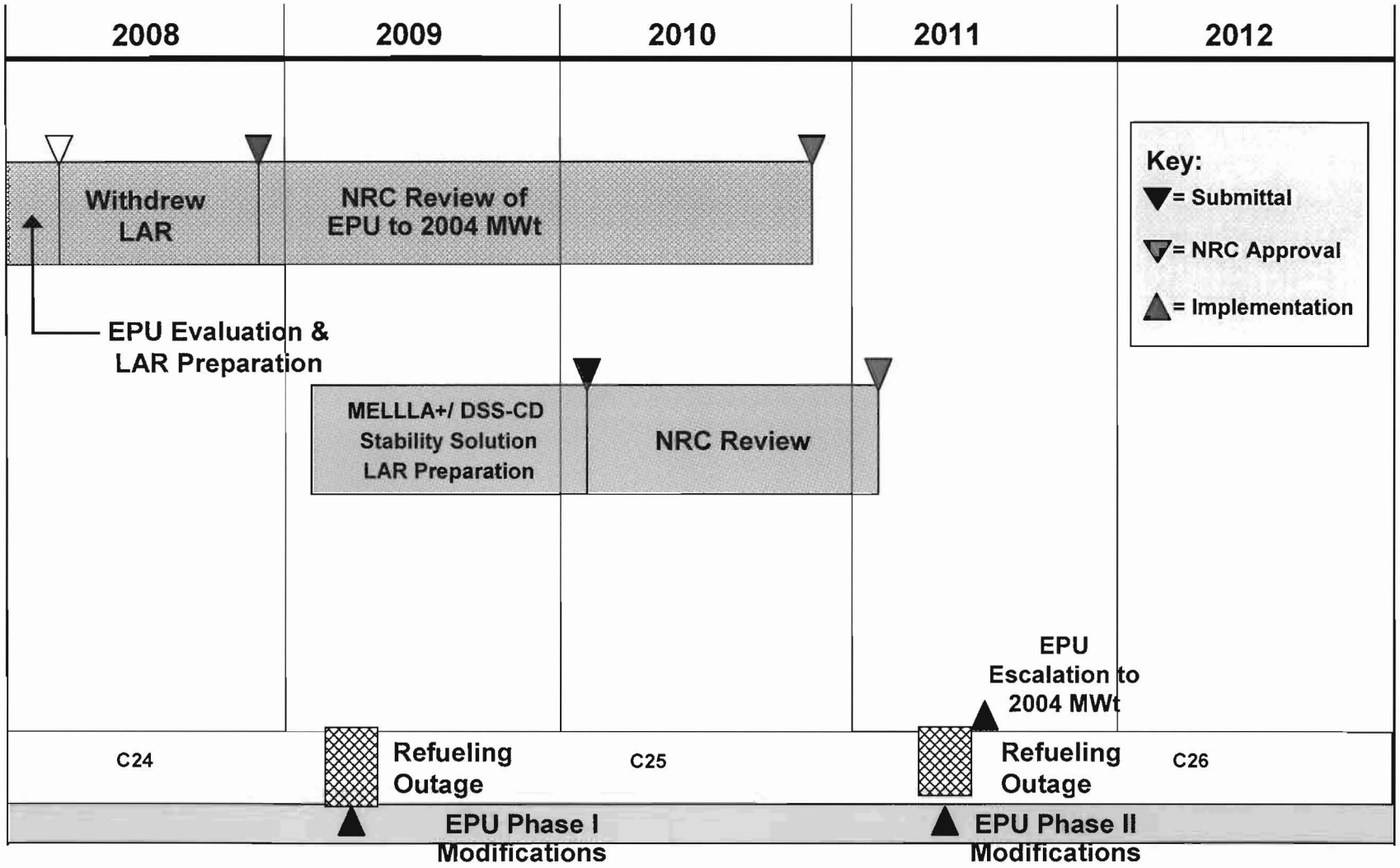
2008
2009
2010
2011
2012
Withdrew LAR
NRC Review of EPU to 2004 MWt
Key:
= Submittal
= NRC Approval
= Implementation
EPU Evaluation & LAR Preparation
MELLLA+/ DSS-CD Stability Solution LAR Preparation
NRC Review
EPU Escalation to 2004 MWt
C24
Refueling Outage
C25
Refueling Outage
C26
EPU Phase I Modifications
EPU Phase II Modifications

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Conclusion

- LAR complies with applicable limitations
- LAR takes no exceptions to LTR requirements
- Proposed submittal date of January 2010
- 12-month review requested

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Discussion

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