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AEP / W / NRC Meeting

D.C. Cook Unit 1 Fuel Upgrade

February 3, 2005

Agenda / Alignment

- Cook Unit 1 15x15 fretting wear issues
- Proposed 15x15 Upgrade fuel design
- LOCA re-analysis commitments
- Past experience / lessons learned
- Analyses and methodology changes
- Technical Specification changes / submittals required
- Schedule / options
- NRC feedback

Fretting Wear Issues

- Past Unit 1 fuel rod failures
- Current 15x15 fuel assembly design
- Proposed 15x15 fuel assembly design
  - Benefit: Design to eliminate (significantly reduce) grid-to-rod fretting as a potential failure mechanism

Fuel Design Description

- Key features of 15x15 Upgrade design compared to current Cook 15x15 design
  - Modified ZIRLO™ structural mid-grids (line contact vs point contact),
  - Modified ZIRLO™ IFM grids, and
  - Tube-in-Tube ZIRLO™ guide thimbles

Licensing Precedence

- 15x15 Upgrade design
  - Licensed under the Westinghouse Fuel Criteria Evaluation Process (FCEP), WCAP-12488-A
  - Per the SER requirements for FCEP, NRC notification required
  - Detailed design aspects in LTR-NRC-04-8, dated February 6, 2004

Design Precedence and Application

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- Design aspects:
  - Applicable DNB correlation – WRB-1
    - no change – currently used15x15 V5H/V+ Cook Unit 1
  - Slight decrease in fuel assembly loss coefficients
  - No new methodology required to support the fuel design
- Current use for full region application
  - Indian Point Unit 2
  - Indian Point Unit 3

Lessons Learned

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- Past fuel transition experience / lessons learned
  - Early dialogue is very beneficial
  - Face-to-face discussions w/ Staff Technical Reviewers is very positive for LAR development / process
- W / NRC Fuel Performance Meeting (12/7/04)
  - Only load core with NRC approved fuel design and analyses
  - Schedule pre-application meeting
  - Secure regulatory concurrence with the plan

Impact Assessment

- Minimize changes to current licensing bases
- Complete assessment of plant impacts
- Assessment results define the required Analyses/Evaluations
  - Thermal / Hydraulic Analyses
  - Anticipated Operation Occurrence (AOO) Transient Analyses
  - Accident Analyses
  - Special Analyses

Analyses / Methodology Changes

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- Opportunity to re-analyze with state-of-the-art LOCA methodology
  - Unit 1 LBLOCA analysis using ASTRUM (WCAP-16009-P-A)
  - WCAP-16009-P-A NRC-approved 11/5/2004
  - Limited Technical Specification change
- COLR changes expected
- Balance Cook near-term & long-term goals

Planned NRC Submittals

- License Amendment Request
  - LBLOCA analysis using the NRC-approved ASTRUM methodology
  - Add WCAP-16009-P-A (ASTRUM) to Tech Spec reference list for methods used to determine Thermal Limits in COLR
    - Current TS Section 6.9.1.9.2
    - Improved TS Section 5.6.5.b
- 10 CFR 50.46 commitment
  - SBLOCA re-analysis using NOTRUMP
    - Currently used, NRC-approved, Appendix K methodology

Options

- Cycle 21 (Fall '06) implementation – interim Appendix K assessment
  - Preferable for timely resolution of fuel fretting wear
  - WCOBRA/TRAC–based PCT assessment to current Appendix K LBLOCA AOR (BASH Evaluation Model)
  - ASTRUM analysis of LBLOCA & COLR TS change for WCAP-16009-P-A submitted for NRC approval
  - Approval mid-Cycle 21
- Cycle 22 (Spring '08) implementation
  - Fuel fretting issue resolution delayed 18 months
  - Approval mid-Cycle 21
  - Not preferred option – inconsistent with AEP/W standards

Transition Core Assessment

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- Use WCOBRA/TRAC to assess transition core effects
  - Line item on BASH Evaluation Model (EM) PCT rack-up sheet
- Justification
  - WCOBRA/TRAC can explicitly model transition effects
    - Loss coefficients
    - Grid heat transfer
    - Code applicability
- Temporary PCT assessment for a fuel cycle

Schedule – Fall '06

(Cycle 21, interim App K assessment)

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• Interim Appendix K assessments	-	May-Aug 2006
• Fuel reload 50.59 complete	-	Aug 2006
• Startup U1C21 with 1st region Upgraded fuel	-	Fall 2006
• LAR for COLR reference change; includes ASTRUM LBLOCA analysis	-	Jan 2007
• SBLOCA re-analysis (10CFR50.46)	-	< Mar 2007
• NRC approval of LAR	-	~ Jan 2008
• Startup U1C22 with 2nd region Upgraded fuel	-	Spring 2008

Schedule – Spring '08
(Cycle 22, ASTRUM LBLOCA)

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- Startup U1C21 with current fuel product - Fall 2006
- LAR submittal (includes ASTRUM LBLOCA analysis) - Jan 2007
- SBLOCA re-analysis (10CFR50.46) - < Mar 2007
- LAR approval - ~ Jan 2008
- Startup U1C22 with 1st region Upgraded fuel product - Spring 2008

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NRC Feedback

- Presentation addressed:
  - Fuel design description
  - Analyses and methodology changes
  - Technical Specification changes
  - Options
  - Schedule

Objectives

- Describe 15x15 Upgrade fuel
- Discuss analyses / methodology to implement
- Understand NRC submittals required
- Discuss submittal schedule and options
- Obtain NRC feedback