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Proposed Solutions to Part 21 on Safety Limit 2.1.1.1, NUREG-1433/34

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Agenda

- Introduction and Purpose
- Presentation
  - Overview of SL 2.1.1.1 Part 21
    - Description
    - Evaluation
  - Subcommittee
  - Proposed Solutions
    - Descriptions
    - Advantages and Disadvantages
  - Schedule
  - Discussion

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Introduction and Purpose

Meeting is intended to provide NRC with the current status of the SL 2.1.1.1 Part 21 issue, and to solicit some feedback. This involves discussion of:

- Two proposed Technical Specifications solutions
- Resolution schedule

Overview of Part 21/Description

- GE Issued on March 29, 2005, as a reportable condition per 21.21(d)
- SL 2.1.1.1 requires that with reactor steam dome pressure below 785 psig or core flow below 10% of rated, THERMAL POWER shall be $\leq$ [25%] of rated (Value can be lower for extended power uprate plants)
- SL 2.1.1.1 intended to preclude the need for CPR calculations below 785 psig
- SL provides conservative bounding conditions for fuel cladding integrity protection during start-up

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Overview of Part 21/Description

- Problem discovered with at-power pressure regulator failure-open (PRFO) transient upon evaluation with newer models
- Early models predict a reactor level swell resulting in turbine trip and subsequent reactor scram
- Newer models predict that level may not increase to the turbine trip
- New models then predict the depressurization is terminated by MSIV closure scram at low pressure isolation setpoint

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Overview of Part 21/Description

- Steam dome pressure could decrease to below 785 briefly with thermal power still above 25% of rated, "violating" the SL
- A scram on MSIV closure position would occur, and, therefore, the time above 25% is very brief

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Overview of Part 21/Evaluation

- Depressurization transients increase the critical bundle power and decrease the bundle power
- This results in an increase in the critical power ratio, CPR=CP/AP
- Application of SL 2.1.1.1 is, therefore, overly conservative for this depressurization transient since the event does not threaten fuel cladding integrity

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Subcommittee

- Subcommittee of Technical Specifications Issues Coordination Committee (TSICC) was formed in May, 2005
- Purpose to develop a proposed generic Technical Specifications (TS) change to the BWR NUREGs and to consider longer term solutions
- Members from SNC, Detroit Edison, GE, TVA, Entergy, Exelon, NMC, and Progress Energy

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Subcommittee

- Subcommittee has met four times
- Two proposed TS/Bases changes are currently under consideration
  - TS Bases only change
  - TS change which eliminates SL 2.1.1.1 and creates a new LCO in Power Distribution limits section 3.2
- A longer term solution is being discussed with GE which involves lowering the steam dome pressure value in the SL. Other fuel vendors (Framatome/Westinghouse) already have lower acceptable value

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Proposed Solutions/Description

- Proposed Solution #1, Bases only change
  - SL 2.1.1.1 stays as-is
  - A paragraph is inserted into Applicable Safety Analysis section of B 2.1.1 indicating that SL 2.1.1.1 is not applicable during depressurization transients
  - Similar wording added to Applicability section of B 2.1.1
  - Eliminate tie to SL 2.1.1.1 in section B 3.3.6.1, Main Steam Line (MSL) Pressure-Low (Per part 21, MSL low pressure should not be an LSSS for protecting SL 2.1.1.1)

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Proposed Solutions/Description

- Proposed Solution #2, TS and Bases change
  - Eliminates SL 2.1.1.1 and corresponding Bases
  - Creates new Limiting Condition of Operation (LCO) 3.2.5, "Reactor Steam Dome Pressure and Core Flow", and corresponding Bases
  - Replaces references to SL 2.1.1.1 in Bases section B 3.3.1.1, "Average Power Range Monitor Neutron Flux-High, Setdown"
  - Eliminates tie to SL 2.1.1.1 in Bases section B 3.3.6.1 for MSL pressure low

Proposed Solutions/Advantages and Disadvantages

Proposed Solution #1, Advantages

- Simple
- No changes necessary to NUREG TS or to plant specific TS
- No changes necessary to longstanding TS SLs

Proposed Solutions/Advantages and Disadvantages

- Proposed Solution #1, Disadvantages
  - TS Applicability unchanged
  - No precedents for qualifying a TS Applicability in the Bases

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Proposed Solutions/Advantages and Disadvantages

- Proposed Solution #2, Advantages
  - Eliminates any ambiguity with respect to Applicability of low pressure/low flow criteria

Proposed Solutions/Advantages and Disadvantages

- Proposed Solution #2, Disadvantages
  - A more complex change, will require extensive re-formatting, re-numbering and re-writing of existing TS and Bases
  - Requires each utility to submit a plant specific Technical Specifications change to NRC

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Schedule

- Subcommittee will present their proposed TS/Bases solution to the full TSICC at the December full committee meeting
- Assuming TSICC approval, work will begin to initiate and generate a TSTF
- Tentative schedule is to submit to NRC by June, 2006. Either proposed solution will require NRC review and approval

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Discussion

- Discussion/Questions/Comments from Participants