

**Safe Plant
Operations**

**People
Processes
Procedures**

**Reliable
Plant Operations**

**Cost Effective
Plant Operations**

FENOC

First Energy Nuclear Operating Company

Davis-Besse Nuclear Power Station
Measurement Uncertainty Recapture Power Uprate
License Amendment Request

January 23, 2007

Agenda

Opening Remarks, Introductions, Background

John Grabnar – Director, Davis-Besse Site Engineering

Proposed Amendment

Henry Hegrat – Supervisor, Fleet Licensing

Proposed Submittal Schedule

Greg Halnon – Director, Fleet Regulatory Affairs

Discussion and Questions

Desired Outcomes

- ▶ **Inform the NRC of FENOC's plans regarding a proposed power uprate for the DBNPS**
- ▶ **Discuss unique features of the submittal**
- ▶ **Provide schedule considerations**
- ▶ **Answer any questions and obtain feedback from the NRC**



Background

- Plant calorimetric measurement calculation currently utilizes venturi-based feedwater flow indication and resistance temperature detector temperature data
- Caldon Inc. Leading Edge Flow Meter (LEFM) CheckPlus™ System installed at the DBNPS (2004)
 - Spool pieces have been installed in each 18-inch feedwater line
 - sixteen ultrasonic transducer assemblies per spool piece
 - Uses acoustic pulses to determine main feedwater flow and temperature for input to plant calorimetric
 - Increased accuracy compared to feedwater venturi and RTD

Background

- A License Amendment Request (LAR) is under preparation proposing a Measurement Uncertainty Recapture (MUR) Power Uprate to take advantage of the increased accuracy of the installed LEFM equipment
 - Current Rated Thermal Power (RTP) is 2772 MWt
 - Proposed RTP increase to 2817 MWt (~1.63%)

Background

- LAR will be consistent with the format and guidance of NRC Regulatory Issue Summary (RIS) 2002-03, *“Guidance on the Content of Measurement Uncertainty Recapture Power Uprate Applications”*

Unique Features of LAR

- Reactor Protection System (RPS) High Flux Allowable Value Setpoints are dependent upon operability of the Ultrasonic Flow Meter
 - Preserve margin to analytical limit
 - Preserve operating margin
- A new Limiting Condition for Operation (LCO) for the Ultrasonic Flow Meter is proposed

Technical Specification (TS) Changes

- Operating License Paragraph 2.C.(1)
 - Maximum Power Level raised to 2817 MWt
- TS 1.3, Definitions
 - RATED THERMAL POWER raised to 2817 MWt
- TS 2.2.1, Limiting Safety System Settings – Reactor Protection System Setpoints
 - High Flux Allowable Value Setpoints revised

TS Changes (cont'd)

■ TS 3/4.3, Instrumentation

- Application of a note establishing requirements for the treatment of as-found and as-left RPS high flux setpoints, consistent with License Amendment No. 274
- Addition of new LCO for Ultrasonic Flow Meter

■ TS 3.7.1.3, Condensate Storage Tanks

- Calculation was revised using current standards and updated assumptions, resulting in a more conservative value for minimum usable tank volume

■ TS 6.9.1.7, Administrative Controls

- Addition of references to Caldon Topical Reports

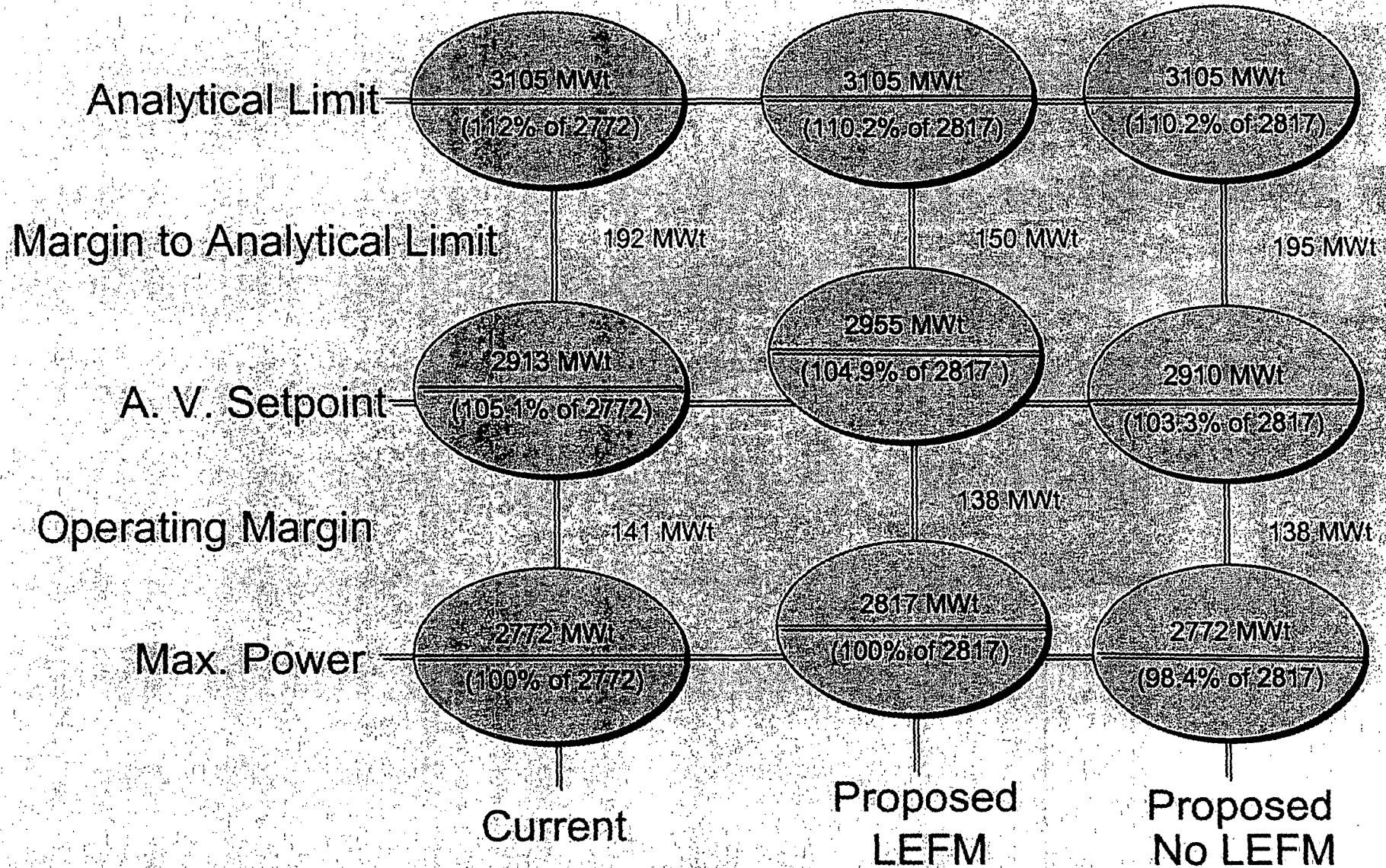
High Flux Setpoints

- Currently TS 2.2.1 contains two High Flux Allowable Value setpoints:
 - 105.1% of RTP for four Reactor Coolant Pump operation
 - 80.6% of RTP for three Reactor Coolant Pump operation

High Flux Setpoints

- Four pump High Flux Allowable Value setpoint is proposed to be changed to 104.9% of RTP if Ultrasonic Flow Meter used
 - Accommodate the power increase (RTP of 2817 MWt)
 - Reduced heat balance error (0.37% vs. 2%)
- Four pump High Flux Allowable Value setpoint is proposed to be changed to 103.3% of RTP if Ultrasonic Flow Meter is not used
 - Retain margin to analytical limit

High Flux Setpoints - Margins



High Flux Setpoints

- Three pump High Flux Allowable Value setpoint does not require change
 - 80.6% of 2817 MWt has been validated for the current operating cycle
 - Setpoint will be validated for each future core reload

Ultrasonic Flow Meter Operability

- Typical amendments associated with MUR power uprates allow actions for an inoperable Ultrasonic Flow Meter to be specified in a licensee controlled document (e.g., DBNPS Technical Requirements Manual)
- Since DBNPS LAR proposes RPS High Flux Allowable Value setpoints that are dependent upon Ultrasonic Flow Meter use, it is believed to be prudent to specify actions for an inoperable Ultrasonic Flow Meter in the TS rather than in a licensee controlled document

Proposed Ultrasonic Flow Meter TS

- Actions if Ultrasonic Flow Meter is not operable or not in use for heat balance calculation are as follows:
 - Prior to the next heat balance calculation, reduce power to $\leq 98.4\%$ of RTP with four pumps operating or $\leq 73.8\%$ of RTP with three pumps operating
 - Within ten hours after the next heat balance calculation, reduce the RPS High Flux setpoint in accordance with TS 2.2.1
 - Affords reasonable time period to recalibrate instruments
 - Nuclear Instrument and setpoint drift would be negligible over the allotted time period
- The Ultrasonic Flow Meter shall be demonstrated operable by performance of a channel check at least once per 24 hours

Supporting Analysis and Calculations

- Caldon Inc. Engineering Report-80P, *“Improving Thermal Power Accuracy and Plant Safety While Increasing Operating Power Level Using the LEFM \sqrt{TM} System,”* Revision 0, dated March, 1997
- Caldon Inc. Engineering Report-157P, *“Supplement to Topical Report ER-80P: Basis for a Power Uprate With the LEFM \sqrt{TM} or LEFM CheckPlus TM System,”* Revision 5, dated October, 2001
- AREVA Report No. 51-9004090-004, *“FirstEnergy Nuclear Operating Company, Davis-Besse Nuclear Power Station, Measurement Uncertainty Recapture, Power Uprate Summary Report,”* dated January 7, 2007
- AREVA NP Calculation 32-5012428-07, *“Davis-Besse Heat Balance Uncertainty,”* dated October, 2006

Closing Remarks

- **Schedule Considerations**
 - LAR scheduled for submittal in February 2007 following onsite and offsite safety review board approvals
 - Approval requested within one year of submittal, with implementation within 120 days of amendment issuance
- **Further Discussion and Questions**
- **Action Item Summary**

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