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United States Nuclear Regulatory Commission
Washington, D. C. 20555-0001

SUBJECT:
Davis-Besse Nuclear Power Station, Unit 1
Docket No. 50-346, License No. NPF-3
Supplemental Information: Condensate Storage Tank (CST) Volume Requirements Relevant to License Amendment Application for Measurement Uncertainty Recapture (MUR) Power Uprate (TAC No. MD5240)

By letter dated April 12, 2007, the FirstEnergy Nuclear Operating Company (FENOC) applied for an amendment to the Technical Specifications for Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1, to accommodate an increase in the Rated Thermal Power from 2772 megawatts thermal (MWt) to 2817 MWt. During a teleconference on November 13, 2007, the Nuclear Regulatory Commission (NRC) staff expressed that it was not apparent that the changes related to the Condensate Storage Tank volume requirements were necessary to support this amendment application. The attachment contains supplemental information relevant to the issues discussed during the teleconference.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 761-6071.

I declare under penalty of perjury that the foregoing is true and correct. Executed on JAN 15, 2008

Sincerely,

Mark B. Bezilla

A001
NRR

Attachment:
Amendment Application Supplement Relevant to CST Volume Requirements

cc: NRC Region III Administrator
NRC Resident Inspector
NRR Project Manager
Utility Radiological Safety Board
Executive Director, Ohio Emergency Management Agency,
State of Ohio (NRC Liaison)

In response to two specific issues discussed during a November 13, 2007 teleconference with the NRC, the following supplemental information is provided regarding the Condensate Storage Tank (CST) volume requirements relative to the MUR power uprate amendment application.

NRC Request:

1) Provide clarifying details justifying the need for requested changes to TS 3.7.1.3 as associated with a measurement uncertainty recapture uprate. Explain why this change should be reviewed as a part of the uprate request, and not as a separate amendment request.

Response:

The proposed changes to Technical Specification (TS) 3.7.1.3 can be classified as changes required for the MUR power uprate and enhancements to the TS Basis for 3.7.1.3. Each aspect is evaluated as follows:

a) Changes Required for the MUR Power Uprate

Many of the Davis-Besse accident analyses were performed at an assumed initial power level of 1.02 times 2772 MWt. This represented the maximum possible reactor power level, including instrument uncertainty, which could exist at the start of the analyzed transient or accident. The CST sizing calculation assumed an initial power level of 2772 MWt, without any uncertainty being added. Therefore, this calculation did not bound the new rated thermal power (RTP) proposed by the MUR power uprate. Using the past practice of starting the analysis at RTP would still require a reanalysis using an initial power of 2817 MWt. Based on the new analysis, the required Technical Specification volume must be revised.

b) Enhancement to the Technical Specification Basis for 3.7.1.3

Initiating a loss of offsite power transient without including instrument uncertainty on initial core power would not meet current licensing practices. Therefore, the analysis was run using an initial power level of 2828 MWt, which bounds the uprated power level with instrument uncertainty value. This is consistent with other safety analyses and design basis calculations. While not part of the current licensing basis, this change is viewed as highly desirable to support conservative plant operation.

The current licensing basis calculation used a best estimate decay heat curve. While reasonable, this is inconsistent with current methodologies. The supporting calculation decay heat was based on the Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, NUREG-0800.

NRC Request:

Summarize the calculation used to determine the required condensate storage tank volume and discuss what changes to the calculation were made that form the basis for the requested technical specification change.

Response:

The calculation used to determine the proposed CST required volume utilized the methodology of NUREG-0800, Revision 2, and included the following inputs:

1) Initial power level was increased to 2828 MWt (equals the MUR RTP plus instrument error).
2) The expected decay heat generated by the core was based on NUREG-0800, Revision 2, rather than a best estimate curve.
3) The reactor coolant system (RCS) was conservatively assumed to be at hotleg temperature of 606 °F, whereas the actual RCS temperature would be at the normal post-trip value of approximately 550 °F, based on a Main Steam Safety Valve setpoint of 1050 psig.
4) The minimum recirculation flow path is normally lined up to the station drain system. It is assumed that operators require 30 minutes to redirect the flow to the CST.
5) The calculation and the proposed Technical Specification value included only the volume of water required to perform the function. It did not include any unusable portion of the CSTs. The proposed improved Standard Technical Specification surveillance is also based on usable volume. The current Technical Specification required volume does include the unusable volume, as described in the Bases.
6) The energy to be removed during the cooldown phase of the transient included core decay heat, RCS metal heat, steam generator metal heat and core metal heat, as well as the energy contained in the RCS fluid. The reactor coolant pumps were assumed to be operating during the cooldown phase, so the energy they impart to the RCS was also included in the energy required to be removed. The original calculation included consideration for sensible heat as well as decay heat, but the decay heat term was lower due to the lower initial power and the use of a best estimate curve.
7) The cooldown from hot standby to 280 °F was assumed to take six hours based on a natural circulation cooldown rate of 50 °F per hour. This is slower than the maximum allowed cooldown rate of 100 °F per hour with reactor coolant pumps running, as was assumed in Item 6 above. This adds

conservatism to the calculation. The original calculation also assumed a six hour cooldown period.

8) The maximum CST temperature is assumed to be 120 °F throughout the transient.

The amount of energy removed by a gallon of CST water was determined and the total amount of energy to be removed was summed. The latter was divided by the former to yield the total number of gallons of CST water required.

The CSTs were sized in this calculation for 13 hours of hot standby, followed by a six hour cooldown to 280 °F. Approximately 270,300 gallons of CST water is required to perform this function. This amount of water will remove decay heat from a 2828 MWt reactor run at full power for a two year operating cycle.