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June 11, 2010
L-10-178

Mr. Mark A. Satorius, Administrator
United States Nuclear Regulatory Commission
Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Subject:
Davis-Besse Nuclear Power Station, Unit 1
Docket Number 50-346, License Number NPF-3
Documentation of Commitments for the Davis-Besse Nuclear Power Station, Unit 1

On February 28, 2010, the Davis-Besse Nuclear Power Station (DBNPS) commenced the Sixteenth Refueling Outage (16RFO). As part of the planned Inservice Inspection activities for this outage, ultrasonic (UT) examinations of all Control Rod Drive Mechanism (CRDM) nozzles penetrating the Reactor Pressure Vessel (RPV) Head and a bare metal visual examination of the outer surface of the RPV Head were performed in accordance with the requirements of 10 CFR 50.55a(g)(6)(ii)(D). Twelve nozzles were identified as having unacceptable flaws via UT examination, with two of these nozzles identified as having pressure boundary leakage. These conditions were entered into the Corrective Action Program, and a Root Cause Evaluation initiated. These nozzles have been modified utilizing the inside diameter temper bead (IDTB) welding method to restore the pressure boundary of the degraded nozzles, which is described in FENOC letter L-10-099 dated April 1, 2010. Supplemental liquid penetrant (PT) examinations and eddy current testing (ET) were performed on the remaining CRDM nozzles, which resulted in an additional 12 nozzles that the FirstEnergy Nuclear Operating Company (FENOC) entered into the Corrective Action Program and decided to modify via the IDTB welding method.

In accordance with 10 CFR 50.73, FENOC submitted Licensee Event Report (LER) 2010-002 dated May 11, 2010, to report the 24 CRDM nozzles with defects and the Reactor Coolant System pressure boundary leakage as operation in a condition prohibited by the Technical Specifications, and as a serious degradation of a principle safety barrier. At the time the LER was submitted, a likely cause of the event was determined to be Primary Water Stress Corrosion Cracking (PWSCC); however, the root cause evaluation of the event was still in progress. The root cause evaluation has

now been completed. The direct cause of the event has been confirmed to be PWSCC. The root cause evaluation identified that there was a less than adequate perception of the risk of PWSCC susceptibility with the RPV Head replaced in 2003, resulting in inadequate identification, development, and implementation of interim actions to mitigate degradation prior to replacement with a PWSCC resistant Alloy 690 RPV Head.

FENOC has developed a number of actions that will be taken to ensure the plant operates safely, reliably, and in compliance with applicable regulations. FENOC is establishing as regulatory commitments the actions outlined in the attachment to this letter. These commitments were discussed during discussions between the NRC and FENOC in a public meeting regarding the repairs to the RPV Head on June 3, 2010, and during follow up telephone discussions between the NRC and FENOC.

If there are any questions or if additional information is required, please contact Mr. Brian T. Hennessy, Acting Manager – Site Regulatory Compliance, at (419) 321-8592.

Sincerely,

Barry S. Allen

GMW

Attachments:
1. Commitments for Davis-Besse Nuclear Power Station
2. Listing of Analytical Crack Growth Rate Calculations

cc: USNRC Document Control Desk
DB-1 NRC/NRR Project Manager
DB-1 Senior Resident Inspector
Utility Radiological Safety Board
Director – International Engineering, American Nuclear Insurers

Attachment 1
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Commitments for the Davis-Besse Nuclear Power Station

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for the Davis-Besse Nuclear Power Station in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not Regulatory Commitments. Please notify Brian T. Hennessy, Acting Manager – Site Regulatory Compliance, at (419) 321-8592 of any questions regarding this document or associated regulatory commitments.

Regulatory Commitment	Due Date
1. Provide to the NRC in writing the results of the Re-Inspection Years (RIY) calculation for Operating Cycle 17 performed in accordance with ASME Code Case N-729-1 based on calculated RPV Head temperatures.	Prior to plant restart (Mode 2)
2. Upon completion of destructive examination of the CRDM Nozzle ring samples removed from nozzles #4 and #10, quarantine one untested minimum full length 90 degree sample, and turn over ownership to the NRC.	Quarantine sample within one month following plant restart (Mode 2) until arrangements can be made to transport sample to independent laboratory selected by NRC.
3. Update the Root Cause Analysis Report to include the following: a. Results of final laboratory report for metallurgical analysis. b. Results of completed analytical crack growth rate calculations listed in Attachment 2. c. Basis for discrediting as a causal factor the impact of: i. Dry and wet layup conditions (including chemistry) at DBNPS prior to replacing the RPV Head in the Thirteenth Refueling Outage. ii. Sulfate chemistry. iii. Weld fabrication defects.	Within 6 months following plant restart (Mode 2)

Regulatory Commitment	Due Date
4. Calculate RIY every 6 months using current operational data and provide results of the calculation to the NRC in writing. Also provide to the NRC in writing any revised or new conclusions regarding root and contributing causes resulting from continued evaluations, or confirm absence of any changes.	One month following each 6 month interval following restart, continuing until RPV Head replacement.
5. Upon reaching Action Level 3 of EN-DP-01171, "Engineering Implementation of the RCS Integrated Leakage Program," plant shall be shutdown in 30 days if RPV Head leakage cannot be ruled out. During subsequent shutdown as part of the containment inspection for RCS leakage, if RPV Head leakage cannot be ruled out a bare metal visual examination of the RPV head will be performed per applicable ASME Code Case and 10 CFR 50.55a(g)(6)(ii)(D).	Ongoing until RPV Head replacement.
6. For continued operation of the RPV Head beyond 17RFO, in addition to performing required volumetric examination of the CRDM nozzles in accordance with 10 CFR 50.55a(g)(6)(ii)(D), perform surface examinations of the J-groove welds to be left in service in accordance with the applicable ASME Code Case.	Prior to attaining 2.25 RIY until RPV Head replacement.
7. Complete a confirmatory crack growth rate analysis from metallurgical tests within 12 months of plant restart (or as agreed upon with the NRC based on the time line provided by the vendor for completion of the analysis) and update the Root Cause Analysis Report with the results of this analysis.	Update Root Cause Analysis Report within one month of receipt of final analysis report.

Attachment 2
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Listing of Analytical Crack Growth Rate Calculations

The following analytical crack growth calculations are being performed and will be incorporated into the Root Cause Analysis Report for DBNPS Condition Report 10-73323, Control Rod Drive Mechanism Nozzle & Weld Cracking with Pressure Boundary Leakage:

Design Document Number	Title
1000422.301	Finite Element Model Development of Bounding CRDM Penetrations for Fracture Mechanics
1000422.302	Davis-Besse CRDM Nozzle Welding Residual Stress Analysis (Dominion Engineering Calculation C-3223-00-01)
1000422.303	Finite Element LEFM Evaluations of Bounding CRDM Nozzle Penetrations
1000422.304	Crack Growth Evaluation of Bounding CRDM Nozzle Penetrations
1000422.305	Deterministic Leak Rate and Wastage Analysis of CRDM Nozzles in Davis-Besse Replacement RPV (Dominion Engineering Calculation C-3223-00-02)
1000422.306	Finite Element LEFM Evaluations of Uphill Side of 38-Degree CRDM Nozzle Penetration
1000422.307	Crack Growth Evaluation of Uphill Side of 38-Degree CRDM Nozzle Penetration
1000422.308	Evaluation of Lack of Fusion at CRDM Nozzle Penetration Welds
1000422.401	Final Report