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10 CFR 50.59(d)(2)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT:
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Report of Facility Changes, Tests and Experiments

In accordance with 10 CFR 50.59(d)(2), the FirstEnergy Nuclear Operating Company hereby submits the attached Report of Facility Changes, Tests and Experiments for Beaver Valley Power Station, Unit No. 2. The report covers the period of May 23, 2008 through October 28, 2010.

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.

Sincerely,

Paul A. Harden

Attachment:
Beaver Valley Power Station, Unit No. 2, Report of Facility Changes, Tests and Experiments for the Period May 23, 2008 to October 28, 2010

cc: NRC Region I Administrator
NRC Resident Inspector
NRR Project Manager
Director BRP/DEP
Site BRP/DEP Representative

IE47
NRR

Beaver Valley Power Station, Unit No. 2,
Report of Facility Changes, Tests and Experiments for the Period
May 23, 2008 to October 28, 2010

Evaluation No: 08-05643, Revision 0

Title: Beaver Valley Power Station Unit No. 2 (BVPS-2) Primary System Zinc Addition

Activity Description

The reactor coolant system (RCS) chemistry control program for BVPS-2 was modified under engineering change package 08-0728 to allow addition of a soluble zinc compound, zinc acetate dihydrate, to the reactor coolant during normal plant operation. The beneficial effects of zinc addition include reduction in shutdown radiation fields, reduction in the general corrosion rate of RCS component materials, reduction in both the initiation and propagation of primary water stress corrosion cracking of Alloy 600, and reduction in the long-term potential for crud induced power shift.

Summary of Evaluation

Effects of the primary system zinc addition were evaluated including the change in the chemistry environment of the fuel, impact of increased radiation dose on occupational radiation exposure and equipment qualification, and the potential for a crud induced power shift (due to increased fuel crud deposits). It was concluded that the zinc addition will not affect cladding corrosion or other fuel performance criteria, is not expected to significantly impact the radiation exposure received by plant personnel and equipment, and the low risk of a crud induced power shift (CIPS) will be maintained by following a prescribed zinc addition strategy. The CIPS risk analysis utilizes previously approved Westinghouse modeling codes. While CIPS itself is not in the BVPS-2 licensing bases, discussion of its effects is conservative, as is implementation of a low CIPS risk strategy. Increased concentrations of zinc and cobalt isotopes do not impact the accident analyses or resultant doses, and concentrations of the additional cobalt isotopes in liquid discharge associated with normal operation will remain a small fraction of the effluent concentration limits of 10 CFR Part 20, Appendix B.

Evaluation No: 09-02468, Revision 0

Title: Beaver Valley Power Station Unit No. 2 (BVPS-2) Updated Final Safety Analysis Report (UFSAR) Change – Containment Sump Screen Passive Failure

Activity Description

The BVPS-2 containment sump screen was designed and installed in accordance with engineering change package 05-0362. The design of the sump screen included perforated plates which separated the recirculation spray pump suctions within the screen assemblies' internal flow path. The use of the perforated plate permits the total screen area to be used for both trains or an individual train of recirculation spray if one train were inoperable or shut down. A non-consequential passive structural failure or a consequential failure due to clogging is not assumed as a part of the screen design criteria.

The containment sump screen is a passive component with no moving parts and is, therefore, evaluated for a passive single failure. A single failure for the containment sump screen is defined as a structural failure where the screen or a portion of the screen is breached (passive non-consequential failure) or where the screen becomes clogged which results in an unacceptable head loss (consequential failure).

Summary of Evaluation

The UFSAR-discussed design function of the containment sump screen related to single failure was identified and evaluated. The UFSAR states "The containment sump assembly is divided into separate trains to ensure that failure of either strainer train does not adversely affect the other strainer train."

Prototype testing was performed. A mechanistic debris generation and transport analysis was conducted to determine the type and quantity of debris that is transported to the sump under a loss of coolant accident (LOCA) and is used in the prototype testing.

Prototype testing was conducted to show that the head loss is acceptable with the total screen area available (100 percent). Since testing has shown that the use of 100 percent screen surface area results in acceptable head loss results and the screen is designed such that both RSS trains can draw from 100 percent of the screen area, a design assumption of train separation and an assumption of a single failure due to clogging is not required.

The new containment sump screen is not designed to accommodate or subject to a non-consequential passive structural failure.

The containment sump screen is designed to the American Institute of Steel Construction (AISC) Manual of Steel Contruction, 7th edition, and is, therefore, determined to be categorized as a structure and not a fluid system component. The single failure criterion of 10 CFR 50, Appendix A, is not applicable to structures; therefore, this 10 CFR 50.59 evalution provided an explanation concluding that a structural failure of the containment screen is not required to be postulated.

The screen assembly is ruggedly designed and constructed with corrosion resistant stainless steel material. The containment sump screens are seismically qualified structures and are not susceptible to potential jet impingement loads from postulated pipe breaks, pipe whip, or internally generated missiles. The screen assembly is not exposed to components, adjacent or above, that are not seismically designed.

The conclusion is that a non-consequential passive structural failure or a consequential failure due to clogging for the new containment sump screen is not credible and, therefore, need not be assumed. It was determined that no license amendment is required as a result of this issue.