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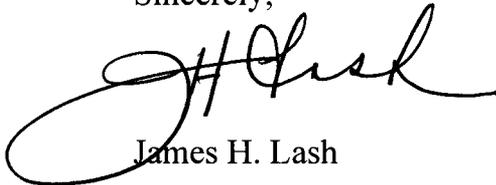
Attention: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Report of Facility Changes, Tests and Experiments

In accordance with 10 CFR 50.59(d)(2), the Report of Facility Changes, Tests, and Experiments for the Beaver Valley Power Station Unit No. 1 is provided as Attachment 1. The report covers the period of November 15, 2004, through April 19, 2006.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Gregory A. Dunn, Manager - FENOC Fleet Licensing, at (330) 315-7243.

Sincerely,



James H. Lash

Attachment

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Sr. Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator

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Change Title

Small Break LOCA Re-Analysis and UFSAR Change

Change

The small break Loss of Coolant Accident (LOCA) for Beaver Valley Power Station Unit No. 1 was re-analyzed to fulfill a commitment to the Nuclear Regulatory Commission (NRC) to perform a full analysis and eliminate peak cladding temperature (PCT) penalties assigned due to miscellaneous unanalyzed loss of coolant accident PCT phenomena. Re-analysis of the small break LOCA determined that peak fuel clad temperature continues to be less than the 10 CFR 50, Appendix K limit.

A common Updated Final Safety Analysis Report (UFSAR) table of large and small break LOCA parameters was replaced by two tables. One table provides parameters used in the large break LOCA analysis, and another table provides parameters used in the small break LOCA analysis.

The parameter values from this evaluation were subsequently superseded by Engineering Change Package 02-0212, Beaver Valley Unit 1 Small Break LOCA (See page 5 of 8). The UFSAR format changes (2 tables) resulting from this evaluation, however, remain in effect.

Change Title

Engineering Change Package 03-0199 - Steam Generator Replacement Project
Containment Construction Opening

Change

During the Spring 2006 steam generator replacement outage for Beaver Valley Power Station Unit No. 1, a temporary construction opening was created in the Containment Building wall to permit removal of the old steam generators and reactor vessel head, and installation of replacement steam generators and reactor vessel head. The existing equipment hatch was not of sufficient size to permit removal and replacement of these components.

On the basis of a probabilistic risk assessment, concrete and reinforcing steel was removed and restored during the Cold Shutdown and Refueling modes of operation, and the defueled condition. There was no impact on the probabilistic risk assessment model core damage frequency, since the model only analyzed Startup and Power-Operation

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modes of operation. The impact to the Shutdown Safety Function status for the Containment Integrity Function was expected to be insignificant, since it was highly unlikely that a missile would strike the temporary opening or the equipment hatch and cause fuel damage.

The containment liner leak test channels in the area of the containment opening were permanently removed. There was no impact on the function of the steel liner plate since the only function of the leak test channels was to serve as an aid to facilitate leak testing of the liner plate welds during original construction.

Change Title

Engineering Change Package 04-0527 - Construction of New Access Openings in the Intake Structure

Change

This design change installed two (2) new personnel access openings and enlarged six (6) existing personnel access openings in the 705 foot elevation floor slab in the Intake Structure. The new and enlarged openings provide additional access to the intake bays. The existing personnel access openings continue to be used for normal and emergency personnel access and egress and the new and enlarged openings are to be used for equipment access and egress. Checkered plate covers were installed over the new and enlarged openings.

This evaluation documented that the Updated Final Safety Analysis Report (UFSAR) design function (missile protection of the service water and river water pumps) that may be adversely impacted has been appropriately considered and evaluated. Accident and component malfunction analyses, as currently described in the UFSAR, remain bounding for all cases where the function of the service water and river water pumps is required.

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Change Title

Engineering Change Package 03-0295 - Steam Generator Replacement Project Install Simplified Reactor Vessel Head Assembly

Change

The original reactor vessel head assembly package at Beaver Valley Power Station (BVPS) Unit No. 1, was replaced with the Simplified Head Assembly which provides the same functions with improved features. This evaluation considered the application of a specific computer code to calculate the hydraulic forces acting on the primary system as a result of postulated pipe breaks associated with the Loss of Coolant Accident.

The methods used in this computer code to analyze hydraulic forces acting on the primary system are different than those used originally. This computer code is well established and has been accepted by the NRC on other plants, including BVPS Unit No. 2.

Change Title

Engineering Change Package 03-0193 - Steam Generator Replacement Project Replacement Steam Generator Evaluation

Change

The original steam generators installed at Beaver Valley Power Station Unit No. 1 were replaced. The overall dimensions of the replacement steam generators are approximately the same as the original steam generators. The major nozzles are located in the same locations. The replacement steam generators have upgraded features.

The stress analysis methods used to analyze the replacement steam generator pressure boundary, in particular the channel head and tube sheet, are different than those used on the original steam generator. Stress analysis methods for the replacement steam generators use finite element computer codes that are well established and have been accepted by the NRC on other plants.

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Change Title

Engineering Change Package 05-0280 - Simultaneous Hot and Cold Leg Safety Injection Recirculation (Low Head Safety Injection to Hot Legs)

Change

Changes were needed under uprated power conditions to ensure adequate capability for simultaneous Reactor Coolant System hot and cold leg recirculation following a design basis Loss of Coolant Accident (LOCA). This Engineering Change Package (ECP) includes changes to emergency operating procedures, motor operated valve program, and inservice test program.

The evaluation of the Low Head Safety Injection (LHSI) flow paths to the Reactor Coolant System hot legs, implementation of minor modifications, inclusion of the associated Motor Operated Valves (MOV) in the station MOV Program, and performance of surveillance testing of LHSI MOVs and check valves ensure the capability of simultaneous hot leg and cold leg recirculation following a design basis LOCA. The Failure Modes and Effects Analysis contained in the ECP 05-0280 Design Report demonstrates that the switchover to hot and cold leg recirculation can occur assuming a single active failure at the Extended Power Uprate power level. The use of LHSI for hot leg recirculation provides adequate flow with margin to prevent boron precipitation following a design basis LOCA at uprated power conditions. The containment boundary and fuel cladding are not impacted as a result of the reanalysis.

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Change Title

Engineering Change Package 05-0281 - Reactor Coolant System Power Operated Relief Valve & Safety Valve Piping Analysis for Extended Power Uprate Spurious Safety Injection Conditions

Change

The licensing basis for Beaver Valley Power Station Unit No. 1 did not address pressurizer overfill for a spurious Safety Injection (SI) event. The Extended Power Uprate (EPU) analysis for a spurious SI event was used for replacement steam generator implementation. This EPU analysis identified the potential for pressurizer overfill. Therefore, this event was incorporated into the Unit No. 1 licensing and design basis.

EPU analyses demonstrate that the pressurizer safety valves, power operated relief valves and associated inlet and discharge piping will not fail following water relief in the event of an inadvertent SI actuation signal and pressurizer overfill. The reactor coolant system pressure boundary will remain intact and acceptance criteria are met for the pressurizer overfill concern.

Change Title

Engineering Change Package 02-0212 – Replacement Steam Generator Master ECP
Beaver Valley Power Station - 1

Change

The small break Loss of Coolant Accident (LOCA) was re-analyzed to support steam generator replacement and power uprate at Beaver Valley Power Station Unit No. 1. This revised LOCA analysis required an increase in the minimum safety injection accumulator pressure limit and Emergency Core Cooling System flows.

The reanalysis showed that under the revised conditions, the peak clad temperature remained bounded by the 10 CFR 50 Appendix K acceptance criterion.

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Change Title

Engineering Change Package 03-0195– Steam Generator Replacement Project Steam Generator Supports

Change

A temporary configuration of piping and supports associated with the replacement steam generators, Residual Heat Removal System, and Reactor Coolant System were evaluated to ensure Design Basis Earthquake (DBE) loads and deadload during Cold Shutdown and Refueling modes of operation would result in acceptable piping stresses.

The analysis concluded that the impact of DBE loads and deadload on the temporary configuration resulted in acceptable piping stresses on the Residual Heat Removal System and Reactor Coolant System (including the Loop Stop Valves).

Change Title

Engineering Change Package 04-0063– Pressure Relief Modification for the Unit 1 East and West Cable Vaults.

Change

The Engineering Change Package was initiated in response to a commitment made in License Event Report 2003-002-01, “Potential Overpressurization of Unit 1 Cable Vaults if a CO₂ Discharge Were to Occur.”

A carbon dioxide (CO₂) fire suppression system discharge in the East or West Cable Vault could over-pressurize the room, and result in damage or failure of a fire door or barrier. This could cause a loss of CO₂ and allow a fire to spread into an adjacent area.

A relief path (vent duct) was installed in order to preclude overpressure of the cable vaults that could result in a loss of CO₂. A separate vent duct was built for each cable vault to address fire area separation concerns. A backdraft damper was installed in each duct to ensure minimal loss of CO₂ from the cable vault rooms and ensure that the cable vaults can be maintained at a negative pressure under normal and post accident conditions.

This design change has no impact on detection, initiation or capability of the CO₂ fire suppression system, nor does it cause any increase in the potential for spurious operation of the CO₂ fire suppression system.

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Change Title

UFSAR Change 105-025– Evaluation of the Effects of Sealing the Unit No. 1 Relay Room Curbed Area Penetrations

Change

An evaluation was performed to assess the impact of sealing penetrations between the Beaver Valley Power Station Unit No. 1 Relay Room and Heating, Ventilation, and Air Conditioning (HVAC) Room. The open penetrations were sealed because the Relay Room is in a different hazard area than the HVAC Room.

The penetrations permitted any external flood water collected in the Relay Room curbed area trough at Elevation 713 feet, 6 inches, to flow to the HVAC Room. A flood level switch in the HVAC Room would send an alarm to the Beaver Valley Power Station Unit No. 1 Control Room when water on the floor reached a predetermined height. The Updated Final Safety Analysis Report (UFSAR) included a description of the flood level switch.

The evaluation found that sealing of the penetrations was appropriate. When it is determined that Ohio River water level will exceed 706 feet, operators check the Relay Room for floodwater once per shift and initiate appropriate corrective actions if floodwater is present. The UFSAR was revised to reflect that the penetrations between the Relay Room and HVAC Room have been sealed.

Change Title

Calculation ERS-JTL-99-014– Safety Analysis of the Radiological Consequences of a Waste Gas System Rupture DBA at BVPS Unit 1, Control Room, EAB, and LPZ Doses

Change

Gaseous waste system rupture radiological calculations were revised to address a power uprate, which increases the Reactor Coolant System radionuclide source terms associated with 1 percent failed fuel. Another calculation change is the incorporation of atmospheric dispersion factors, developed by the computer code, for calculation of Control Room doses.

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In the Gaseous Waste System decay tank rupture scenario, the Control Room whole body Effective Dose Equivalent (EDE) and skin doses increased (more than doubled) due to the increase in source activity and the increased atmospheric dispersion factor. In the Gaseous Waste System line break scenario, Control Room whole body EDE and skin doses increased, as did Exclusion Area Boundary and Low Population Zone whole body EDE doses. The dose increases were less than 10% of the difference between the current licensing basis values and the regulatory (10 CFR 100 or General Design Criteria 19) limits.