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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Cycle 8 Reload

Gentlemen:

Beaver Valley Power Station, Unit No. 1 will complete the seventh cycle of operation on September 1, 1989 with an expected burnup of 16,640 MWD/MTU. This letter describes the Cycle 8 reload design, documents our review in accordance with 10 CFR 50.59, and provides our determination that no technical specification changes or unreviewed safety questions are involved.

The Cycle 8 core configuration is arranged in a low leakage loading pattern and involves replacing sixteen (16) Region 7 and fifty-two (52) Region 8 fuel assemblies with sixteen (16) Region 10A fuel assemblies enriched to 3.6 w/o and fifty-two (52) Region 10B fuel assemblies enriched to 4.0 w/o. The one Region 1 fuel assembly located in the center of the core will be replaced with another Region 1 fuel assembly. The mechanical design of the sixty-eight (68) new fuel assemblies is the same as the Region 9 fuel assemblies except for the upgraded fuel features including the Vantage 5H Zircaloy grids, Reconstitutable Top Nozzles, Debris Filter Bottom Nozzles, Snag Resistant grids and standardized fuel pellets. Fuel rod design evaluations for the Cycle 8 fuel were performed using the NRC approved methodology to demonstrate that all of the fuel rod design bases are satisfied.

The report "Plant Safety Evaluation for Beaver Valley Power Station Unit 1 Vantage 5H Fuel Upgrade and Increased Peaking Factors" evaluated the effects of the Vantage 5H Zircaloy girds and is currently under NRC review as a basis for proposed Technical Specification Change No. 162.

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The Reconstitutable Top Nozzle (RTN) is different from the current Top Nozzle design in that (1) a groove is provided in each thimble thru-hole in the nozzle plate to facilitate attachment and removal, and (b) the nozzle plate thickness is reduced to provide additional space for fuel rod growth. Along with the RTN, a long tapered fuel rod bottom end plug is used to facilitate removal and reinsertion of the fuel rods.

The Debris Filter bottom Nozzle (DFBN) is designed to inhibit debris from entering the active fuel region of the core to maintain fuel performance by minimizing debris related fuel failures. The DFBN is a low profile bottom nozzle design made of stainless steel, with reduced plate thickness and leg height. The DFBN is structurally and hydraulically equivalent to the existing low profile bottom nozzle.

The snag resistant grids contain grid straps which are modified to help prevent assembly hangup due to grid strap interference during fuel assembly removal. This was accomplished by changing the grid strap corner geometry and adding guide tabs on the outer grid strap.

The standardized fuel pellets are a refinement to the current pellet design with the objective of improving manufacturability while maintaining or improving performance. This design incorporates a reduced pellet length, modification to the previous dish size and the addition of a chamfer.

Duquesne Light Company has performed a detailed review of the Cycle 8 reload core design including a review of the core characteristics to determine those parameters affecting the postulated accidents described in the UFSAR. The consequences of those incidents described in the UFSAR which could potentially be affected by the reload core characteristics were reanalyzed, and we have verified that the reanalyses were performed in accordance with the NRC approved methodology described in WCAP-9273-A "Westinghouse Reload Safety Evaluation Methodology". The effects of the reload on the design basis and postulated incidents analyzed in the UFSAR were accommodated within the conservatism of the initial assumptions or were reanalyzed and determined not to exceed the safety analyses limits.

No technical specification changes are required as a result of the Cycle 8 reload design.

The NRC approved dropped rod methodology [WCAP-10298-A (Non-Proprietary), June 1983] was used for the Cycle 8 design evaluation and confirmed that the peaking factors did not exceed the safety analyses limits.

The reload core design will be verified by performing the standard Westinghouse reload core startup physics tests. The results of the following startup tests will be submitted in accordance with Technical Specification 6.9.1.3:

1. Control rod drive tests and rod drop time measurements.

2. Critical boron concentration measurements.

3. Control rod bank worth measurements.

4. Moderator temperature coefficient measurements.

5. Startup power distribution measurements using the incore flux mapping system.

The Beaver Valley Onsite Safety Committee (OSC) and the Duquesne Light Company Offsite Review Committee (ORC) have reviewed the Cycle 8 reload safety evaluation and determined that this reload core design will not adversely affect the safety of the plant and does not involve an unreviewed safety question.

Very truly yours,

J. D. Sieber

J. D. Sieber
Vice President
Nuclear Group

cc: Mr. J. Beall, Sr. Resident Inspector
Mr. W. T. Russell, NRC Region I Administrator
Mr. P. Tam, Sr. Project Manager
Mr. R. Saunders (VEPCO)