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50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
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SUBJECT: Informs that Rev 2 to ex-core neutron flux monitoring sys satisfies intent of Rev 2 to Reg Guide 1.97. No further mods required. Results of hot functional testing of sys & data evaluation discussed.

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Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Project Director
BWR Project Directorate No. 3
Division of BWR Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
EXCORE NEUTRON FLUX MONITORING SYSTEM RANGE
PLA-2671 FILE R41-2, S-78

Docket Nos. 50-387
50-388

Dear Ms. Adensam:

In PLA-2222, dated May 31, 1984, PP&L committed to providing the actual range of the Excore Neutron Monitoring System and justifying the minimum range should the required range of 1×10^{-6}% up to 100% power not be satisfied. The purpose of this letter is to transmit the results of hot functional testing of the Excore Neutron Monitoring System and PP&L's evaluation of that data with respect to the system's range. This testing provides a basis for calculating the system's actual range.

Hot functional testing of the Unit 2 Excore Neutron Monitoring System was completed on January 13, 1985. The excore monitor maximum indicated count rate was benchmarked against APRM reactor power. Additionally, a vessel heat balance was done and recorded to confirm the APRM readings. Based on this data, the lowest reading indicated on the excore system would correspond to a calculated power of 5×10^{-5}% power immediately following a reactor shutdown. This means that the Excore Neutron Monitoring System would have had a minimum range of 5×10^{-5}% power at that point in time if the reactor shut down. Additional data observed on February 15, 1985 indicated that the count rate observed by the Excore Neutron Monitoring System had increased by 50%. This was determined by comparing indicated APRM power to indicated Excore Neutron Monitoring System Power at 100% core power. This indicates that the lower detectable range had dropped to approximately 3.3×10^{-5}% power at shutdown at that point in time. Count rate vs. power data, taken on May 13, 1986, indicates that this value has not changed over the remaining time in the first fuel cycle on Unit 2.

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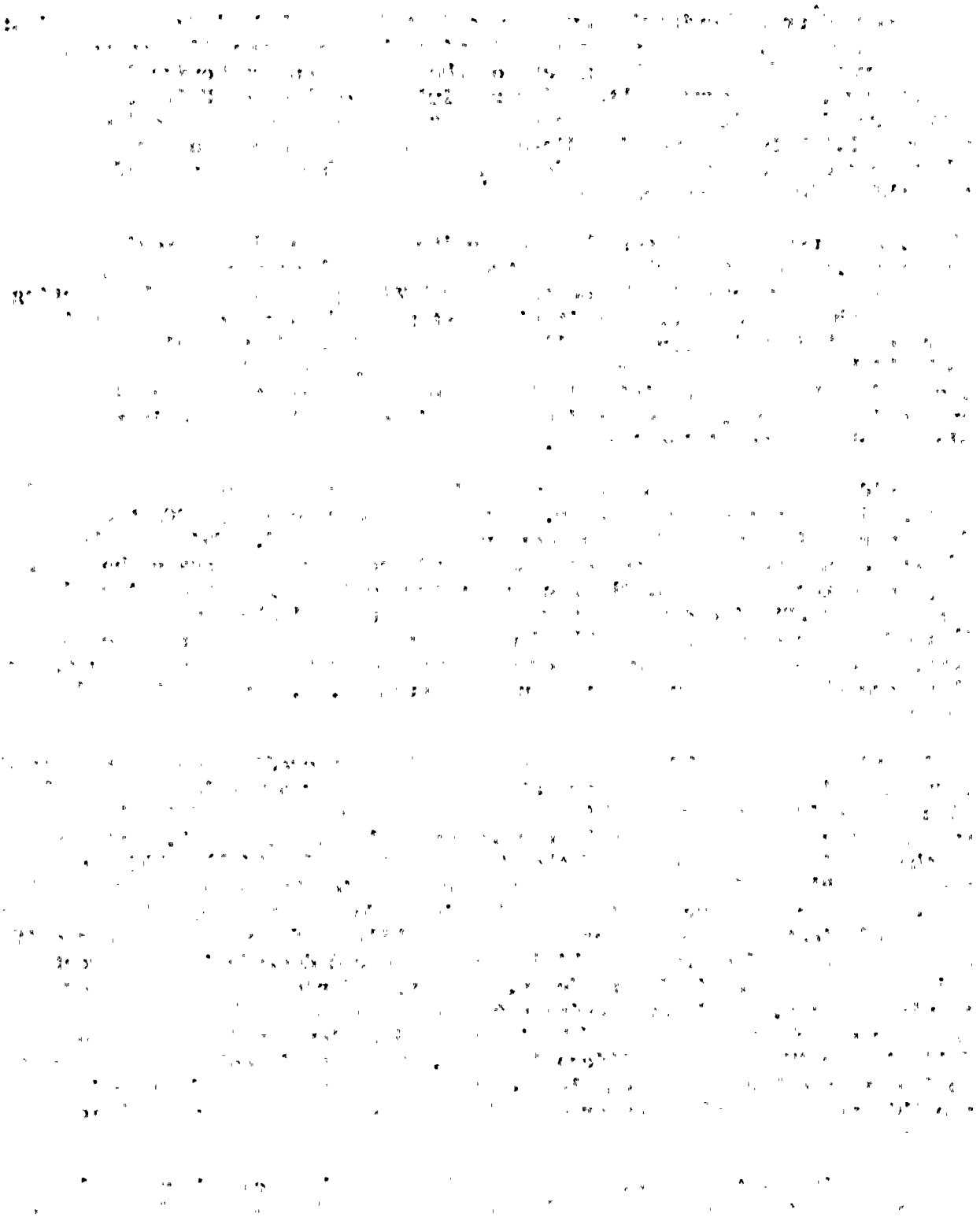
The Excore Neutron Monitoring System was installed in Unit 1 during the first refueling outage. During start-up following the first refueling outage, testing was performed to obtain data on the Excore Neutron Monitoring System's performance. The results obtained were similar to those of Unit 2. The lowest reading indicated on the excore system corresponded to a calculated power of 3.3×10^{-5}% power immediately following a reactor shutdown. Additional data taken at power after the second refueling outage indicates that this value has not changed.

The primary use of the Excore Neutron Monitoring System is to provide confirmatory indication that all control rods have been inserted and, therefore, the reactor is shutdown. It is PP&L's position that the existing range of the Excore Neutron Monitoring System is adequate to perform this function. This holds true for all transients and accidents analyzed in the FSAR which assumes all control rods are inserted. With all control rods inserted a BWR has a sufficiently large shutdown margin to prevent it from ever going critical. This shutdown margin is controlled and monitored by plant Technical Specification 3.1.1.

It should be noted that for some analyzed accidents the actual range of this system will dramatically increase. For example during a DBA LOCA the downcomer region surrounding the core will become voided. This has the effect of increasing the vessel neutron leakage and therefore increasing the lower range of detectability for the Excore Neutron Monitoring System. A study performed by PP&L indicates that vessel fast neutron leakage will increase by 1½ to 2 orders of magnitude. The low end detectable range of the Excore Neutron Monitoring System will increase by approximately the same amount. In this case the range required by Regulatory Guide 1.97, Revision 2 could be satisfied or even exceeded.

It is PP&L's and the BWROG's position that the only credible event that would require monitoring neutron fluxes at very low reactor power levels would be a dilution accident after an ATWS. This position was documented in the BWR Owners' Group Position on NRC Regulatory Guide 1.97, Revision 2. Subsequent to this position the NRC passed the ATWS Rule (10CFR50.62(c)). This rule requires BWR's to install an Alternate Rod Insertion System and increase the capacity and performance of the Standby Liquid Control System. The effects of these modifications are to decrease the probability of having an ATWS and if an ATWS occurs reduce the probability that it would degrade into an event which would release fission products. PP&L will implement these changes required by law. It is our position that once the above changes are implemented, the probability of having to monitor low level neutron fluxes following an ATWS is insignificantly small. The cost in dollars and man-rem to improve the Excore Neutron Flux Monitoring System's low end range is prohibitively large when compared to the small gain in plant and public safety.

In summary it is, therefore, PP&L's position that the Excore Neutron Flux Monitoring System presently installed on Units 1 and 2 satisfy the intent of



Regulatory Guide 1.97, Revision 2 and that no further modifications to the system are required.

Very truly yours,

H. W. Keiser
Vice President-Nuclear Operations

cc: L. R. Plisco USNRC
M. J. Campagnone USNRC