

Duquesne Light Company

Beaver Valley Power Station
P.O. Box 4
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SUSHIL C. JAIN
Division Vice President
Nuclear Services
Nuclear Power Division

October 10, 1996

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

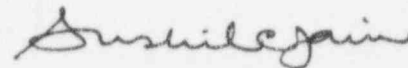
**Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Reply to Notice of Violation
(NRC Inspection Report 50-334/96-05 and 50-412/96-05)**

In response to NRC correspondence dated September 11, 1996, and in accordance with 10 CFR 2.201, the attached reply addresses the Notice of Violation transmitted with the letter.

The cited event was discussed in Integrated Inspection Report Nos. 50-334/96-05 and 50-412/96-05 and also during a Predecisional Enforcement Conference held on August 28, 1996.

If there are any questions concerning this response, please contact Mr. Roy K. Brosi at (412) 393-5210.

Sincerely,



Sushil C. Jain

Attachment

c: Mr. H. J. Miller, NRC Region I Administrator
Mr. D. M. Kern, Sr. Resident Inspector
Mr. D. S. Brinkman, Sr. Project Manager

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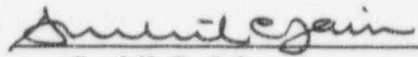


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COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF BEAVER)

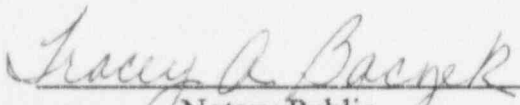
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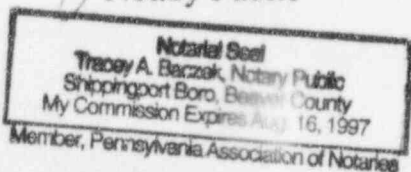
Before me, the undersigned notary public, in and for the County and Commonwealth aforesaid, this day personally appeared Sushil C. Jain, to me known, who being duly sworn according to law, deposes and says that he is Division Vice President, Nuclear Services of the Nuclear Power Division, Duquesne Light Company, he is duly authorized to execute and file the foregoing submittal on behalf of said Company, and the statements set forth in the submittal are true and correct to the best of his knowledge, information and belief.


Sushil C. Jain

Subscribed and sworn to before me

on this 10th day of October, 1996


Notary Public



DUQUESNE LIGHT COMPANY
Nuclear Power Division
Beaver Valley Power Station, Unit Nos. 1 and 2

Reply to Notice of Violation
Letter dated September 11, 1996

VIOLATION (Severity Level III; Supplement I)

Description of Violation (EA 96-244)

10 CFR 50.62(c)(1) requires, in part, that each pressurized water reactor must have equipment from sensor output to final actuation device, that is diverse from the reactor trip (protection) system, to automatically initiate the auxiliary feedwater system and initiate a turbine trip under conditions indicative of an anticipated transient without scram (ATWS), and that this equipment must be designed to perform its function in a reliable manner.

Contrary to the above, since original installation in 1988 until June 1996 for Unit 1, and since original installation in 1989 until June 1996 for Unit 2, the ATWS Mitigation System Circuitry (AMSAC), (i.e., the equipment installed to automatically initiate the auxiliary feedwater system and initiate a turbine trip under conditions indicative of an ATWS) had not been designed to perform its function in a reliable manner. This equipment was not designed to perform its function in a reliable manner in that a design deficiency that had been present since the original installation of the system, namely, the failure to incorporate static pressure effect and hydraulic fluctuations in the design margin for "out-of-range" flow signals. The deficiency was evidenced by the fact that on May 31, 1996, a transient occurred in which, although the reactor trip system functioned as required, conditions also existed (namely, a loss of normal feedwater) which should have caused the AMSAC to initiate. However, AMSAC failed to initiate as expected during this operational occurrence. (IFS 01013)

Reason for Violation

The original AMSAC design did not explicitly consider signal error sources, including static pressure effect and process noise. More specifically, the field input interface to AMSAC was not thoroughly characterized in that the dynamic conditions that could drive the flow transmitters into the "reverse flow" range were not recognized. The nature of this problem was subtle and was not identified by the initial verification.

Corrective Actions Taken and Results Achieved

After the Independent Safety Evaluation Group identification that multiple timer resets had prevented the actuation of Unit 1 AMSAC during the May 31, 1996, Unit 1 turbine/reactor trip, the following actions were taken:

1. The Nuclear Shift Supervisor was notified and the Unit 1 AMSAC was immediately declared inoperable.
2. A Problem Report (1-96-523) was initiated which included an evaluation of the problem and a Basis for Continued Operation (BCO).
3. An administrative "Limiting Condition for Operation" (LCO) was voluntarily applied which imposed a time limit to restore the Unit 1 AMSAC to an operable status or reduce plant power level to less than 40%.
4. Following troubleshooting of the feedwater flow inputs into the Unit 1 AMSAC, it was determined that the lower feedwater flow "out-of-range" AMSAC setpoint was not properly set to account for the dynamic conditions affecting the flow transmitters. It was recognized that this problem also affected the Unit 2 AMSAC; therefore, the Unit 2 AMSAC was declared inoperable, a Problem Report (2-96-299) and BCO were written and the administrative LCO was voluntarily applied.
5. A review of industry information available on AMSAC problems was conducted. It was determined that the problem affecting the Beaver Valley AMSAC setpoints had not been previously reported. An INPO Nuclear Network entry was initiated to notify the industry of this event.
6. A review of past Beaver Valley trip data was performed, and it was determined that during prior trips, AMSAC had initiated when expected.
7. A formal TapRoot root cause investigation into the cause of the event was conducted by Engineering Assurance.
8. Modifications were made to both the Unit 1 and Unit 2 AMSAC to decrease the lower feedwater flow "out-of-range" setpoint for a flow instrument failure. These modifications were completed at both units within the imposed time limit for restoring AMSAC to an operable status.

Actions Taken to Prevent Recurrence

1. A focused design review of the Unit 1 and Unit 2 AMSAC system was conducted utilizing internal and external expertise. This review was a comprehensive review of the AMSAC system design, function and performance and was completed on July 31, 1996. The review team concluded that the current AMSAC system design is capable of performing its intended function.
2. In order to evaluate the extent of condition for similar design concerns, additional focused design reviews were completed on the Unit 1 Inadequate Core Cooling Monitoring (ICCM) system, Post Accident Sampling System (PASS), and the High Energy Line Break (HELB) isolation system. These systems were selected because, like AMSAC, they were representative of systems installed after initial plant licensing and were customized from generic designs. This sample included both Technical Specification and non-Technical Specification systems. The review team concluded that the current ICCM, PASS and HELB system designs are capable of performing their intended functions.
3. Specific recommendations from the four focused design reviews are being evaluated and tracked for follow-up. To further assess the generic implications of the findings from these reviews, the results of these reviews are now being evaluated. This evaluation will be completed by October 31, 1996.
4. To ensure awareness of the causes of this event, and to maintain engineering sensitivity to potential design issues, design engineers will be required to review a training package pertaining to the AMSAC reliability deficiencies. Careful consideration of system input characteristics when establishing design margins will be emphasized. Static pressure effects, process noise, and response to dynamic conditions will be included as examples. The review of the training packages will be completed by November 15, 1996.

Date When Full Compliance Will Be Achieved

As described above, Duquesne Light Company is in full compliance at this time.

The above actions will be completed by November 15, 1996.