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January 8, 1985

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. George W. Knighton, Chief
Licensing Branch 3
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Auxiliary Systems Branch Open Items/Questions

Gentlemen:

This letter forwards supplementary responses to Auxiliary Systems Branch (ASB) draft SER Open Items 133, 134, 137, 148 and 149. The response to ASB Question 410.54 is also included.

These responses have been discussed in telecons with the ASB reviewers, and it is our understanding that the status of Question 410.54 and Open Item 133 will now be "confirmatory" based upon completion of the analyses and that the status of Open Items 134, 137, 148 and 149 will now be "closed." Please provide written confirmation of this status.

DUQUESNE LIGHT COMPANY

By E. J. Woolever
E. J. Woolever
Vice President

JJS/nml
Attachment

cc: Mr. R. DeYoung, Director (3) (w/a)
Mr. B. K. Singh, Project Manager (2) (w/a)
Mr. G. Walton, NRC Resident Inspector (w/a)
INPO Records Center (w/a)
NRC Document Control Desk (w/a)

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SUBSCRIBED AND SWORN TO BEFORE ME THIS
8th DAY OF January, 1985.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On this 8th day of January, 1985, before me, a Notary Public in and for said Commonwealth and County, personally appeared E. J. Woolever, who being duly sworn, deposed and said that (1) he is Vice President of Duquesne Light, (2) he is duly authorized to execute and file the foregoing Submittal on behalf of said Company, and (3) the statements set forth in the Submittal are true and correct to the best of his knowledge.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

BEAVER VALLEY POWER STATION UNIT NO. 2

SUPPLEMENTARY RESPONSES TO ASB DRAFT SER OPEN ITEMS
133, 134, 137, 148 and 149

OI 133

The applicant's analyses for all pipe break locations, including pipe whip, jet impingement, flooding, and environment effects of postulated high and moderate pipe breaks on safety-related equipment and structures in response to our Question 410.10 is not complete. The applicant has stated that this information will be supplied at a later date.

Until receipt of acceptable information as discussed above, we cannot conclude that the applicant has adequately designed and protected areas and systems required for safe plant shutdown following postulated events, including the combination of pipe failure and single active failure.

Supplementary Response (Original Response 8-13-84, 2NRC-4-121)

The pipe break analyses are scheduled for completion in 1985.

OI 134

The applicant stated that the fuel pool heat loads have been calculated in accordance with Branch Technical Position ASB 9-2. The applicant states that under normal heat load (defined below), the pool temperature would be maintained below 140 degrees Fahrenheit assuming the failure of one cooling train. This heat load has been defined as one-third core after 150 hours of decay, one-third core with one year of decay plus one-third core with 400 days decay. We consider the maximum normal heat load to be that which would exist when the pool is completely filled with successive normal refueling batch discharges.

We will require the applicant to demonstrate that the Spent Fuel Pool Cooling System is capable of maintaining the pool water temperature at or below 140 degrees Fahrenheit when the storage pool is completely filled with normal discharges assuming that one cooling train has failed.

The maximum abnormal heat-load is defined by the applicant as one full core discharge with 150 hours of decay plus one-third core discharge with 36 days decay and one-third core with 400 days decay. With this heat load, the applicant stated that the pool tempertaure is maintained at or below 165 degrees Fahrenheit. We consider the maximum abnormal heat load as one full core discharge plus all other fuel storage cells in the storage pool filled with successive normal refueling batch discharges. We will require the applicant to demonstrate that the spent fuel pool cooling system is capable of maintaining the pool water temperature below boiling when the pool contains a full core discharge and all other storage spaces are filled with normal discharges.

Supplementary Response (Original Response 7-2-84, 2NRC-4-099)

Analyses have been performed for the two heat load cases stated in the Open Item. For the case of the storage pool being completely filled with successive yearly refueling discharges and a last refueling discharge with the 150 hours of decay plus the assumed loss of one cooling train, a peak temperature of 149.9 degrees Fahrenheit has been calculated. For the case of the storage pool being completely filled with yearly refueling discharges and a last discharge of one full core with 150 hours of decay, a peak temperature of 157.1 degrees Fahrenheit has been calculated.

(It is noted that a temperature switch is provided which would activate an alarm at 140 degrees Fahrenheit so that the purification portion of the cooling system could be secured, but the cooling portion of the system would remain operational.)

OI 137

We cannot conclude that the SSWS (Standby Service Water System) adequately ensures a sufficient supply of service water to accomplish unit shutdown and subsequent cooldown in the event the SWS (Service Water System) Seismic Category I intake structure is lost due to a gasoline barge impact/explosion since we cannot confirm that the requirements of General Design Criteria 45 and 46 are met.

The applicant has not addressed the measures (e.g., design and procedures) that will be taken to prevent fouling and degradation of the SSWS as a result of marine growth nor has the applicant confirmed that the periodic SSWS testing and inspection will be assured by technical specifications.

Supplementary Response (Original Response 7-2-84, 2NRC-4-099)

The results of the operating surveillance test on the BV-1 Auxiliary River Water System have shown the system to be capable of providing at least 8,000 gpm of cooling water. Four tests have been satisfactorily performed since 1980. In these tests, one of the auxiliary river water pumps is operated in a recirculation mode and the flow is throttled to give an orifice pressure differential corresponding to 8,000 gpm flow. A valve in the recirculation line is then closed and an outlet valve on one of the component cooling water heat exchangers is throttled open to obtain the same pump discharge pressure as obtained in the recirculation mode, which corresponds to 8,000 gpm flow. The system is operated for at least 2 hours to verify adequate performance. The BV-2 SSWS will be similarly tested at least once per 18 months.

The following SSWS surveillance requirements will be performed in accordance with the Draft BV-2 Technical Specifications.

At least one SSWS System shall be demonstrated operable.

A. At least once every 31 days by:

1. Starting each pump from its control station.

2. Verifying that each pump develops at least (later) psig discharge pressure while pumping through its test flow line.

3. Verifying that each pump operates for at least 15 minutes.

4. Cycling its power operated discharge valve through at least one complete cycle of full travel.

B. At least once per 18 months during shutdown by:

1. Starting a SSWS pump, and

2. Shutting down one SWS pump.

3. Verifying that the Standby Service Water Subsystem provides at least 8,000 gpm cooling water to that protion of the Primary SWS under test for at least 2 hours.

OI 148

The applicant's response to our request for performance of a test to demonstrate that the potential for feedwater water hammer has been adequately provided is unacceptable. It is our position that a test is necessary in order to verify the effectiveness of the design provisions. Therefore, we will require a commitment for such a test. The test should be conducted at system conditions as close to those experienced during normal plant operations. Automatic initiation of the Auxiliary Feedwater System should be allowed to occur following the tripping of the main feedwater pumps. The applicant should observe and record the initial conditions and the transient that follows. The applicant should also provide physical drawings which illustrate the system water hammer prevention design features.

Supplementary Response (Original Response 8-13-84, 2NRC-4-121)

DLC will perform a water hammer test by allowing automatic initiation of the Auxiliary Feedwater System to occur following the tripping of tne main feedwater pumps. DLC will listen for and pass judgment on any resulting noise. No instrumentation will be required for this test.

OI 149

The applicant has not provided a response to our March 10, 1980 generic letter concerning the Auxiliary Feedwater System (AFWS) design including the criteria of TMI Task Action Plan, NUREG 0737, Item II.E.1.1. This response should include the following:

A. A detailed point-by-point review of the AFWS design against the criteria of the SRP Section 10.4.9 and Branch Technical Position ASB 10-1.

B. A point-by-point review of the AFWS design, Technical Specifications, and operating procedures against the generic short-term and long-term recommendations discussed in the March 10, 1980 letter and NUREG-0611.

C. An evaluation of the design basis for the AFWS flow requirements, and verification that the AFWS will meet these requirements (refer to Enclosure 2 of the March 10, 1980 letter).

D. A cursory review of the AFWS simplified reliability analysis as described in the FSAR Appendix 10A to Secion 10.4.9 has shown that the information provided is inadequate in that the quantification of the analysis cannot be verified. Therefore, the applicant should provide an AFWS reliability analysis consistent with that described in the March 10, 1980 letter and NUREG-0611, or provide a comparison of the date bases, methodology, assumptions, and numerical results used in AFWS simplified reliability analysis discussed in Appendix 10A against that contained in NUREG-0611. Include a verification of compliance with the 10 to the minus 4 power to 10 to the minus 5 power demand numerical reliability acceptance criteria for the loss of main feedwater and loss of offsite power (loop) cases.

Supplementary Response (Original Response 7-2-84, 2NRC-4-099)

Refer to the response provided for Question 410.52 provided in Amendment 9, December 1984. A future amendment will revise the paragraph for additional short-term recommendation 5.3.4 of NUREG-0611 to the following:

5.3.4 System Availability during Periodic Surveillance Testing

> The BV-2 Technical Specifications will require that constant communciations between the Control Room and Auxiliary Feed Pump Room be established and maintained while any normal discharge valve is closed during surveillance testing of the auxiliary feed water pumps.

The following excerpts from the Draft BV-2 Technical Specifications further address the concerns of short-term recommendations GS-1 and GS-6 of NUREG-0611:

GS-1

With one auxiliary feed pump inoperable, restore the three auxiliary feedwater pumps (two capable of being powered from separate emergency busses and one capable of being powered by an operable Steam Supply System) to operable status within 72 hours or be in hot shutdown within the next 12 hours.

GS-6

Each auxiliary feedwater pump shall be demonstrated operable:

A. At least once per 31 days by:

1. Starting each pump from the Control Room.

2. Verifying that:

   a. Each motor driven pump develops a discharge pressure of greater than 1,335* psig of recirculation flow, (*to be verified during pre-operational testing), and

   b. The steam turbine driven pump develops a discharge pressure of greater than 1,335* psig on recirculation flow when the secondary steam pressure is greater than 600 psig.

3. Verifying that each pump operates for at least 15 minutes.

4. Cycling each testable power operated valve in the flow path through at least one complete cycle of full travel.

5. Verifying that each valve (manual or power operated) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

6. Reverifying the requirements of Technical Specification Surveillance 4.7.1.2.A.5 by a second and independent operator.

7. Establishing and maintaining constant communications between the Control Room and the Auxiliary Feed Pump Room while any normal discharge valve is closed during surveillance testing.

8. Verifying operability of each SWS auxiliary supply valve by cycling each manual SWS to Auxiliary Feedwater System valve through one complete cycle.

9. Following an extended plant outage, verify auxiliary feedwater flow from TK-210 to the steam generators with the auxiiliary feedwater valves in their normal alignment.

B. At least once per 18 months during shutdown by:

1. Cycling each power operated (excluding automatic) valve in the flow path that is not testable during plant operation, through at least one complete cycle of full travel.

2. Verifying that each automatic valve in the flow path actuates to its correct position on a test signal.

BEAVER VALLEY POWER STATION UNIT NO. 2

QUESTION 410.54

In regard to internally generated missile protection inside/outside containment (i.e., SRP Section 3.5.1.1 and 3.5.1.2), we are unable to confirm that you have properly assumed a single active failure concurrent with postulated internally generated missiles. Verify that redundant safety- related trains are protected from damage which may result from the impact of missiles generated from non-safety related sources consistent with the guidelines of Position C.2 of Regulatory Guide 1.29.

Response

A single failure is assumed concurrently with postulated internally generated missiles inside and outside containment in accordance with Section 3.1.1.3. Section 3.2.1.2, first sentence of the second paragraph will be revised in a future amendment to read as follows:

> A Seismic Category II Classification is identified for those portions of structures, systems and components which are not required to perform safety functions but whose failure, including becoming a gravity missile, could adversely affect safety-related, Seismic Category I components.

The missile analyses are scheduled for completion in 1985.