



# Duquesne Light

Nuclear Group  
P.O. Box 4  
Shippingport, PA 15077-0004

Telephone (412) 393-6000

June 13, 1985

Director of Nuclear Reactor Regulation  
United States Nuclear Regulatory Commission  
Attn: Mr. Steven A. Varga, Chief  
Operating Reactors Branch No. 1  
Division of Licensing  
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66  
Response to Supplemental SER on the IST Program

Gentlemen:

Your letter dated March 7, 1985 forwarded the referenced Supplemental Safety Evaluation Report (SSER) which identified several issues which were not accepted by the staff. We were requested to respond to these within 90 days following receipt of the SSER. Attached, please find our response to each item the staff had left open. We have addressed each item and are proposing testing which we believe will satisfy the staff's concern.

Two of these items dealt with the denial of our relief requests from the Code required testing, these are:

- a request for relief from obtaining stable bearing temperatures in accordance with ASME XI subsection IWP for the Outside Recirculation Spray Pumps.
- a request for relief from full-stroke exercising the accumulator discharge check valves in accordance with ASME XI Subsection IWV.

With respect to the testing of the Outside Recirculation Spray Pumps, the proposed test method intends to permit obtaining stable bearing temperatures in accordance with IWP-3500(b). The design of this system is such that it is subject to gradually increasing temperatures of the pumped fluid since wet testing requires the continuous recirculation of a relatively small volume of water. This is not how the system is intended to function in the unlikely event of a DBA. During accident mitigation, this system would be recirculating a large volume of water throughout containment and through a heat exchanger supplied with river water as the heat sink.

The ASME XI Code has as its basis assumptions that pump operating conditions remain constant and are repeatable. Since the design and installation of our system was completed prior to having inservice testing requirements as they exist today, this system was not designed to achieve those parameters

8506260433 850613  
PDR ADOCK 05000334  
E PDR

A047  
1/1

contained in ASME XI. Therefore, the testing proposed in the attachment may not fully satisfy the Code. If this test is successful in running to its intended completion, the data obtained will serve as reference values for future testing. The test data will require assessment to determine its acceptability for meeting the Code or whether a relief request to provide an alternate assessment of bearing temperatures is needed. Our conclusions will be submitted to the NRC within one month following startup from our fifth refueling outage.

Since these pumps were successfully demonstrated as being able to perform their intended function during pre-operational testing, the subsequent inservice testing performed which demonstrates reference values are repeatable are considered satisfactory in determining the operational readiness of these pumps. Successful testing of this type precludes the need to consider plant modifications which are categorized as backfits.

The proposed test method for demonstrating the safety injection accumulator check valves is considered an acceptable method for full-stroke exercising these valves. The EG&G Technical Evaluation Report attached to your initial SER dated June 29, 1982 stated any flow rate less than design will be considered part-stroke exercising unless it can be shown that the check valve's disk position at the lower flow rate would be equivalent to or greater than the design flow rate through the valve. Our calculations show that the proposed test will full-stroke the subject check valves at a lower than design flow. We therefore have satisfied the staff's position in proposing a test method which will full-stroke exercise these disks and also meet the criteria set forth in the initial SER.

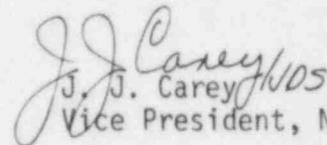
The final item requiring action as stated in your SER is pressure isolation verification for valves SI-15, 16, 17 and MOV-RH-700 and 701. We share your concern over the importance of verifying the pressure isolation function of these valves and have considered your request that we test beyond the requirements of the Code in order to verify this pressure isolation capability. Therefore, for valves SI-15, 16 and 17, we will re-categorize them as ASME XI Category A/C and perform testing in accordance with Section IWV-3420. For valves MOV-RH-700 and 701, we will utilize the pressure monitoring technique suggested in your initial SER of June 29, 1982. Further information on these tests is included in the attachment to this submittal.

In conclusion, we will perform inservice testing to demonstrate the operational readiness of the above referenced components. Every reasonable attempt will be made to obtain pump bearing temperatures as previously discussed. We will submit our conclusions on the success of our efforts in testing the outside recirculation spray pumps within one month following startup from our next refueling outage. Successful testing of the accumulator discharge check valves will be accomplished by providing sufficient flow through them to assure full-disc lift. The safety injection system pressure isolation valves referenced above will be leak tested and the residual heat removal system isolation valves will be tested using a pressure monitoring method.

Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66  
Response to Supplemental SER on the IST Program  
Page 3

If you have any questions concerning this submittal, please contact me or members of my staff.

Very truly yours,

  
J. J. Carey  
Vice President, Nuclear

Attachment

cc: Mr. W. M. Troskoski, Resident Inspector  
U.S. Nuclear Regulatory Commission  
Beaver Valley Power Station  
Shippingport, PA 15077

U. S. Nuclear Regulatory Commission  
c/o Document Management Branch  
Washington, DC 20555

Director, Safety Evaluation & Control  
Virginia Electric & Power Company  
P.O. Box 26666  
One James River Plaza  
Richmond, VA 23261

ATTACHMENT

(to letter dated June 13, 1985)

Response to NRC Letter of March 7, 1985

Item 1: Outside Recirculation Spray Pumps; RS-P-2A and RS-P-2B

NRC Request

The licensee has not shown that the pumps meet the Code requirements for length of run and stable bearing temperatures. Either the testing method be revised or modifications be made to enable testing that can determine the Code required characteristics. Submit a schedule and method to achieve the Code required wet testing of these pumps during refueling outages (not to exceed two years).

DLC Response

The Outside Recirculation Spray Pumps are presently tested dry monthly for 60 seconds and on wet recirculation for 15 minutes during refueling outages. The 15-minute time limit was placed on these pumps because the vibration readings are approximately 4 mils peak to peak while the pumps are running on recirculation. The manufacturer's suggested limit is 5 mils.

Our previous submittals had stated that based on earlier evaluations, it was concluded that these pumps could not run for sufficient length of time to allow the bearing temperatures to stabilize, therefore, relief was requested from the Code with respect to obtaining this parameter. Upon re-evaluation of pre-operational test data and current test practices, we have concluded that an extended pump run may be possible. This is based on the critical pump parameters remaining below their limits during the 15-minute wet recirculation tests.

We will conduct additional testing to obtain these Code-required pump parameters during the fifth refueling outage. In addition to flow, discharge pressure and bearing temperature readings, a full set of vibration readings will be taken and suction pressure readings will be taken with a test gage installed on the pump casing. However, due to the location of the pressure gage, the possibility of turbulent conditions and the size of the recirculation line at this measurement point, the validity of the suction pressure readings will have to be determined at the time of the test. The pumps will be run on recirculation until either the bearing temperatures stabilize or the vibrations approach the manufacturer's limit. If the bearing temperatures do not stabilize, the pumps will be run for a maximum of 60 minutes or until the vibrations reach the manufacturer's limit or bearing temperatures approach their upper temperature limits. Sixty minutes is the time required for this system or the inside recirculation spray subsystem, a 100% redundant subsystem, to return containment pressure to subatmospheric conditions following a DBA.

Upon completion of these tests, the test data will be reviewed and the degree to which we are able to meet ASME XI for obtaining stable bearing temperatures under recirculation conditions will be assessed. The design of the recirculation spray system, as it was originally designed to satisfy the periodic testing requirements in existence at the time of construction, provides for a fixed volume of water to be recirculated through an abbreviated flow path when performing tests to determine the operational readiness of these pumps. This test configuration may result in gradually increasing temperatures, a condition not expected for this system if operating following a DBA. We will submit this information and our conclusions, including the proposed future testing with recommended acceptance criteria within one month following startup from our fifth refueling outage.

Item 2: Safety Injection Check Valves; SI-48, 49, 50, 51, 52, 53

NRC Request:

The present testing method of verifying partial opening of these check valves does not meet the Code testing requirements. The suggested alternate test of part stroke exercising is not accepted as a means for determining operability of these valves on a refueling frequency. The staff concludes that exercise testing is required by the Code to assure valve operability on a refueling frequency (not to exceed two years). The licensee is to submit a schedule for compliance with the refueling outage frequency full-stroke exercise requirements of the Code.

DLC Response:

Further investigation of various testing methods have been performed. It has been determined that based on valve design, a reduced pressure/volume test can be conducted which would assure that the minimum pipe velocity for disc lift is achieved, thus satisfying the Code. Therefore, two of the accumulator discharge check valves will be full-stroke exercised each refueling outage by verifying that the valves open completely when a known flow is passed through them. Calculations show that a flow of approximately 6.1 ft/sec is required to stroke the valves completely. We propose testing one accumulator, two valves, each refueling outage by having the accumulator at approximately 100 psig, and then stroking the motor operated isolation valve. This would dump the accumulator into the reactor coolant system, which will be vented to the pressurizer relief tank. The flow rate achieved with this test will be greater than the 6.1 ft/sec needed for a full stroke exercise.

This, or any other reduced pressure/volume test which produces a fluid velocity greater than the minimum flow velocity necessary to assure full disc lift, is considered satisfactory for demonstrating that the flow path is open to pass the full design flow thus demonstrating the capability of these valves to fulfill their intended function.

In addition to the above, check valves SI-52 and SI-53, associated with two separate accumulators, are full stroke-exercised each time the Residual Heat Removal (RHR) System is placed in service. These check valves are located downstream of the RHR discharge into the reactor coolant system (Ref. UFSAR Figure 6.1-1). The RHR flowrate is in excess of the design accumulator discharge flowrate and therefore further demonstrates the ability of these two valves to meet their intended function.

Item 3: Valves Requiring Pressure Isolation Verification

Part 1 - Valves SI-15, 16, 17, 20, 21, 22

NRC Request

The NRC considers the redundant isolation provided by these valves to be important. The staff therefore considers it necessary to assure that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity. The staff further concludes that if SI-15, 16 and 17 are leak tested, the necessary isolation redundancy will be provided and SI-20, 21 and 22 need not be leak tested. The licensee is to provide a schedule and method to accomplish this testing.

DLC Response

These check valves will be leak tested each refueling outage to determine the condition of each valve. The method of testing to be used, will be to pressurize the RCS and measure any leakage past SI-20, 21, 22 through a downstream telltale connection. Then the pipe between SI-20, 21, 22 and SI-15, 16, 17 will be pressurized. The amount of make-up water required to maintain that pressure will be measured and the overall leakage for SI-15, 16, 17 will be determined. This leakage will then be corrected to account for the system functional pressure differential.

The acceptance criteria for each valve will be:

1. Leakage rates less than or equal to 1.0 gpm for each valve are considered acceptable.
2. Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered acceptable if the latest measured rate has not exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.
3. Leakage rates greater than 5.0 gpm are considered unacceptable.

Part 2 - Valves MOV-RH-700 and 701

NRC Request

The NRC considers the redundant isolation provided by these valves to be important. It is concluded that since the two valves are located in series to protect the low pressure RHR system, if one of the redundant valves fail, it could go undetected, thus compromising isolation valve redundancy between high and low pressure piping. The licensee should submit a schedule and method to accomplish the requested testing.

DLC Response

The Safety Evaluation Report of the IST Program dated June 29, 1982, stated, "The NRC considers it necessary to assure that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity. For these reasons, some method, such as pressure monitoring, leak testing, radiography or ultrasonic testing should be used to assure the condition of each valve is satisfactory in maintaining this pressure isolation function."

Therefore, one of these gate valves will be tested each refueling to assure that the condition of each of these valves is adequate to maintain redundant pressure isolation and system integrity. The pressure of the RHR system will be monitored over a period of time while one of the series valves is open and the RCS is at some pressure higher than the RHR pressure. The final test procedure and acceptance criteria will be developed and in place before the fifth refueling outage. This pressure monitoring will provide adequate verification of redundant pressure isolation capability and is considered an acceptable method as stated in the SER of June 29, 1982.