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August 8, 1994

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

Subject: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Request for Relief for a Non-Code
Repair on River Water Pipe 18"WR-16-151-Q3

Attached for NRC review and approval is a request for relief for a non-code repair on river water pipe 18"WR-16-151-Q3. A pinhole leak was discovered in this pipe on July 15, 1994. The flaw causing the leak has been evaluated in accordance with the requirements of Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping" and found to meet the criteria for a non-code repair.

The leak cannot be isolated and code repaired during the time permitted by Tech Spec 3.7.4.1 (72 hours) and a code repair would necessitate a plant shutdown. Based on the above and the guidance provided by Generic Letter 90-05, a code repair during power operation is impractical. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is requested that the NRC grant relief for a temporary non-code repair to be used until the next scheduled outage exceeding 30 days, but no later than the Tenth Refueling Outage (1R10) which is scheduled to begin in October, 1994.

If there are any questions concerning this matter, please contact Mr. N. R. Tonet at (412) 393-5210.

Sincerely,

T. P. Noonan

T. P. Noonan
Division Vice President
Nuclear Operations

Attachment

cc: Mr. L. W. Rossbach, Sr. Resident Inspector
Mr. T. T. Martin, NRC Region I Administrator
Mr. G. E. Edison, Project Manager

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DUQUESNE LIGHT COMPANY
Nuclear Power Division
Beaver Valley Power Station Unit No. 1

Request for Relief for a Non-Code Repair
on River Water Pipe 18"WR-16-151-Q3

On July 15, 1994, during Beaver Valley Unit 1 (BV-1) power operation, a pinhole leak was discovered on river water pipe 18"WR-16-151-Q3 by an operator performing a routine tour of the Primary Auxiliary Building. The pinhole leak was located just below the weld immediately downstream of RW-190, the river water outlet isolation valve for CC-E-1C (See Figure 1). The pinhole is less than 1/16" (0.0625") in diameter and was leaking a small stream of water. The leak stopped when RW-190 was closed.

The pinhole leak is located on a section of Class 3 piping that cannot be isolated and code repaired within the time period permitted (72 hours) by the limiting condition for operation of Technical Specification 3.7.4.1. In addition, the performance of a code repair would require a plant shutdown. Based on the above and the guidance provided by Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping," a code repair during power operation is impractical. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is requested that the NRC grant relief for a temporary non-code repair to be used until the next scheduled outage exceeding 30 days, but no later than the Tenth Refueling Outage (1R10) which is scheduled to begin in October, 1994.

Flaw Characterization

The pipe was ultrasonically (UT) scanned circumferentially to determine the area of erosion. Following paint removal, the area around the pinhole was UT examined using a 3/8" transducer to determine pipe wall thickness. An area approximately 7" by 8" was characterized using a 1/2" grid pattern. In addition, UT measurements were taken incrementally in the immediate area surrounding the pinhole including the weld crown after surface conditioning. The UT examinations did not identify any area (other than the pinhole) with a thickness below the code required minimum wall thickness.

Root Cause Determination

The UT examinations showed a localized area of wall erosion downstream of RW-190. The cause of the erosion is theorized to be from cavitation occurring due to the throttling of RW-190 when CC-E-1C is in service.

Pipe wall erosion in this same location has occurred previously due to the reasons described above. During the Ninth Refueling Outage (1R9), in March of 1993, this piping header was replaced with like kind material with a nominal wall thickness of 0.375". While some erosion in this area was expected due to the service conditions, the observed erosion rate since the header replacement is unexpectedly higher than previously seen. The river water outlet isolation valves

Root Cause Determination (Continued)

(RW-188, 189 & 190) for the component cooling water heat exchangers were also replaced during 1R9 with valves designed for throttled service. The flow characteristics of the new valves may be contributing to the higher erosion rates.

In order to prevent further erosion of the pipe wall in the area of the flaw, RW-190 was closed isolating river water flow through CC-E-1C. If CC-E-1C must be returned to service, the frequency of the augmented inspection will be increased to ensure that the maximum allowable flaw size is not exceeded.

Corrective Actions

The pipe flaw will be removed and repaired in accordance with ASME Section XI requirements during the Tenth Refueling (1R10) which is the next scheduled outage exceeding 30 days. In addition, corrective action will be developed and implemented during 1R10 to mitigate piping erosion downstream of RW-188, 189 and 190.

Flaw Evaluation

The flaw was evaluated using the "through-wall flaw" approach provided by Enclosure 1 of Generic Letter 90-05. The code required minimum wall thickness for 18"WR-16-151-Q3 was determined to be 0.051" based upon the design Code ANSI B31.1 with a material type of A106-Grade B and a design pressure and temperature of 85 psi and 120°F respectively.

Using the "through-wall flaw" methodology, the maximum length of a flaw with a wall thickness less than 0.051" was determined to be 1.08" with a corresponding value of "K" equal to 34,733 $psi(in)^{0.5}$. The UT examination did not identify any areas below the code required minimum wall thickness of 0.051" with the exception of the actual pinhole. Therefore, the actual flaw size is less than 1.08" and the "through-wall flaw" approach criteria is satisfied.

Augmented Inspection

Augmented UT examinations of the other locations most susceptible to the specific erosion mechanism identified were performed. These locations are downstream of RW-188 and RW-189 (See Figure 1). The UT examination of 18"WR-14-151-Q3 downstream of RW-188 did not identify any areas with a wall thickness below 0.348". The UT examination of 18"WR-15-151-Q3 downstream of RW-189 also identified a localized area of erosion. However, no areas were found with a wall thickness below the code required minimum thickness of 0.051".

Weekly UT examinations will be performed on the areas experiencing significant pipe wall erosion on 18"WR-15-151-Q3 and 18"WR-16-151-Q3. A UT examination of 18"WR-14-151-Q3 will be performed monthly. These UT examinations will continue until the piping is repaired in accordance with code requirements. The results of the periodic UT examinations will be evaluated to ensure that the piping is acceptable for continued service.

System Interactions

With RW-190 closed, a vacuum condition exists in 18"WR-16-151-Q3 at the pinhole due to the piping configuration. Therefore, the potential for flooding, spraying water and loss of flow to the system due to the pinhole is insignificant.

Regular operator tours of the general area in the Primary Auxiliary Building are performed once per shift. Degradation of the structural integrity of the piping would be reported to the control room.

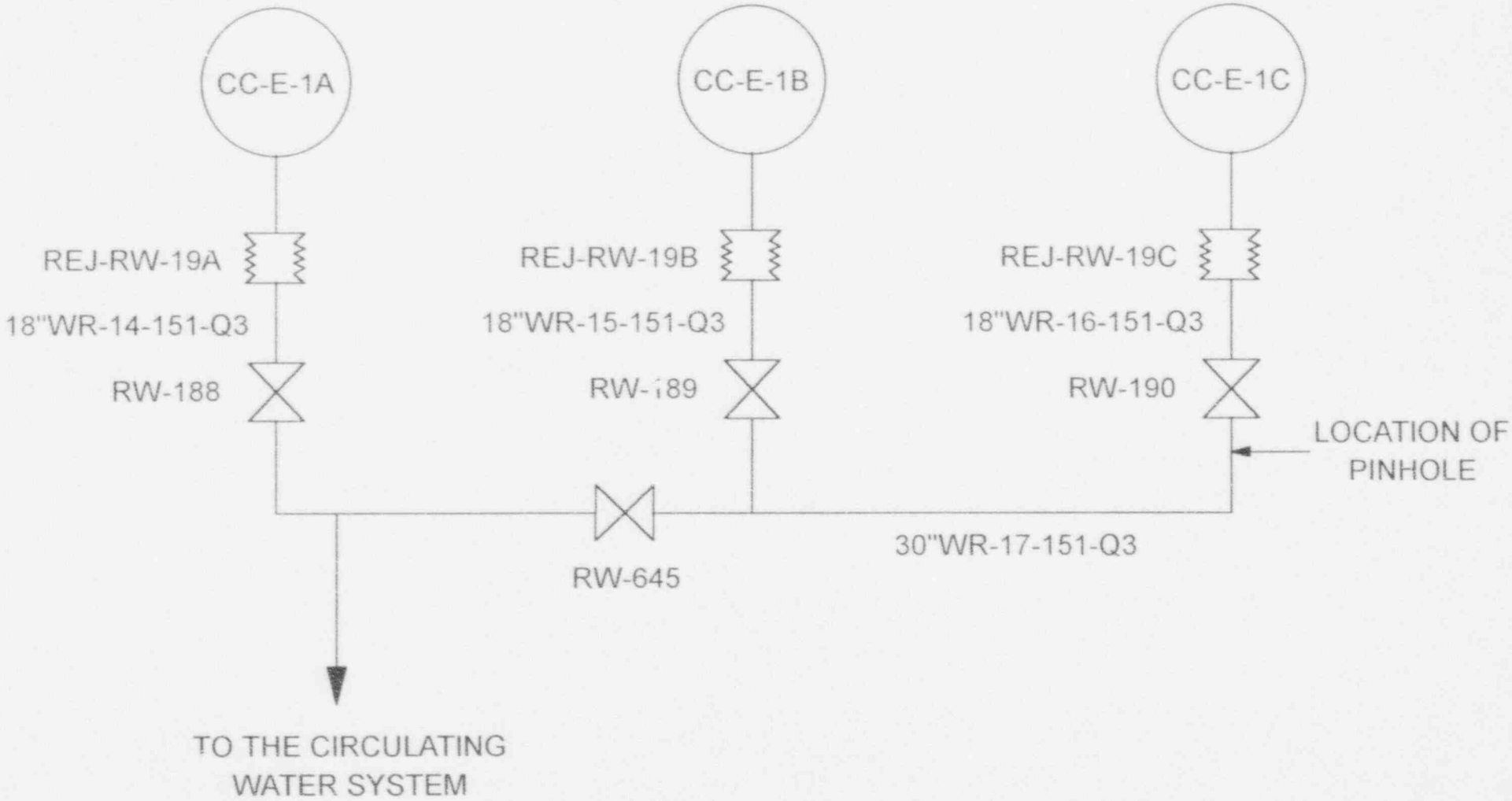
Temporary Repair

A temporary repair consisting of a rubber patch secured with a hose clamp was applied over the pinhole for housekeeping purposes. This repair is removable to allow for the performance of periodic UT examinations.

Conclusion

The structural integrity of 18"WR-16-151-Q3 was assessed using the "through-wall flaw" approach provided in Enclosure 1 of Generic Letter 90-05 and found to be acceptable. Based on the above review, it is requested that the NRC grant relief for a temporary non-code repair to be used until the piping can be code repaired during the Tenth Refueling Outage (1R10).

Figure 1
Simplified Drawing of River Water Discharge Piping from the Component Cooling Water Heat Exchangers



Ref: UFSAR Figure 9.9-1A