



A Centeror Energy Company

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Docket Number 50-346

License Number NPF-3

Serial Number 1825

July 10, 1990

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Relief Request to Allow Temporary Non-Code Repair of Service
Water Piping (TAC Number M77037)

Gentlemen:

On June 26, 1990, Toledo Edison (TE) received Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping" (dated June 15, 1990, Log Number 3258). A telephone call was initiated on that date between TE and Nuclear Regulatory Commission (NRC)/Office of Nuclear Reactor Regulation (NRR) personnel to discuss a small leak in a four inch service water system line at the Davis-Besse Nuclear Power Station (DBNPS). This leak had been identified and documented on June 9, 1990, during startup of DBNPS from the sixth refueling outage. Since piping integrity and system function were not affected by the leak, Toledo Edison provided a use-as-is temporarily disposition until an outage of 30 days or greater during the fuel cycle or until the seventh refueling outage, whichever occurred first. However, for housekeeping reasons, a gasketed patch and clamp were utilized to repair the leak. It was TE's position that continued startup efforts were within the guidance for "continued operation" as cited by the Generic Letter, and the plan for deferred final repair was justified on this basis. The NRC personnel agreed and stated relief pursuant to 10CFR50.55a(g)(b)(i), and as further explained in Generic Letter 90-05, would be required.

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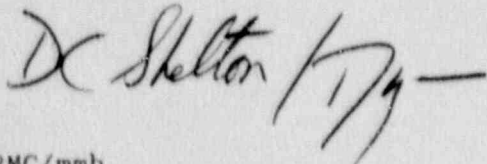
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Pursuant to 10CFR50.55a(a)(3), Toledo Edison requests approval of a temporary non-Code repair and augmented inspection of the affected service water piping as an alternative to the requirements of ASME Code, Section XI, IX-4000. Detailed justification for the requested relief is provided in the attachment. The justification was prepared pursuant to Generic Letter 90-05 and the NRC staff's guidance on preparing the relief request (the latter was telecopied to TE on June 26, 1990, by NRC). This request justifies continued operation of DBNPS with the temporary non-Code repair of the service water line until the next refueling outage (presently scheduled for September 1991) or until an outage of 30 days or greater during the present operating cycle, whichever occurs first.

Based on the justification provided, TE concludes that the proposed alternative provides an acceptable level of quality and safety, and compliance with the specified Code requirements would result in hardship without a compensatory increase in the level of quality or safety. Granting of this relief by NRC is requested by July 17, 1990.

If you have any questions, please contact Mr. R. W. Schrauder, Manager - Nuclear Licensing, at (419) 249-2366.

Very truly yours,

A handwritten signature in dark ink, appearing to read "D. Shelton" followed by a stylized flourish or initials.

RMC/mmb

cc: P. M. Byron, DB-1 Senior Resident Inspector
A. B. Davis, Regional Administrator, NRC Region III
T. V. Wambach, DB-1 NRC Senior Project Manager

RELIEF REQUEST TO ALLOW TEMPORARY NON-CODE
REPAIR OF SERVICE WATER SYSTEM PIPING LEAK

Description of Flaw Detection

On June 9, 1990, a leak in the service water system was identified and documented in Potential Condition Adverse to Quality Report (PCAQR) 90-0503. The particular line affected is the service water piping to the Emergency Core Cooling System (ECCS) Room Cooler coils and the Hydrogen Dilution Blowers for Train 2. The leak was described as approximately one gallon per minute. This piping is four inch diameter, 150 pound rated, schedule 40 ASME (SA53, Gr. B) Section III, Class 3. Ultrasonic (UT) examination of the piping was performed later the same day to determine piping wall thickness in the area of the flaw. This data was evaluated, and, on June 12, 1990, in response to the PCAQR, Engineering provided a disposition that piping integrity and system function were not affected and that the piping was acceptable for use until plant conditions were established which would allow sufficient time to effect weld repair of the flawed area. This disposition was accepted by the Authorized Nuclear Inservice Inspector (ANII) on June 12, 1990. A gasketed patch and clamp were used to repair the leak in the interim.

Determination of Impracticality of Repair

The flaw was determined to be acceptable for use temporarily (i.e. until the next refueling outage or until an outage of 30 days or greater, whichever occurred first) as described in the PCAQR disposition. On June 26, 1990, upon receipt of Generic Letter (GL) 90-05 and discussion with the NRC Staff, TE determined relief from the Code was needed due to the impracticality of repair during operational startup activities then underway. Repair was estimated to require approximately 89 hours which is in excess of the allowable out-of-service time for systems required to be isolated to effect repair, e.g., the Containment Cooling Units (Technical Specification 3/4.6.2.2). The NRC Staff concurred that interruption of startup activities did not appear warranted.

Subsequent Flaw Characterization

Following discussion with the NRC Staff personnel on June 26, 1990, TE began addressing the temporary non-Code repair (i.e. the gasketed patch and clamp) in accordance with the aspects of GL 90-05. On June 28, 1990, additional UT examination measurements were performed to further characterize the flaw. The measurements were further supplemented by a Radiographic (RT) examination on July 1, 1990, which showed the flaw to be a through-wall hole of approximately 3/16" diameter with a cavity of 5/8" x 7/16". It has been assumed the through-wall hole could grow to the dimensions of the cavity as the wall thickness in the cavity is approximately 1/32". Therefore, evaluations of the flaw have been performed assuming a through-wall hole of 5/8" diameter. The apparent root cause of the flaw is localized corrosive attack as adjacent piping areas indicate a greater wall thickness than the minimum required by the Code. Following final repair of the pipe, the piping will be examined and a thorough root cause evaluation will be performed.

Five additional areas of the Service Water System have been selected and inspected based on susceptibility to the same type of corrosion attack and accessibility of the piping for examination. These inspections, performed in accordance with GL 90-05 and presently being evaluated, will aid in further characterizing the corrosion mechanism and any effects on overall system degradation.

Flaw Evaluation Results

Analysis of the flaw utilizing the "through-wall flaw" approach presented in GL 90-05 requires calculating a stress intensity factor "K" to be less than $35 \text{ ksi (in)}^{0.5}$ for ferritic steel. Applying the equations as presented in GL 90-05, results in a "K" value of approximately $53.6 \text{ ksi (in)}^{0.5}$.

It is noted that the GL 90-05 equations are based on NUREG/CR-4572, "NRC Leak-Before-Break (LBB/NRC) Analysis Method for Circumferentially Through-Wall Cracked Pipe Under Axial Plus Bending Loads" (May 1986). These equations incorporate a geometric assumption that R/t be less than or equal to 16 and greater than or equal to 4. NUREG/CR-4572 suggests the use of 4 or 16, as appropriate, for R/t when the calculated R/t falls outside the specified range. Since the calculated R/t value for the 4 inch Schedule 40 Service Water piping under evaluation is approximately 95, the use of 16 for R/t is more appropriate. Thus, the estimated "K" value for this case is approximately $6.6 \text{ ksi (in)}^{0.5}$ which is much less than the maximum acceptance criteria of $35 \text{ ksi (in)}^{0.5}$.

In addition, a confirmatory evaluation was performed utilizing alternate equations for circumferential through-wall flaw stability as cited in NUREG/CR-3464, "The Application of Fracture Proof Design Methods Using Tearing Instability Theory to Nuclear Piping Postulating Circumferential Through-Wall Cracks" (September 1983), page 78. Use of these equations, in conjunction with a safety factor of 1.4 as specified by the GL, yields a "K" value of $7.73 \text{ ksi (in)}^{0.5}$. This compares favorably with the "K" value stated in the preceding paragraph.

Description and Evaluation of Temporary Repair

The temporary repair of the piping flaw consists of a clamp-type arrangement with rubber gasketing. The clamp is not intended to serve any structural function for this application, and its effect on the piping system is negligible due to the very small additional loading involved (estimated to be approximately 5-10 pounds) and the very low stress levels in the vicinity of the clamp. Systems interactions (such as flooding, spraying water on equipment and loss of system flow) have been evaluated, assuming the absence of the clamp and considering the flaw location and area sump capacity, and found to be negligible.

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Augmented Inspections

Toledo Edison, during plant walkdowns, will implement a weekly qualitative assessment of leakage through the temporary non-Code repair.

An assessment of the integrity of the temporary non-Code repair will be made at least quarterly by UT or RT.

Toledo Edison will notify the NRC if flaws which require evaluation in accordance with the rules of ASME Section XI are detected in the augmented inspections or the aforementioned inspections of the selected five susceptible locations.

Conclusion

Based on the above, the Service Water System flaw identified is acceptable until an outage of 30 days or greater or until the next refueling outage, whichever occurs first. Therefore, relief from ASME Code, Section XI, IWX-4000 in accordance with 10CFR50.55a(a)(3) is justified.