Docket file

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 23, 1993

Docket No. 50-461

Mr. Richard F. Phares
Director - Licensing
Clinton Power Station
Post Office Box 678
Mail Code V920
Clinton, Illinois 61727

Dear Mr. Phares:

SUBJECT: CLINTON POWER STATION, UNIT NO. 1 - AUTHORIZATION TO USE ASME, SECTION XI, CODE CASE N-516, PURSUANT TO 10 CFR 50.55a (TAC NO. M88151)

Your letter of November 4, 1993 (U-602208), requested authorization to use the American Society of Mechanical Engineers (ASME), Section XI, Code Case N-516, "Underwater Welding, Section XI, Division 1," to perform underwater repair (welding) to piping supports for the Residual Heat Removal (RHR) full flow test return lines located in the suppression pool at the Clinton Power Station.

We understand that work performed during the current refueling outage has resulted in the identification of a design error in the RHR piping supports. This design error has permitted actual stresses to be higher than originally predicted. The proposed modification to reduce these stresses would require welding of steel support plates to the existing piping support structures. Repair of components within the scope of ASME, Section XI, must be performed in accordance with Section XI Article IWA-4000. Per Article IWA-4300, welding must be performed in accordance with the requirements of ASME, Section IX, and the additional requirements of Sections III and XI. However, Section IX does not address underwater welding and options considered to remove the volume of suppression pool water necessary to expose the piping supports would have an adverse impact on the current refueling outage.

ASME, Section XI, Code Case N-516, specifically addresses underwater welding to facilitate repairs of P-8 materials (of which the RHR supports are constructed) and was approved by the ASME Code Case Committee on August 9, 1993. While the Code Case has been approved by ASME, it does not appear in the most recent listing of NRC approved Code Cases in Regulatory Guide 1.85, "Materials Code Case Acceptability - ASME Section III Division 1," Revision 29. Accordingly, your request, pursuant to 10 CFR 50.55a(a)(3), seeks expedited staff approval to use the Code Case in performance of repairs.

The NRC staff has reviewed your request to use Code Case N-516. Pursuant to 10 CFR 50.55a(a)(3)(i), the staff concludes that authorization is acceptable as it provides an acceptable level of quality and safety. Conditions to this finding include the following: (1) authorization is limited to the current refueling outage at the Clinton Power Station, (2) authorization is provided for the RHR piping supports identified in your letter and may be extended to

other supports of this type located in the suppression pool, and (3) authorization is limited to piping supports as described in your letter and may not be extended to other applications.

A copy of our Safety Evaluation is enclosed.

Original signed by
George F. Dick for:
James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

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Safety Evaluation

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Mr. Richard F. Phares
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Unit No. 1

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR AUTHORIZATION TO USE ASME CODE CASE N-516

FOR USE IN UNDERWATER WELDING

CLINTON POWER STATION, UNIT 1

DOCKET NO. 50-461

1.0 BACKGROUND

During the current refueling outage, and while investigating the results obtained from an inspection recently performed on piping supports associated with the "A" and "B" loops of the Residual Heat Removal (RHR) system, a design deficiency in the piping supports was identified. These supports are for the RHR full flow test return lines and are physically located inside containment in the suppression pool. It has been determined by the licensee that the support design is deficient due to a misapplied structural section modulus equation such that the actual stresses in the support structure would be higher than originally predicted.

The proposed modification to reduce these stresses would require welding of steel support plates to the existing piping support structures. Repair of components within the scope of the American Society of Mechanical Engineers (ASME), Section XI, must be performed in accordance with Section XI Article IWA-4000. Per Article IWA-4300, welding must be performed in accordance with the requirements of ASME, Section IX, and the additional requirements of Sections III and XI. However, Section IX does not address underwater welding.

The licensee considered several options to lower the suppression pool level in order to expose the piping supports. The suppression pool level would have to be reduced approximately four feet which would correspond to 250,000 gallons of water. The first option considered was to drain the suppression pool and temporarily store the water. Storage was not considered feasible due to limited available storage facilities and the resulting impact on ongoing work associated with the refueling outage. The second option considered was to discharge the water to the environment and process new water. This option would involve an unnecessary release to the environment and would require a lengthy evolution that would adversely impact the outage schedule. The third option involved constructing a coffer dam to displace water immediately around the pipe support structure. This option was rejected due to the time necessary to design and install the dam, difficulties anticipated in overcoming pool buoyant forces, attaching the dam, and working within limited clearances. The final option was to perform underwater welding.

ASME, Section XI, Code Case N-516, specifically addresses underwater welding to facilitate repairs of P-8 materials (of which the RHR supports are constructed) and was approved by the ASME Code Case Committee on August 9, 1993. While the Code Case has been approved by the ASME, it does not appear in the most recent listing of NRC approved Code Cases in Regulatory Guide 1.85, "Materials Code Case Acceptability - ASME Section III Division 1," Revision 29.

The licensee's letter of November 4, 1993, requested authorization, pursuant to 10 CFR 50.55a(a)(3), to use ASME, Section XI, Code Case N-516. While the licensee's letter focused on the RHR piping supports described above, the licensee stated that their investigation was ongoing and requested authorization to apply the Code Case to other supports located in the suppression pool if it is determined that the design deficiency exists and underwater repairs are required for those supports as well.

2.0 EVALUATION

The Code Case addresses controls (in addition to ASME Section IX) for welding procedure qualifications and welder performance qualifications. During discussions with the licensee, the staff has been informed that the welders will be qualified to plate positions 1G, 2G, 3G, and 4G in order to perform the fillet welds as specified by Table 2.1-2 of the Code Case. The Code Case also requires each filler metal heat, lot, waterproof coating type, and supplementary coating type to be tested and a confirmatory weld to be done in the same or similar underwater conditions to confirm the ability to achieve the proper weld quality. Further, the Code Case provides alternative examination procedures for those instances in which the procedures required by Section XI would be impractical. The staff has reviewed the Code Case and concludes that the controls stated above, particularly the requirement to perform a confirmatory weld, provides adequate assurance of welds performed under water and provides an acceptable level of quality and safety.

The staff has reviewed the Code Case and finds it acceptable for this specific application. The staff has inspected welds performed underwater and concludes that satisfactory results can be attained using Code Case N-516.

3.0 CONCLUSION

The staff has determined that use of Code Case N-516 is acceptable for use by the Clinton Power Station for this specific refueling outage. Relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i), as the proposed alternative provides an acceptable level of quality and safety. The Code Case use is provided for the RHR system modifications and may be extended to other piping supports of this type located in the suppression pool. Use of this Code Case is restricted to piping support applications described in the licensee's letter of November 4, 1993.

Principle Contributor: D. Pickett

Date: November 23, 1993

other supports of this type located in the suppression pool, and (3) authorization is limited to piping supports as described in your letter and may not be extended to other applications.

A copy of our Safety Evaluation is enclosed.

Original signed by
George F. Dick for:
James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

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Safety Evaluation

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