



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

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUESTS FOR RELIEF FROM ASME CODE SECTION XI
EXAMINATION REQUIREMENTS FOR REACTOR
COOLANT PUMP CASING WELDS AND
INTERNAL SURFACES

SACRAMENTO MUNICIPAL UTILITY DISTRICT
RANCHO SECO NUCLEAR GENERATING STATION
DOCKET NO. 50-312

I. BACKGROUND

Technical Specification 4.2.2 for the Rancho Seco Nuclear Generating Station states that inservice examination of ASME Code Class 1, 2, and 3 components shall be performed in accordance with the requirements of Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by 10 CFR 50.55a(g) except where specific written relief has been granted by the Commission. By letter dated January 28, 1983, the NRC transmitted to the Sacramento Municipal Utility District (SMUD) a Safety Evaluation with an attached Technical Evaluation Report in which requests for relief from certain examination and testing requirements of Section XI for Rancho Seco were evaluated and the requests either granted or denied. The granting or denying of the requests was based on information submitted to the NRC by SMUD by letters dated July 18 and December 10, 1979, and April 19, 1982, in the inservice inspection program, revisions, or additional information related to requests for relief from the Code requirements for Ranch Seco.

By letter dated March 5, 1985, SMUD transmitted to the NRC a revision to the request for relief from examination of the reactor coolant pumps at Rancho Seco. This request had been denied in the Safety Evaluation/Technical

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Evaluation Report cited above. The revised request and supporting information are evaluated and the necessary findings made to grant relief from the Section XI requirements. The revised request, supporting information, and our evaluation and conclusions are given below.

II. REQUEST, INFORMATION, EVALUATION, AND CONCLUSIONS
RELIEF REQUEST

Relief is requested from performing 100% of the Code requirements for a reactor coolant pump

CODE REQUIREMENTS (1974 Edition, Summer 1975 Addenda)

(1) Item B 5.6, Examination Category B-L-1:

The pressure-retaining welds in the pump casing shall be volumetrically examined during each inspection interval. The examination shall include 100% of the welds in at least one pump in each group of pumps performing similar functions in the system. The areas examined shall include the weld metal and base metal for one wall thickness beyond the edge of the weld.

(2) Item B 5.7, Examination Category B-L-2:

The internal pressure boundary surfaces of one pump in each group of pumps performing similar functions in the system shall be visually examined during each inspection interval. The examination may be performed on the same pump selected for the Category B-L-1 examination.

The B-L-1 and B-L-2 examinations may be performed at or near end of the inspection interval.

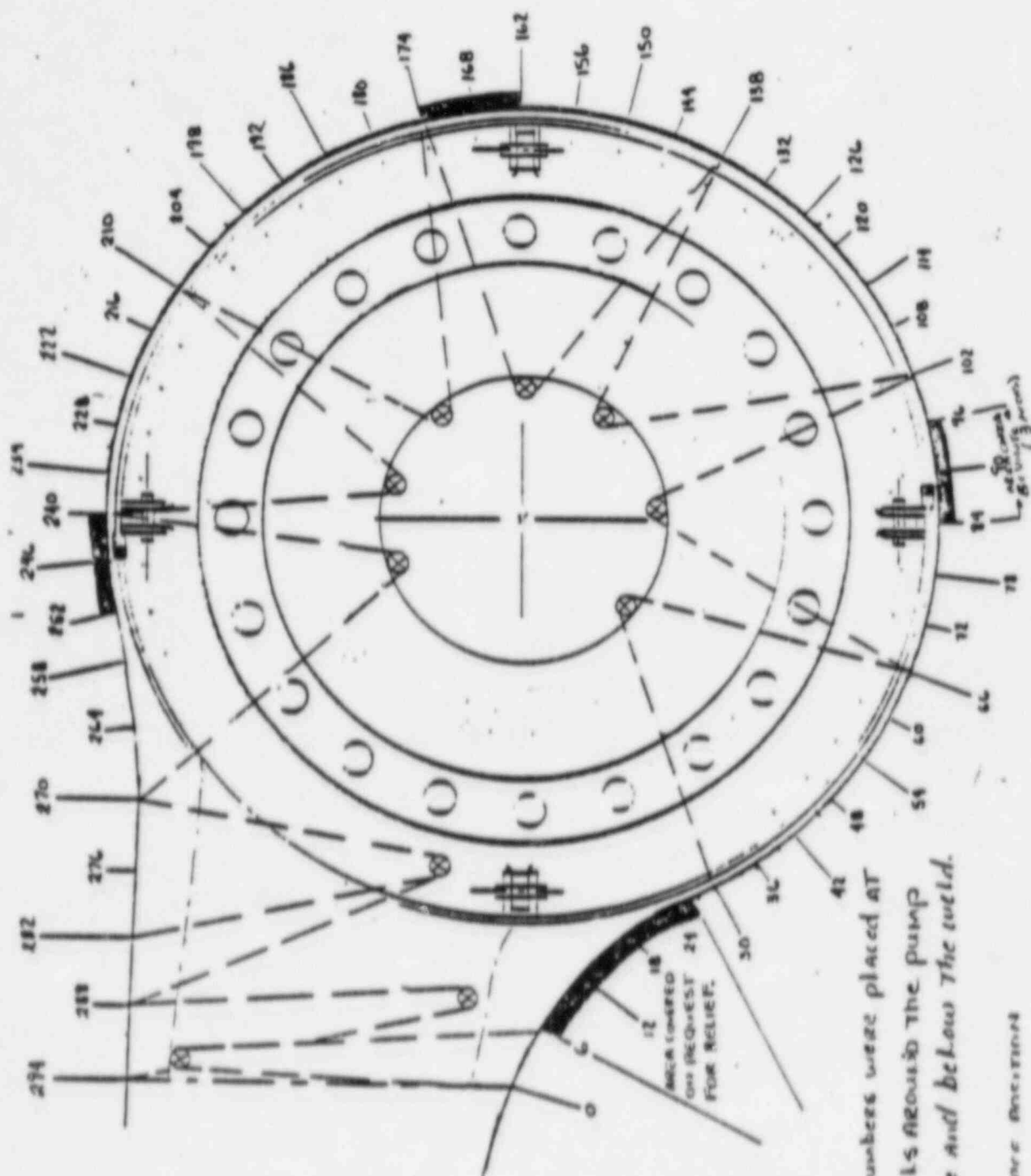
LICENSEE'S BASES FOR REQUESTING RELIEF

The Reactor Coolant Pumps were designed and manufactured by Bingham-Willamette Company before Section XI of the ASME Boiler and Pressure Vessel Code was developed. The pump casing was designed in such a way that a large portion of the internal pressure boundary is inaccessible for visual inspection, and small areas at the outer edges of the volute are inaccessible for volumetric inspection using radiography. The area on the inside radius of the discharge nozzle is too thick (.14") to inspect with any available technique. The geometry of the pump casing and the internal volute also make it impractical to achieve the 1T base metal coverage specified by Table 1WB 2500 of the 1974 Section XI with Summer '75 Addenda. The pump casing is composed of cast stainless steel. Ultrasonic inspection is impractical due to the large grain size and high attenuation. Therefore, the Code as it presently stands does not give adequate consideration to pumps that were designed in this manner. These areas can be seen on the attached illustration. A visual inspection of the areas above the internal volute would require cutting the pump casing open.

PROPOSED ALTERNATE EXAMINATIONS

The remaining portion of the casing can be visually and volumetrically inspected and the results of this portion of the inspection should be indicative of the conditions that may exist in the inaccessible areas. The area covered by the volumetric inspection will be as shown in figure 1WB-2500-16 of the 1980 Edition of ASME Section XI, except in the areas covered by the volute (estimated to be less than 7% of the area of interest) and the inside radius of the discharge nozzle (approximately 5% of the area of interest). The visual inspection will cover those areas accessible through the four volute openings.

RCP ILLUSTRATION



Lead numbers were placed at 6° intervals around the pump 2.5" above and below the weld.

IN PICTURE POSITION

STAFF EVALUATION AND CONCLUSIONS

The Code requirements to perform (1) volumetric examination of 100% of the pressure-retaining pump casing weld, (2) visual examination of 100% of the internal pressure boundary surfaces, and (3) volumetric examination of the base metal for one wall thickness beyond the edge of the weld are impractical to perform on the reactor coolant pumps at Rancho Seco because of the pumps' design. The internal volute prevents access for performing 100% volumetric examination of the pump casing weld and 100% visual inspection of the internal surfaces. The base metal thickness of the pump casing (which can typically vary from 8 inches to 14 inches) makes the requirement to examine one wall thickness beyond the edge of the weld an impractical requirement.

We have reviewed the Code requirements as applicable to the Rancho Seco reactor coolant pump examinations. The licensee stated in the letter of March 5, 1985, that the area subject to examination but covered by the pump volute is less than 7% and that in the area of the discharge nozzle approximately 5%. The requirement to examine the base metal one wall thickness beyond the edge of the weld was changed in later editions of the Code in recognition that the heat affected zone does not extend one wall thickness in relatively thick components. The requirement was changed to 1/2-inch beyond the edge of the weld as shown in IWB-2500-16 of the 1980 Edition of Section XI and as proposed to be examined by the licensee.

We conclude that the licensee's proposed alternative examinations of the reactor coolant pumps at Rancho Seco will provide the necessary assurance of the pumps' structural integrity and that relief from the requirements, as requested, may be granted. We conclude, based on the considerations discussed above, that the granting of this relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Dated:

Principal Contributor: G. Johnson