SMUD
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AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

AGM/NUC 89-136

October 11, 1989

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

Docket No. 50-312
Rancho Seco Nuclear Generating Station
License No. DPR-54
SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN, REQUEST FOR ADDITIONAL INFORMATION

Attention: George Knighton

Reference: NRC to SMUD letter dated July 7, 1989, Second 10-Year Interval Inservice Inspection Program Plan, Request For Additional Information

The NRC requested additional information on the Second 10-year Interval Inservice Inspection (ISI) Program in the referenced letter. The attachment to this letter provides responses to questions raised within the referenced letter.

Rancho Seco is currently in a cold shutdown condition and is proceeding toward defueling the reactor. Pursuant to the requirements of IWA-2400(c), the District will take an extension to the second 10-year program for ISI equivalent to the length of the current outage. As such, the second 10-year ISI program will not begin until the reactor is refueled and taken to the heatup-cooldown condition. Therefore, the inspections included in the second 10-year ISI Program will not be performed unless Rancho Seco is to return to power. This schedule meets the requirements of 10 CFR 50.55a and ASME Section XI.

Members of your staff with questions requiring additional information or clarification may contact Dave Swank at (209) 333-2935, extension 4920.

Sincerely,

J. R. Keuter for

Dan R. Keuter
Assistant General Manager
Nuclear

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Attachment

cc w/atch: J. B. Martin, NRC, Walnut Creek
A. D'Angelo, NRC, Rancho Seco

SACRAMENTO MUNICIPAL UTILITY DISTRICT
RANCHO SECO NUCLEAR GENERATING STATION
DOCKET NUMBER 50-312

Additional Information/Clarification Required

A. Provide a listing of all ASME Nuclear Component Code Cases being used during second 10-year interval ISI examinations at Rancho Seco.

Response - The scope of subjects to be addressed in Inspection Plans are specified in IWA-2420, Inspection Plans and Schedules.

The extent of Code Cases to be used is not available at this time and will only be ascertained when the inspection vendor is determined.

Any Code Cases to be used during this ten year interval would be listed as accepted by the NRC in Regulatory Guide 1.147.

B. Augmented examinations have been established by the NRC when added assurance of structural reliability is deemed necessary. Examples of documents which may require augmented examination are:

(1) High Energy Fluid Systems, Protection Against Postulated Piping Failures in Fluid Systems Outside Containment, Branch Technical Position ASB 3-1;

Response - The Technical Specifications address this subject as follows:

"4.13 AUGMENTED INSERVICE INSPECTION PROGRAM FOR HIGH ENERGY LINES OUTSIDE OF CONTAINMENT

A. For the 41 welds identified on Figures 4.13-1, 4.13-2 and 4.13-3:

1. Prior to initial power operation (greater than 5 percent) a volumetric examination will be performed with 100 percent inspections of welds in accordance with the requirement of ASME Section XI Code, Inservice Inspection of Nuclear Power Plant Components, to establish system integrity and baseline data.

2. The inservice inspection at each weld will be performed in accordance with the requirements of ASME Section XI Code, Inservice Inspection of Nuclear Power Plant Components, with the following schedule: (The inspection intervals identified below sequentially follow the baseline examination of Specification 4.13 A.1 above):

Successive Inspection Intervals

Every 10 years thereafter (or nearest refueling outage)	Volumetric inspection of 1/3 of the welds at the expiration of each 1/3 of the inspection interval with a cumulative 100 percent coverage of all welds.

Note - The welds selected during each inspection period shall be distributed among the total number to be examined to provide a representative sampling of the conditions of the welds.

3. Examinations that reveal unacceptable structural defects in a weld during an inspection under 4.13 A.2 shall be extended to require an additional inspection of another 1/3 of the welds. If further unacceptable defects are detected in the second sampling, the remainder of the welds shall be inspected.

4. In the event repairs of any welds are required following any examination during successive inspection intervals, the inspection schedule for the repaired welds will revert back to the first 10 year inspection program."

The 41 welds specified in this section of Technical Specifications are listed in the Inspection Plan, Section 1, under item C5.51-XX on pages 37 through 42 and item C5.81-XX on page 44.

(2) Regulatory Guide 1.150, Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations;

Response - Attachment 1 shows the quantity of circumferential and longitudinal welds in the Reactor Vessel. They are labeled to show those to be examined due to ASME Code requirements (noted C), and those also to be examined as stated in the Program Plan as augmented (noted A). The Code requires three of the six circumferential and one of the four longitudinal welds to be examined. Our augmented program picks up the remaining three circumferential and three longitudinal welds. Thus, all reactor vessel welds will be 100% volumetrically examined from the inside surface, as well as all eight nozzle welds.

Further specifics addressing Regulatory Guide 1.150 cannot be clarified until the inspection contractor to perform the examinations has been established.

(3) Regulatory Guide 1.14, Reactor Coolant Pump Flywheel Integrity; and

Address these and any other augmented examination which may have been incorporated in the Rancho Seco Nuclear Generating Station Second 10-Year Interval Inservice Inspection Program Plan.

Response - The Technical Specifications address the motor flywheel as follows:

"4.2.2 Inservice Inspection

4.2.2.2 ...each reactor coolant pump motor flywheel will be inspected volumetrically during the ten-year inspection interval. One hundred percent of the flywheel will be examined. All flywheels received a one hundred percent ultrasonic examination prior to installation on the motor."

These examinations are listed in the Plan on page 76, Section 1, under item X.1-X.

Another augmented series of examinations under item X.2-X is included as a result of the report, "B&W Owners Group Safe End Task Force Report on Generic Investigation of HPI/MU Nozzle Component Cracking."

C. Provide a listing of all Class 2 Residual Heat Removal (RHR), Emergency Core Cooling (ECC), and Containment Heat Removal (CHR) systems at Rancho Seco and include the total number of welds in each of these systems.

Staff review of all Class 2 piping welds receiving volumetric examinations during the second 10-year inspection interval at Rancho Seco shows the following:

Pipe Sizes >4" NPS and Wall Thicknesses ≥3/8"

System		Volumetric and Surface
Aux FW		5
Decay Heat A		5
Decay Heat B		3
	Total Welds	13

Pipe Sizes ≥2" and ≤4" NPS and Wall Thickness >1/5"

System	Volumetric and Surface
Makeup Discharge	8
HPI A Discharge	7
HPI B Discharge	8
HPI Mini Flow	3
Total Welds	26

A representative sampling of welds in the RHR, ECC, and CHR systems should receive inservice volumetric examinations. The staff has previously determined that a 7.5% augmented volumetric sample constitutes an acceptable resolution at similar plants. Discuss the impact of performing volumetric examination of at least a 7.5% sampling of the Class 2 piping welds in these systems.

Response - The submitted Plan is written to ensure at least a 7.5% sampling of all Class 2 required welds. Hence, there is no impact of performing volumetric examinations of the 7.5% sampling of the Class 2 welds.

The following table shows the number of welds by size in column C, the calculated 7.5% sample size in column D and the number of welds to be examined in column E.

A System	B Pipe Size (Stainless Stl. Unless Noted)	C No. of Welds	D 7.5% Sample	E No. of Welds to be Inspected in Plan	
Aux FW	6"	65	4.9	5	
	6" CS	16	1.2	2	
Decay Heat A	12"	46	3.45	4	Plus 8
	10"	17	1.3	1	Augmented
Decay Heat B	12"	11	0.8	1	Plus 5
	10"	20	1.5	2	Augmented
MU Disch.	4"	53	3.98	4	
	2 1/2"	49	3.7	4	
HPI A Disch.	4"	58	4.35	4	
	3"	13	0.98	1	
	2 1/2"	27	2	2	
HPI B Disch.	4"	57	4.3	4	
	3" & 2 1/2"	45	3.4	4	
HPI Mini Flow	2 1/2"	5	0.4	1	
	2"	29	2.2	2	

D. Review of Section 1 of the ISI Plan listing the NDE examinations being performed during the second interval and the calibration block drawings in Section 7 shows that some of the calibration blocks may not meet the applicable Code requirements. Examples are as follows: Calibration Block #26 (10-inch diameter, 1.125-inch thick) is being used for ISI examinations of Item B09.11-27 (12.8-inch diameter, 1.3-inch wall thickness) and Item B09.11-31 (14-inch diameter, 1.4-inch wall thickness). Calibration Block #27 (3-inch thick flat block) is being used for the examination of Items B09.31-1 through B09.31-4 (small diameter branch connections-to-large diameter primary coolant system piping). Calibration Block #23 (stainless steel) is being used to examine Item B05.040-4 (carbon steel-to-inconel dissimilar metal weld).

It is also noted that many of the calibration block drawings in Section 7 of the Plan have been reduced in size and are illegible with regard to dimensions and material specifications.

Appendix III, "Ultrasonic Examination of Piping Systems," of Section XI of the Code requires that basic calibration blocks be made from material of the same nominal diameter and nominal wall thickness or pipe schedule as the pipe to be examined. The calibration blocks for similar metal welds shall be fabricated from the material specified for the piping being joined by the weld. Calibration blocks for dissimilar metal welds shall be fabricated from the material specified for the side of the weld from which the examination will be conducted. If the examination will be conducted from both sides, calibration reflectors shall be provided in both materials.

The staff considers inservice volumetric examinations of Code Class 1 and 2 systems crucial to plant safety and, therefore, feels that proper calibration standards should be obtained and utilized for all ISI examinations.

Provide a discussion of the calibration blocks being used for ISI examinations during the second 10-year interval at Rancho Seco and either confirm that all calibration blocks meet or exceed the Code requirements or provide technical justifications in the form of requests for relief for the continued use of any blocks which do not meet the Code requirements.

Response - Calibration Block #26 is used for both 10" and 12" diameter pipe examinations since the block wall thickness is within the tolerance of the piping wall thicknesses. However, all 14" diameter 1.4" thick pipe welds will be examined using Block #37 which was originally mounted for remote examinations. The Plan will be revised to reflect the designated calibration block change.

Calibration Block #27 is being used for branch connections in the Hot and Cold Leg Reactor Coolant piping. While the piping diameter may seem small, the size of the weld in the RC piping is not small, as noted in the following table:

ITEM	NOMINAL PIPE	WELD DIA. IN RC PIPE
9.31-1	10"	21 1/2"
9.31-2	12"	22"
9.31-3	2 1/2"	10"
9.31-4	2 1/2"	9 1/2"

Larger, more legible drawings of Calibration Blocks are available at the site along with nozzle and other branch connection weld configuration details.

The notch configurations of Appendix III will be added to all piping calibration blocks where space permits.

E. Relief Request #2: Relief is requested from the ASME Code-required surface examination of RPV core flood nozzle safe end welds. The Licensee has proposed performing a volumetric examination of 100% of the pipe thickness with automated inspection equipment from the nozzle ID.

The proposal could be considered acceptable provided that the Licensee meets the following conditions:

(1) The remote volumetric examination includes the entire weld volume and heat affected zone instead of only the inner one-third of the weld as required by the Code.

(2) The ultrasonic testing instrumentation and procedure are demonstrated to be capable of detecting OD surface-connected defects, in the circumferential orientation, in a laboratory test block. The defects should be cracks and not machined notches.

Provide a discussion of the above conditions and verify that they will be met.

Response

(1) The volumetric examination will include the entire weld heat affected zone as well as 100% of the weld.

(2) Currently, two B&W designed units in Regions II and III have developed an automated inspection technique to identify OD surface defects while examining from the ID surface. A longitudinal beam is transmitted by surface contact and does locate small EDM notches. We intend to use this same procedure.

F. Relief Request #3: Relief is requested from performing the ASME Code-required volumetric examination of Primary Coolant Pump casing welds and visual (VT-3) examination of the pump casing internal surfaces. The Licensee has proposed performing a visual examination of 100% of the external surfaces of the welds in lieu of the Code-required volumetric examination.

Other plants with similar pump configurations have committed to performing surface examinations of the exterior surfaces of the welds once per inspection interval and, if the pumps are disassembled for maintenance, a surface examination of the accessible interior surfaces of the welds. Discuss the impact of performing surface examinations as described above in lieu of the proposed visual examination for these welds.

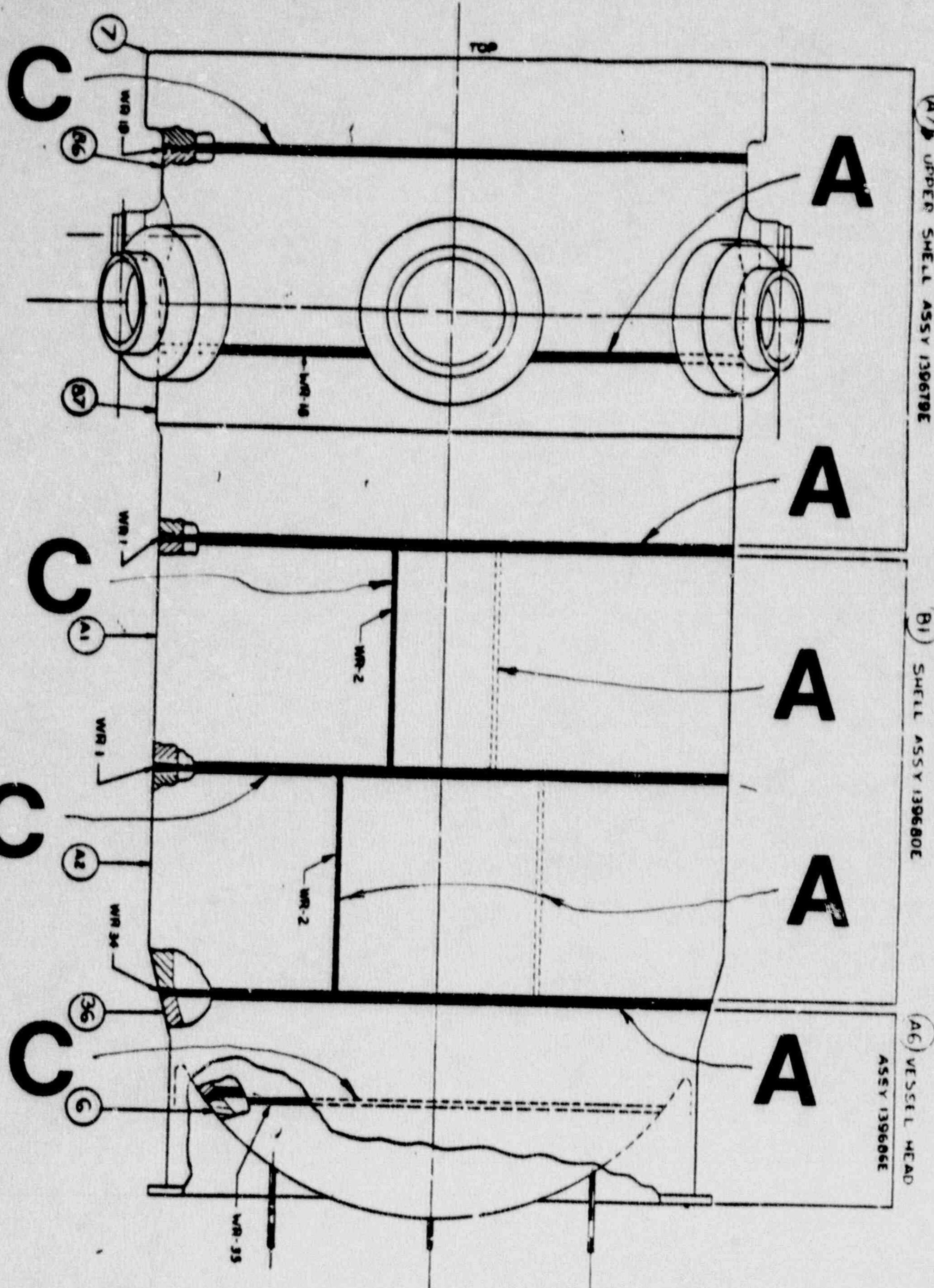
Response - Performing internal surface examinations on RC Pumps manufactured by Bingham Willamette is impractical because of internal contamination and interference from quadrant volutes.

We will perform a surface examination on the exterior surface of the weld.

G. Relief Request #4 (Class 2 hydrostatic test) and Relief Request #5 (Class 3 hydrostatic test): Discuss the operating and design pressures of the affected components as compared to the Code-required hydrostatic test pressure. As it is noted that the proposed substitute examination (a leak check during normal system operation) is a Code requirement and not a substitute examination, include a discussion of the design pressure of the affected pump seals giving consideration as to what the maximum alternative test pressure could be in order to meet the intent of the Code.

Response - Isolating the pump casings from the piping hydrostatic tests includes a minuscule portion of the system. The maintenance isolation valves are closely located to the pump suction and discharge. Since the maximum pressure the pumps can experience occurs while running, leak tests on these pumps are accomplished during the normal quarterly pump testing surveillances. Thus, the checks for maximum leakage is performed far more frequently than the hydro requirements.

In ASME Section XI, the Special Working Group on Pressure Testing is currently working to reduce and/or eliminate inservice hydrostatic tests.



C = CODE REQMTS

A = AUGMENTED