



Omaha Public Power District

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August 24, 1979

Mr. K. V. Seyfrit, Director
U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region IV
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

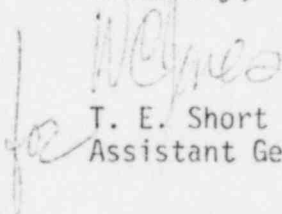
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Reference: Docket No. 50-285

Dear Mr. Seyfrit:

The Omaha Public Power District received Bulletin No. 79-17, dated August 14, 1979, requesting information in regard to pipe cracks in stagnant borated water systems at PWR plants. Accordingly, the attachment to this letter responds to your request, as applicable to the Fort Calhoun Station.

Sincerely,


T. E. Short
Assistant General Manager


TES/KJM/BJH/lp

Attachment

pc: LeBceuf, Lamb, Leiby & MacRae
1333 New Hampshire Avenue, Suite 1100
Washington, D. C. 20036

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IE Bulletin 79-17 has asked the District to review and identify systems at Fort Calhoun which contain stagnant oxygenated, borated water. This review has been necessitated by cracks which occurred at other PWR plants in the H.A.Z. of welds in the stainless steel piping systems containing stagnant borated water.

The following are responses to Items 1 and 2 of IE Bulletin 79-17.

Item 1

Conduct a review of safety-related stainless steel piping systems within 30 days of the date of this Bulletin to identify systems and portions of systems which contain stagnant oxygenated borated water. These systems typically include ECCS, decay/residual heat removal, spent fuel pool cooling, containment spray and borated water storage tank (BWST-RWST) piping.

- (a) *Provide the extent and dates of the hydrotests, visual and volumetric examinations performed per 10 CFR 50.55a(g) (Re: Circular 76-06 enclosed) of identified systems. Include a description of the non-destructive examination procedures, procedure qualifications and acceptance criteria, the sampling plan, results of the examinations and any related corrective actions taken.*

Response

At the Fort Calhoun Station the following systems have been identified as containing areas of stagnant, oxygenated, borated water:

- (i) ECCS
- (ii) Containment Spray System
- (iii) Shutdown Cooling System

Portions of this piping which are subject to examination as required by the ASME Section XI Code, through Summer 1975 Addenda, are examined to the additional requirements of IE Circular 76-06.

No hydrostatic/visual examinations of (i)-(iii) have yet been performed. These examinations will be performed as scheduled in the Fort Calhoun Station Ten Year ISI Plan in accordance with 10 CFR 50.55a(g). Volumetric examinations have been performed per 10 CFR 50.55a(g) as scheduled in the Ten Year ISI Plan. The volumetric examinations were performed during the October/November, 1978, refueling outage at Fort Calhoun. In all,

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20 welds were examined, representing about six percent of the above identified system welds subject to IE Circular 76-06. For all piping welds (both thin wall and pressure piping) identical procedures were used.

The following documents form a part of the procedures used for these examinations:

- (1) ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition with Addenda through Summer 1975, "Rules for Inservice Inspection of Nuclear Power Plant Components."
- (2) ASME Boiler and Pressure Vessel Code, Section V, 1974, Edition with Addenda through Summer 1975, "Nondestructive Examination," with the exception of the following:
 - (a) Subparagraph T-533.1(a) requires the basic calibration block for production material thicknesses up to and including 1 inch, to be 3/4 inch or "t." Paragraph 5.0 of this procedure requires the basic calibration block to be either "t"; no more than 25% less than "t"; or closer in thickness to the production material than the 3/4-inch alternate thickness allowed by Article 5 for production material thicknesses up to and including 1 inch. This exception will assure a more accurate calibration than the Article 5 basic calibration block design allowed by Code.
 - (b) Subsubparagraph T-535.1(d) of Article 5 states that transfer (attenuation compensation) be accomplished between the production material and basic calibration block and a correction be made for the difference. No attempt shall be made by the examiner to determine differences in the acoustic properties between the basic calibration block and the production material as stated in Paragraph 7.3. of this procedure.
- (3) SwRI Nuclear Quality Assurance Program Manual (NQAPM).

The acceptance criteria for all piping welds examined are in accordance with the ASME Boiler and Pressure Vessel Code, Section SI, 1974 Edition through the Summer 1975 Addenda, Article IWA-3000, *Standards for Examination Evaluations*.

The procedure qualifications are maintained by the Southwest Research Institute (the vendor who performed the volumetric examinations) Nuclear Quality Assurance Program. The SwRI QA program is periodically audited by Omaha Public Power District Quality Assurance. The sampling plan as found in the Ten Year ISI Plan was developed in accordance with Articles IWA-2000, IWB-2000, and IWC-2000, *Examination and Inspection*, of the Summer 1975 Addenda of the ASME Boiler and Pressure Vessel Code,

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Section XI. No cracking and no sign of unsatisfactory welds were detected, and therefore no corrective actions were needed.

Item 1 (Continued)

- (b) Provide a description of water chemistry controls, summary of chemistry data, any design changes and/or actions taken, such as periodic flushing of recirculation procedures to maintain required water chemistry with respect to pH, B, CL^- , F^- , O_2 .

Response

See Table 1 (attached).

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- (c) Describe the preservice NDE performed on the weld joints of identified systems. The description is to include the applicable ASME Code sections and supplements (addenda) that were followed, and the acceptance criterion.

Response

Visual and ultrasonic tests were performed on some portions of (i)-(iii) (located inside containment and up to the first isolation valves on the outside of containment) for preservice examination in accordance with ASME Section XI Code, 1971 edition, through Summer 1972 Addenda. The acceptance criterion for UT and VT testing is given in Table 2 (attached). A repair cycle was completed on the welds containing any defect indications, and when these were re-examined using the same procedures as used on the original inspection, the welds were found to be defect-free.

- (d) Facilities having previously experienced cracking in identified systems, Item 1, are requested to identify (list) the new materials utilized in repair or replacement on a system-by-system basis. If a report of this information and that requested above has been previously submitted to the NRC, please reference the specific report(s) in response to this Bulletin.

Response

There has been no occurrence of any cracking in the listed systems at Fort Calhoun and as a consequence, no new materials or replacements have been made for any repairs.

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Item 2

Facilities at which ISI examinations have not been performed (i.e., visual and volumetric UT) on stagnant portions of systems identified in Item 1 above, shall complete the following actions at the earliest practical date, but not later than 90 days after the date of the Bulletin.

Response

Item 2 does not apply to the Fort Calhoun Station as ISI volumetric examinations have been performed on a representative number of identified piping systems welds. Visual exams of piping welds are not appropriate in that the Summer 1975 Addenda of the Section XI Code do not specify such an exam. Hydrostatic testing is called for by the Code and has been scheduled, as stated above, in the Ten Year ISI Plan. Additional volumetric and hydrostatic exams will be performed in accordance with the Ten Year ISI Plan schedules.

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TABLE 1

SAMPLING OF DEMINERALIZED WATER USED TO MAKE UP SIRWT, WHICH PROVIDES WATER
FOR CITED STAGNANT WATER SYSTEMS

Analysis	Frequency	Technical Specification (ppm)	Typical* Valves (ppm)	Corrective Action
Conductivity	Weekly	<2.0 $\mu\text{mho/cm}$	1.0-1.7 $\mu\text{mho/cm}$	Commence Resin Regeneration
pH	Weekly	6.0-8.0	7.0-8.0	Add De-ionized Water to Release pH
				Add Ammonia or Morpholine to Increase pH
CL ⁻	Weekly	<0.1	0.01	Commence Resin Regeneration
SiO ₂	Weekly	<0.02	0.015-0.02	Chemically Check the Entire System
B**	Monthly	>1900	1900-2200	Add More Boric Acid

* Range of Values Observed During Operation.

**Boron Concentration in SIRWT.

TABLE 2

Examination Method	% Distance Amplitude Correction (DAC)	Term Used	Action Taken
Piping UT	0-49	No Indications	So noted on data sheet as "No Recordable Indications"
	50-99	Insignificant Indications	Recorded for future reference
	>100	Significant Indications Geometrical	Data recorded and analyzed as geometrical indication
		Significant Indications Other	Data recorded, analyzed, and reported accordingly

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Examination Method	Nature of Indication	Term Used	Action Taken
VT	Surface free of defect indications	No Indications	So noted on data sheet as "No Recordable Indications"
	Minor surface irregularities; i.e., weld spatter, minor scratches, hammer marks, etc.	Insignificant Indications	Recorded for future reference
	Beyond code acceptable limits, as described in IS-211, Section XI	Significant Indications	Recorded, analyzed, and reported accordingly

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