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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

May 7, 1982

IE BULLETIN NO. 82-01 REVISION 1: ALTERATION OF RADIOGRAPHS OF WELDS IN PIPING SUBASSEMBLIES

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or construction permit (CP). R1 R1

Action:

This bulletin was previously forwarded on March 31, 1982 for action to the CP holders of the reactors listed in Table 1 and for information to all other reactor CP holders and licensees. Table 1 has been revised to add three nuclear power reactor facilities. No revision has been made to the scope of actions already requested. The bulletin is sent to the CP holders of these facilities for action before issuance of an OL or within 90 days of receipt of this revised bulletin, whichever occurs first. The action date for all other facilities listed in Table 1 is unchanged. R1 R1 R1 R1 R1 R1 R1 R1

Purpose:

The purpose of this revision to IE Bulletin No. 82-01 is to change Table 1 to reflect further information provided by Associated Piping and Engineering Corporation regarding facilities for which they supplied piping assemblies. A minor revision has been made to clarify the extent of the actions required. (See revision to action item 1 on page 2). R1 R1 R1 R1 R1

Description of Circumstances:

On October 19, 1981, the U.S. Nuclear Regulatory Commission (NRC) was notified by Washington Public Power Supply System (WPPSS) that alterations were found in certain radiographs of 21 shop welds in piping subassemblies supplied to their WPPSS-3 by Associated Piping and Engineering Corporation (AP&E) of Compton, California. Further examination of essentially all AP&E radiographs previously sent to the site revealed alterations on 14 additional radiographs associated with eight welds in quality Class 1 stainless steel piping of less than ½-inch wall thickness. All affected 29 welds in the thin-wall piping were reexamined radiographically in accordance with the ASME Code. No evidence of unacceptable weld quality was identified.

The alterations consisted of artificial enhancement of the ASME Code specified penetrameter 4T-Hole image. This was apparently accomplished in one of three ways: (1) touchup with a soft lead pencil, (2) scribed or scratched with a sharp object, or (3) indention with a sharp object. These forms of enhancement are very difficult to detect by normal film interpretation techniques (i.e.,

subdued background lighting). However, utilizing direct overhead lighting, the alterations may be detected by close inspection of the film surface reflections as the film is being manipulated by the observer at various oblique angles.

After this finding, an investigation was made at AP&E by the NRC Region IV staff on December 7-11, 1981.

The results of the investigation were reviewed at the Region IV headquarters and determined to be potentially generic. On January 29, 1982, the specific plants potentially affected were identified by the regional office. The investigation and review established the following:

1. Radiographs were altered on occasion by one Level II interpreter over a period of approximately eight years prior to the date of this investigation.

2. The alterations were limited to the set of radiographs of welds submitted for customer review and approval.

3. The alterations involved welds associated with pipe wall thickness of less than ½-inch that used isotope radiography techniques and a number 10 or 12 penetrameter.

4. Radiograph sets retained in AP&E file for WPPSS Unit 2 contained unaltered radiographs that did not exhibit the Code-required 2-4T penetrameter sensitivity.

5. A number of nuclear plant sites receiving fabricated piping assemblies from AP&E may have similar discrepancies. The affected sites as amended (R-1) are listed in Table 1.

ASME Section III Code Rules, Articles NB-5000 and NC-5000, requires that weld quality acceptance of Class 1 and 2 piping be evaluated on the basis of radiography. In radiography examination, meaningful interpretation of weld quality is dependent on the use of a radiographic technique of sufficient sensitivity as shown by the penetrameter image indicators on the film. The adequacy of technique sensitivity is confirmed by the ability to visibly discern the appropriate T-hole images of the penetrameter when evaluating the radiographs for weld quality in accordance with the governing Code rules. Radiographs that have had penetrameter image quality indicators artificially enhanced by the discussed methods violate the intent of ASME Code requirements. Accordingly, the following actions are necessary to independently reverify that the examined welds of the subassemblies fabricated by AP&E are acceptable for plant service.

<u>Action To Be Taken by Applicants for an Operating License and Holders of Active Construction Permits (Group 1, Table 1)</u>:

1. Determine on the basis of a 100 percent review of radiograph sets representing the welds associated with pipe wall thickness less than ½-inch in shop fabricated quality Class 1 & 2 subassemblies R1 R1

provided by AP&E, whether the applicable ASME Code penetrameter sensitivity (2-2T or 2-4T as required) is unaltered, and clearly discernible, and that acceptable weld quality is demonstrated.

2. In those cases where the specified penetrameter sensitivity is not discernible or is apparently enhanced in any manner, as by the methods discussed, weld quality interpretation may be based on the equivalent or higher penetrameter sensitivity discernible on the film sets. For example, for those radiograph sets for which the required 2-4T penetrameter sensitivity is not discernible, or found artificially enhanced on visual inspection, film interpretation of weld quality may be based on the presence of discernible 2-2T or 2-1T sensitivity exhibited by the radiographs.

3. Where conformance with Items 1 and 2 cannot be satisfied, appropriate steps shall be taken to ensure the acceptability of the affected welds in accordance with the applicable ASME Section III Code requirements in effect for plant construction.

4. The above actions are to be completed prior to issuance of an OL or within 90 days of receipt of this bulletin, whichever occurs first. All quality assurance records reflecting the review findings and disposition of discrepancies identified shall be maintained and available for NRC review.

5. A written report describing the findings and corrective actions taken, signed under oath or affirmation under provisions of Section 182a, Atomic Energy Act of 1954, shall be submitted within 30 days after completion of Items 1 through 4 to the Regional Administrator of the appropriate NRC Regional Office. A copy of the report is to be forwarded to the Director, Office of Inspection and Enforcement, NRC, Washington, D.C. 20555.

Actions To Be Taken by Applicants for Construction Permits or Utilities Whose Construction Permits Are Suspended or Delayed (Group 2; Table 1):

No action required except as noted in Item 2, below.

1. For information only.

2. In the event reactivation of construction or transfer, sale, or other consignment of the subject piping subassemblies to another nuclear plant site is contemplated, both the NRC and recipient permit holder, or licensee, are to be notified of the disposition of said subassemblies under provisions of 10 CFR Part 21 regulations.

This request for information was approved by OMB under clearance number: 3150-0084. Comments on burden and duplication should be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D.C. 20503.

The format of Bulletins, Circulars and Information Notices has been changed, effective April 5, 1982, to facilitate a centralized distribution. A change has also been made to eliminate a separate transmittal letter. R1 R1 R1

If you need additional information, please contact the Regional Administrator of the appropriate NRC Regional Office or this office. R1 R1

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Attachments:
1. Table 1
2. Previously Issued IE Bulletins

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TABLE 1

SITES WITH PIPING ASSEMBLIES FROM AP&E

Group 1	Group 2	
Grand Gulf Units 1&2	Bailly Unit 1	
LaSalle Units 1&2	Black Fox Units 1&2	
River Bend Units 1&2	Hartsville A1, B1, A2 & B2	
Clinton Units 1&2	Phipps Bend 1&2	
Shoreham	Allens Creek Unit 1	
Limerick Units 1&2		
WPPSS-2		
Nine Mile Point 2		
Hope Creek Units 1&2		
Enrico Fermi 2	WPPS-5	R1
Susquehanna 1 & 2		R1

PREVIOUSLY ISSUED IE BULLETINS

Bulletin No.	Subject	Date of Issue	Issued to
82-01	Alteration of Radiographs of Welds in Piping Subassemblies	03/31/82	The Table 1 facilities for action and to all others for information
81-02 Supplement 1	Failure of Gate Type Valves to Close against Differential Pressure	08/18/81	All power reactor facilities with an OL or CP
81-03	Flow Blockage of Cooling Water To Safety System Components by CORBICULA SP. (ASIATIC CLAM) and MYTILUS SP. (MUSSEL)	04/10/81	All power reactor facilities with an OL or CP
81-02	Failure of Gate Type Valves to Close Against Differential Pressure	04/09/81	All power reactor facilities with an OL or CP
81-01 Rev. 1	Surveillance of Mechanical Snubbers	03/04/81	Specific power reactor facilities with a CP
81-01	Surveillance of Mechanical Snubbers	01/27/81	All power reactor facilities with an OL and selected power reactor facilities with a CP

OL = Operating License
CP = Construction Permit