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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

September 29, 1978

Docket No. 50-334

Duquesne Light Company
ATTN: Mr. C. N. Dunn
Vice President
Operations Division
435 Sixth Avenue
Pittsburgh, Pennsylvania 15219

Gentlemen:

Enclosed is IE Bulletin No. 78-12 which requires action by you with regard to your power reactor facility(ies) with an operating license or a construction permit, with specified exceptions.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely,

Robert T. Carlson for
Boyce H. Grier
Director

Enclosures:
1. IE Bulletin No. 78-12
2. List of IE Bulletins
Issued in 1978

cc w/encls:
F. Bissert, Technical Assistant Nuclear
R. Washabaugh, QA Manager
J. Werling, Station Superintendent
G. Moore, General Superintendent, Power Stations Department
J. J. Carey, Nuclear Technical Assistant

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

IE Bulletin No. 78-12
Date: September 29, 1978

ATYPICAL WELD MATERIAL IN REACTOR PRESSURE VESSEL WELDS

Description of Circumstances:

On August 4, 1978, the NRC was informed by the Duke Power Company and the Babcock and Wilcox Company (B&W) that the weld wire used in some of the reactor vessel welds in Oconee Unit No. 3 may have differed from that specified. A chemical analysis of one sample of archive material by B&W disclosed that the nickel content was measured to be 0.1 percent (versus 0.45 to 0.8 percent nominal specified) and the silicon content was measured to be 1.0 percent (versus 0.3 to 0.6 percent nominal specified). The heat of weld metal in question was supplied by the Page Company, a Division of the American Chain & Cable Co., Bowling Green, Kentucky to B&W, the manufacturer of the Oconee Unit No. 3 vessel. Further checks by B&W of its records have identified eleven additional vessels in which the incorrect weld material may have been used. Owners of these vessels have been notified.

The NRC staff has made a determination of the possible effects on reactor vessel integrity of the use, or possible use, of the improper weld material. Weldments containing the atypical material are likely to have higher than normal nil-ductility transition temperature characteristics. Therefore to maintain reactor vessel safety margins, implementation of new conservative pressure/temperature operating limits may be required.

While the specific problem has been identified as possibly affecting twelve vessels manufactured by B&W, it is not possible to conclude in the absence of specific information that similar atypical weld material was not also supplied to other vessel manufacturers and used in reactor pressure vessel fabrication.

Action To Be Taken By Licensees and Permit Holders:

For all power reactor facilities with an operating license or a construction permit, except those already identified as possibly having atypical weld material[1]:

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[1] The twelve nuclear units identified as having possible atypical pressure vessel weldments are: Three Mile Island Unit Nos. 1 and 2, Crystal River Unit No. 3, Arkansas Nuclear One Unit No. 1, Oconee Unit No. 3, Rancho Seco Unit No. 1, Midland Unit No. 1, Quad Cities Unit No. 2, Browns Ferry Unit No. 1, Turkey Point Unit No. 4 and Zion Unit Nos. 1 and 2.

1. Conduct a record search[2] of all primary reactor pressure vessel weldments (excluding partial penetration welds) and submit the following information[3]:

   a. The principal vessel manufacturer. If other manufacturers were utilized, identify those companies and the weldments completed by those firms.

   b. The type and form of weld materials and the identifying heat and lot numbers used in each weldment.

   c. The weld material manufacturer(s) and the types and form of materials supplied.

   d. The specified properties of the weld materials and the completed weldments (Chemistry, tensile and impact properties, as appropriate).

2. Describe the procedures utilized during fabrication to verify conformance to the specifications. Specifically provide the following:

   a. Describe the type, number and dates of tests performed on welding materials to satisfy the material conformance testing requirements for each heat, lot or combination of heat and batch, etc., of welding materials used in the construction or repair of the reactor pressure vessel in your facility. Indicate whether each heat, lot or batch subdivision (coil or spool) was tested and the extent of such testing, i.e., were both ends of a coil or spool of wire tested for each sub-arc flux-wire combination or heat-flux batch combination.

   b. Describe the type, number and dates of other tests such as procedure qualification, welder performance tests, in-process checks on post-weld tests which were performed.

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[2] The record search may be performed by the vessel manufacturer and the requested information reviewed as appropriate by each licensee prior to forwarding to the NRC. It is not the intent of this Bulletin to require each licensee to individually examine manufacturing records of a generic nature. Records of nonconforming conditions that may be identified by the manufacturer and are uniquely applicable to a specific vessel should however be carefully examined by the owner.

[3] Some of the information requested by this Bulletin may have been previously supplied to the NRC under the Surveillance Program. Information previously submitted may be referenced in lieu of resubmittal.

c. For each of the tests described in 2(a) and 2(b) above, describe the parameters of each test and provide the results obtained. Identify the applicability to specific weldments by correlation of heat, lot or batch as appropriate.

3. Identify those cases of weld filler material which did not meet procurement specifications based on verification tests, i.e. mechanical or chemical properties. Describe the disposition action taken or the acceptance basis for utilization in vessel fabrication. In such cases, discuss the effect that the atypical weld composition has on the fracture toughness of the weld metal.

4. Provide information on the availability of archive weld materials which might be used for verification purposes.

5. Please provide your response in writing within 60 days. Reports should be submitted to the Director of the appropriate NRC Regional Office and a copy should be forwarded to the U.S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, Division of Reactor Construction Inspection, Washington, D.C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7/31/80. Approval was given under a blanket clearance specifically for identified generic problems.

LISTING OF IE BULLETINS ISSUED IN 1978

Bulletin No.	Subject	Date Issued	Issued To
78-01	Flammable Contact - Arm Retainers in G.E. CR120A Relays	1/16/78	All Power Reactor Facilities with an Operating License (OL) or Construction Permit (CP)
78-02	Terminal Block Qualification	1/30/78	All Power Reactor Facilities with an OL or CP
78-03	Potential Explosive Gas Mixture Accumulations Associated with BWR Offgas System Operations	2/8/78	All BWR Power Reactor Facilities with an OL or CP
78-04	Environmental Qualification of Certain Stem Mounted Limit Switches Inside Reactor Containment	2/21/78	All Power Reactor Facilities with an OL or CP
78-05	Malfunctioning of Circuit Breaker Auxiliary Contact Mechanism-General Model CR105X	4/14/78	All Power Reactor Facilities with an OL or CP
78-06	Defective Cutler-Hammer, Type M Relays With DC Coils	5/31/78	All Power Reactor Facilities with an OL or CP
78-07	Protection afforded by Air-Line Respirators and Supplied-Air Hoods	6/12/78	All Power Reactor Facilities with an OL, all Class E and F Research Reactors with an OL, all Fuel Cycle Facilities with an OL, and all Priority 1 Material Licensees

LISTING OF IE BULLETINS ISSUED IN 1978

Bulletin No.	Subject	Date Issued	Issued To
78-08	Radiation Levels from Fuel Element Transfer Tubes	6/12/78	All Power, Test, and Research Reactor Facilities with an OL having Fuel Element Transfer Tubes.
78-09	BWR Drywell Leakage Paths Associated with Inadequate Drywell Closures	6/14/78	All BWR Power Reactor Facilities with an OL (for action) or CP (for information).
78-10	Bergen-Paterson Hydraulic Shock Suppressor Accumulator Spring Coils	6/27/78	All Power Reactor Facilities with an OL or CP.
78-11	Examination of Mark I Containment Torus Welds	7/21/78	BWR Power Reactor Facilities with an OL for action: Peach Bottom 2 and 3, Quad Cities 1 and 2, Hatch 1, Monticello and Vermont Yankee. All other BWR Power Reactor Facilities with an OL for information.