



Carolina Power & Light Company

P. O. Box 1551 • Raleigh, N. C. 27602

SERIAL: LAP-83-438

OCT 14 1983

E. E. UTLEY
Executive Vice President
Power Supply and Engineering & Construction

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-324
LICENSE NO. DPR-62
RESPONSE TO CONFIRMATORY ORDER
INSPECTIONS OF BWR STAINLESS STEEL PIPING

Dear Mr. Denton:

On August 26, 1983, the Division of Licensing, Operating Reactors Branch 2, issued an Order for the Brunswick Steam Electric Plant, Unit No. 2 (Brunswick-2), related to intergranular stress corrosion cracking (IGSCC). Carolina Power & Light Company (CP&L) has reviewed this Order and hereby provides the actions taken or planned in response to the Order.

Item A.1:

The reactor coolant system leakage shall be limited to a 2 gpm increase in unidentified leakage within any 24-hour period (leakage shall be monitored and recorded once every 4 hours). Should this leakage limit be exceeded, the unit shall immediately start an orderly shutdown. The unit shall be placed in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours.

Response:

Brunswick-2 has annotated its Technical Specifications through approved plant procedures (AI-45) to reflect the more stringent requirements of this item. The Daily Surveillance Report (OI-03) has also been revised to provide a more accurate method of determining drywell leakage. The Control Operators are manually pumping both the floor and equipment drain sumps every four hours to account for any inleakage inventory in the sump prior to calculating the individual leak rates. A method has also been devised to recalculate and reset the sump fill timer setpoint to allow detection (annunciation) of a 2 gpm increase in the sump fill rate. In addition, the On-site Nuclear Safety group is reviewing the drywell calculations on a daily basis to provide an independent assessment of drywell leakage.

8310200143 831014
PDR ADOCK 05000324
G PDR

AD47
1/1

Item A.2:

At least one primary containment sump collection and flow monitoring system shall be operable. With the primary containment sump collection and flow monitoring system inoperable, restore the inoperable system to operable status within 24 hours or immediately initiate an orderly shutdown and be in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours.

Response

Brunswick-2 has annotated its Technical Specifications through approved plant procedures (AI-45) to reflect the more restrictive ACTION requirements dictated by this item.

Item A.3:

A visual examination for leakage of the reactor coolant piping shall be performed during each plant outage anticipated to be 48 hours or more. The examination shall be performed consistent with the requirements of IWA-5241 and IWA-5242 of the 1980 Edition of Section XI of the ASME Boiler and Pressure Vessel Code. The system boundary subject to the examination shall be in accordance with IWA-5221.

Response:

During each plant outage prior to the November 1983 outage (Brunswick-2) anticipated to be 48 hours or more, an in-service leak test will be performed on the Recirculation System and the ASME Code Class I portions of the reactor water cleanup (RWCU) and residual heat removal (RHR) systems that involve stainless steel and are located inside the drywell. These tests will be performed during startup at a system pressure of 900 psi or greater. The examination shall be performed consistent with the requirements of IWA-5241 and IWA-5242 of the 1980 Edition of Section XI of the ASME Code. The system boundary subject to the examination shall be in accordance with IWA-5221.

Item A.4:

All systems/subsystems of the ECCS shall be operable as defined in the plant Technical Specifications. With any one system/subsystems of the ECCS inoperable, restore the inoperable system/subsystem to operable status within 72 hours or immediately initiate an orderly shutdown. The unit shall be placed in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours.

Response:

Brunswick-2 has annotated its section of ECCS Technical Specifications through approved plant procedures (AI-45) to reflect the more restrictive ACTION requirements dictated by this item.

Item A.5:

Within 24 hours of receipt of this Order, the licensee shall initiate refresher training on leak monitoring and LOCA mitigation to all licensed personnel who would be expected to manipulate reactor controls or supervise control room activities.

Response:

Training was initiated for licensed operators at the Brunswick Plant on August 27, 1983, and was completed on September 9, 1983, for those personnel who missed the initial training (August 27 through 29). This training included a discussion of IGSCC, operational constraints imposed by the Order, drywell leakage monitoring systems, drywell leakage calculations, and LOCA mitigation procedures. Testing was provided at the completion of each training session.

Item B:

The licensee shall shutdown the facility to conduct UT examinations of reactor coolant system piping as soon as practicable but not later than November 1, 1983.

Response:

Carolina Power & Light Company will shut down Brunswick-2 on or before November 1, 1983, to perform the inspections identified in Item C below.

Item C:

The facility shall remain in cold shutdown until the Director, Office of Nuclear Reactor Regulation, finds that the licensee has satisfactorily completed the following actions or has provided adequate justification for not completing a given action.

1. To the extent practicable, the licensee shall conduct an ultrasonic examination of 100%, but in no case less than the number specified in Attachment A to the July 21, 1983 50.54(f) letters, of the welds involving 304 stainless steel piping of greater than or equal to four inches in the following systems or portions thereof:
 - a. Recirculation System.
 - b. ASME Code Class 1 portion of the Residual Heat Removal System.
 - c. ASME Code Class 1 portion of the Core Spray System external to the reactor vessel.
 - d. ASME Code Class 1 portion of the Reactor Water Cleanup System.

2. Within ten days of the date of this Order or prior to the commencement of the inspections required by this Order, whichever is later, the licensee shall provide to the Director, Office of Nuclear Reactor Regulation, a list of the welds specified above that it does not intend to inspect during this current outage together with a suitable technical justification for not conducting such inspections at this time. This list should identify each weld not being inspected by system, locations, and size.
3. All UT personnel conducting these inspections shall have received appropriate training in IGSCC inspection using cracked thick-wall pipe specimens. All Level II and Level III UT operators shall have successfully completed the performance demonstration tests described in IEB 83-02. The footnote on page 4 of IEB 83-02, which allowed qualification under IEB 82-03, Revision 1, is no longer applicable.
4. Based on the results of the inspections, the licensee shall take appropriate corrective actions.
5. The licensee shall provide a report of the results of the inspection and the corrective actions taken. This report should also include the susceptibility matrix for welds selected and examined (e.g., stress rule index, carbon content, high stressed welds examined for the RHR System). The written report shall be submitted to the Director, Office of Nuclear Reactor Regulation, Washington, DC 20555, under oath or affirmation, under provisions of Section 182a, Atomic Energy Act of 1954, as amended, with copies to the appropriate Regional Administrator and the Director, Office of Inspection and Enforcement. Other reports generated, such as may be required by Technical Specifications, shall also be provided.

Response:

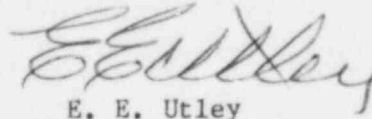
During the Brunswick-2 outage scheduled to commence on or before November 1, 1983, CP&L commits to inspect those welds identified in Table 1, and all RHR system welds involving stainless steel. Table 1 identifies selected welds on the recirculation system and RWCU system. The core spray system at Brunswick does not contain any stainless steel piping external to the reactor vessel. These inspections will be conducted by personnel who have received appropriate training in IGSCC inspections.

The weld selection for recirculation piping welds to be inspected during the November 1983 outage is based on high carbon content, high stress rule index, or incidence of cracking at other facilities. For RWCU system welds, the stress rule indices are not available; therefore, the weld inspection selection is based on carbon content. The sample of welds to be inspected in November 1983 does not include those welds that were inspected in February 1983. If flaws indicative of cracking are identified in these examinations, additional inspections will be conducted in accordance with IWB-2430 of ASME Code Section XI.

The remaining welds, identified in Table 2, will be inspected during the maintenance outage scheduled to commence on or before March 31, 1984. The conservatism of the sample selection and the sample expansion requirements ensures that any significant cracking present will be detected during the November 1983 outage. In addition, the unit will be operated for only a short time (approximately four and one-half months) following the November 1983 outage before the inspections will be 100% complete. Required reports will be submitted following both the November 1983 and March 1984 inspections.

Carolina Power & Light Company fully realizes the significance of IGSCC and the need to establish and implement an aggressive inspection program. Carolina Power & Light Company is confident that the testing, surveillance, and inspection program established by this response will help to assure that Brunswick-2 will continue to be operated in such a manner that the health and safety of the public is not compromised.

Yours very truly,



E. E. Utley

EEU/ccc (7965WRM)

Enclosures

cc: Mr. D. O. Myers (NRC-BSEP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. S. D. MacKay (NRC)

TABLE 1

RECIRCULATION & RWCU SYSTEM WELDS TO BE
INSPECTED IN NOVEMBER 1983

Weld No.	Description	SRI	Carbon Content	Susceptibility Rank
2-B32-RECIRC-28"-A-2	Pipe to safe end	1.08	0.055	2
2-B32-RECIRC-28"-A-14	Pipe to elbow	1.51	0.059	1
2-B32-RECIRC-28"-A-15	Pipe to elbow	1.42	0.059	1
2-B32-RECIRC-22"-AM-3	Discharge manifold cross-tie valve to pipe	1.03	0.048	2
2-B32-RECIRC-22"-AM-6	Discharge manifold pipe to end cap	1.14	0.058	1
2-B32-RECIRC-22"-AM-5BC-B	Discharge manifold sweep-o-let adjacent to end cap	1.16	0.070	4
2-B32-RECIRC-12"-AR-C1	Pipe to reducer	1.57	0.075	1
2-B32-RECIRC-12"-AR-C2	Pipe to elbow	1.58	0.075	1
2-B32-RECIRC-12"-AR-C3	Pipe to elbow	1.54	0.075	1
2-B32-RECIRC-12"-AR-D4	Pipe to safe end	1.35	0.075	1
2-B32-RECIRC-12"-AR-E2	Pipe to elbow	1.57	0.075	1
2-B32-RECIRC-12"-AR-E3	Pipe to elbow	1.53	0.075	1
2-B32-RECIRC-28"-B-11	Elbow to pump	1.46	0.059	1
2-B32-RECIRC-28"-B-12	Pump to pipe	1.12	0.051	1
2-B32-RECIRC-28"-B-15	Elbow to pipe	1.40	0.059	1
2-B32-RECIRC-22"-BM-1	Discharge manifold pipe to end cap	1.14	0.056	1
2-B32-RECIRC-22"-BM-4	Discharge manifold pipe to cross-tie valve	1.14	0.059	1
2-B32-RECIRC-22"-BB-1BC-A	Discharge manifold sweep-o-let adjacent to end cap	1.16	0.060	4
2-B32-RECIRC-12"-BR-G3	Pipe to elbow	1.53	0.075	1
2-B32-RECIRC-12"-BR-H1	Pipe to reducer	1.59	0.075	1
2-B32-RECIRC-12"-BR-H2	Pipe to elbow	1.57	0.075	1
2-B32-RECIRC-12"-BR-J4	Pipe to safe end	1.30	0.075	1

TABLE 1 (Cont'd)

Weld No.	Description	SRI	Carbon Content	Suscep- tibility Rank
2-G31-RWCU-6"-7	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-8	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-9	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-10	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-11	RWCU suction line	N/A	0.070	N/A

TABLE 2

RECIRCULATION & RWCU SYSTEM WELDS TO BE
INSPECTED IN MARCH 1984

Weld No.	Description	SRI	Carbon Content	Suscep- tibility Rank
2-B32-RECIRC- 28"-A-3	Pipe to elbow	1.46	0.059	1
2-B32-RECIRC- 28"-A-4	Pipe to elbow	1.41	0.059	1
2-B32-RECIRC- 28"-A-5	Pipe to pipe	0.95	0.057	3
2-B32-RECIRC- 28"-A-6	Pipe to pipe	0.97	0.057	3
2-B32-RECIRC- 28"-A-7	Pipe to elbow	1.38	0.057	1
2-B32-RECIRC- 28"-A-8	Elbow to valve	1.41	0.051	1
2-B32-RECIRC- 28"-A-9	Pipe to valve	1.07	0.040	3
2-B32-RECIRC- 28"-A-10	Pipe to elbow	1.58	0.059	1
2-B32-RECIRC- 28"-A-11	Elbow to pump	1.52	0.059	1
2-B32-RECIRC- 28"-A-12	Pump to pipe	1.12	0.051	1
2-B32-RECIRC- 28"-A-13	Pipe to valve	1.13	0.051	1
2-B32-RECIRC- 28"-A-16	Pipe to pipe	0.98	0.062	3
2-B32-RECIRC- 28"-A-17	Pipe to cross	1.02	0.062	2
2-B32-RECIRC- 28"-A-18	Cross to reducer	0.95	0.053	3
2-B32-RECIRC- 28"-A-9BC	Branch connections	1.20	0.055	1
2-B32-RECIRC- 28"-A-12BC	Branch connections	1.04	0.071	2
2-B32-RECIRC- 28"-A-15BC	Branch connections	0.98	0.071	3
2-B32-RECIRC- 22"-AM-1	Discharge manifold	1.15	0.058	1
2-B32-RECIRC- 22"-AM-2	Discharge manifold	1.11	0.058	1
2-B32-RECIRC- 22"-AM-4	Discharge manifold	1.24	0.053	1
2-B32-RECIRC- 22"-AM-5	Discharge manifold	1.18	0.058	1
2-B32-RECIRC- 22"-AM-3BC-A	Discharge manifold sweep-o-let	1.20	0.070	4
2-B32-RECIRC- 22"-AM-3BC-B	Discharge manifold sweep-o-let	1.20	0.070	4
2-B32-RECIRC- 22"-AM-5BC-A	Discharge manifold sweep-o-let	1.19	0.070	4

TABLE 2 (Cont'd)

Weld No.	Description	SRI	Carbon Content	Susceptibility Rank
2-B32-RECIRC-12"-AR-A1	Jet pump riser	1.08	0.075	2
2-B32-RECIRC-12"-AR-A2	Jet pump riser	1.48	0.075	1
2-B32-RECIRC-12"-AR-A3	Jet pump riser	1.46	0.075	1
2-B32-RECIRC-12"-AR-A4	Jet pump riser	1.27	0.075	1
2-B32-RECIRC-12"-AR-B1	Jet pump riser	1.06	0.075	2
2-B32-RECIRC-12"-AR-B2	Jet pump riser	1.39	0.075	1
2-B32-RECIRC-12"-AR-B3	Jet pump riser	1.51	0.075	1
2-B32-RECIRC-12"-AR-B4	Jet pump riser	1.36	0.075	1
2-B32-RECIRC-12"-AR-C4	Jet pump riser	1.60	0.075	1
2-B32-RECIRC-12"-AR-D1	Jet pump riser	1.08	0.075	2
2-B32-RECIRC-12"-AR-D2	Jet pump riser	1.46	0.075	1
2-B32-RECIRC-12"-AR-D3	Jet pump riser	1.44	0.075	1
2-B32-RECIRC-12"-AR-E1	Jet pump riser	1.14	0.075	1
2-B32-RECIRC-12"-AR-E4	Jet pump riser	1.58	0.075	1
2-B32-RECIRC-4"-A-1	Discharge valve bypass line	1.22	0.071	1
2-B32-RECIRC-4"-A-11	Discharge valve bypass line	1.19	0.071	1
2-B32-RECIRC-28"-B-2	Pipe to safe end	1.03	0.055	2
2-B32-RECIRC-28"-B-3	Pipe to elbow	1.34	0.059	1
2-B32-RECIRC-28"-B-4	Pipe to elbow	1.32	0.059	1
2-B32-RECIRC-28"-B-5	Pipe to pipe	0.93	0.062	3
2-B32-RECIRC-28"-B-6	Pipe to pipe	0.94	0.057	3
2-B32-RECIRC-28"-B-7	Pipe to elbow	1.36	0.057	1
2-B32-RECIRC-28"-B-8	Elbow to valve	1.36	0.057	1
2-B32-RECIRC-28"-B-9	Pipe to valve	1.05	0.040	3
2-B32-RECIRC-28"-B-10	Pipe to elbow	1.51	0.059	1

TABLE 2 (Cont'd)

Weld No.	Description	SRI	Carbon Content	Susceptibility Rank
2-B32-RECIRC-28"-B-13	Pipe to valve	1.12	0.051	1
2-B32-RECIRC-28"-B-14	Valve to elbow	1.48	0.059	1
2-B32-RECIRC-28"-B-16	Pipe to pipe	0.97	0.062	3
2-B32-RECIRC-28"-B-17	Pipe to cross	1.01	0.062	2
2-B32-RECIRC-28"-B-18	Cross to reducer	0.95	0.053	3
2-B32-RECIRC-28"-B-9BC	Branch connection	1.20	0.055	1
2-B32-RECIRC-28"-B-12BC	Branch connection	1.04	0.071	2
2-B32-RECIRC-28"-B-15BC	Branch connection	0.98	0.071	3
2-B32-RECIRC-22"-BM-2	Discharge manifold	1.20	0.053	1
2-B32-RECIRC-22"-BM-3	Discharge manifold	1.21	0.059	1
2-B32-RECIRC-22"-BP-1BC-B	Discharge manifold sweep-o-let	1.19	0.060	4
2-B32-RECIRC-22"-BB-3BC-A	Discharge manifold sweep-o-let	1.18	0.060	4
2-B32-RECIRC-22"-BB-3BC-B	Discharge manifold sweep-o-let	1.21	0.060	4
2-B32-RECIRC-12"-BR-F1	Pipe to sweep-o-let	1.12	0.075	1
2-B32-RECIRC-12"-BR-F2	Pipe to elbow	1.53	0.075	1
2-B32-RECIRC-12"-BR-F3	Pipe to elbow	1.45	0.075	1
2-B32-RECIRC-12"-BR-F4	Pipe to safe end	1.46	0.075	1
2-B32-RECIRC-12"-BR-G1	Pipe to sweep-o-let	1.10	0.075	2
2-B32-RECIRC-12"-BR-G2	Pipe to elbow	1.51	0.075	1
2-B32-RECIRC-12"-BR-G4	Pipe to safe end	1.42	0.075	1
2-B32-RECIRC-12"-BR-H3	Pipe to elbow	1.53	0.075	1
2-B32-RECIRC-12"-BR-H4	Pipe to safe end	1.53	0.075	1
2-B32-RECIRC-12"-BR-J1	Pipe to sweep-o-let	1.06	0.075	2
2-B32-RECIRC-12"-BR-J2	Pipe to elbow	1.41	0.075	1
2-B32-RECIRC-12"-BR-J3	Pipe to elbow	1.45	0.075	1

TABLE 2 (Cont'd)

Weld No.	Description	SRI	Carbon Content	Susceptibility Rank
2-B32-RECIRC-12"-BR-K1	Pipe to sweep-o-let	1.07	0.075	2
2-B32-RECIRC-12"-BR-K2	Pipe to elbow	1.42	0.075	1
2-B32-RECIRC-12"-BR-K3	Pipe to elbow	1.38	0.075	1
2-B32-RECIRC-12"-BR-K4	Pipe to safe end	1.25	0.075	1
2-B32-RECIRC-4"-B-1	Discharge valve bypass line	1.22	0.071	1
2-B32-RECIRC-4"-B-11	Discharge valve bypass line	1.20	0.071	1
2-G31-RWCU-6"-1	RWCU suction line	N/A	0.060	N/A
2-G31-RWCU-6"-1A	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-2	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-3	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-3A	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-4R	RWCU suction line	N/A	0.059	N/A
2-G31-RWCU-6"-5R	RWCU suction line	N/A	0.059	N/A
2-G31-RWCU-6"-5A	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-6	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-12	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-13	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-14	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-15	RWCU suction line	N/A	0.070	N/A
2-G31-RWCU-6"-16	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-17	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-18	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-6"-19	RWCU suction line	N/A	0.055	N/A
2-G31-RWCU-4"-2	RWCU return line	N/A	0.053	N/A
2-G31-RWCU-4"-3	RWCU return line	N/A	0.053	N/A