

Carolina Power & Light Company
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APR 01 1997

SERIAL: BSEP 97-0114

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

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
ASME CODE, SECTION XI RELIEF REQUEST
HIGH PRESSURE COOLANT INJECTION PUMP STUD INSPECTION

Gentlemen:

In accordance with 10 FR 50.55a(a)(3), Carolina Power & Light (CP&L) Company requests approval for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2 to use an alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI requirements for volumetric examination of the high pressure coolant injection (HPCI) system main pump studs. The basis for this request is provided in Enclosure 1.

Please refer any questions regarding this submittal to Mr. Mark Turkal, Supervisor - Licensing at (910) 457-3066.

Sincerely,

Keith R. Jury
Manager — Regulatory Affairs
Brunswick Steam Electric Plant

WRM/wrm

Enclosures:

1. Basis for Relief Request
2. List of Regulatory Commitments

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PDR ADDCK 05000324
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pc (with enclosures):

U. S. Nuclear Regulatory Commission
ATTN.: Mr. Luis A. Reyes, Regional Administrator
101 Marietta Street, N.W., Suite 2900
Atlanta, GA 30323-0199

U. S. Nuclear Regulatory Commission
ATTN: Mr. C. A. Patterson, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461

U. S. Nuclear Regulatory Commission
ATTN.: Mr. David C. Trimble, Jr. (Mail Stop OWFN 14H22)
11555 Rockville Pike
Rockville, MD 20852-2738

The Honorable J. A. Sanford
Chairman - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Division of Boiler and Pressure Vessel
North Carolina Department of Labor
ATTN: Mr. Jack Given, Assistant Director of Boiler and Pressure Vessels
4 West Edenton Street
Raleigh, NC 27601-1092

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324
LICENSE NOS. DPR-71 AND DPR-62
ASME CODE, SECTION XI RELIEF REQUEST
HIGH PRESSURE COOLANT INJECTION PUMP STUD INSPECTION

SUMMARY:

In accordance with 10 CFR 50.55(a)(3), Carolina Power & Light (CP&L) Company requests approval for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2 to use alternative requirements for volumetric examination of the high pressure coolant injection (HPCI) system main pump studs.

DISCUSSION:

The current inservice inspection (ISI) Program for BSEP Unit Nos. 1 and 2 is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1980 Edition with Winter 1981 Addenda.

10 CFR 50.55a(g)(1) states:

For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued prior to January 1, 1971 [this applies to BSEP Unit Nos. 1 and 2], components (including supports) must meet the requirements of paragraphs (g)(4) and (5) of this section to the extent practical.

10 CFR 50.55 a(g)(4) states:

Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2 and Class 3 must meet the requirements, except design and access provisions . . . to the extent practical within the limitations of design, geometry and materials of construction of the components.

The ASME Code, Section XI, Table IWC-2500-1 requires a volumetric examination of the studs for the HPCI main pump during each 10-year inspection interval. A copy of the applicable ASME Code requirement is attached as Exhibit A.

There are 17 HPCI main pump studs involved in this request. These studs connect the upper pump casing to the lower pump casing. The diagram enclosed as Exhibit B depicts the 17 HPCI main pump studs.

A full volumetric ultrasonic examination of the HPCI main pump studs requires removal of the stud cap nuts, which are tensioned to 8,000 foot-pounds. CP&L attempted removal of the BSEP Unit No. 1 stud cap nuts during the 1996 refueling outage (B111R1) using HyTorc™ equipment, but these attempts were unsuccessful. Further attempts to non-destructively remove the stud cap nuts could potentially damage the studs or pump casing. As a result, the best option available for removing the stud cap nuts without damaging the studs themselves is to destructively remove (i.e., cut) the stud cap nuts.

The HPCI main pump studs are completely restricted from the top by protective cap nuts. Currently, stud numbers 4, 5, 6, 7, 8, 11, 14, 15, and 16 of the HPCI main pump studs are accessible from the bottom of the stud due to the design of the HPCI main pump casing (see the diagram in Exhibit B). However, stud numbers 1, 2, 3, 9, 10, 12, 13, and 17 are not accessible from the bottom of the stud due to the design of the HPCI main pump casing.

As an alternative to the ASME Code, Section XI requirement to perform volumetric examination of the 17 main pump studs, CP&L is proposing an alternative volumetric examination on those studs which are accessible (i.e., 9 of the 17 studs) from the bottom of the stud. The proposed alternative examination is based on accessibility of the studs due to the design of the HPCI main pump casing.

The pressure retaining components of the HPCI system (including the HPCI main pump) receive a visual examination during each refueling outage. In addition, a VT-2 examination of the HPCI system pressure retaining components is performed once per period. No degradation of the HPCI main pump pressure retaining components (i.e., the casing and studs) has been identified through these examinations.

By not requiring destructive removal of the HPCI main pump stud cap nuts, this relief request reduces the hardship imposed on CP&L while implementing an inspection consistent with the requirements of ASME Code, Section XI to the extent practical within the limitation of design, geometry and materials of construction of components. CP&L has determined that the use of this relief request would provide an acceptable level of quality and safety for the following reasons:

- The sampling selection (more than 50 percent of the HPCI main pump studs) provides reasonable assurance that degradation of the HPCI main pump pressure retaining components (casing and studs) will be identified.
- The alternative visual examination is performed each outage, and the VT-2 examination is performed once per period. Thus, these visual examinations are performed much more frequently than the ASME Code volumetric examination, which is performed only once during each 10-year inspection interval. During this 10-year inspection interval, the HPCI main pump has been visually examined after each outage for leakage and VT-2 examined at reactor pressure for two periods with no degradation noted to the HPCI main pump pressure retaining components. This provides a significant check of degradation on an ongoing basis rather than once every ten years.
- The accessible HPCI main pump studs (i.e., 9 of the 17 studs) have already been volumetrically examined with no indications or degradation noted. This sampling provides reasonable assurance that the remaining studs have not experienced significant degradation.

If the HPCI main pump requires disassembly for maintenance or repair during the remainder of the current 10-year inspection interval, CP&L will use this opportunity to perform the volumetric examination of the main pump studs in accordance with the requirements of the ASME Code, Section XI, Table IWC-2500-1.

CONCLUSIONS:

Based on the above, the proposed alternative examination provides an acceptable level of quality and safety. The approval to use the alternative provisions of this relief request is requested for the remainder of the second 10-year inspection interval. As noted above, if the HPCI main pump

requires disassembly for maintenance or repair during the remainder of the current 10-year inspection interval, CP&L will use this opportunity to perform the volumetric examination of the main pump studs in accordance with the requirements of the ASME Code, Section XI, Table IWC-2500-1.

CP&L requests NRC review and approval of this relief request be completed by August 1, 1997 in order to support planning activities for the next scheduled refueling outage of BSEP Unit No. 2. The next BSEP Unit No. 2 refueling outage is currently scheduled to begin on September 13, 1997.

EXHIBIT A

ASME CODE, SECTION XI,
TABLE IWC-2500-1, ITEM C4.30
(COPY ATTACHED)

TABLE IWC-2500-1 (CONT'D)
EXAMINATION CATEGORIES

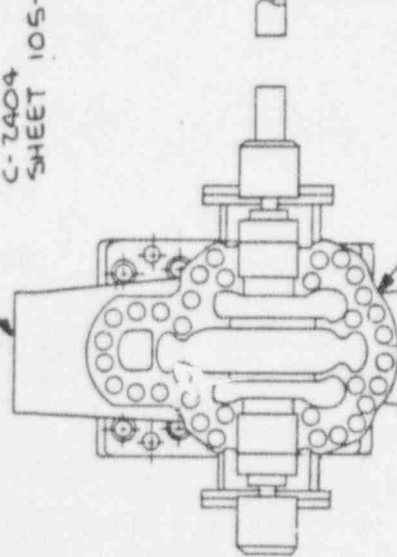
EXAMINATION CATEGORY C-D, PRESSURE RETAINING BOLTING GREATER THAN 2 in. IN DIAMETER						
Item No.	Parts Examined	Examination Requirements / Fig. No.	Examination Method	Acceptance Standard	Extent of Examination ^{1,2,3}	Frequency of Examination ⁴
C4.10	Pressure Vessels Bolts and Studs	IWC-2500-6	Volumetric	IWC-3000	100% bolts and studs at each bolted connection of components required to be inspected	Each inspection interval
C4.20	Piping Bolts and Studs	IWC-2500-6	Volumetric	IWC-3000	100% bolts and studs at each bolted connection of components required to be inspected	Each inspection interval
C4.30	Pumps Bolts and Studs	IWC-2500-6	Volumetric	IWC-3000	100% bolts and studs at each bolted connection of components required to be inspected	Each inspection interval
C4.40	Valves Bolts and Studs	IWC-2500-6	Volumetric	IWC-3000	100% bolts and studs at each bolted connection of components required to be inspected	Each inspection interval
NOTES: (1) The examination may be performed on bolting in place under load or upon disassembly of the connection. (2) The examination of bolting for vessels, pumps, and valves may be conducted on one vessel, one pump, one valve among a group of vessels, pumps, and valves in each system required to be examined and which are similar in design, size, function, and service. In addition, where the one component to be examined contains a group of bolted connections of similar design and size (such as flange connections, manway covers) the examination may be conducted on one bolted connection among the group. (3) The examination of flange bolting in piping systems required to be examined may be limited to the flange connections in pipe runs selected for examination under Examination Category C-F. (4) The areas selected for the initial examination shall be reexamined over the service lifetime of the component.						

EXHIBIT B

HIGH PRESSURE COOLANT INJECTION SYSTEM
MAIN PUMP DIAGRAM
(COPY ATTACHED)

PUMP SUCTION
CONT. ON DWG.
C-7404
SHEET 105-1

PUMP DISCHARGE
CONT. ON DWG.
C-7404
SHEET 107-1



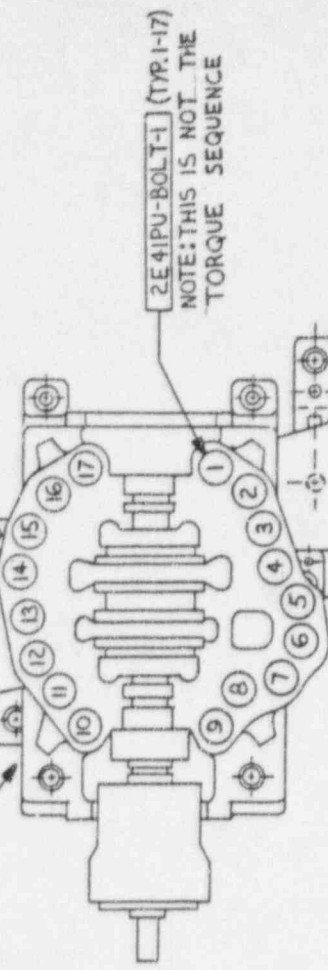
BOOSTER PUMP

2E41PU-59-SW6

2E41PU-59-SW7

2E41PU-59-SW1

MAIN PUMP



2E41PU-BOLT-1 (TYP. 1-17)
NOTE: THIS IS NOT THE
TORQUE SEQUENCE

2" SOL.

0.75" THREDOLET

59-12-152

2E41PU-59-SW8

2E41PU-59-SW2

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKET NOS. 50-325 AND 50-324
OPERATING LICENSE NOS. DPR-71 AND DPR-62
ASME CODE, SECTION XI RELIEF REQUEST
HIGH PRESSURE COOLANT INJECTION PUMP STUD INSPECTION

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Carolina Power & Light (CP&L) Company in this document. Any other actions discussed in the submittal represent intended or planned actions by CP&L. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager - Regulatory Affairs at the Brunswick Steam Electric Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
1. If the HPCI main pump requires disassembly for maintenance or repair during the remainder of the current 10-year inspection interval, CP&L will use this opportunity to perform the volumetric examination of the main pump studs in accordance with the requirements of the ASME Code, Section XI, Table IWC-2500-1.	During the second 10-year in-service inspection interval.