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SUBJECT: Responds to NRC Bulletin 89-001, "Failure of Westinghouse  
 Steam Generator Tube Mechanical Plugs."

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JUN 14 1989

A. B. CUTTER  
Vice President  
Nuclear Services Department

United States Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261/LICENSE NO. DPR-23

SHEARON HARRIS NUCLEAR POWER PLANT  
DOCKET NO. 50-400/LICENSE NO. NPF-63

RESPONSE TO NRC BULLETIN 89-01  
FAILURE OF WESTINGHOUSE STEAM GENERATOR TUBE MECHANICAL PLUGS

Gentlemen:

Carolina Power & Light Company (CP&L) hereby submits the following response to NRC Bulletin No. 89-01 as applicable for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2) and the Shearon Harris Nuclear Power Plant (SHNPP).

**RESPONSE TO ACTIONS REQUESTED**

Item 1: Addressees are requested to verify that information contained in References 1 and 2 relating specifically to their plants is correct for plugs supplied from heat numbers 3279, 3513, 3962, and 4523. The specific information to be verified is the number of Westinghouse mechanical plugs installed in the hot and cold legs broken down by steam generator number, heat number, and date of installation. If information from these references is incorrect, appropriate corrections should be identified. Addressees are requested to so state if their plants have not installed Westinghouse mechanical plugs from the subject heats.

Response to Item 1: Westinghouse mechanical plugs manufactured from the suspect heats (3279, 3513, 3962, and 4523) have not been installed in the steam generators at SHNPP.

With respect to HBR2, the information contained in References 1 and 2 to NRC Bulletin No. 89-01 has been reviewed and verified as correct. Specifically, HBR2 Steam Generator "C" has one hot leg tube plug and one cold leg tube plug (one plug in each end of the same steam generator tube) supplied from heat number 4523. These plugs were installed in December 1988.

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Item 2: Addressees are requested to take the following actions, to be implemented initially during any refueling outage or extended outage (greater than four weeks) which ends 30 days or more following receipt of this bulletin and during all future refueling outages.

Item 2(a): Steam generator tube plug lifetime for plugs from heats 3279, 3513, 3962, and 4523 should be estimated using the methodology from References 1 and 2 and should be based on the Millstone Unit 2 benchmark subject to any corrections per item 1 above. Lifetime estimates in Reference 2 for plugs fabricated from heat 4523 are based on the Farley Unit 2 benchmark. These estimates should be adjusted to reflect the Millstone Unit 2 benchmark using the methodology described in Section 4.1.2 of Reference 1.

Response to Item 2(a): Not applicable to SHNPP based on response to Item 1.

For HBR2, the steam generator tube plug lifetimes have been estimated using the methodology from References 1 and 2 to NRC Bulletin No. 89-01, based on the Farley Unit 2 benchmark, and adjusted to reflect the Millstone Unit 2 benchmark using the methodology described in Section 4.1.2 of Reference 1 to NRC Bulletin No. 89-01. The tube plug estimated lifetimes, expressed in Effective Full Power Days (EFPD) are as follows:

EFPD to Minimum Ligament

Cold Leg Tube Plug	3581
Hot Leg Tube Plug	550

Based on unit operation as of May 17, 1989, these tube plugs had been exposed to 63 EFPD. As such, the remaining tube plug lifetimes are:

Remaining EFPD  
to Minimum Ligament

Cold Leg Tube Plug	3518
Hot Leg Tube Plug	487

The design length for the current Cycle 13 is 347 EFPD. Therefore, the tube plugs of concern have lifetimes which extend beyond the next HBR2 refueling outage.

Item 2(b): Addressees should implement appropriate remedial actions (i.e., repair and/or replacement) for all plugs whose estimated lifetimes in 2a, above do not extend to the next refueling outage. If operation is planned beyond a refueling outage that represents the last outage before any plug exhausts the predicted lifetime, an alternative schedule with the appropriate technical justification should be submitted to the NRC at least 30 days before the end of this refueling outage.

Item 2(c): Prior to any plug repairs or replacement, addressees are reminded that their responsibilities under ALARA require analysis of the various plug repair or replacement methods available to determine which method will result in the lowest overall personnel radiation exposure while still remaining

cost-effective. In choosing a plug repair or replacement method, the licensee should consider the accessibility of the plugs and the dose reduction benefit of using robotic manipulators. Prior to plug repair or replacement, the licensee should consider steam generator decontamination and/or local shielding to reduce working area dose rates.

**Response to Items 2(b) and 2(c):** Not applicable to SHNPP based on response to Item 1.

HBR2 will continue to review and assess tube plug performance and will work with Westinghouse to establish a final resolution to the tube plug concern. This will include an evaluation of tube plug repair or replacement methods and techniques. When considering available options, radiation exposure and ALARA will be prominent considerations. The "Additional Development(s)" described in Section 4.1.1.3 to WCAP-12244, Revision 1, will also be considered for possible implementation during any future steam generator tube plug repair or replacement.

**Item 2(d):** Installation of Westinghouse mechanical plugs from heats 3279, 3513, 3962, and 4523 should be discontinued.

**Response to Item 2(d):** Westinghouse mechanical tube plugs from heats 3279, 3513, 3962, and 4523 will be excluded from future installation at both SHNPP and HBR2.

**Item 2(e):** Westinghouse mechanical plugs removed from steam generators, regardless of heat number, should be examined for PWSCC on a sample basis for each heat. Addressees should maintain a record of these examinations and the results should be provided to Westinghouse to improve the database concerning the susceptibility of plugs to PWSCC.

**Response to Item 2(e):** Westinghouse mechanical plugs removed from steam generators, regardless of heat number, will be examined for primary water stress corrosion cracking (PWSCC) on a sample basis for each heat. A record of any such examinations will be maintained and the results will be provided to Westinghouse to improve the database concerning the susceptibility of plugs to PWSCC.

**Item 3:** Remedial actions at plants where the steam generator tubes are partially-depth-expanded within the tubesheet as described above may be deferred on a one-time basis to the next scheduled refueling outage if the outage that immediately follows receipt of this bulletin ends before October 1, 1989.

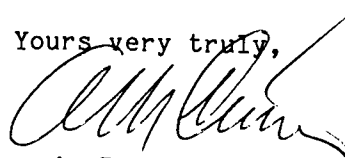
**Item 4:** Remedial actions for "sentinel related" mechanical plugs described above may be deferred on a one-time basis to the next refueling outage if the outage that immediately follows receipt of this bulletin ends before October 1, 1989.

Response to Items 3 and 4: Not applicable to SHNPP based on response to Item 1.

HBR2 neither has partially-depth-expanded tubes nor has installed "sentinel related" mechanical plugs. Therefore, remedial actions with respect to these items are not applicable to HBR2.

If you have any questions concerning this information, please contact Mr. L. I. Loflin at (919) 546-6242.

Yours very truly,



A. B. Cutter

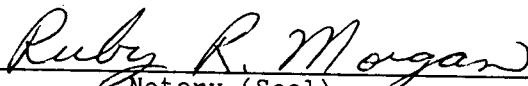
ABC/LSR/crs (357CRS)

cc: Mr. R. A. Becker  
Mr. W. H. Bradford  
Mr. S. D. Ebnetter  
Mr. L. Garner (NRC - HBR)  
Mr. R. Lo

A. B. Cutter, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

My commission expires:

11/27/89

  
Notary (Seal)

