

Carolina Power & Light Company  
PO Box 10429  
Southport NC 28461-0429

William R. Campbell  
Vice President  
Brunswick Nuclear Plant

SERIAL: BSEP 95-0569  
NOV 15 1995

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

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62  
RESPONSE TO THE NRC STAFF REQUEST FOR INFORMATION REGARDING NRC  
BULLETIN 95-02, "UNEXPECTED CLOGGING OF RESIDUAL HEAT REMOVAL (RHR) PUMP  
STRAINER WHILE OPERATING IN SUPPRESSION POOL COOLING MODE"

Gentlemen:

On October 17, 1995, the NRC issued Bulletin 95-02, "Unexpected Clogging of Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode." The NRC requested that within 30 days from the date of the bulletin, each licensee should provide a written response indicating to what extent the licensee has complied with the requested actions in this bulletin, or a detailed description of any proposed alternate course of action. Enclosure 1 provides Carolina Power & Light Company's (CP&L) 30-day response to Bulletin 95-02.

Please refer any questions regarding this letter to Mr. George Honma at (910) 457-2741.

Sincerely,

William R. Campbell

GMT/gmt

Enclosures:

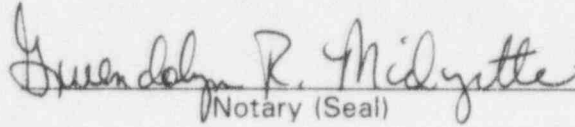
1. Response to NRC Bulletin 95-02
2. List of Regulatory Commitments

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PDR

Tel 910 457-2496 Fax 910 457-2803

William R. Campbell, 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, and agents of Carolina Power & Light Company.

  
Notary (Seal)

My commission expires: August 12, 1996

- cc: Mr. S. D. Ebnetter, NRC Regional Administrator, Region II  
Mr. C. A. Patterson, NRC Senior Resident Inspector - Brunswick Plant  
Mr. D. C. Trimble, Jr., NRR Project Manager - Brunswick Plant  
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

## ENCLOSURE 1

### BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 NRC DOCKET NOS. 50-325 & 50-324 OPERATING LICENSE NOS. DPR-71 & DPR-62

#### RESPONSE TO THE NRC STAFF REQUEST FOR INFORMATION REGARDING NRC BULLETIN 95-02, "UNEXPECTED CLOGGING OF RESIDUAL HEAT REMOVAL (RHR) PUMP STRAINER WHILE OPERATING IN SUPPRESSION POOL COOLING MODE"

CP&L's Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2 has completed or plans to implement the following actions for Bulletin 95-02:

##### NRC Requested Action 1:

*Verify the operability of all pumps which draw suction from the suppression pool when performing their safety functions (e.g., ECCS, containment spray, etc.) based on an evaluation of suppression pool and suction strainer cleanliness conditions. This evaluation should be based on the pool and strainer conditions during the last inspection or cleaning and an assessment of the potential for the introduction of debris or other materials that could clog the strainers since the pool was last cleaned.*

##### CP&L Response

Both BSEP Units 1 and 2 suppression pools were drained and the suppression pool liners cleaned to allow recoating as part of the torus liner refurbishment projects during each unit's last refueling outage. The suppression pool suction strainers (Zurn stacked disk strainers) were also inspected at that time and the results are discussed in the response to action 4.

The Unit 2 suppression pool was drained, cleaned, recoated (one half of the torus liner immersion zone) and inspected in the spring of 1994 during the B211R1 refuel outage. The suction strainers were inspected at this time, finding no fibrous material and only a minimal amount of debris. Prior to refilling the suppression pool a visual cleanliness inspection of the torus liner was performed with criteria to insure the surfaces were free of particulate contaminants and foreign objects. The Unit 2 suppression pool is scheduled to be drained, cleaned, and inspected again in February 1996 during the B212R1 refueling outage. This will allow recoating of the remaining suppression pool liner immersion zone.

The Unit 1 suppression pool was similarly drained, cleaned, and the entire liner immersion zone recoated in the spring of 1995 during the B110R1 refueling outage. The suction strainers were also inspected, with the results being similar to Unit 2. Prior to the suppression pool fill, a cleanliness inspection as outlined above was conducted.

Following the inspections associated with the above draining and cleaning evolutions, controls were re-established to assure foreign material was not introduced prior to sealing the suppression pool hatches. Additionally, both BSEP Units have Mark I style containments with enclosed suppression pools (torus). This design limits the opportunity for foreign material, including fibrous material, to enter the suppression pools during plant operation. The suppression pools' hatches have remained sealed since the refueling outages in which they were cleaned, with limited access to the drywells.

During Technical Specification surveillance testing of the Residual Heat Removal (RHR) and Core Spray (CS) pumps, running suction pressure data has been gathered since 1988. A review of this data showed no adverse trends before or after desludging the suppression pools that would indicate a material build-up on the strainers. These data are consistent with previous strainer inspection findings.

In addition, on July 13, 1995, Unit 1 experienced a Reactor Scram (LER 1-95-015). The event resulted in extended operation of the RHR loops (~ 15 hours) in the Suppression Pool Cooling (SPC) mode in support of High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC) and the Reactor safety relief valves. No indication of strainer clogging was noted. Both Unit 1 RHR loop strainers now have run times approaching 200 hours since the last refueling outage. This run time includes the lengthy SPC mode operation needed to support HPCI and RCIC surveillances. Since the last Unit 2 refueling outage, the Unit 2 RHR loops have each accumulated run times of approximately 65 hours, including the SPC mode operation needed to support HPCI and RCIC surveillances. No indication of suction clogging was noted during RHR system surveillance runs.

#### NRC Requested Action 2:

*The operability evaluation in requested action 1 above should be confirmed through appropriate test(s) and strainer inspection(s) within 120 days of the date of this bulletin.*

#### CP&L Response

Due to the relatively recent suppression pool cleaning (U-2 in 1994 and U-1 in 1995), strainer inspections, and a design that limits opportunities for the introduction of foreign material, the running pump suction data gathered by existing surveillances is considered adequate to have demonstrated the continued operability of the involved systems.

Additional strainer performance testing will be performed in which a short dual loop RHR, Suppression Pool Cooling (SPC) mode run (to maximize mixing), is followed by switching to a single loop SPC run for at least 6 hours (this equates to 4.5 suppression pool volume exchanges). Experience from the event at Limerick indicate that positive indication of strainer clogging should be evident during the first 1 1/2 hours of the test with the strainer suction pressure expected to reach a plateau during the remainder of the run. This strainer performance testing will be scheduled to coincide with regularly scheduled system surveillance testing, where possible, and is expected to be completed for both Units by the end of 1995. These tests are considered an adequate demonstration of the absence of fibrous material, and sufficient to confirm pump operability without initiating the plant shutdowns required for strainer inspections.

### NRC Requested Action 3:

*Schedule a suppression pool cleaning. The schedule for cleaning the pool should be consistent with the operability evaluation in requested action 1 above. In addition, a program for cleaning the suppression pool should be established, including procedures for the cleaning of the pool, criteria for determining the appropriate cleaning frequency, and criteria for evaluating the adequacy of the pool cleanliness.*

### CP&L Response

As part of the torus refurbishment projects at BSEP, CP&L has cleaned the Unit 1 suppression pool during the spring of 1995 and the Unit 2 suppression pool in the spring of 1994. The Unit 2 suppression pool is scheduled to be drained, cleaned, and inspected again in February 1996 during the B212R1 refueling outage to complete the liner recoating. The Unit 1 torus refurbishment project was completed in the spring of 1995 during the B110R1 refueling outage, with the entire suppression pool liner immersion zone having been cleaned and recoated.

CP&L plans to develop a long term program for inspecting/cleaning the suppression pools based on the inspection to be performed during the Unit 2 (B212R1) refueling outage in February of 1996. The inspection of the Unit 2 suppression pool during B212R1 will enable CP&L to analyze the conditions after one full operational cycle with the new liner coating in place (over half of the suppression pool) and desludged. This, along with the continuing collection and evaluation of pump suction data during both Units quarterly Technical Specification surveillances is adequate to insure continued operability. The Unit 2 inspection will provide baseline conditions and the data needed to allow CP&L to establish a suppression pool inspection/cleaning program, including an appropriate frequency, criteria for evaluating cleanliness, and procedures to implement the program prior to the Unit 1 refueling outage (B111R1) in the Fall of 1996.

### NRC Requested Action 4:

*Review FME procedures and their implementation to determine whether adequate control of materials in the drywell, suppression pool, and systems that interface with the suppression pool exists. This review should determine if comprehensive FME controls have been established to prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool, and whether workers are sufficiently aware of their responsibilities regarding FME. Any identified weaknesses should be corrected. In addition, the effectiveness of the FME controls since the last time the suppression pool was cleaned and the ECCS strainers inspected, and the impact that any weaknesses noted may have on the operability of the ECCS should be assessed.*

### CP&L Response

The BSEP FME and cleanliness control procedures that control materials in the drywell, suppression pool, and systems that interface with the suppression pool, are:

1. OAI-106, "Establishing and Controlling a Foreign Material Exclusion Area," which includes the suppression pool area. Revision 6 covered suppression pool FME and was issued September 19, 1995. Prior to the issue of revision 6, the suppression pool cleanliness was controlled by OAI-91, "Instructions for Establishing a Controlled Access Area." OAI-91 was deleted September 14, 1995.
2. OAI-125, "Fluid Systems Cleanliness," which includes the systems that interface with the suppression pool.
3. OAI-127, "Drywell Inspection and Closeout," which includes the drywell and suppression pool areas.

These procedures have been reviewed and determined to have been adequate to control FME in these areas. Materials that could potentially impact ECCS operations are properly controlled and prevented from entering the suppression pool. Workers are sufficiently trained and aware of their responsibilities to use the applicable procedures. Additionally, during the upcoming refueling outage the drywell manager has been tasked to insure cleanliness standards are maintained throughout the outage, and that the drywell will be ready for the OAI-127 closeout inspections.

The ECCS suction strainers are designed such that they do not reach their maximum pressure drop until they are 50% clogged, per the suppression chamber suction strainer specification 9527-001-236-21. The following table gives the results of ECCS suction strainer inspections for the last three years.

ECCS Strainer	Approx. Azimuth (degrees)	O.D. (inches)	% Filled Spaces Unit 1 1993	% Filled Spaces Unit 2 1994	% Filled Spaces Unit 1 1995
HPCI	180	23 1/4	< 1%	0%	< 0.5%
RCIC	225	11	< 1%	0%	0%
A CS	45	20 3/4	< 1%	0%	< 0.5%
B CS	315	20 3/4	< 1%	0%	< 0.5%
A RHR	135	32	< 1%	0%	≤ 3.5%
B RHR	225	32	< 1%	1%	≤ 2%

The following BSEP documents recorded these ECCS suction strainer inspections: Final Engineering Report, FER-7122, Unit 1 "Torus Underwater Desludging and Inspection," submitted by Underwater Engineering Services, Inc., 1993; Special Procedure, 1SP-94-011, "Unit 2 Torus Liner and Components Examination," 1994; Special Procedure, 2SP-94-109, "Unit 1 Torus Liner and Components Examination," 1995.

In 1995, the Unit 1 ECCS suction strainers were inspected prior to the underwater portion of the suppression pool being sandblasted, cleaned, and repainted. During this inspection, no fibrous material was noted, with the debris primarily being paint chip particles from

failed areas of the old coating, which were located primarily on top side of the strainers, and small pieces of duct tape. The type and amount of debris found during the inspection was reviewed and evaluated at that time, and it was determined the findings did not impact ECCS strainer operability. On completion of the 1995 Unit 1 torus liner refurbishment project, the entire liner immersion zone had been recoated.

Therefore, CP&L believes FME controls have been effective in maintaining the cleanliness of the ECCS suction strainers and the suppression pools.

NRC Requested Action 5:

*Consider additional measures such as suppression pool water sampling and trending of pump suction pressure to detect clogging of ECCS suction strainers.*

CP&L Response

BSEP currently gathers pump suction pressure data during RHR and CS Technical Specification surveillance testing. This trended data will be supplemented by the strainer performance test data collected per the response to action 2. In addition, suppression pool water/sludge sampling will be performed during the next Unit 2 refueling outage. Future sampling will be evaluated along with the inspection/cleaning program discussed in item 3 above. FME, periodic inspections, and our long term cleaning program will control the Mark I suppression pool cleanliness and provide reasonable assurance against ECCS suction strainer clogging.

ENCLOSURE 2  
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LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. 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 Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
1. Strainer performance testing will be performed in which a short dual loop RHR, Suppression Pool Cooling (SPC) mode run (to maximize mixing), is followed by switching to a single loop SPC run for at least 6 hours. This strainer performance testing will be scheduled to coincide with regularly scheduled system surveillance testing, where possible, and is expected to be completed for both Units by the end of 1995.	N/A
2. CP&L will perform an inspection/cleaning of the Unit 2 suppression pool and suction strainers.	B212R1
3. Suppression pool water/sludge sampling will be performed during the Unit 2 refueling outage.	B212R1
4. CP&L plans to develop a long term program for inspecting/cleaning the suppression pools based on the inspections performed during the B212R1 outage in the spring of 1996.	B111R1