



Carolina Power & Light Company

Brunswick Steam Electric Plant
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May 29, 1983

Mr. James P. O'Reilly, Administrator
U. S. Nuclear Regulatory Commission
Region II, Suite 3100
101 Marietta Street N.W.
Atlanta, GA 30303

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USNRC REGION II
ATLANTA, GEORGIA

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-324
LICENSE NO. DPR-62

SUPPLEMENT TO SPECIAL REPORT PER APPENDIX B SPECIFICATION 2.5.2.e

Dear Mr. O'Reilly:

This supplemental report provides clarity to our previous special report.

During Unit No. 2 power operation at 2330 on May 9, 1983, the duty Shift Operating Supervisor observed that both main condenser steam jet air ejector off-gas radiation monitors A and B were not indicating as expected for that power level. An investigation revealed both monitors were inoperable due to closure of the root isolation valves to each monitor, 2-OG-V35 and 2-OG-V36. The inoperability of these monitors renders the automatic closure capability of the Off-Gas System discharge valve inoperable. Whenever these monitors are inoperable, technical specifications require placing the affected unit into hot shutdown within 24 hours of the event discovery. From initial startup of the main condenser steam jet air ejectors to discovery of this event, a total of 25.5 hours had elapsed.

Chronological Reconstruction of Events
Leading to Isolation of 2-OG-V35 and 2-OG-V36

<u>Date</u>	<u>Time</u>	<u>Event</u>
4/10/83	0217	Clearance 2-506 hung for Plant Modification 80-228B (Off-Gas System Modification) which included 30 Off-Gas System, service air, and augmented off-gas (AOG) valves.

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<u>Date</u>	<u>Time</u>	<u>Event</u>
4/17/83	Day Shift	Clearance 2-506 was partially restored. This action should have restored 21 valves to their original position and this action would constitute a <u>return to service</u> of the Off-Gas System. Included in this clearance restoration was placing valves V33, V34, V35, and V36 to the open position.
4/25/83	0403	Startup of Unit No. 2 was in progress. SJAE was started briefly (for a few minutes only), but could not be maintained on line due to low pressure and Group 1 isolations (main steam line isolation valve closures). Unit No. 2 was then subsequently placed in shutdown.
4/26/83		Trouble ticket 2M-83-1477 was written by Chemistry for low flow condition annunciated for the SJAE monitor. This trouble ticket was eventually canceled because this condition was normal for a shutdown unit and no work was ever performed.
4/29/83	0235	Clearance 2-506 was canceled and replaced by clearance 2-506A. This resulted in two additional valves being added to the original clearance.
5/08/83	2200	Unit No. 2 startup was in progress and SJAE A and B were placed in half-load by the Control Operator (CO). It was not noted if the annunciator for hi-lo flow cleared. However, it was later noted that the annunciator for hi-lo flow was still present. This was judged by the CO not to warrant immediate action because of past problems with these monitors due to condensation in the sample lines and due to low steam pressure (which would require 30 minutes to 1 hour to clear). Also, difficulty was encountered with placing the air ejector in service due to valves not performing as required (V2, V55, and V56 [loop seal drains]).
5/08/83	2330	
5/09/83	2330	Three different shifts assigned to the unit startup failed to identify the isolation of the SJAE monitors. The annunciator, although recognized, was not made a turnover item requiring follow-up. Several indications were available to make this determination: (1) The abnormally low reading for the SJAE monitors (specifically, shifts from 0800 to 2330 on May 9, 1983).

<u>Date</u>	<u>Time</u>	<u>Event</u>
5/08/83	2330	
5/09/83	2330	(2) Failure of the SJAE monitor reading to increase with the reading on the main stack monitor or the main steam line radiation monitors (specifically, shifts from 0800 to 2330) during power ascension.
(cont'd)		(3) The continued presence of the annunciator indicating off-gas monitor hi-lo flow.
		(4) Recording in the Daily Surveillance Report (DSR) of virtually the same reading for the SJAE monitor for five shifts even though power had increased from 0 percent to approximately 55 percent power. Five shifts, from startup to when the problem was identified, had taken data; and the last shift prior to 2330 on May 9, 1983, should have identified the problem of low SJAE readings.
5/09/83	2330	Shift turnover was in progress when the Shift Operating Supervisor (SOS) identified the low readings on the SJAE monitor. The duty SOS and the oncoming SOS discussed this, and the oncoming SOS assigned the resolution of low readings to the Unit No. 2 Shift Foreman. Shift turnover then continued for all personnel.
5/10/83	0045	Shift turnover was completed. (This was a long turnover due to a large number of ongoing actions related to the startup.) The duty Unit No. 2 CO was assigned to personally investigate the cause of the low SJAE monitor reading by the Unit No. 2 Shift Foreman. A channel check was performed on the monitors and a comparison with backpanel indication was made. No failure of recorders or other Control Room hardware was indicated.
5/10/83	0100	The duty Unit No. 2 CO verified local flow at the SJAE monitors to be approximately 3.5-5.5 cfm. Subsequent discussions with the duty Chemistry technician indicated normal flow should be from 12-15 cfm. The low indicated flow resulted in investigation of condensation and plugging in the lines. (A history of condensation and

<u>Date</u>	<u>Time</u>	<u>Event</u>
5/10/83	0100 (cont'd)	line plugging existed and was felt to be the most probable cause of the problem. This was based upon operator experience.) At this point, solenoid valves 2-OG-SV-7051 and 2-OG-SV-7050 were also verified to be energized and full open. The manual isolation valves V35 and V36 were not checked at this time. Local flow indication was adjusted and normal flow was established. This flow was likely the result of in-leakage into the piping. There was present in each SJAE room evidence of past attempts for leak detection (i.e., can of leak teck, a trouble ticket for in-leakage, etc.).
5/10/83	0245	The SJAE monitor charts were compared with the flux tilt monitor (an additional linear SJAE monitor) and the main stack monitor. This revealed that: (1) No range changes had been made on the flux tilt monitor. At the present power level, three range changes should have been performed. (2) The air ejectors were not increasing with the main stack monitor.
5/10/83	0315	A no flow condition was determined to exist to the SJAE monitor. System drawings for the SJAE monitor were reviewed. Subsequently, the duty Unit No. 2 CO proceeded to verify the position of the V35 and V36 valves.
5/10/83	0350	Valve V35 was opened after being found closed.
5/10/83	0400	Valve V36 was opened after being found closed. All Control Room indications returned to normal including the clearing of the hi-lo flow annunciator for SJAE monitors and SJAE monitor indications. Times are confirmed by SJAE charts.

Corrective Action Taken and Action to be Taken to Prevent Recurrence

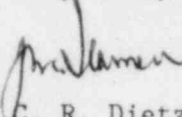
1. On-shift Operations personnel, excluding Radwaste and Fire Protection, were immediately counseled as to the importance of properly positioning valves and other plant equipment and on the importance of strict adherence to the clearance procedure. This was accomplished by the Operations on-shift training program. Additionally, each of these on-shift Operations personnel has also been counseled about awareness of indications available and the necessity to review and initial charts on each shift. A complete audit of clearances issued during the recent Unit No. 2 outage (April 10 through May 8, 1983) was performed.

2. Personnel involved with this incident will have their individual performance reviewed for possible disciplinary action, employee counseling, and possible training or retraining.
3. Specific requirements for review of annunciator status has been established which requires updating each shift. A revision to the Control Operators' Checksheet will be made to reflect this requirement.
4. The clearance procedure will be reviewed and revised as required to provide auditability. It is desirable that all steps of the clearance procedure be auditable and that equipment condition (i.e., valve position) be determinable and the time and date of such manipulations be documented.
5. A review of General Procedure 01 will be conducted to assure that Operations management is aware of the details of major maintenance. The Operations Engineering staff will be used to evaluate major maintenance performed on equipment and communicate potential areas of concern with each shift's management.
6. The potential for in-leakage into the off-gas sampling lines appears to be small compared with sample off-gas flow to the SJAЕ monitor chamber, but a full evaluation of this will be made to the satisfaction of the Plant Nuclear Safety Committee.

Data prior to the reactor shutdown was very similar to data following the SJAЕ event on May 10, 1983, which indicates that the health and safety of the public was not affected by this event.

<u>Parameter/Date</u>	<u>Preshutdown</u> <u>April 3, 1983</u>	<u>Poststartup</u> <u>May 11, 1983</u>
Power	98 percent	90 percent
I-131 Dose Equivalent	$1.781 \text{ E}^{-2} \text{ } \mu\text{Ci/ml}$	$1.235 \text{ E}^{-2} \text{ } \mu\text{Ci/ml}$
Stack Release Rate	$4.017 \text{ E}^{-2} \text{ } \mu\text{Ci/sec}$	$2.119 \text{ E}^{-2} \text{ Ci/sec}$
SJAЕ Monitor	$33,780 \text{ } \mu\text{Ci/sec}$ (April 8, 1983)	$26,604 \text{ } \mu\text{Ci/sec}$ (May 12, 1983)

Very truly yours,


C. R. Dietz, General Manager
Brunswick Steam Electric Plant

RMP/joh/LETGC4

cc: Mr. R. C. DeYoung
NRC Document Control Desk