



Carolina Power & Light Company

Brunswick Nuclear Project  
P. O. Box 10429  
Southport, NC 28461-0429  
May 31, 1991

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10CFR21

Mr. Stewart D. Ebnetter, Administrator  
NRC Region II  
101 Marietta Street, N. W.  
Atlanta, Georgia 30323

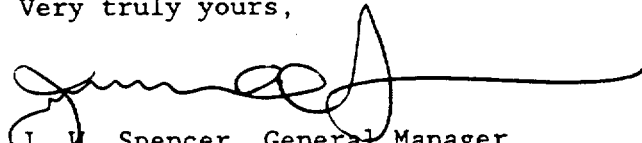
BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 AND 2  
DOCKET NO. 50-325 AND 50-324  
LICENSE NO. DPR-71 AND DPR-62  
NOTIFICATION OF A 10CFR21 REPORTABLE OCCURRENCE

Dear Mr. Ebnetter:

This confirms the telephone conversation at 1610 on May 24, 1991, between Mr. H. Christensen (of your staff) and Mr. Michael Foss (of my staff) which satisfied the requirements of 10CFR21 reporting criteria. It reported an apparent defect in a Diesel Generator 4kV output breaker manufactured by ITE Imperial Corporation/Asea Brown Boveri (ABB). ABB is aware that we are reporting this as a 10CFR21 concern.

If you have any questions regarding this matter please contact me at 919-457-2210 or Keith Ahern at 919-457-2404.

Very truly yours,



J. W. Spencer, General Manager  
Brunswick Nuclear Project

TMJ/

Enclosure

cc: Director, Office of Nuclear Reactor Regulation  
Mr. H. O. Christensen  
Mr. N. B. Le  
Mr. R. L. Prevatte

10CFR21 Report  
(Brunswick Evaluation Number 91-012)

INITIATING EVENT

04-27-91

Diesel Generator (DG) #2 4kV generator output breaker did not close while racked to the test position when an attempt was made to close it prior to performing a DG test. The charging circuit activated and energized the charging springs motor, but the springs did not charge.

*2 instances*

Additionally, subsequent to the referenced event, a similar problem was found on a non-safety related breaker grounding assembly.

BREAKER DATA

Manufacturer: ITE Imperial Corporation/Asea Brown Boveri (ABB)  
Model: 5HK350, 1200 amp, safety related breaker  
Serial #: 47219-G2-1-5C

*Sanford, FL?*

ROOT CAUSE

Incorrect assembly of the sub-assembly for the two holding pawls. Three charging pawls were installed instead of two holding pawls and one charging pawl. This is a "deviation" as defined by 10CFR21.

PROBLEM

A charging pawl, two holding pawls and a ratchet gear make up the ratchet assembly which drives the charging mechanism. The incorrect assembly resulted in the holding pawls being mis-aligned and only meshing with the face of the ratchet plate teeth by about 50%. As a result, the ratchet plate teeth were effectively experiencing double their normal loading, causing one tooth to break which then prevented the "holding pawl" from engaging.

Manual charging is not effected by this problem. Therefore, this will not prevent a circuit breaker from closing when it has been manually charged. Also, it will not prevent a breaker from tripping. However, when this problem exists, the charging spring motor may not charge the springs after a breaker closes and, if the breaker were to trip, the breaker could not automatically re-close.

10CFR21 EVALUATION SUMMARY

On May 5, 1991, it was determined that this condition is a "defect", as defined in 10CFR21 and is reportable pursuant to 10CFR21. This determination was based on the following scenario:

Testing is being performed which has a DG output breaker closed, powering its associated emergency bus (E bus). This condition exists, the ratchet tooth breaks and the charging springs fail to be charged (ie; compressed). During the testing, a loss of off-site power occurs. As designed, the loss of offsite power results in stripping of the E bus loads and tripping of the DG output breaker. Since the charging springs have not been automatically re-charged, the DG output breaker can not automatically close to power the E bus resulting in a loss of that E bus and associated systems. Additionally, a single failure occurs in conjunction with this event, in that another DG fails, resulting in the loss of both of a unit's E busses.

Loss of both of a unit's E busses could create a "Substantial Safety Hazard" as defined in 10CFR21 and results in the determination that the "deviation" represents a defect within the meaning of 10CFR21.

#### NUMBER AND LOCATION OF SUCH COMPONENTS AT BRUNSWICK

Attachment 1 is a listing of the 55 safety related breakers currently installed on the 4kV E buses at Brunswick Units 1 and 2. An additional 72 non-safety related breakers are also currently in use at the Brunswick Units. There are no spare breakers currently at the site, an additional 3 safety related and 2 non-safety related are being ordered.

#### CORRECTIVE ACTIONS

The defective breaker was replaced and the original was sent to ABB for root cause determination.

To date, 21 of the 55 safety related breakers currently installed have been inspected for incorrect assembly of the holding pawl sub-assembly and none were identified with the incorrect assembly.

DG's 1, 3 and 4 output breakers were included in the above inspection. The 4kV breaker which was installed to replace the DG 2 failed output breaker remains to be inspected. It is scheduled to be inspected on June 3, 1991.

During the performance of scheduled preventative maintenance, the remaining safety and non-safety related 4kV breakers at the Brunswick Plant will be inspected to determine if the assembly problem exists.

*Call licensee to  
obtain results  
of inspecting  
remaining breakers*

## ATTACHMENT 1

## BUS E1

COMPT	DESCRIPTION	PAWLS INSPECTED
AG1	Tie To Bus E2	YES
AG0	Tie To Bus E3	YES
AF9	NUC SW Pmp 1A	YES
AF8	Feed To Sub E5	NO
AF7	Conv. SW Pmp 1B	YES
AF6	Conv. SW Pmp 2C	YES
AF5	RHR Pmp 2C	YES
AF4	RHR SW Pmp 2C	NO
AF3	CRD Pmp 1A	NO
AF2	CS Pmp 1A	NO
AF1	RHR SW Pmp 1C	NO
AF0	RHR Pmp 1C	NO
AE9	DG 1 Output	YES
AE6	Line From Bus 1D	NO

## BUS E2

COMPT	DESCRIPTION	PAWLS INSPECTED
AH9	Tie to Bus E4	YES
AH8	Tie To Bus E1	YES
AH7	Fire Pmp Norm. Feed	YES
AH6	NUC SW Pmp 1B	YES
AH5	RHR Pmp 1D	NO
AH4	RHR SW Pmp 1D	NO
AH3	CRD Pmp 1B	NO
AH2	Conv. SW Pmp 1C	NO
AH1	Feed to Sub E6	NO
AH0	CS Pmp 1B	NO
AG9	RHR Pmp 2D	NO
AG8	RHR SW Pmp 2D	NO
AG7	DG 2 Output	NO
AG4	Line From Bus 1C	NO

## ATTACHMENT 1

## BUS E3

COMPT	DESCRIPTION	PAWLS INSPECTED
AJ6	Tie To Bus E4	YES
AJ5	Tie To Bus E1	YES
AJ4	Conv. SW Pmp 2A	YES
AJ3	NUC SW Pmp 2A	NO
AJ2	CRD Pmp 2A	NO
AJ1	RHR Pmp 2A	YES
AJ0	Feed To Sub E7	NO
AI9	RHR SW Pmp 1A	NO
AI8	RHR Pmp 1A	NO
AI7	RHR SW Pmp 2A	NO
AI6	CS Pmp 2A	NO
AI5	DG 3 Output	YES
AI2	Line From 2D	NO

## BUS E4

COMPT	DESCRIPTION	PAWLS INSPECTED
AL5	Tie to E2	YES
AL4	Tie to E3	YES
AL2	Conv. SW PMP 2B	NO
AL1	NUC SW Pmp 2B	YES
AL0	RHR Pmp 1B	NO
AK9	RHR SW Pmp 1B	NO
AK8	CRD Pmp 2B	NO
AK7	Feed To Sub E8	NO
AK6	Conv. SW Pmp 1A	YES
AK5	CS Pmp 2B	NO
AK4	RHR SW Pmp 2B	NO
AK3	RHR Pmp 2B	NO
AK2	DG 4 Output	YES
AJ9	Line From Bus 2C	NO