

## LICENSEE EVENT REPORT

CONTROL BLOCK:

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 N C B E P 1 2 0 0 - 0 0 0 0 - 0 0 3 4 1 1 1 1 4 5  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

CON'T

0 1 REPORT SOURCE L 6 0 5 0 - 0 3 2 5 7 0 4 2 6 8 3 8 0 5 2 4 8 3 9  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 During a Unit No. 1 refueling outage, while performing periodic switchgear trip  
0 3 testing on plant 230 kV bus 1A, a Unit No. 1 loss of off-site power occurred when 230 kV  
0 4 bus 1B was inadvertently tripped. The four diesel generators auto started and diesels  
0 5 1&2 tied onto their respective emergency buses. Soon thereafter, a fire was reported  
0 6 in 4160/480 transformer between emergency bus E-2 and E-6. The E-6 bus was deenergized,  
0 7 the transformer isolated, and the bus reenergized by cross-tying with bus E-5. This  
0 8 event did not affect the public health and safety.

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

0 9 SYSTEM CODE E B 11 CAUSE CODE A 12 CAUSE SUBCODE X 13 COMPONENT CODE Z Z Z Z Z Z Z 14 COMP. SUBCODE Z 15 VALVE SUBCODE Z 16  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

17 LER/RO REPORT NUMBER 8 3 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Personnel performing the switchgear trip testing failed to properly clear bus 1A for  
1 1 testing and tripped bus 1B by actuating a switchgear trip relay which is common to  
1 2 both buses. The trip signal was cleared and off-site power was restored to Unit No. 1.  
1 3 The E-6 transformer, Type V9, Specification No. 21122-301, was replaced. Additional  
1 4 corrective actions have been or will be performed in relation to these events.

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 5 FACILITY STATUS H 28 % POWER 0 0 0 29 OTHER STATUS NA 30 METHOD OF DISCOVERY A 31 DISCOVERY DESCRIPTION Operational Event 32  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 6 ACTIVITY CONTENT RELEASED OF RELEASE Z 33 Z 34 AMOUNT OF ACTIVITY NA 35 LOCATION OF RELEASE NA 36  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 7 PERSONNEL EXPOSURES NUMBER 0 0 0 37 TYPE Z 38 DESCRIPTION NA 39  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 8 PERSONNEL INJURIES NUMBER 0 0 0 40 DESCRIPTION NA 41  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 9 LOSS OF OR DAMAGE TO FACILITY TYPE Z 42 DESCRIPTION NA 43  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

2 0 PUBLICITY ISSUED N 44 DESCRIPTION NA 45  
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

NAME OF PREPARER

R. M. Poulk, Jr.

PHONE: (919) 457-9521

LER ATTACHMENT - RO #1-83-23

Facility: BSEP Unit No. 1

Event Date: April 26, 1983

Initial Site Conditions Prior To Event

Unit No. 1:

Unit No. 1 was in a refueling outage with the reactor vessel head removed, the reactor cavity flooded, and the fuel pool gates removed. The unit torus was drained and undergoing major modification work. The unit 230 kV bus 1A was under equipment clearance for periodic bus switchgear trip testing.

Unit No. 2:

Unit No. 2 was in reactor startup at 150 psi and 2 percent thermal power.

Chronological Description of Event

<u>Time</u>	<u>Happening and Consequence</u>
1431	A Unit No. 1 loss of off-site power occurred when 230 kV bus 1B was inadvertently tripped. As a result, all four plant emergency diesel generators automatically started with diesel generators Nos. 1 and 2, respectively, tying on plant emergency buses E-1 and E-2 which had deenergized when bus 1B tripped.
1435	A fire was discovered in the plant emergency bus 480 V E-6 switchgear transformer and was extinguished.
1439	The E-6 bus was manually deenergized.
1448	Normal power supply to plant emergency buses E-1 and E-2 was reestablished and the process of securing the plant emergency diesel generators to normal standby readiness was performed.
1451	The plant was secured from a fire alarm condition which had affected the E-6 transformer.
1500	An unusual event was declared and required notifications were made because of the fire.
1510	Began cross-tying plant electrical loads normally supplied from E-6 with plant emergency bus E-5.
1520	Cross-tying of all E-6 loads with E-5 completed.

LER ATTACHMENT - RO #1-83-23 (Cont'd)

Facility: BSEP Unit No. 1

Event Date: April 26, 1983

Direct Effects of the Event

1. Unit No. 2 was rendered into a Limiting Conditions for Operation (LCO) due to the loss of E-6 which made Unit No. 2 B RHR loop suppression pool cooling and B RHR loop LPCI inoperable for two hours and seven minutes until the E-6 loads were cross-tied with E-5. A subsequent shutdown of Unit No. 2 occurred as a direct result of the loss of E-6 (Technical Specification 3.8.2.1).
2. The Unit No. 1 refueling outage was impacted due to additional equipment repairs which resulted from the E-6 transformer fire.

Summary of the E-6 Transformer Failure Analysis

A failure analysis of the transformer, Brown Boveri Serial No. 21122-B01, was conducted by the plant Engineering Subunit, the Carolina Power & Light Company Harris Metallurgical Unit, and the transformer manufacturer representative.

Following the loss of off-site power to E-6, the plant emergency diesels automatically started and the subsequent initial current flow to the transformer C phase initiated major arcing in the lower lug of the E-6 4160 volt primary lead at the tap collector bar.

It is felt the arcing began as a result of broken cable strands in the bore of the primary lug. The broken cable strands, which are aluminum, are attributed to either overtightening of the lug setscrew or mechanical stressing of the cable where it enters the lug. The arcing was most likely long-term in nature, where the lug had become weakened and degraded over an extended, undetermined period of time. The sudden initial current flow through the lug which occurred when E-6 was reenergized then caused the failure to initiate.

Due to the arcing, the lower portion of the lug melted. This then propagated to the transformer tap collector bar where approximately two-thirds of the bar was melted and/or vaporized. During this time period, the E-6 C phase coil became damaged, which then caused arcing from the remaining tap collector bar to the exposed coils and/or arcing between C phase coils. The 4160 volt primary feeder cable then broke away from the lug which then allowed the arc to propagate to a support lug common to the transformer B phase. At this time, it is felt the transformer feeder tripped due to overcurrent on the transformer C phase approximately six and one-half minutes after the loss of off-site power.

LER ATTACHMENT - RO #1-83-23 (Cont'd)

Facility: BSEP Unit No. 1

Event Date: April 26, 1983

Due to the extent of damage to the E-6 transformer C phase coil, it was replaced with a suitable transformer which was placed into service. In addition, a plant special procedure was developed and performed which inspected the electrical jumpers and pigtailed on the plant emergency bus transformers to assure they were "equal to" or "better than" original condition.

An investigation of the loss of off-site power event which led to the failure of E-6 is in progress. Following completion of this investigation, a supplement to this report outlining the results of the investigation and corrective actions associated with it will be submitted.



Carolina Power & Light Company

Brunswick Steam Electric Plant  
P. O. Box 10429  
Southport, NC 28461-0429

May 24, 1983

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SERIAL: BSEP/83-1567

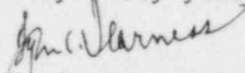
Mr. James P. O'Reilly, Administrator  
U. S. Nuclear Regulatory Commission  
Region II, Suite 3100  
101 Marietta Street N.W.  
Atlanta, GA 30303

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1  
DOCKET NO. 50-325  
LICENSE NO. DPR-71  
LICENSEE EVENT REPORT 1-83-23

Dear Mr. O'Reilly:

In accordance with Section 6.9.1.9b of the Technical Specifications for Brunswick Steam Electric Plant, Unit No. 1, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREG-0161, July 1977.

Very truly yours,

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

RMP/gvc/LETGC4

Enclosure

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

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