



Carolina Power & Light Company

Brunswick Nuclear Plant  
P. O. Box 10429  
Southport, N.C. 28461-0429

MAR 25 1993

FILE: B09-13510C  
Serial: BSEP-93-0043

10CFR50.73

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1  
DOCKET NO. 50-325  
LICENSE NO. DPR-71  
SUPPLEMENT TO LICENSEE EVENT REPORT 1-92-016

Gentlemen:

In accordance with Title 10 of the Code of Federal Regulations, 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 submitted in accordance with the format set forth in NUREG-1022, September 1983.

Very truly yours,

C. C. Warren, Plant Manager - Unit 2  
Brunswick Nuclear Plant

SPT/

Enclosure

cc: Mr. S. D. Ebnetter  
Mr. P. D. Milano  
BSEP NRC Resident Office

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## LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Brunswick Steam Electric Plant, Unit 1

DOCKET NUMBER (2)

05000325

PAGE (3)

1 of 4

TITLE (4)

Fire Seals Around Diesel Generator Pedestals Outside Technical Specifications

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	22	92	92	- 16 -	01	03	26	93	Brunswick Unit 2	05000324
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	04	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)							
POWER LEVEL (10)	00	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)	
		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)	
		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vi)		OTHER	
		20.405(a)(1)(iii)	X	50.73(a)(2)(ii)		50.73(a)(2)(viii)(A)		(Specify in Abstract and Text)	
		20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)			
		20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)			

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Steve F. Tabor, Regulatory Compliance Specialist

TELEPHONE NUMBER

(919) 457-2178

## COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

## SUPPLEMENTAL REPORT EXPECTED (14)

YES		X		NO		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
If yes, complete EXPECTED SUBMISSION DATE:									

## ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewritten lines) (16)

On April 2, 1992, plant management requested that Technical Support (TS) inspect the Rodofam 300 seals around the four emergency diesel generator (EDG) pedestals which appeared to be soaked with petroleum products. A request was made to the Nuclear Engineering Department (NED) to evaluate the effect of the oil on the seals and to provide corrective actions for the problem of the leaking oil from the collection system. A work request was also initiated to replace the seals. It appears that Rodofam 300 was used at Brunswick Steam Electric Plant initially as a seismic joint filler material and later qualified as fire barrier material in some applications. Later discussions with the vendor indicated that while the material may not support combustion until 700 degrees, it will begin to soften and melt at temperatures as low as 150 degrees fahrenheit. If the material melted, it could potentially impact cable trays located below the gap; therefore, a fire barrier application in this case is not acceptable. A design change will be developed and implemented on all four diesel generator oil collection trenches to prevent oil seepage into the seismic gap seals. A design change will be developed and implemented on the diesel generator pedestal seals to specify a three hour rated fire seal. In the event of a fire on the elevation of the EDGs, the Rodofam seals could potentially melt and drip to the elevation below prior to reaching combustion temperature. Compensatory fire watches were established as required.

The status of corrective actions is provided in the supplemental information section of Supplement One to this LER.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

TITLE

Fire Seals Around Diesel Generator Pedestals Outside Technical Specifications

INITIAL CONDITIONS

On April 2, 1992, at 1710 hours, Unit 1 was at 100 % reactor power and Unit 2 was at 80% reactor power.

EVENT NARRATIVE

On April 2, 1992, plant management requested that Technical Support (TS) inspect the Rodofam 300 seals around the four emergency diesel generator (EDG) pedestals which appeared to be soaked with petroleum products. Upon inspection, the TS team determined that the seals were in fact saturated with oil. The EDG skids contain collection systems which route oil to a tank. These systems were found to be leaking into the seal around the EDG pedestal. Conservatively, a seven day fire barrier Limiting Condition of Operation (LCO) and a work request were initiated on each of the four EDG seals (4 LCOs). Appropriate fire watches were established at that time. A request was made to the Nuclear Engineering Department (NED) to evaluate the effect of the oil on the seals and to provide corrective actions for the problem of the leaking oil from the collection system. A work request was also initiated to replace the seals. Because it had not been determined whether the seals were actually 10CFR50, Appendix A and/or R seals and if so whether or not the seals were inoperable, the active LCOs were transferred to short term tracking LCOs until an operability determination could be made by NED. The fire watches were removed when the LCOs were transferred to tracking. On April 20, 1992, both units 1 & 2 were shutdown due to non-related issues. On May 22, 1992, NED determined that the seals were inoperable and were 10CFR50 Appendix A and R seals. The tracking LCOs were transferred back to active LCOs with re-establishment of fire watches. On May 29, 1992, the LCOs exceeded seven days and a special report was issued.

CAUSE OF EVENT

It appears that Rodofam 300 was used at Brunswick Steam Electric Plant initially as a seismic joint filler material and later qualified as fire barrier material in some applications. It appears that the initial analyses were based on the properties of Rodofam II material (a cross-linked polyethylene plastic) which has dissimilar material composition than Rodofam 300. Rodofam 300 is a polyvinyl chloride plastic.

The seals around EDG pedestals function as a seismic gap seal and a fire barrier seal. In 1985, an engineering evaluation was performed on the qualification of these seals as fire barriers. At that time, they were deemed acceptable. The evaluation was based on a Rodofam 300 combustion temperature of 700 degrees. The evaluation did not take into account the effect of oil leakage on the seals.

In 1989, a nonconformance report was issued on the improper use of Rodofam 300 as a fire barrier in the Emergency Core Cooling System/Reactor Core Isolation Cooling (ECCS/RCIC) piping penetration room. The ensuing nonconformance report determined that Rodofam 300 is not a tested fire seal. Records indicate that it was recognized that the Rodofam 300 was installed around the diesel generator pedestals but had been previously evaluated in 1985 and found to be acceptable "as is".

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

Later discussions with the vendor indicated that while the material may not support combustion until 700 degrees, it will begin to soften and melt at temperatures as low as 150 degrees fahrenheit. If the material melted, it could potentially impact cable trays located below the gap; therefore, a fire barrier application in this case is not acceptable.

CORRECTIVE ACTIONS

A design change will be developed and implemented on all four diesel generator oil collection trenches to prevent oil seepage into the seismic gap seals.

A design change will also be developed and implemented on the diesel generator pedestal seals to specify a three hour rated fire seal.

NED will perform a 10% sampling of fire protection seal evaluations to verify sound technical bases have been applied.

NED will review other engineering evaluations which address the use of the Rodofam seal material to determine if the conclusions are acceptable.

SAFETY ASSESSMENT

In the event of a fire on the elevation of the EDGs, the Rodofam seals could potentially melt and drip to the elevation below prior to reaching combustion temperature. In this case, Rodofam material and hot oil could affect the cable trays below. In the event of a fire in the lower elevation, the rising heat could melt the Rodofam and potentially allow Halon to escape the lower area, thereby reducing the Halon concentration and fire suppression capability. Compensatory fire watches were established as required.

PREVIOUS SIMILAR EVENTS

LER 2-83-095 - Fire barrier did not meet criteria.

EIIS COMPONENT IDENTIFICATIONSystem/ComponentEIIS Code

\*\*\* NONE

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

SUPPLEMENTAL INFORMATION

The following is a status of the corrective actions delineated in Revision 0 to this LER:

To support the design change process necessary to prevent oil seepage into the diesel generator seismic gap seals and to upgrade the diesel generator pedestal fire seals to a three hour rated seal, a pilot plan was developed for the Emergency Diesel Generator #4. The plan was designed to determine if the Rodofam material and steel perimeter angle could be removed without affecting diesel operability. Removal of the Rodofam installed around the Emergency Diesel Generator #4 pedestal and associated steel perimeter angle has been completed. The Rodofam material and steel perimeter angle were removed successfully without affecting diesel operability.

Additionally, Plant Modification (PM) 92-90 has been developed and approved for implementation. This modification provides the new design requirements for all four Emergency Diesel Generator pedestals, including qualified fire sealing materials, redesign of the oil collection pan where the major leakage onto the original seal material occurred, and repair details for other areas where leakage could occur in the future.

The new fire seal design has been installed around the Emergency Diesel Generator #4 pedestal in accordance with PM-92-090. Correction of the oil leakage on the four Emergency Diesel Generators and installation of qualified fire seals for the remaining Emergency Diesel Generators is scheduled to be worked in series and completed by December 31, 1993. Compensatory measures in accordance with the Technical Specifications will remain in effect until each fire seal is replaced and declared operable.

To verify that sound technical bases was applied in the development of other fire protection seal evaluations, the Nuclear Engineering Department performed a review of a 10% sample of fire protection seal evaluations. This review identified concerns associated with the level of technical justification provided in two of the evaluations reviewed. Based on these identified concerns, the Nuclear Engineering Department expanded the review to include the remaining 90% of fire seal evaluations. This review will be completed by October 4, 1993.

Additionally, the Nuclear Engineering Department has completed a review of the other engineering evaluations which address the use of Rodofam seal material. This review revealed that although the conclusions of these evaluations are acceptable, one evaluation did not address the fact that the Rodofam material melts at temperatures less than 400 degrees Fahrenheit. This evaluation will be revised as part of the review addressed in the preceding paragraph.