CP&L
Carolina Power & Light Company

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

MAY 2 2 1992

FILE: B09-13510C 10CFR50.73

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1 AND 2
DOCKET NO. 50-325 AND 50-324
LICENSE NO. DRP-71 AND DPR-62
LICENSEE EVENT REPORT 1-92-012
AND
NOTIFICATION OF A 10CFR21 REPORTABLE OCCURRENCE

Gentlemen:

In accordance with Title 10 of the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report is submitted in accordance with the format set forth in NUREG-1022, September 1983. This report is being submitted a day beyond the required thirty days and this delay was communicated by telephone to Robert Carrol at the NRC regional office.

This notification also supplies the information required for 10CFR21 reporting. A notification was made by telephone at 1601 hours on April 24, 1992, between Mr. Scarfo (of your staff) and Mr. Godley (of my staff) which satisfied the initial 10CFR21 reporting criteria. It reported that, during initial Plant construction, defectively installed bolting of Emergency Diesel Generator Building internal wall seismic supports occurred. The 10CFR21 Evaluation/Notification review was completed April 22, 1992, and was presented to the Plant Nuclear Safety Committee on April 24, 1992. The Plant General Manager, and the Vice President Brunswick Nuclear Project were notified on April 24, 1992.

Very truly yours,

J. W. Spencer, General Manager
Brunswick Nuclear Project

GMT/gmt

Enclosure

cc: Mr. S. D. Ebneter
Mr. R. H. Lo
Mr. R. L. Prevatte

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NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Brunswick Steam Electric Plant Unit 1	05000325	1

TITLE (4) EMERGENCY DIESEL GENERATOR BUILDING INTERNAL WALL SEISMIC SUPPORT BOLTING WAS DEFECTIVELY INSTALLED DURING PLANT CONSTRUCTION

EVENT DATE (5)			LER NUMBER (6)					REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQ. NO.		REV. NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	21	92	92	-	012	-	00	05	22	92	BSEP Unit 2	500324

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9)	1		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)
POWER LEVEL (10)	100		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)	X	OTHER (Specify in Abstract and Text)
			20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	X	10CFR21
			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)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Glen M. Thearling, Regulatory Compliance Specialist	(919) 457-2038

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)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
Y	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		06	30	92

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

An April 4, 1992, inspection of the Emergency Diesel Generator (EDG) Building masonry block walls found a substantial number of anchor bolts for the walls' seismic supports had not [illegible]en installed per plant drawings. Preliminary evaluation determined that this did not make [illegible] walls inoperable. The scope of the inspections was expanded. On April 7, 1992, the [illegible]ion of the anchor bolting of a masonry block wall between EDG #4 and its associated Emergency (E) Bus resulted in EDG #4 being declared inoperable because of seismic concerns. The seismic integrity was restored on April 12, 1992. At 0210 on April [illegible]th Unit 1 operating at 100% reactor power and Unit 2 at 78% reactor power, a [illegible]e wall (9D-1) between the #1 EDG and the 480 volt E6 Bus was declared [illegible] to the condition of the wall's seismic support anchor bolting. The continuing [illegible]ined at 0420 on April 21, 1992, that the condition of wall 9D-1 also [illegible]ant E5 Bus. This required that Technical Specification 3.0.3 be entered. [illegible] verbally granted a four hour waiver of compliance to provide [illegible]air the wall. Subsequently, it became apparent that other walls in [illegible]kely to cause operability concerns and CP&L concluded shutdown was [illegible]tent and location of the defective anchor bolting this is 10CFR21 [illegible]on into the extent of this issue is still in progress. Brown and [illegible]onstructor of the Brunswick plant during the early to mid-1970's [illegible]tion is believed to have occurred. Repairs co re-establish [illegible]alls are continuing as problems are found. A probabilistic [illegible]here was a small increase in the estimated core damage

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			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)	X	OTHER (Specify in Abstract and Text)
			20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	X	10CFR21
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewritten lines) (16)

An April 4, 1992, inspection of the Emergency Diesel Generator (EDG) Building masonry block walls found a substantial number of anchor bolts for the walls' seismic supports had not been installed per plant drawings. Preliminary evaluation determined that this did not make the walls inoperable. The scope of the inspections was expanded. On April 7, 1992, the condition of the anchor bolting of a masonry block wall between EDG #4 and its associated 480 volt Emergency (E) Bus resulted in EDG #4 being declared inoperable because of seismic integrity concerns. The seismic integrity was restored on April 12, 1992. At 0210 on April 21, 1992, with Unit 1 operating at 100% reactor power and Unit 2 at 78% reactor power, a poured concrete wall (9D-1) between the #1 EDG and the 480 volt E6 Bus was declared inoperable due to the condition of the wall's seismic support anchor bolting. The continuing evaluation determined at 0420 on April 21, 1992, that the condition of wall 9D-1 also affected the redundant E5 Bus. This required that Technical Specification 3.0.3 be entered. At 0900 NRC Region II verbally granted a four hour waiver of compliance to provide sufficient time to repair the wall. Subsequently, it became apparent that other walls in the EDG Building were likely to cause operability concerns and CP&L concluded shutdown was warranted. Due to the extent and location of the defective anchor bolting this is 10CFR21 reportable. The investigation into the extent of this issue is still in progress. Brown and Root Inc. was the overall constructor of the Brunswick plant during the early to mid-1970's when the anchor bolt installation is believed to have occurred. Repairs to re-establish seismic qualification of the walls are continuing as problems are found. A probabilistic risk assessment has determined there was a small increase in the estimated core damage frequency.

TITLE: EMERGENCY DIESEL GENERATOR BUILDING INTERNAL WALL SEISMIC SUPPORT BOLTING WAS DEFECTIVELY INSTALLED DURING PLANT CONSTRUCTION

INITIAL CONDITIONS

On April 4, 1992, with Unit 1 at 100% and Unit 2 at 78% reactor power, an inspection of the Emergency Diesel Generator (EDG) Building masonry block walls found a substantial number of anchor bolts for the walls' seismic supports had not been installed per plant drawings (see Attachment 1 for a bolting detail sample). A preliminary evaluation determined that this condition did not make the walls inoperable. The scope of the inspections was expanded due to these findings.

EVENT NARRATIVE

On April 7, 1992, the condition of the anchor bolting of the masonry block wall (see attachment 2) between EDG #4 and its associated 480 volt Emergency Bus (E8) resulted in EDG #4 being declared inoperable.

The types of anchor bolting deficiencies identified at that point included:

- Bolt bodies cut off and welded either to inside or outside of angle supports with no hole drilled in concrete.
- Complete bolts installed, but welded to inside of angle supports with no anchor sleeves in concrete holes.
- Anchor bolts installed in angle supports and sleeves, but sleeves rotated in the holes.
- Bolt bodies cut and set in a partial holes with no sleeves, tack welded to angle supports.
- Washer plates welded on one or both sides of the wall with no through-wall bolts installed in between.
- Bolt holes with no bolts installed.

The significant number of anchor bolts that had been improperly installed during initial building construction on the interior masonry block wall invalidated the seismic integrity of the wall. The seismic integrity of the wall was restored on April 12, 1992.

At 0210 on April 21, 1992, a poured concrete wall (9D-1) between the #1 Emergency Diesel Generator (EDG) and the 480 volt Emergency Bus E6, was declared inoperable due to inadequate seismic support anchor bolting. The seismic support anchor bolting is similar to that used on masonry block walls. At 0420 it was determined that the condition of wall 9D-1 also affected the redundant Emergency Bus E5. This required that Technical Specification 3.0.3 be entered which required both units to be placed in HOT SHUTDOWN within 6 hours and COLD SHUTDOWN within the following 30 hours. At 0800, CP&L briefed NRR and NRC Region II regarding plans to repair EDG wall 9D-1 and to inspect four similarly constructed poured concrete walls in the EDG Building. CP&L requested a waiver of compliance to extend the shutdown constraints of Technical Specification 3.0.3 for a time sufficient to repair the 9D-1 wall. At 0900 NRC Region II verbally granted a four hour waiver of compliance. At approximately

1200, it became apparent that other walls in the EDG Building were likely to cause operability concerns and CP&L concluded that plant shutdown of both units was warranted. This decision was communicated to the NRC and plant shutdown commenced. CP&L subsequently requested and was granted a temporary Waiver of Compliance from Technical Specification 3.0.3 to allow a sequential and orderly shutdown of both units and to allow investigation of sources of Unit 1 drywell in-leakage. Due to the extent and location of the defective anchor bolting this is 10CFR21 reportable. The investigation into the extent of this issue to date indicates the fake anchor bolting installation is limited to the EDG Building, elevation 23 foot. Brown and Root Inc. was the overall constructor of the Brunswick plant during the early to mid-1970's when the anchor bolt installation is believed to have occurred. CP&L is still investigating to determine the construction group responsible for anchor bolt installation in the EDG Building. Repairs to re-establish seismic qualification of the walls are progress.

Field inspections of EDG building steel plated masonry block walls resulted in one wall being found inoperable and nine other walls "short-term" (i.e. degraded but will remain functional if subjected to the Design Basis Earthquake) seismically qualified. EDG building masonry block walls without steel plates were field inspected unless the anchor bolts were modified per IEB 80-11, Masonry Design (bolting was verified by IEB 80-11 documentation reviews). The inspection resulted in three unplated masonry block walls being degraded but "short term" seismically qualified. Inspections of EDG building poured concrete walls determined that five walls were inoperable.

Inspections/records evaluations were expanded to include the masonry block walls with anchor bolts in the Control Building and both Reactor Buildings. Fake anchor bolt installations did not affect the Control Building or Reactor Building walls but six Control Building stairwell walls, required to maintain the safety function of the Control Room Habitability Zone, were found to have been erroneously classified as non-safety-related during the IEB 80-11 masonry wall program. Analysis demonstrated that three walls meet seismic criteria in their existing condition with the remaining three walls being inoperable and requiring modification to meet seismic criteria.

CAUSE OF EVENT

The original construction of the seismic but non-safety related EDG building masonry block/poured concrete walls did not require inspection/installation documentation. As a result, no turnover documentation, installation records, or audit/inspection reports were found during approximately 500 hours of document searches conducted. Brown and Root Inc. was the overall constructor of the Brunswick plant during the early to mid-1970's when the anchor bolt installation is believed to have occurred. Turnover information was found for work completed in the EDG building by the Mechanical Services, Electrical, and Instrumentation organizations within Brown & Root's work force. Documentation was also available from Civil groups on concrete pours, but again, nothing concerning the installation of masonry walls was found. It appears from this review that Quality Assurance (QA) documentation does not exist for these masonry block/poured concrete walls.

CORRECTIVE ACTIONS

Masonry Block and Poured Concrete Walls

A 100% inspection/document review of anchor bolts installed during the original EDG Building masonry block and poured concrete wall construction for interior walls using anchor bolted seismic supports was completed. The Control Building and both Units' Reactor Buildings contain masonry walls that were included within the scope of the

expanded inspection/document reviews.

Repairs to re-establish seismic qualification of the walls are continuing as problems are identified. Walls identified as not having valid seismic qualification will be repaired prior to the affected Unit's reactor startup.

Other Anchor Bolt Applications

Pipe supports, raceway supports, building steel, and equipment foundation anchor bolt applications were assessed.

An audit of the previous IEB 79-02 evaluation of pipe supports concluded that no further inspections were warranted.

Previous work associated with raceway supports and building steel has not discovered defective anchor bolt installation.

Equipment foundation bolts are also not considered an issue, as large equipment normally employs embedded anchors and random samples of small equipment (decommissioning, corrosion refurbishment, and plant modification work) has not resulted in any fake anchor bolt installation being reported. A review of representative QA records for safety-related foundation supports will be conducted to insure proper installation is validated for foundation supports. If QA records cannot validate the proper installation of foundation anchors, a plan and a schedule for physical examination will be prepared.

A sampling plan has been developed. Walkdowns of a cross section of raceway, building steel, heating/ventilation/air conditioning, and equipment foundations in the Control, Reactor and EDG Buildings will be performed. The walkdown will review structural systems in each of these components for fake anchor bolt installations.

SAFETY ASSESSMEMT

The safety significance was initially considered high enough that both Units were placed in COLD SHUTDOWN per Technical Specification and the Emergency Busses were declared inoperable. This was based on the conservative assumption that, until the walls have been verified operable, a seismic event could damage redundant Emergency Busses/EDGs.

A probabilistic risk assessment has since been completed that estimated an increase for core damage frequency of 1.2×10^{-5}/year (ie; 0.000012/year).

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

PREVIOUS SIMILAR EVENTS

LER 1-88-35 Overloaded "misc." steel.

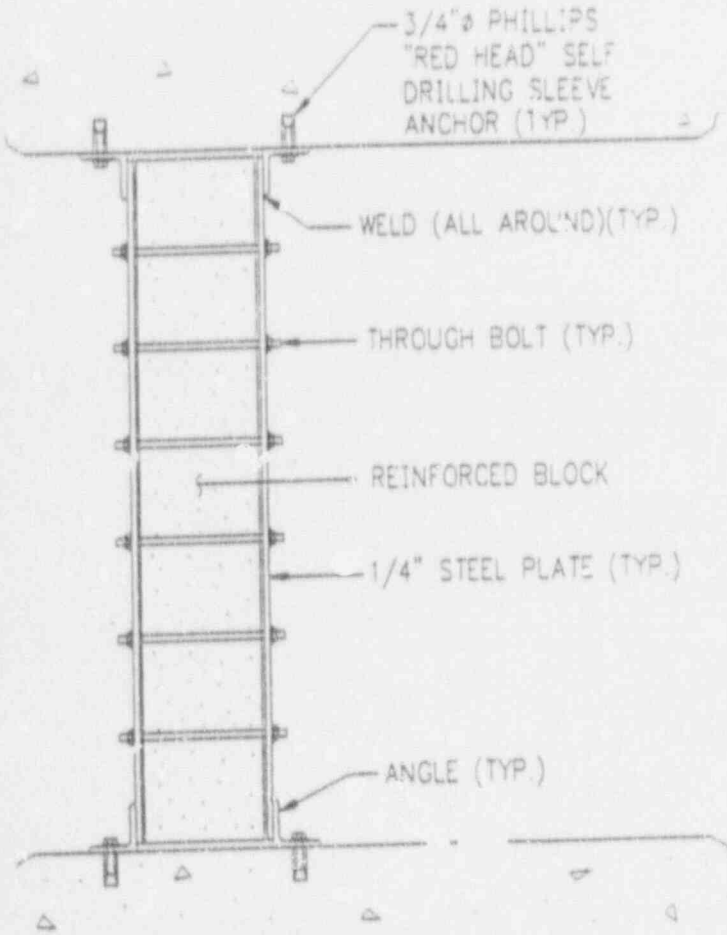
LER 1-91-24 Power supply to Residual Heat Removal was seismically inoperable due to raceway support not being attached.

LER 1-92-06 Service Water pressure switches not seismically qualified due to corrosion.

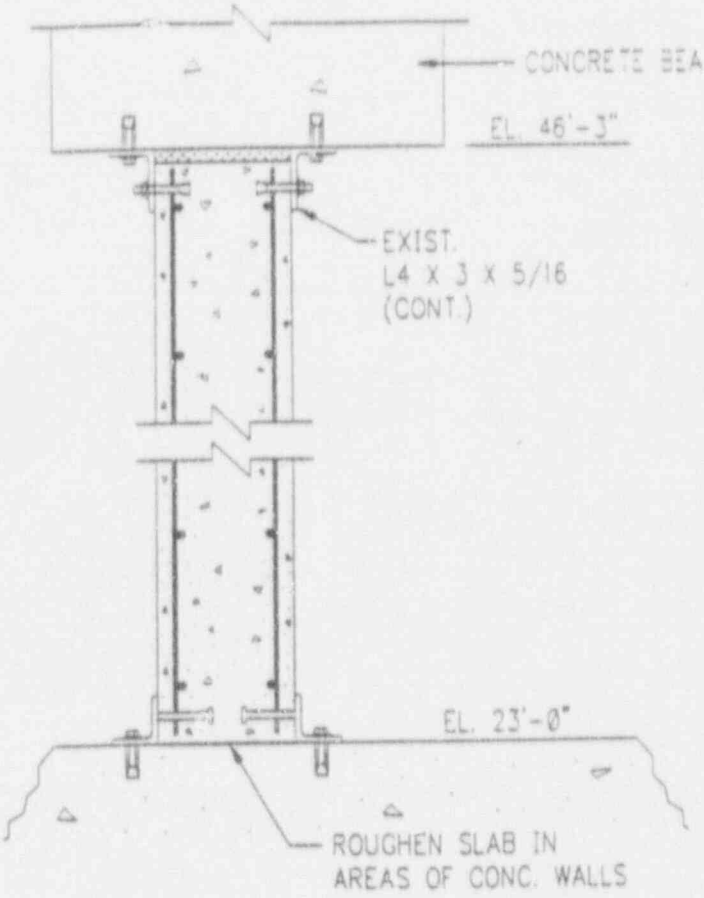
EIIS COMPONENT IDENTIFICATION

System/Component	EIIS Code
Emergency Onsite Power Supply Building	NB

ATTACHMENT 1



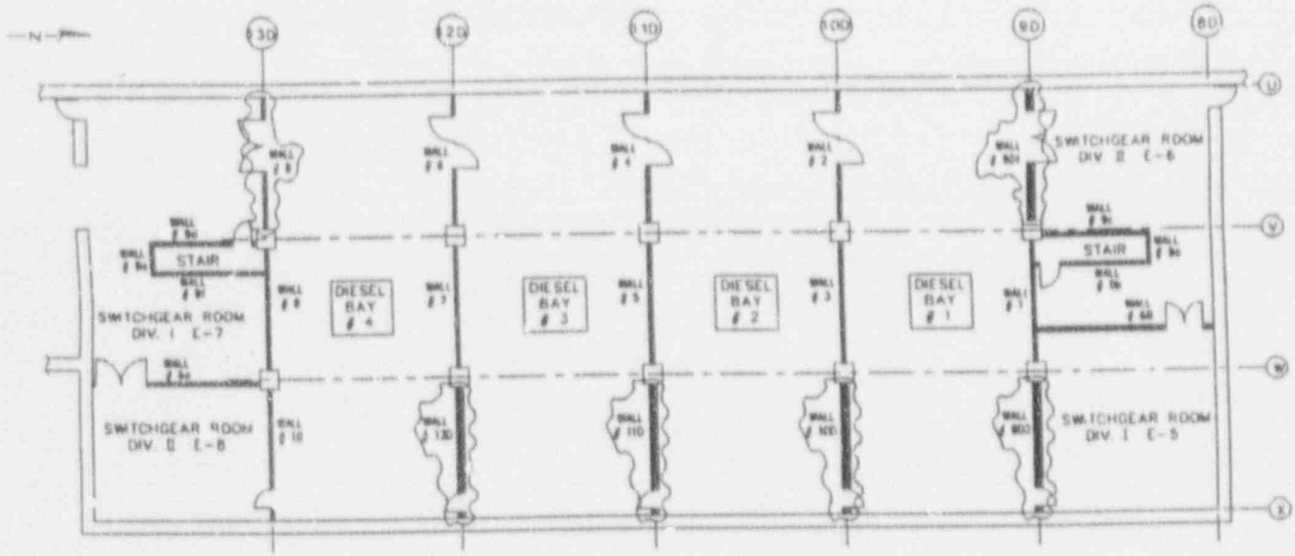
PLATED BLOCK WALLS



REINFORCED CONCRETE PANEL
(AS DESIGNED)

ATTACHMENT 2

EDG BUILDING PARTIAL PLAN FOR ELEV. 23'



KEY PLAN

DIESEL GENERATOR BLDG.
(PARTIAL PLAN @ ELEV. 23'-0")

WALL LEGEND

- DECLARED INOPERABLE