GPU NUCLEAR

GPU Nuclear, Inc.
U.S. Route #9 South
Post Office Box 388
Forked River, NJ 08731-0388
Tel 609-971-4000

June 9, 2000
1940-00-20141

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report 00-004: Fire Barrier Enclosure Does Not Meet Design Requirements Due to Personnel Error

Enclosed is Licensee Event Report 00-004. This event did not affect the health and safety of the public or plant personnel.

If any additional information or assistance is required, please contact Ken Quintana, OC Licensing Engineer, at 609-971-4917.

Very truly yours,

Sander Levin
Acting Site Director

SL/KCQ

cc: Administrator, Region I
NRC Project Manager
Senior Resident Inspector

RGN-001

IE22

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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.

LICENSEE EVENT REPORT (LER)

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TITLE (4)

Fire Barrier Enclosure Does Not Meet Design Requirements Due to Personnel Error

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
										05000
05	11	00	00	004	0	06	09	00	FACILITY NAME	DOCKET NUMBER
										05000

OPERATING		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR □: (Check one or more) (11)									
	N		20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)		
POWER			20.2203(a)(1)		20.2203(a)(3)(i)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)		
	100		20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71		
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER		
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)				
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)				

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Fred Barbieri	973.316.7358

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On, May 11, 2000, at approximately 1300 hours, it was determined that Oyster Creek was outside the design basis for mitigating the consequences of a fire. The evaluation for compliance with Appendix R utilized a fire resistance rating of three hours in accordance with Section III.G.2.a. criteria for the fire barriers enclosing and separating Fire Areas TB-FA-3A and TB-FA-3B. Subsequently, it was determined that while the wall and roof panels of the enclosures are covered with a sufficient thickness of fireproofing material to provide a three hour fire rating, the thickness of the fireproofing material covering the structural steel only provides a fire resistance rating of two hours.

The root cause of this condition was the failure to properly translate design basis criteria from Appendix A to Branch Technical Position APCSB 9.5-1 for the fire barrier rating requirements to construction documents and then to properly reflect as-built conditions in the FHAR.

Given the fixed fire detection and suppression features in the area, the existing fire resistance rating of the barriers in question, the low combustible loading and potential for a fire and the availability of a trained fire brigade, the safety significance of this condition is considered to be minimal. Additional fireproofing material will be applied to the structural steel in question to provide a three hour rating.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

DATE OF OCCURRENCE

The condition described in this report was determined to be reportable on May 11, 2000.

IDENTIFICATION OF OCCURRENCE

During a review of fire barrier [EIIC-ISL] construction records for fire areas TB-FA-3A and TB-FA-3B, which enclose 4160V Switchgear [EIIC-SWGR] Vaults 1C and 1D respectively, it was discovered that the structural steel framing [EIIC-FRM] that both supports and is a part of the barrier enclosures for these areas does not have a sufficient thickness of fireproofing material to provide a fire resistance rating equivalent to three hours. The wall and roof panels [EIIC-PL] of the enclosures are covered with a sufficient thickness of fireproofing material to provide a three hour fire rating, but the thickness of the fireproofing material covering the structural steel only provides a fire resistance rating of two hours. The fire barriers are described in the Oyster Creek Fire Hazards Analysis Report (FHAR) as having a three hour fire resistance rating. This event was determined to be reportable under 10 CFR 50.73 (a)(2)(ii).

CONDITIONS PRIOR TO OCCURRENCE

The plant was operating at approximately 100% power with normal temperatures and pressures for full power operation. However, the plant has been operated in all modes with these fire barriers supported by structural steel protected for a two hour fire resistance rating since initial installation in 1980.

DESCRIPTION OF OCCURRENCE

In response to a task identified during the annual fire protection audit, the installed fire barriers that enclose 4160V Switchgear Vaults 1C and 1D (fire areas TB-FA-3A and TB-FA-3B, respectively, on the Turbine [EIIC-TRB] Building Mezzanine- Fire Zone TB-FZ-11C) were evaluated. The task was performed to address an inconsistency identified between the fire resistance rating values contained in the FHAR and those specified in the original design documents for these barriers.

An initial review of the installed fire proofing material resulted in the judgement of the assembly being adequate. However, upon further review and analysis, it was determined that both the 'C' and 'D' 4160V Switchgear Vaults could not be considered complete three hour fire rated assemblies.

In order to be considered in compliance with Appendix R Section III.g.2.a., Fire Areas TB-FA-3A and TB-FA-3B must be separated from both each other and the remainder of the Turbine Building by three

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DESCRIPTION OF OCCURRENCE (Cont'd.)

hour fire barriers. The evaluation that concluded on May 11, 2000 determined that the wall and ceiling panels of the enclosures are coated with a sufficient thickness of fireproofing material to provide a fire resistance rating of three hours but the structural steel that both supports and is a portion of these walls has only enough fireproofing material to provide a fire resistance rating of two hours. This means that the structural steel is not protected to the equivalent rating of the walls and ceilings. Compensatory measure requirements were reviewed and it was determined that existing compensatory measures (one hour roving fire watch) due to degraded Thermolag cable [EIIC-CBL5] raceway fire barriers were adequate and were extended to include these fire areas in accordance with Oyster Creek's Fire Protection Program requirements.

APPARENT CAUSE OF OCCURRENCE

The root cause of this event was the failure to properly translate design basis criteria from Appendix A to Branch Technical Position APCSB 9.5-1 for the fire barrier rating requirements applicable to Fire Areas TB-FA-3A and TB-FA-3B to the construction documents and then to properly reflect as-built conditions in the FHAR. These barriers were installed to meet regulatory commitments for compliance with Appendix A to Branch Technical Position APCSB 9.5-1 and were constructed to protect the 4160V 1C and 1D Switchgear Vaults from an oil hazard in the general vicinity. The construction documents for the enclosure boundaries specified an incorrect coating thickness for the structural steel to qualify as a three hour barrier, however, the entire fire area boundary was credited as a three hour fire barrier in the FHAR. The wall between the switchgear vaults was specified, designed and installed as a two hour fire resistant barrier and then incorrectly documented in the FHAR as a three hour barrier. The Appendix R safe shutdown evaluation, performed some years later, of each fire area for conformance to Section III.G.2.a was conducted under the assumption that the wall between the "C" and "D" 4160V Switchgear Vaults and the outer walls and ceiling were all three hour fire barriers as documented in the Fire Hazards Analysis. In fact, the amount of protective material installed on the load bearing structural steel is insufficient to provide a three hour fire resistance rating.

Since the fire resistant rating of the wall between the switchgear vaults was not properly documented in the FHAR and the structural steel was not coated with a sufficient thickness of fireproofing material to achieve the three hour fire resistant rating, the evaluation for compliance with Appendix R Section III.G is in error. The Appendix R evaluation assumes all the walls in question have a three hour fire resistant rating which means all the safe shutdown circuits within Fire Areas TB-FA-3A and TB-FA-3B need not assume fire interaction with each other. In order to be in compliance with Appendix R, these walls must have a three hour fire resistant rating.

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ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

The Oyster Creek FHAR relies on circuits (electrical power [EIIS-EB], core spray [EIIS-BM], emergency service water [EIIS-BI]) in Fire Area TB-FA-3B for a fire occurring in Fire Area TB-FA-3A and vice versa in order to achieve safe shutdown. The FHAR also relies on protection of circuits in these fire areas from a fire external to both of these areas to achieve safe shutdown.

The fire barrier(s) with a rating of two hours instead of three hours places Oyster Creek outside the design basis for mitigating the consequences of a fire because the evaluation for compliance with Appendix R assumes that the barriers enclosing and separating Fire Areas TB-FA-3A and TB-FA-3B have a fire resistance rating of three hours in accordance with Section III.G.2.a. Each fire area is protected by an automatic early warning ionization fire detection system [EIIS-IC] and a manually actuated fixed total flooding Carbon Dioxide Suppression System [EIIS-KQ] with manual hose backup available. Detection early enough to suppress a fire is assured by the automatic early warning ionization fire detection system and the combustible loading in these areas is low enough such that the two hour fire resistance rating of the walls and ceilings is adequate to prevent fire spread beyond these barriers. A fire occurring outside the room presents a higher exposure potential to the structural steel supporting the barriers than a fire originating from within the rooms because of the lube oil [EIIS-TD] lines in the vicinity. These lines pass through the area outside the vaults and consist of welded steel construction designed to the ANSI B31.1 Power Piping Code, which makes failure of these lines unlikely. In addition, a fire in the area surrounding Fire Areas TB-FA-3A and TB-FA-3B would not result in fire exposure as severe as the test which establishes the thickness requirements for the fireproofing on the structural steel because the area around these fire areas is open to the remainder of the floor which allows a heat release path resulting in a lower fire exposure.

The existing fire protection program requirement for a one hour fire watch patrol, which has been in place since the existing cable raceway fire barriers were considered degraded, was reviewed and extended to cover these areas and found to be adequate. Given the fixed fire detection and suppression features in the area, the existing fire resistance rating of the barriers in question (2 hours vs. the required 3 hours), the low combustible loading and potential for a fire and the availability of a trained fire brigade, the safety significance of this condition is considered to be minimal. After extending an existing fire watch patrol to include these specific areas, there was no need to further augment the compensatory measure of that one hour fire patrol.

CORRECTIVE ACTION

Immediate Corrective Action

An existing one hour fire watch patrol was extended to include Fire Areas TB-FA-3A and TB-FA-3B as well as the surrounding Fire Zone TB-FZ-11C.

An extent review identified an additional fire area enclosure of similar construction surrounding "C" Battery [EIIC-BTRY] Room (Fire Area TB-FA-26) which is currently being analyzed. There are no other fire barriers in the plant that are constructed in this fashion.

Future Corrective Action

The structural steel beams discussed above will be coated with additional fireproofing material such that the resulting thickness will provide a three hour fire resistance rating.

The root cause of this condition occurred over twenty years ago. Since then there have been major changes in both the methods utilized and procedures that govern the conduct of engineering. Extensive training has been conducted during the entire period to emphasize the importance of adherence to the new methodologies, controls and processes. Therefore, no additional corrective actions are required.

SIMILAR EVENTS

LER 89-10 Design Deficiency Causes Non-Conformance with 10 CFR 50 Appendix R Criteria

LER 98-02 480V Switchgear Room Fire Barrier Deficiency Due to Inadequate Fire Barrier Specifications