FPL Energy
Seabrook Station

FPL Energy Seabrook Station
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MAY 23 2006

Docket No. 50-443
SBK-L-06109

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Seabrook Station
Licensee Event Report (LER) 2006-003-00
Voluntary LER for Deficient Hydrostatic Barriers

Enclosed is Licensee Event Report (LER) 2006-003-00. This is a voluntary LER that reports an event that occurred at Seabrook Station on February 5, 2006.

Should you require further information regarding this matter, please contact Mr. James M. Peschel, Regulatory Programs Manager, at (603) 773-7194.

Very truly yours,

FPL Energy Seabrook, LLC

Gene St. Pierre
Site Vice President

cc: S. J. Collins, NRC Region I Administrator
G. E. Miller, NRC Project Manager, Project Directorate I-2
G. T. Dentel, NRC Senior Resident Inspector

IE22

ENCLOSURE TO SBK-L-06109

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Seabrook Station	05000 443	1 OF 3

4. TITLE
Voluntary LER for Deficient Hydrostatic Barriers

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	05000
02	05	2006	2006	- 003 -	00	05	23	2006	FACILITY NAME: N/A	DOCKET NUMBER: 05000

9. OPERATING MODE
1

10. POWER LEVEL
100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☒ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
James M. Peschel, Regulatory Programs Manager	603-773-7194

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

This is a voluntary LER. On February 5, 2006 at approximately 0400, personnel performing scheduled surveillance testing inadvertently actuated one of five fire protection water deluge subsystems in the Seabrook Station cable-spreading room. The actuation resulted in a discharge of approximately 1000 gallons of water to the cable spreading room. An operator responding to the event discovered several small puddles of water on the floor of the safety related "A" train switchgear room located directly below the cable spreading room. An inspection of the switchgear room determined the electrical distribution equipment was unaffected by the water. The presence of water in the switchgear room was unexpected because the design of the cable spreading room floor is to function as a watertight hydrostatic barrier. The safety-related electrical equipment in the essential switchgear rooms does not have a comprehensive design tolerance for water. The cause of the event was that design basis flood protection requirements contained in various design and licensing documents were not incorporated into the original penetration seal specifications or the cable spreading room floor slab design. As a result, the cable spreading room floor and associated seals were not originally specified, designed or installed as hydrostatic barriers. No adverse consequences resulted from this event.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Seabrook Station	0500-0443	2006	003	00	2 OF 3

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

I. Description of Event

On February 5, 2006 at approximately 0400, personnel performing scheduled surveillance testing of the fire protection system [KP] inadvertently actuated one of five fire protection water deluge subsystems in the Seabrook Station cable-spreading room [NA]. The actuation of the deluge system, which was isolated in about two minutes, resulted in a discharge of approximately 1000 gallons of water to the cable spreading room. An operator responding to the event subsequently discovered water on the floor of the safety-related "A" train switchgear room located directly below the cable spreading room. The water was removed and the electrical distribution equipment in the switchgear room was inspected for damage and determined to be unaffected by the water.

The presence of water in the switchgear room was unexpected because the design of the cable spreading room floor is to function as a watertight hydrostatic barrier. The safety-related electrical equipment in the essential switchgear rooms does not have a comprehensive design tolerance for water. A subsequent investigation found a number of degraded cable spreading room floor seals [SEAL], two unsealed holes, and floor construction joints that were not designed to be watertight.

II. Cause of Event

An evaluation of this event identified the following root cause:

1. Design basis flood protection requirements contained in various design and licensing documents were not included in the penetration seal or concrete floor design specifications. As a result, the cable spreading room floor and associated seals were not originally specified, designed or installed as hydrostatic barriers.
2. The work control process did not ensure positive configuration control for cables that were removed, and work instructions did not clearly identify all breaches that would require repairs.

III. Analysis of Event

Hydrostatic Seal Design and Licensing Basis

Initial investigations following the event focused on large blockout seals containing multiple cable trays [TY] and associated cables [CBL]. These blockout assemblies extend into the 12" thick concrete floor and are built-up approximately 4 inches above the floor inside a kick plate enclosure. These assemblies are sealed with BISCO SF-60 elastomeric material. The steel kick plate surrounding the penetration is sealed with caulking at the concrete floor interface. Several seals failed initial inspection criteria specified in plant procedures, with a total breach area of approximately 8 square inches. Each was repaired using approved methods. There were three SF-60 seals located in the actuated zone coverage area with sufficient defects to permit water leakage into the switchgear room. Their locations generally corresponded to wetted areas in the "A" switchgear room. A subsequent investigation of the cable spreading room and mechanical equipment room floor seals revealed five small penetrations that were sealed only with a foam material not meeting the hydrostatic design requirements. An inspection of the cable spreading room floor seals found two unsealed holes in the seals where cables had been removed and the seal was not subsequently repaired.

The specification for the wall and floor penetration seals in the cable spreading room and adjacent mechanical equipment rooms required the design, material and installation of the penetration seals to be performed in accordance with 10 CFR 50 Appendix B, Appendix R, and the Quality Assurance requirements in ANSI N45.2-1977. Accordingly, the seal materials and installed penetration are classified as ANS safety-related items. Although the barrier requirements call for the seals to be hydrostatic barriers, no documented evidence exists that the seals were originally specified, designed, installed, or inspected as hydrostatic barriers.

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

A review of structural drawings and specifications revealed that the cable spreading room floor was not designed or constructed with features that would ensure its intended watertight integrity. A review of concrete placement drawings revealed a construction joint above a known leak location. Water could leak through this joint and follow the Q-decking to the wall inside the electrical switchgear room.

Seal Maintenance and Inspection Procedures

Station procedures were originally developed to inspect fire rated penetration seals and barriers in accordance with Technical Requirement 11-4.7.9.5. The inspection attributes specified in these procedures addressed only fire rated qualifications of the barriers and seals. An evaluation performed in 1991 concluded that the procedures used for fire barrier and seal inspections would also demonstrate seal/barrier integrity for other safety-related applications, such as hydrostatic, air, and tornado barrier functions. However, the fire seal acceptance criteria allowed for certain defects to remain without repairs while, for hydrostatic seals, these allowable defects may not be sufficient to ensure a watertight seal. Although the procedures that provide administrative controls for the repair, removal, modification, and installation of the fire barrier penetration seals require a dedicated work order for penetration seal repairs and modifications, the guidance does not consider penetration seals in the cable removal steps. In addition, the post-maintenance and modification inspection attributes apply the fire rated seal inspection criteria and do not consider the hydrostatic barrier function.

Safety Consequences

No consequences resulted from this event and, therefore, the event had no adverse impact on the plant or on the health and safety of the public. The degraded seals did not present a safety hazard and would not have prevented the fulfillment of any safety function. In the event of a fire, the seals will tend to expand as they are subjected to the heat of the fire, improving their effectiveness as a water barrier. The amount of leakage experienced during the deluge actuation was minimal and resulted in no adverse impact on equipment in the essential switchgear room. Further, although the equipment in the essential switchgear room is not designed to be waterproof; a certain amount of protection is provided by the inherent design of the metal enclosures. Most of the enclosures have solid tops with entry by conduit, and most vents, where provided, on the sides of the equipment have small hoods to prevent water intrusion. Vents on the top of inverters have drip shields covering the vents, and equipment mounted on the walls is offset by attachments to unistrut, preventing damage from water trickling down the walls. A fire in the cable spreading room is an extremely unlikely event due to the flame qualification of the cables, the absence of permanent combustibles in this area, and the rigid controls on transient combustible material in this area. From a PRA perspective, this area is one of the lowest risks of any fire areas with regard to fire frequencies. A conservative estimate of the frequency of loss of both buses from a fire deluge is 1E-7/yr. Additionally, there have been hourly fire watches going into the cable spreading room since early 2005.

IV. Corrective Actions

The corrective actions taken to address this event include:

1. The deficient seals were repaired.
2. Design changes were developed to upgrade the cable spreading room seals and floor joints.

Planned corrective actions will provide a detailed barrier and seal basis document and revise the administrative controls for maintenance and configuration control of barriers and seals.

V. Similar Events

LER 89-010 reported that three piping penetrations in the condensate storage tank enclosure did not contain the required hydrostatic seals. The cause of the condition was attributed to a failure to transform the sealing requirements into field fabrication and installation drawings. Following this event, an inspection verified that all required hydrostatic seals were installed.