Consumers Power

POWERING MICHIGAN'S PROGRESS

Big Rock Point Nuclear Plant, 10269 US-31 North, Charlevoix, MI 49720

Patrick M Donnelly
Plant Manager

January 3, 1994

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 - BIG ROCK POINT PLANT - LICENSEE EVENT REPORT 93-012; INADVERTENT REMOVAL OF DIESEL FIRE PUMP FROM SERVICE DURING FACILITY POWER OPERATION.

LICENSEE EVENT REPORT 93-012; INADVERTENT REMOVAL OF DIESEL FIRE PUMP FROM SERVICE DURING FACILITY POWER OPERATION, is attached. This event is reportable to the NRC pursuant to 10 CFR 50.72(b)(2)(iii) and 10 CFR 50.73(a)(2)(vii).

Patrick M Donnelly
Plant Manager

CC: Administrator, Region III, USNRC
NRC Resident Inspector - Big Rock Point

ATTACHMENT

IE22
1/1

NRC Form 366
(6-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
BIG ROCK POINT PLANT	0 5 0 0 0 1 5 5	1 OF 0 5

TITLE (4) INADVERTENT REMOVAL OF DIESEL FIRE PUMP FROM SERVICE DURING FACILITY POWER OPERATION

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (8)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	
									N/A	0 5 0 0 0
1 2	0 6	9 3	9 3	- 0 1 2	- 0 0	0 1	0 3	9 4	N/A	0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 4	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)	X 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		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
	AREA CODE
Michael D Bourassa, Senior Licensing Engineer	6 1 6 5 4 7 - 6 5 3 7

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	
A	B M	P	W 3 1 8	N							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On December 6, 1993, at approximately 1045, the diesel fire pump fuel line was punctured. An inspection hole was being drilled in the floor near the fire pump to accommodate a zebra mussel observation camera system. The fuel line was not shown on the plant drawings and was not detected by radar equipment used to map the floor.

The pump was immediately declared inoperable and a Limiting Condition of Operation (LCO) entered. The NRC Operations Center was notified by 1430 of the event. Repairs were performed within the window of the Technical Specification LCO, and the pump returned to service on December 7, 1993, at 0528.

The root cause of the event has been attributed to human error, incorporating several causal factors that address protective equipment use and management oversight.

Corrective actions will include revisions to plant procedures and safety standards to address the use of drill stop boxes; and a generic review of safety evaluations will be performed.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
BIG ROCK POINT PLANT	0 5 0 0 0 1 5 5	9 3	— 0 1 2	— 0 0	0 2 OF 0 5

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

IDENTIFICATION OF EVENT

I. Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(A) Shutdown the reactor and maintain it in a safe shutdown condition,

(B) Remove residual heat,

(C) Control the release of radioactive material, or

(D) Mitigate the consequences of an accident. (10 CFR 50.72(b)(2)(iii)).

II. Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to:

(A) Shutdown the reactor and maintain it in a safe shutdown condition,

(B) Remove residual heat,

(C) Control the release of radioactive material, or

(D) Mitigate the consequences of an accident. (10 CFR 50.73(a)(2)(vii)).

CONDITIONS PRIOR TO EVENT

Power operation - Reactor Power 94% - Unit load - 72.5 MWe.

DESCRIPTION OF THE EVENT

On December 6, 1993, at approximately 1045, the diesel fire pump (P) fuel line was punctured. An inspection hole 6 inches in diameter was being drilled in the 18 inch concrete floor near the fire pump to accommodate a zebra mussel observation camera (TVC) system. In addition to fire suppression, the diesel fire pump is redundant to the electric driven fire pump, and used for core/containment spray (BO).

The diesel fire pump was immediately declared inoperable and a Limiting Condition of Operation (LCO) entered. In accordance with the LCO, if the pump was not returned to service within 24 hours, a normal orderly shutdown of the reactor (RCT) would be required. The NRC Operations Center was also notified at 1430 of the event.

The fuel oil present in the line was contained. Less than one-half gallon migrated to Lake Michigan. As a precaution, an oil boom was placed in the discharge canal, and a continuous fire watch was initiated for the screenhouse.

After enlarging the work area, compression fittings were used to reconnect the severed lines. These repairs were performed within the window of the Technical Specification LCO, and the pump returned to service on December 7, 1993, at 0528, avoiding a reactor shutdown.

ROOT CAUSE ANALYSIS OF THE EVENT

1. Failure to Use Proper Protective Equipment

   This event could have been avoided if a "drill stop box" had been used during core drilling operations. This is a commercially available device that plugs into the electrical outlet. The core drill is then plugged into the drill stop box. The device functions to interrupt power when the drill bit contacts metal. When it is necessary to cut through rebar, special drill bits can be used in conjunction with the drill stop box that prevent power from being interrupted by the severed rebar while maintaining the protective conduit contact trip feature.

2. Lack of Knowledge/Plant Safety Standards

   The project engineer initially considered the use of a drill stop device, but dismissed the idea when he was informed by two separate contractor/vendor sources that such a device was not commercially available and would require special design and construction. In lieu of a drill stop box, the radar locating technique was utilized to provide assurance that the selected core drill sites were clear of interfering conduit and other imbedded service lines.

   The Accident Prevention Manual for Generating Plants (Jan. 1991 Rev.1) does not provide any guidance or safety standards for drilling into concrete structures that may contain imbedded service lines. Core and anchor bolt drilling activities, both of which are commonly performed at various Consumers Power Company (CPCo) facilities, are not discussed in the safety manual and the use of drill stop devices is not required. Had the safety manual required the use of such a device, this event may have been avoided.

3. Lack of Plant Review Committee (PRC) Oversight

The engineering design change (EDC) that controlled the core drilling activity included a safety evaluation (SE) which improperly concluded that the work activity was nonsafety-related (NSR) and that it would not affect safety-related (SR) items. This is incorrect since the screenhouse is a safety-related structure, and safety-related electrical circuits and service lines are imbedded in the floor. Had the safety evaluation appropriately classified this activity as safety-related, PRC review would have been required.

NOTE: Although the SE concluded the activity was NSR, the work order was appropriately classified as "Q".

The project engineer did engage in discussions with various members of plant management with respect to the potential hazards associated with drilling. The potential hazards, while not formally documented, were recognized by the parties involved and were discussed. It was through these discussions, that the use of radar locating technology was recommended in order to minimize the risk of drilling through imbedded service lines.

4. Engineering judgement

Reliance was placed on the radar mapping technology to locate imbedded service lines. This state-of-the-art technology, while very good, has some limitations. Most notably the process requires interpretation by the technician. Reflected signals from conduit appear very similar to those reflected from rebar, and pattern recognition is relied upon to distinguish between the two (i.e., rebar is lain in a gridwork pattern). There is the possibility of misinterpretation or not being able to adequately distinguish conduit from rebar of similar size and orientation.

The technology is also dependent upon the technician moving the transducer (TD) at a constant velocity. The first few inches of any scan are lost in "noise" as the technician starts to move the transducer and establish a constant transducer velocity. This makes it more difficult to located imbedded lines that are adjacent to walls or pump pedestals since the transducer scan either starts or ends at the wall or pedestal. In addition, L-shaped rebar was utilized in the diesel fire pump pedestal which creates additional reflectors that must be correctly interpreted. The drilling location at which the fuel line was severed was, of necessity, adjacent to the pump pedestal.

The limitations of radar mapping technology were generally understood by the involved parties. There was a common understanding that radar mapping could not provide absolute assurance that the selected drill sites were clear of imbedded lines. The decision to proceed was made based on the belief that appropriate measures had been taken to locate imbedded lines, and benefits provided by the inspection ports outweighed the risks associated with core drilling.

CORRECTIVE ACTION TO PREVENT RECURRENCE

1. Perform statistically valid sampling of completed safety evaluations to determine if misclassification is a common/generic problem.

2. Evaluate the revision of appropriate plant procedures and safety standards to require the use of "drill stop boxes" when drilling into concrete structures.

THESE ACTIONS WILL BE COMPLETED BY MAY 1, 1994.

SAFETY SIGNIFICANCE

The failure to use a drill stop box during core drill operations constitutes a "near miss" with respect to personnel and plant safety. Had the drill operator severed a conduit containing an energized electrical circuit, a serious personnel injury may have occurred. In addition, severance of an energized circuit in the screenhouse could have had other significant plant effects (e.g., fire, interruption of Reactor Depressurization System (RDS) auto logic circuitry, Circulating Water Pump trip, etc.), all of which could have led to a required plant shutdown. Accomplishing the repairs within the time frame of the Limiting Condition of Operation averted a required plant shutdown, minimizing the safety significance of this event.