

**LICENSEE EVENT REPORT (LER)**

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS 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

FACILITY NAME (1) Point Beach Nuclear Plant, Unit 1	DOCKET NUMBER (2) 05000266	PAGE (3) 1 OF 5
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TITLE (4)  
Unanticipated Partial Service Water System Isolation During A Special Test

EVENT DATE (b)			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
01	22	98	98	006	00	02	20	98	PBNP Unit 2	05000301
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 091	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(viii)			
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		50.73(a)(2)(x)			
	20.2203(a)(2)(ii)		20.2203(a)(3)(iii)		50.73(a)(2)(iii)		73.71			
	20.2203(a)(2)(iii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER			
	20.2203(a)(2)(iv)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below			
		20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)				or in NRC Form 386A

LICENSEE CONTACT FOR THIS LER (12)

NAME Glenn D. Adams, Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (414) 221-4691
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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
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO						

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

On January 22, 1998, with Unit 1 operating at 91 percent power and Unit 2 in a cold shutdown condition, several non-essential loads of the service water system were isolated by an automatic actuation that was not anticipated. This partial actuation of an Engineered Safety Feature (ESF) occurred during a special test of emergency diesel generator G-02. The systems to which service water was isolated were not ESF systems and were not essential to accident mitigation or safe shutdown of the plant. The isolated service water supplies were restored within a matter of minutes, and the associated systems restored without incident. The event was caused by an inadequate procedure which did not anticipate the actuation. A root cause evaluation is being performed.

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

**Event Description:**

On January 22, 1998, with Unit 1 operating at 91 percent power and Unit 2 in a cold shutdown condition, some non-essential loads of the service water (SW) system [BI] were isolated by an automatic actuation which was not anticipated. This partial actuation of an Engineered Safety Feature (ESF) occurred during a special test.

At approximately 1039 hours on January 22, 1998, plant personnel initiated a special test procedure designated PBTP-77, "Transient Response of G-02 Replacement Governor." This was a very extensive procedure, developed to requalify the emergency diesel generator (EDG) [DG] designated G-02 as a standby emergency power source. At the commencement of the test, the operating staff entered Point Beach Nuclear Plant (PBKP) Technical Specification 15.3.7.3.1.h for Unit 1. This Limiting Condition for Operation (LCO) allows for the emergency power supply for electrical A-Train buses [BU] 1A05/B03 and 2A05/B03 to be out-of-service for a 7-day period. The operating staff also entered TS 15.3.3.D.2.a; an LCO which allows the removal of normal and emergency power supply to a service water pump [BI:P] for a 7-day period. The removal of the power supply was prescribed by the procedure to establish appropriate test conditions.

At approximately 1110 hours on January 22, 1998, plant personnel actuated the undervoltage condition on safeguards bus 2A05 and a manual safety injection (SI) signal on Unit 2, in accordance with the test procedure. EDG G-02 started and the emergency power system functioned as expected.

At approximately 1148 hours on January 22, 1998, EDG G-02 was supplying AC power to safeguards buses 2A05 and 2B03 with an A-Train manual SI signal present and service water pumps P-32A, B, D, and F running. Pump P-32F was powered from bus 2B03. In accordance with test procedure PBTP-77, the output breaker from G-02 to bus 2A05 was opened to simulate a full-load rejection. Consequently, the Unit 2 A-Train SW pump P-32F was deenergized; leaving three SW pumps running (P-32A, B, and D). As designed (SI sequence with less than 4 running SW pumps), the A-Train portion of the SW actuation logic isolated the following non-essential A-Train SW system loads by closing the associated valves: (1) cooling water to the blowdown waste evaporator (isolated by valve LW-61), and (2) cooling water to auxiliary building air conditioning equipment (isolated by valve SW-2816). A signal was also sent to isolate the A-Train spent fuel heat exchanger [DA:HX] (isolated by valve SW-2930A); however, the valve had already been shut prior to the test. The actuation of SW isolation was not addressed by the test procedure.

Coincident with the non-essential SW isolation actuation, G-02 EDG restored power to buses 2A05 and 2B03. The P-32F service water pump automatically started, thus providing the fourth operating service water

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pump, and clearing the partial service water isolation signal. The inadvertently-shut isolation valves were then manually re-opened to restore normal service water cooling flow. The testing portion of procedure PBTP-77 was completed without further incident, and associated systems restored to service.

At approximately 1319 hours on January 22, 1998, the normal and emergency power supplies to SW pumps had been restored, and all the aforementioned TS LCOs had been exited.

**System and Component Description:**

The PBNP SW system serves essential and non-essential loads of both PBNP units. During normal operation, service water is distributed to both units through a single ring header configuration. However, to isolate leaks or to isolate equipment for maintenance or testing, the ring header may be subdivided into west, north, and south headers by the manual isolation of remotely-operated valves. Supply of service water for essential services is redundant and can be maintained in case of failure of one Section header. As described later, non-essential headers are isolated by other automatically-operated valves.

Six electric motor-driven service water pumps are provided. SW pumps P-32A, B, and F are assigned to A-Train power supplies, and pumps P-32C, D, and E are assigned B-Train power supplies. The service water pumps are connected to the 480 volt buses that can be supplied by the emergency diesels in the event of loss of all offsite power. Under the conditions of a concurrent loss-of-coolant accident and loss-of-offsite power, any three pumps using the emergency power are capable of supplying the required cooling capacity to the containment cooling systems, diesel generator, and auxiliary feedwater pumps.

Should the safeguards sequence occur and less than four service water pumps start, the service water system is designed to supply cooling water to only the required emergency systems of the affected Unit while maintaining the supply to the normal loads of the unaffected unit. Valves are provided to automatically isolate non-essential service water loads under these conditions.

PBNP emergency power system has four EDGs. EDGs G-01 and G-02 are assigned to A-Train, and G-03 and G-04 are assigned to B-Train. Each EDG is capable of sequentially starting and supplying the power requirement of one complete train of safeguards (ESF) equipment for one reactor Unit and providing sufficient power to allow the second reactor Unit to be placed in a safe shutdown condition.

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EDG G-02 is an A-train EDG which is typically aligned to Unit 2 via 4 Kv bus designated 2A05; however, it may also be tied to the Unit 1 A-Train bus designated 1A05. Safeguards bus 2B03 is a 480-volt bus which is connected to bus 2A05.

**Cause:**

Preliminary investigation has shown that this event was caused by an inadequate test procedure. The new procedure (PBTP-77) was derived from a similar procedure without recognizing the potential for inadvertent ESF actuation. During procedure development, the procedure scope was not extensive enough and the engineering evaluation did not recognize that the test sequence could result in the SW isolation.

**Corrective Actions:**

1. Procedure PBTP-77 will be archived with documentation of its deficiencies. There is no plan to revise this procedure because it was a one-time use procedure, and there is no intent to use it in the future.
2. A formal root cause evaluation of this event will be conducted. Any related corrective actions will be managed under the corrective action program.

**Reportability:**

A four-hour non-emergency report to the NRC duty officer was made at 1317 CST on January 22, 1998. The NRC resident inspectors were also notified. This Licensee Event Report is being submitted in accordance with the requirements of 10 CFR 50.73(a)(2)(iv), "any event or condition that resulted in a manual or automatic actuation of any engineered safety feature (ESF), including the reactor protection system (RPS)."

**Safety Assessment:**

The automatic isolation of the Train-A non-essential loads was brief and had no adverse safety effect on Unit 1 or Unit 2. The isolated systems are not Engineered Safety Features and are not essential to accident mitigation or safe shutdown of the plant. The isolation signal to the A-Train SW supply to spent fuel cooling was inconsequential because the B-Train was in service at the time of the event. The isolated SW supplies were restored within a matter of minutes, and the associated systems restored without incident.

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**Similar Occurrences:**

The following reports also identify recent events involving inadvertent actuations of engineered safety features:

<u>LER</u>	<u>Description</u>
266/98-001-00	Failure Of The High Voltage Station Auxiliary Transformer
<u>LER</u>	<u>Description</u> (continued)
266/97-034-00	Unplanned Loss Of Voltage On Train B Safeguards Buses
266/96-001-00	Inadvertent ESF Actuation In Train B Due To DC System Ground
301/96-001-00	Reactor Trip Due To Spurious Closure Of Turbine Stop Valves

**System and Component Identifiers**

The Energy Industry Identification System component function identifier for each component or system referred to in this Licensee Event Report are as follows:

<u>System</u>	<u>Identifier</u>
Essential Service Water	BI
Fuel Pool Cooling and Purification	DA
<u>Component</u>	<u>Identifier</u>
Pump	P
Diesel Generator	DG
Valve	V
Bus	BU
Heat Exchanger	HX