

LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1)
Point Beach Nuclear Plant, Unit 2

DOCKET NUMBER (2)
0 5 0 0 0 3 0 1 1

PAGE (3)
1 OF 0 6

TITLE (4)
Inadvertent ESF Actuation as a Result of As-Built Wire Tracing

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 NAMES		DOCKET NUMBER(S)
1	0	2	0	9	2	9	2	0	0	6	0 1 0 2 1 9 9 3
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THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)

OPERATING MODE (9)	20.402(b)	20.405(c)	50.73(e)(2)(iv)	72.71(b)
N			X	
POWER LEVEL (10)	20.405(a)(1)(i)	50.36(c)(1)	50.73(e)(2)(v)	72.71(c)
0 0 1 0	20.405(a)(1)(ii)	50.36(c)(2)	50.73(e)(2)(vi)	
	20.405(a)(1)(iii)	50.73(e)(2)(i)	50.73(e)(2)(vii)(A)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iv)	50.73(e)(2)(ii)	50.73(e)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(e)(2)(iii)	50.73(e)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Bill Hennig-Electrical and Instrumentation System Engr.	4 1 1 4 7 5 5 1 - 1 2 3 2 1 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) ☒ NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

ABSTRACT:

On October 20, 1992, with Unit 2 shutdown for its annual maintenance and refueling outage, a pre-shift walkdown of the control boards was being performed by the Duty Shift Superintendent (DSS). At 2:50 p.m., the DSS observed that the Unit 2 B04 non-safeguards equipment lockout on the rear of Main Control Board C01R was in the tripped position. This equipment lockout is designed to trip following a "B" train safety injection signal, stripping non-safeguards loads from Safeguards Bus 2B04. It is believed that the trip of this lockout was caused when a "B" train safety injection relay was inadvertently bumped during as-built wire tracing that was being performed in the Unit 2 safeguards racks. The trip of this lockout is being reported because it is an actuation of an Engineered Safety Feature (ESF).

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TEXT CONTINUATION

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 (F830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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

EVENT DESCRIPTION:

On October 20, 1992, with Unit 2 shutdown for its annual maintenance and refueling outage, a pre-shift walkdown of the control boards was being performed by the Duty Shift Superintendent (DSS). At 2:50 p.m., the DSS observed that the Unit 2 B04 non-safeguards equipment lockout on the rear of Main Control Board C01R was in the tripped position. This equipment lockout strips non-safeguards loads from 2B04, the "B" train 480 volt safeguards bus, following a "B" train safety injection signal. This load stripping ensures that the emergency diesel generators supply power only to essential safeguards equipment. Therefore, the tripping of this equipment lockout was an unexpected actuation of an Engineered Safety Feature (ESF).

It is believed that the tripping of the lockout occurred when a "B" train safety injection relay was inadvertently bumped during as-built wire tracing. This wire tracing was taking place in the Unit 2 safeguards racks in the vicinity of the "B" train safety injection relay on the same day that the tripped lockout was discovered.

One of the loads from 2B04 that should be stripped following the trip of the equipment lockout is non-safeguards Motor Control Center MCC B21. The stripping of this load should have resulted in the actuation of a control room annunciator. This annunciator failed to actuate. Further investigation determined that MCC B21, had not stripped off of 2B04, as required. The failure of MCC B21 to strip necessitated an inspection of the wiring associated with the 2B04 lockout circuit.

The wiring inspection showed that the output wiring from the 2B04 lockout was not connected to the 2B04 supply breaker 2B52-28C for MCC B21. The inspection revealed that the 2B04 supply breaker for MCC B21 was connected to the 2B03 lockout circuit. The output wiring discrepancy was subsequently corrected. Additionally, the lockout circuitry and associated wiring was checked for each train on both Point Beach Nuclear Plant, Units 1 and 2. The four non-safeguards lockout circuits were all wired to their appropriate loads.

COMPONENT AND SYSTEM DESCRIPTION:

2B04 is the Unit 2 "B" train 480 volt safeguards bus. This bus supplies safeguards power to safeguards loads including two containment ventilation fans, two service water pumps, a containment spray pump, a component cooling water pump, a residual heat removal pump, a motor-driven auxiliary feedwater pump, Battery Charger D08, Motor Control Center 2B42, and non-safeguards Motor Control Center B21. 2B04 is supplied from 2A06, a 4160 volt safeguards bus. In the event of a loss of power to 2A06, Diesel Generator G02 will start and supply emergency power to re-energize the bus.

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TEXT (If more space is required, use additional NRC Form 866A's) (17)

A lockout of the 480 volt safeguards buses occurs to assure that excessive loads are not present on the safeguards buses in the event a safeguards diesel generator is automatically cycled on, and to ensure that two electrically separated, dedicated sources of power are available to each of the two safeguards trains. A train-specific lockout will occur as a result of its train-related safety injection signal.

A safety injection signal will trip the 480 volt safeguards bus lockout relays (86B-03 and 86B-04), which, in turn, causes all non-safeguards loads on Buses B03 and B04 to strip, including the backup supply feeders to the two non-safeguards Buses, B01 and B02, and the B03 to B04 bus tie breaker, if closed.

The bus lockout relays are tripped electrically and can be manually reset when the safety injection signal has cleared, been blocked, or been reset. Tripping circuit continuity and power to each lockout relay is monitored by a local white lamp and a fuse monitoring relay which will annunciate "Common Critical Control Power Failure" in the control room following a loss of DC control power.

All breakers on the 480 volt safeguards Buses B03 and B04, with the exception of the bus supply breakers, safeguards MCC supply breakers, Component Cooling Water (CCW) pump breakers, and the motor-driven auxiliary feedwater pump breakers, have undervoltage trips. The CCW pump breakers will be stripped from their associated bus should an undervoltage condition occur coincident with a safety injection signal. The auxiliary feedwater pump breakers will be stripped by a safety injection signal and will be reclosed during the subsequent safeguards sequence.

CAUSES:

1. An evaluation of this event was performed and concluded that the ESF actuation was most probably caused when a "B" train safety injection relay was accidentally bumped by contractor personnel during as-built wire tracing in the Unit 2 safeguards racks earlier in the day on October 20, 1992.
2. A review of material history was performed in order to determine why non-safeguards MCC B21 was connected to the 2B03 lockout circuit. This review determined that power for MCC B21, during initial construction, was supplied from 1B01, a Unit 1, 480 volt non-safeguards bus. It appears that a decision was subsequently made to power the motor control center from 2B03, the "A" train 480 volt safeguards bus. However, supplying power to this MCC from 2B03 would have resulted in 3 motor control centers being powered from the same bus. It was therefore decided to power MCC B21 from 2B04, the "B" train 480 volt

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TEXT (If more space is required, use additional NRC Form 266A's) (17)

safeguards bus. MCC B21 was subsequently powered from 2B04, but the equipment lockout was still wired to the 2B03 non-safeguards lockout circuit. This condition has been determined to be a result of an error during initial construction.

3. The evaluation also determined why the wiring discrepancy had not been detected at an earlier date. The capability of the B03 and B04 lockout circuitry to perform their functions is tested during each unit's annual maintenance and refueling outage during the performance of Operations Refueling Test (ORT) 3, "Safety Injection Actuation with Loss of Engineered Safeguards AC." This procedure tests both the B03 and B04 equipment lockouts simultaneously. Therefore, the test had always been completed satisfactorily because MCC B21 did strip, based on it being connected to the opposite train equipment lockout. This wiring discrepancy would have been detected immediately if each train of the lockout circuitry had been tested separately during ORT 3. The testing of both trains is performed simultaneously because PBNP plant design has redundant pushbuttons which both manually actuate the two trains of safety injection. Train separation is maintained on these pushbuttons through wiring techniques and contact separation.

CORRECTIVE ACTIONS:

Immediate:

1. Following discovery that the 2B04 equipment lockout had tripped, a check was conducted to determine which loads had been stripped off of 2B04. This check revealed that all of the required loads had been properly stripped, with the exception of MCC B21.

Short-Term:

1. A review of the procedure used during the wire tracing, Instrumentation and Control Procedure (ICP) 11.468, "As-Built Wire Tracing of the Safeguards Relay Racks Unit 2," was performed. This review revealed that the procedure did provide adequate precaution statements concerning the need to use extreme caution to ensure that relays and switches are not accidentally bumped, causing their contacts to change state. No changes to this procedure are currently planned.
2. Inspection of the 2B04 lockout circuitry revealed that the output from the 2B04 lockout relay was not connected to 2B52-28C, the 2B04 supply breaker to MCC B21. This cabling was subsequently reconnected on October 20, 1992.

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3. The capability of the B03 and B04 lockout circuitry to perform their functions is tested during each unit's annual maintenance and refueling outage during the performance of Operations Refueling Test (ORT) 3, "Safety Injection Actuation With Loss of Engineered Safeguards AC." This procedure tests both the B03 and B04 equipment lockouts simultaneously. Plant personnel concluded that MCC B21 always tripped during ORT 3 because it was improperly connected to the 2B03 equipment lockout circuitry. Therefore, an "A" train safety injection signal would cause MCC B21, which is powered from the "B" train 480 volt safeguards bus, to trip. This was subsequently confirmed during field inspections of the wiring of the 2B03 lockout circuitry. The wiring from the 2B03 lockout circuitry to the supply breaker for MCC B21 was subsequently disconnected on October 21, 1992.
4. In order to confirm that all of the equipment lockout circuitry was properly installed, an inspection of the B03 and B04 lockout circuits and associated wiring for both units was conducted. All of the required equipment was verified to be connected to the appropriate lockout circuit.
5. On October 24, 1992, following correction of the wiring discrepancy, a modified ORT 3 was performed that tested each train of the Unit 2 lockout circuitry separately. This test was successfully completed on each train. We currently plan to conduct a similar test on both trains of the Unit 1 lockout circuitry during the 1993 maintenance and refueling outage.

REPORTABILITY:

This Licensee Event Report is being submitted in accordance with the requirements of 10 CFR 50.73(2)(iv), "Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)." A 4-hour NRC notification was made at 5:40 p.m. on October 20, 1992, in accordance with the requirements of 10 CFR 50.72(b)(2)(ii). The NRC Resident Inspectors were also informed of this event at 5:50 p.m. on October 20, 1992.

SAFETY ASSESSMENT:

During the time period when MCC B21 was connected to the 2B03 non-safeguards equipment lockout circuit, the actuation of both trains of safety injection still would have resulted in the stripping of MCC B21 from 2B04. A potential problem could have existed with the as-found condition of the 2B04 lockout circuit and associated wiring if G02, the emergency diesel generator, was the only power source supplying 2A06 and 2B04 and a

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safety injection actuation occurred with only the "B" train being actuated. This would have required G02 to carry all of the safeguards loads on 2A06 and 2B04, as well as MCC B21.

During power operation, G02 would not normally be the only power source supplying 2A06 and 2B04. The Point Beach Technical Specifications Section 15.3.7.B.1.d only allows such a condition for a period of 7 days during power operation. Otherwise, the affected unit would have to be placed in hot shutdown. The Point Beach Technical Specifications also prohibit taking a reactor critical if A05, A06, B03, and B04 are not energized from their normal power supplies.

During power operation, in our normal electrical configuration, the occurrence of this condition would be highly unlikely. This condition would result if a loss of voltage condition occurred, with a failure of the MCC B21 supply breaker to trip on the loss of voltage, coincident with a safety injection actuation, with only the "B" train being actuated. This condition would require two independent failures and is not postulated to occur. Therefore, this event did not endanger the health and safety of plant personnel or the general public.

SIMILAR OCCURRENCES:

A review of Licensee Event Reports was conducted. The following Licensee Event Reports describe ESF actuations that resulted from personnel error:

LER 266/91-006-00	Inadvertent Start of G01 Emergency Diesel Generator
LER 301/90-005-00	Inadvertent Relay Actuation Causes Loss of Condensate Flow
LER 301/90-004-00	Inadvertent ESF Actuation; Service Water Low Flow Annunciation