

## LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 503 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20546, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Point Beach Nuclear Plant, Unit 1

DOCKET NUMBER (2)

0 5 0 0 0 2 6 6

PAGE (3)

1 OF 0 4

TITLE (4) Isolation of SI Pump Flow Path During IST of Minimum Flow Recirc Line Isolation Valves

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 (9)																
1	2	0	8	9	2	9	2	0	1	0	0	0	1	0	7	9	3	PBNP Unit 2	0	5	0	0	0	3	0	1
																			0	5	0	0	0			

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11):

OPERATING MODE (12)	20.402(b)	20.405(a)	20.73a(1)(2)(4)	20.73b(1)
N	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
POWER LEVEL (13)	20.405(a)(1)(B)	20.394a(1)	20.73a(1)(2)(4)	20.73b(1)
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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OTHER (Specify in Abstract below and in Text, NRC Form 295A)

LICENSEE CONTACT FOR THIS LER (12)

NAME

TELEPHONE NUMBER

Mr. Tom Staskal, Sr. Project Engineer--Performance Eng

414 755-2321

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)

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

YES (If yes, complete EXPECTED SUBMISSION DATE)

☒ NO

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

## ABSTRACT

At 1450 on December 8, 1992, while Point Beach Nuclear Plant (PBNP) Units 1 and 2 were operating at 100% and 95% power respectively, it was discovered that Inservice Tests IT-40, "Safety Injection Valves (Quarterly), Unit 1," and IT-45, "Safety Injection Valves (Quarterly), Unit 2," could lead to the isolation of all available flow paths for the safety injection (SI) pumps. Tests IT-40 and IT-45 perform quarterly stroke tests of safety injection/containment spray minimum flow recirculation line isolation valves 1&2SI-897A and 1&2SI-897B (hereinafter referred to as valves 897A&B). IT-40 and IT-45 place the plant in a condition in which pump damage could occur if the SI pumps automatically started while reactor coolant system (RCS) pressure was greater than SI pump shutoff head and either Valve 897A or Valve 897B remained shut. Operating the SI pumps at shutoff head would cause pump damage after approximately one minute. The tests were last performed on 11/15/92 (Unit 1) and 11/19/92 (Unit 2). A 4-hour NRC ENS notification was made in accordance with 10 CFR 50.72(b)(2)(iii)(D). The NRC Resident Inspector was also notified. A Probabilistic Risk Assessment (PRA) was subsequently performed and determined that the probability of this event occurring is approximately 1.0 E-6 events/year, or an increased pump damage risk of approximately 2 percent. Due to the increased risk of damaging the SI pumps by testing Valves 897A&B on a quarterly frequency, the tests will subsequently be performed on a cold shutdown frequency.

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LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), 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)

DOCKET NUMBER (2)

LVR NUMBER (3)

PAGE (3)

YEAR SEQUENTIAL REVISION

NUMBER NUMBER NUMBER

Point Beach Nuclear Plant, Unit 1 0 5 0 0 0 2 6 6 9 2 0 1 0 0 0 0 2 OF 0 4

TEXT IF space is required, use additional NRC Form 306A's (17)

EVENT DESCRIPTION

At 1450 on December 8, 1992, while Point Beach Nuclear Plant (PBNP) Units 1 and 2 were operating at 100% and 95% power respectively, it was discovered that Inservice Tests IT-40, "Safety Injection Valves (Quarterly), Unit 1," and IT-45, "Safety Injection Valves (Quarterly), Unit 2," place the plant in a condition in which damage could occur to both SI pumps. IT-40 and IT-45 perform quarterly stroke tests of SI/CS mini-recirculation line isolation Valves 142SI-897A and 142SI-897B (hereinafter referred to as Valves 897A&B). The damage could occur if the SI pumps automatically started while either Valve 897A or 897B was shut. Operating the SI pumps with either Valve 897A or 897B shut would cause SI pump damage due to operation of the SI pumps at shutoff head without minimum recirculation flow if reactor coolant system (RCS) pressure was greater than SI pump shutoff head and plant operators failed to open one of the valves, 897A or 897B, within approximately one minute. The tests were last performed on 11/15/92 (Unit 1) and 11/19/92 (Unit 2). Upon identification of this condition on December 8, 1992, a 4-hour NRC ENS notification was made in accordance with 10 CFR 50.72(b)(2)(iii)(D). The NRC Resident Inspector was also notified.

Although the ENS notification identified that the containment spray (CS) pumps could also be damaged under the same circumstances, this condition is now considered to be of less concern. The CS pumps have a flow path to containment regardless of the position of Valves 897A&B unless both of the two parallel motor-operated discharge valves per CS pump fail to open on an automatic signal. Because the CS pump discharge valves are powered from separate safeguards trains, concurrent failure of both pairs of discharge valves is not a credible event.

A Probabilistic Risk Assessment (PRA) was subsequently performed and determined that the probability of an automatic initiation of SI occurring while either Valve 897A or 897B is shut is approximately 1.0 E-6 events/year, or an increased pump damage risk of approximately 2 percent. Section XI of the ASME Boiler and Pressure Vessel Code, Article IWB-3412a, 1986 Edition, allows plants to identify those valves which cannot be tested during plant operation and provide for full-stroke testing of these specific valves during cold shutdowns. The PBNP Inservice Testing (IST) program accounts for valves requiring this type of testing in Appendix G, "Cold Shutdown Justifications." Therefore, due to the elevated risk of pump damage while testing Valves 897A&B during plant operation, testing of Valves 897A&B will be deferred to periods when the respective unit is in cold shutdown and both SI pumps may be taken out of service.

Wisconsin Electric addressed a related issue in a letter to the NRC dated July 24, 1985. The letter, submitted in accordance with 10 CFR 21, notified the NRC that the failure of a single component in the control circuitry for the SI recirculation path isolation valves could, under specific circumstances, result in the failure of both safety injection pumps. During a post-implementation review of the Emergency Operating Procedures (EOPs), it was discovered that a failure of the power supply breaker in the remote control circuitry for Valves 897A&B would result in those valves closing. This failure would simultaneously result in loss of valve position indication and defeat the annunciation for 897A&B valve closure on the main control board. The corrective actions specified in response to this issue included gagging the manual handwheel operators on Valves 897A&B in the open position so that the automatic operators would be overridden. This corrective action was also referenced in our response to NRC IEB 86-03, "Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air-Operated Valve in the Minimum Flow Recirculation Line," dated November 12, 1986. However, quarterly inservice stroke tests in which the valves were ungagged for a short period of time and repositioned for testing were considered at that time to pose no significant increase in risk to the SI pumps.

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FACILITY NAME (1):

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92	0110	010

Point Beach Nuclear Plant, Unit 1 0500026692-0110-010 03 OF 04

TEXT (If space space is required, use additional NRC Form 364-A's) (17)

## EQUIPMENT DESCRIPTION (Note: Information in [] indicates Energy Industry Identification System (EIIIS) identifiers)

An orificed minimum flow bypass line is provided at the discharge of each SI [BQ] pump [P] to recirculate flow to the refueling water storage tank (RWST) [TK] through a common header (or, "mini-recirc" line) in the event the pumps are run while the RCS [AB] pressure is above the pumps' shutoff head. These bypass lines also permit the performance of periodic surveillance tests required by the Technical Specifications to prove pump operability. The recirculation line is provided with air-operated isolation Valves 897A&B [ISV], in series, which are closed to prevent flow of contaminated water to the RWST when in the containment sump recirculation phase following an accident. Because Valves 897A&B fail shut, they are normally gagged open to prevent closure on a loss of instrument air. If the SI pumps are operated without a flow path, the pumps will overheat and quickly deteriorate.

Valves 897A&B are interlocked with containment sump "B" isolation Valves 1&2SI-851A&B [ISV] (hereinafter referred to as Valves 851A&B). These motor-operated gate valves are normally closed except when required for containment sump recirculation following an accident. This interlock insures that Valves 851A&B cannot be opened until at least one valve, 897A or 897B, is closed which prevents the inadvertent release of containment sump vapor or liquid to the RWST during the containment sump recirculation phase of long-term cooling following a design basis accident.

The manual handwheel operators on Valves 897A&B are currently maintained in the open position to prevent closure on a loss of instrument air.

CAUSE

The re-evaluation of the PBNP quarterly inservice testing practices for Valves 897A&B was prompted by NPO Nuclear Network Message OE 5692, "Loss of All ECCS Pumps During Monthly Surveillance Testing," transmitted on November 24, 1992, by Calvert Cliffs Nuclear Plant.

Prior to this re-evaluation, quarterly inservice stroke tests in which Valves 897A&B were ungagged for a short period of time and repositioned for testing were deemed necessary and considered to pose no significant increase in risk to the SI pumps.

CORRECTIVE ACTIONS

## A. Immediate:

1. Further testing of Valves 897A&B was suspended.

## B. Short term:

1. A Probabilistic Risk Assessment (PRA) was performed to determine the probability of an SI actuation during the time Valves 897A&B are being tested. Station logs were reviewed and indicated that the approximate time to complete IT-40/45 is on the order of two hours (however, the valves are not shut for the full duration of the test) and therefore the time that the valves are ungagged each calendar quarter is small. Given this information, it was determined that the probability of this event occurring is approximately 1.0 E-6 events/year, or an increased pump damage risk of approximately 2 percent.



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TEXT (if more space is required, use additional NRC Form 305A's) (17)

- The pumps' manufacturer, Byron Jackson, was consulted and stated that the SI pumps can be operated at shutoff head for up to one minute before pump degradation begins. Therefore, control operators would have up to one minute after an automatic pump start to restore the flow path if instrument air is available. If instrument air is not available, the valves would require manual handwheel operation.

## C. Long Term:

- A Cold Shutdown Justification (CSJ) for Valves 1&2SI-897A&B will be included in the IST program to allow testing on a cold shutdown frequency. This change was submitted to the NRC on December 23, 1992.
- Test procedures will be developed to provide for the inservice testing (stroke time, fail-safe, position indication verification, leak rate testing) of Valves 1&2SI-897A&B on a cold shutdown frequency. This will be completed by the Operations Group by February 28, 1993.
- The Operations Group will ensure that all other valves currently tested under Procedures IT-40 and IT-45 on a quarterly basis will continue to be tested on a quarterly basis. Procedures to accomplish this testing will be developed if necessary. All necessary procedure revisions will be completed or new procedures developed by February 28, 1993.

REPORTABILITY

This event is being reported under the requirements of 10 CFR 50.73(a)(2)(v)(D), "The licensee shall report...any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident." A 4-hour NRC ENS notification was made in accordance with 10CFR50.72(b)(2)(iii)(D). The NRC Resident Inspector was also notified.

SAFETY ASSESSMENT

A Probabilistic Risk Assessment (PRA) was performed and determined that the probability of operating an SI pump at shutoff head after Valves 897A&B have been ungagged and the valves have failed shut is  $1.0 \times 10^{-6}$  events/year. The probability of failure of the SI pumps for other reasons is calculated to be  $5.3 \times 10^{-5}$  events/year. Therefore, this identified condition would result in an increased risk of failure of the SI pumps of about 2%. This condition is a small contributor to the failure of the SI pumps. Hence, the probability of pump damage occurring as a result of the scenario described above is determined to not be a significant contributor to core damage frequency. The safety of the plant and the health and safety of the public and plant employees were not jeopardized by this plant condition.

GENERIC IMPLICATIONS

No generic implications have been identified.

SIMILAR OCCURRENCES

There have been no similar occurrences identified at PBNP.