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December 1, 1993

Document Control Desk
U.S. NUCLEAR REGULATORY COMMISSION
Mail Station P1-137
Washington, DC 20555

Gentlemen:

DOCKETS 50-266 AND 50-301
LICENSEE EVENT REPORT 93-008-01
SW-LW-61 DETERMINED TO BE INOPERABLE DURING SURVEILLANCE TESTING
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

Enclosed is Licensee Event Report 93-008-01 for Point Beach Nuclear Plant, Units 1 and 2. This report is provided in accordance with 10 CFR 50.73(a)(2)(i), "Any operation or condition prohibited by the plant's Technical Specifications." This supplement is being submitted to provide additional information in the "Safety Assessment" portion of the report. None of the information contained in the original report has been changed or deleted by this supplement.

Please contact us if there are any questions.

Sincerely,

Bob Link
Vice President
Nuclear Power

FDP/jg

Enclosure

cc: NRC Regional Administrator, Region III
NRC Resident Inspector

070057

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Point Beach Nuclear Plant, Units 1 and 2	05000266	1 OF 7

TITLE (4)
SW-LW-61 Determined to be Inoperable During Surveillance Testing

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
09	10	93	93	-- 008 --	01	11	30	93	Point Beach Nuclear Plant, 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)	100		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)		50.73(a)(2)(vii)		OTHER
			20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
			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 (Include Area Code)
Frank Padovano, Senior Licensing Engineer	(414) 221-3374

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)

At 0205, on September 10, 1993, during the performance of In-Service Test, IT-72, "Service Water Valves (Quarterly)," SW-LW-61, the service water inlet isolation to each unit's blowdown tank vent condenser, the blowdown evaporator overhead condenser, and the blowdown evaporator distillate cooler, failed to shut as required. The subsequent inspection revealed that the instrument air tubing was incorrectly connected to the valve ports of SW-LW-61-S, the associated solenoid valve. Incorrectly connecting this tubing prevented instrument air from properly venting off when the solenoid valve shut. This prevented SW-LW-61 from shutting, as required. Maintenance was subsequently performed to correct the situation, with the valve being returned to service at 1422 on September 10, 1993, following the successful completion of post-maintenance testing.

EVENT DESCRIPTION:

At 0205, on September 10, 1993, during the performance of In-Service Test, IT-72, "Service Water Valves (Quarterly)," SW-LW-61, a pneumatically-operated butterfly valve, failed to shut as required. The subsequent inspection revealed that the instrument air tubing was incorrectly connected to the valve ports of SW-LW-61-S, the associated solenoid-operated valve. Incorrectly connecting this tubing prevented instrument air from properly venting off when the solenoid-operated valve shut. This prevented SW-LW-61 from shutting, as required. A review of the maintenance history for SW-LW-61 and SW-LW-61-S was conducted in response to this event and is detailed in the following paragraphs.

On April 15, 1993, corrective maintenance was performed to replace the solenoid on SW-LW-61-S, a solenoid-operated valve which serves to isolate the instrument air to SW-LW-61, a pneumatically-operated butterfly valve. SW-LW-61 serves as the service water inlet isolation for each unit's blowdown tank vent condenser, the blowdown evaporator overhead condenser, and the blowdown evaporator distillate cooler. Following the completion of the maintenance, In-Service Test IT-72, "Service Water Valves (Quarterly)," was performed to verify the valve's operability. This testing was completed satisfactorily.

Following the maintenance and subsequent post-maintenance testing, a plant engineer inspected the installation and determined that the solenoid had been installed upside down. The valve supplier specifies that the solenoid should be installed in the upright position. In fact, a red arrow is placed on the solenoid to indicate the proper orientation. Upon discovering the improper orientation of the solenoid, the engineer initiated a maintenance work request (MWR) to correct the condition. He also initiated a condition report to document the condition. The plant regulatory personnel who performed a screening of the condition report determined, following a review of the vendor technical information and the results of post-maintenance testing, determined that the orientation of the solenoid did not affect the operability of the valve.

The corrective maintenance performed on April 15, 1993, was performed by maintenance electricians because of the electrical connections that had to be completed during the installation of the solenoid. For this reason, the plant engineer discussed the newly-initiated MWR with the electrical maintenance planner. They both determined that correcting the orientation of the solenoid would not require any electrical support. Therefore, the maintenance was scheduled to be performed by maintenance mechanics during the upcoming blowdown evaporator maintenance outage.

On June 14, 1993, the maintenance was performed by two maintenance mechanics. The MWR stated, in the problem description, "valve mounted in opposite direction which is required by vendor manual. Change in mount will require retubing." The work plan section of the MWR stated, "change valve orientation as requested. See maintenance planner for 3/8 inch tubing. No QC hold or inspection points." The maintenance mechanics interpreted these statements to mean that the instrument air connections to the valve were connected in the opposite direction. They, therefore rotated the valve to accommodate rerouting of the instrument air tubing. They did not perform any maintenance that corrected the orientation of the valve's solenoid.

Upon completion of the maintenance, the MWR was returned to the maintenance planner. He forwarded the work package, along with several other work packages associated with the blowdown evaporator maintenance outage, to the Operations group for review. The MWR was reviewed and SW-LW-61 was returned to service by Operations personnel on June 24, 1993. There is no indication that any post-maintenance testing was performed prior to restoring SW-LW-61 to service. The work package did, however, state that a valve cycle should be performed and that IT-72 is the post-maintenance operability test applicable to SW-LW-61.

Following completion of the maintenance, the plant engineer responsible for solenoid valves inspected the valve to assess the adequacy of the maintenance. He determined that the solenoid was still installed in the improper orientation. He discussed the situation with personnel from the maintenance group. The maintenance group determined that another MWR should be initiated to correct the condition. This MWR was initiated on July 14, 1993.

On September 10, 1993, prior to performing any maintenance on SW-LW-61-S, IT-72 was performed to meet a periodic surveillance requirement. At 0205, during performance of the in-service test, SW-LW-61 failed to shut, as required. This test failure placed both units in a 48-hour Limiting Condition for Operation (LCO) in accordance with Technical Specification 15.3.3.D.2.c. The LCO was exited at 0240 when a dedicated operator was stationed at SW-LW-61. The Duty and Call Superintendent determined that manual action performed by a dedicated operator could be substituted for automatic action had it been necessary.

An inspection of the valve by Operations personnel determined that the instrument air to the solenoid valve was tubed incorrectly. SW-LW-61 was correctly tubed, and the solenoid was correctly oriented, under the existing July 14, 1993 MWR and returned to service at 1422, following the successful completion of post-maintenance testing.

COMPONENT AND SYSTEM DESCRIPTION:

SW-LW-61-S is a 1/4 inch, solenoid-operated globe valve manufactured by the Automatic Switch Company. This valve is rated for 150 psig and is the instrument air isolation valve for SW-LW-61. The solenoid valve is normally energized and will shut, isolating instrument air to SW-LW-61, when de-energized.

SW-LW-61 is an 8 inch, pneumatically-operated butterfly valve manufactured by the Fisher Governor Company. This valve is rated for 75 psig and serves as the service water inlet isolation valve for each unit's blowdown tank vent condenser, the blowdown evaporator overhead condenser, and the blowdown evaporator distillate cooler. The valve is designed to shut, when SW-LW-61-S is de-energized and shuts, isolating instrument air to the valve operator of SW-LW-61.

SW-LW-61 and SW-LW-62, the associated service water outlet isolation valve, are designed to shut following a safety injection signal if less than four service water pumps are running. Service water is isolated to each unit's blowdown tank vent condenser, the blowdown evaporator overhead condenser, and the blowdown evaporator distillate cooler in order to ensure that sufficient service water flow is supplied to essential safety-related components.

CAUSE AND CORRECTIVE ACTION:

In response to the event, a Human Performance Enhancement System (HPES) evaluation was performed. The HPES evaluator determined that an inadequate work package combined with personnel error contributed to this event.

The work package was determined to be inadequate because it did not clearly describe the work that had to be performed to reorient the solenoid. The maintenance mechanics believed that the work plan directed retubing the solenoid valve to redirect the instrument air flow. The actual intent of the MWR, however, was to correct the orientation of the solenoid. Had the work plan been clear, this event could have been avoided. The work package did, however, state that a valve cycle should be performed and that IT-72 is the post-maintenance operability test applicable to SW-LW-61.

A review was performed to determine if adequate guidance is in place regarding MWR work plans. This review determined that there is a procedure, Point Beach Nuclear Plant Procedure (PBNP) 5.17, "Standards for MWR Work Plans," that provides adequate guidance for drafters of MWR

work plans. However, this procedure was issued on July 30, 1993, subsequent to the drafting of the inadequate MWR work plan. Copies of this Licensee Event Report, PBNP 5.17, and the HPES evaluation will be forwarded to the appropriate Nuclear Power Department training advisory committees. These committees will review the material and determine the type of, and need for training. These reviews will be completed by December 1, 1993.

Discussions were also held with the Manager - Maintenance following this event. He stated that it is expected that maintenance planners clearly understand the problem to be corrected prior to writing any work plan. Additionally, it is expected that the applicable maintenance supervisor review the work package prior to the performance of the maintenance. These reviews are performed to ensure that the scope of the work is properly identified and that the work plan adequately describes the work to be performed. In this case, both of these reviews failed to identify any problems with the work package. In response to this event, management expectations with regards to pre-job work package reviews will be emphasized to all maintenance planners and supervisors.

Personnel error was also determined to be a contributing factor in this event because no post-maintenance testing was performed upon completion of the maintenance. Had testing been performed, the improper maintenance would have been immediately discovered and corrected. Following completion of any maintenance, the MWR work package is forwarded to the on-shift Operations crew for review. During this review, the responsible Operations supervisor is required to determine if any post-maintenance testing is necessary prior to returning the equipment to service, based on the scope of the work performed. If a determination is made that no testing is required, an explanation must be provided on the MWR.

In this case, however, the Operations supervisor returned the valve to service without performing any post-maintenance testing, but did not provide any explanation as to why post-maintenance testing was not required. The responsible supervisor, when questioned, did not remember his review of the MWR work package, nor could he provide any explanation for his actions. The Manager - Operations has since counseled the responsible supervisor, emphasizing the need for thorough reviews of MWRs. Post-maintenance testing requirements for safety-related equipment were also discussed. We believe, based on a review of previous plant condition reports, that the improper closeout review discussed in this LER is an isolated case and that sufficient controls are already in place. However, in order to confirm this, we intend to conduct a quality assurance audit of completed MWRs to verify proper closeout review with regards to post-maintenance testing. The adequacy of work plans and

their pre-job reviews will also be examined during this audit. We anticipate completing this audit by February 28, 1994.

REPORTABILITY:

This event is being reported in accordance with the requirements of 10 CFR 50.73(a)(2)(i), "Any operation or condition prohibited by the plant's Technical Specifications." An NRC notification in accordance with 10 CFR 50.72 was not required in response to this event. The NRC Resident Inspectors were informed.

SAFETY ASSESSMENT:

In order to isolate service water flow to nonessential loads following a safety injection signal with less than four service water pumps running, SW-LW-61 and SW-LW-62 are designed to shut. These automatic actions will isolate service water flow to each unit's blowdown tank vent condenser, the blowdown evaporator overhead condenser, and the blowdown evaporator distillate cooler. During the period when SW-LW-61-S was installed improperly, SW-LW-61, the inlet isolation valve would not have shut following the safeguards signal, as required. However, service water flow still would have been isolated to these nonessential components because SW-LW-62, the outlet isolation valve, would have shut, as designed. Therefore, the health and safety of the public and of plant personnel were not endangered by this event.

SIMILAR OCCURRENCES:

A thorough review of recent Licensee Event Reports was conducted. The following Licensee Event Reports describe events caused by an inadequate procedure combined with personnel error:

LER 266\93-002-00, "Inoperability of Both Diesel Generators"

LER 301\92-007-00, "Inadvertent ESF Actuation as a Result of Improper Surveillance Testing"

The following Licensee Event Reports describe events caused by personnel error:

LER 301\93-002-00, "Reactor Trip During Turbine Trip Testing"

LER 266\93-004-00, "Containment Hatch Temporary Third Door Tied Open During Refueling Operations"

LER 266\92-001-00, "Turbine Runback Caused by Improper Post-Maintenance Testing"

LER 301\92-001-00, "Improper Calibration of One Channel of Over-Temperature Delta T, Resulting in a Technical Specification Violation"

LER 266\92-003-00, "Inadvertent Start of Emergency Diesel Generator Due to Personnel Error"

LER 266\92-005-00, "Excessive Cool-Down Transient"

SUPPLEMENTAL INFORMATION:
SAFETY ASSESSMENT:

Procedural controls are also in place to ensure that SW-LW-61 and SW-LW-62 are shut following a safety injection signal with less than four service water pumps running. Emergency Operating Procedure (EOP)-0, "Reactor Trip or Safety Injection," directs plant operators to locally shut SW-LW-61 and SW-LW-62 if less than four service water pumps are running. During the period when the solenoid valve, SW-LW-61-S, was improperly installed, SW-LW-61 still could have been locally operated, allowing the EOP-0 actions to be performed, if required.

A review of the operating logs was also conducted to determine the actual service water pump configurations and emergency diesel generator availability for the period when SW-LW-61-S was improperly installed. This information was used as input data into a computerized service water flow model. The results of the flow model indicated that sufficient service water flow would still have been supplied to all essential service water loads following a design basis event, even if both SW-LW-61 and SW-LW-62 had remained open.

In addition to their safeguards function, SW-LW-61 and SW-LW-62 also serve as isolation valves between Seismic Class I portions of the service water system and the Seismic Class III piping of the blowdown evaporator system. Stress analysis engineers inspected the routing and supports of the blowdown evaporator system piping and judged that the Seismic Class III piping would maintain its pressure boundary following a seismic event. However, had a seismic event occurred and affected the blowdown evaporator system piping, both SW-LW-61 and SW-LW-62 could have been locally shut to isolate the affected piping. Abnormal Operating Procedure 9A, "Service Water System Malfunction," also describes actions to be taken to segment and isolate portions of the service water system following a piping rupture, should one occur.