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VPNPD-92-327  
NRC-92-117

October 16, 1992

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

Gentlemen:

DOCKET 50-301  
LICENSEE EVENT REPORT 92-003-00  
ONE TRAIN OF CONTAINMENT SPRAY INOPERABLE  
DUE TO FOREIGN MATERIAL  
POINT BEACH NUCLEAR PLANT, UNIT 2

Enclosed is Licensee Event Report 92-003-00 for Point Beach Nuclear Plant, Unit 2. This report describes an event which occurred on September 18, 1992, during the performance of testing to meet the requirements of ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Systems and Components." Train "A" of the Unit 2 containment spray system was rendered inoperable due to foreign material blocking the containment spray pump suction during testing. This event does not meet the reporting requirements of 10 CFR 50.72 or 10 CFR 50.73, but is being reported on a voluntary basis as an event with potential serious consequences of generic interest to other licensees and to the NRC staff.

Please contact us if you have any questions or desire additional information.

Sincerely,

Bob Link  
Vice President  
Nuclear Power

TGM/jg

220033

cc: NRC Regional Administrator, Region III  
NRC Resident Inspector

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NRC FORM 316 (6-89)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED ONE NO 3160-0104 EXPIRES 4/30/92 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 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 PAPER: "REDUCTION PROJECT 13150-01-04, OFFICE OF MANAGER, 1 AND BUDGET, WASHINGTON, DC 20503	
<b>LICENSEE EVENT REPORT (LER)</b>					
FACILITY NAME (1)				DOCKET NUMBER (2)	
Point Beach Nuclear Plant, Unit 2				0 5 0 0 0 3 0 1 1	
TITLE (6)				PAGE 15	
One Train of Containment Spray Inoperable				1 OF 0 17	
EVENT DATA (5)		LER NUMBER (6)		REPORT DATE (7)	
MONTH	DAY	YEAR	YEAR	MONTH	DAY
0	9	1	8	9	2
OPERATING MODE (8)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (13)		OTHER FACILITIES INVOLVED (6)	
N		20 402(x) 20 406 W(1)(1) 20 406 W(1)(2) 20 406 W(1)(3) 20 406 W(1)(4) 20 406 W(1)(5)		20 406(x) 20 36(x)(1) 20 36(x)(2) 20 73 W(1)(1) 20 73 W(1)(2) 20 73 W(1)(3) 20 73 W(1)(4) 20 73 W(1)(5)	
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		20 73 W(1)(16) 20 73 W(1)(17) 20 73 W(1)(18) 20 73 W(1)(19) 20 73 W(1)(20)		20 73 W(1)(21) 20 73 W(1)(22) 20 73 W(1)(23) 20 73 W(1)(24) 20 73 W(1)(25)	
LICENSEE CONTACT FOR THIS LER (12)					
NAME				TELEPHONE NUMBER	
N. L. Hoefert, Manager - Operations				4114 7151 51-12131211	
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (14)					
CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC	
E	BIE	11 IP	1101715	Y	
SUPPLEMENTAL REPORT EXPECTED (14)					
<input checked="" type="checkbox"/> YES (If so, complete EXPECTED SUBMISSION DATE)					
<input type="checkbox"/> NO					
EXPECTED SUBMISSION DATE (15)					MONTH DAY YEAR 11 01 6 9 2
ABSTRACT (Limit to 1000 words; if additional material is necessary, attach single space typewritten pages) (16)					
<b>ABSTRACT</b>  On September 18, 1992, at 0804, quarterly test IT-06, "Containment Spray Pumps And Valves, Unit 2," was commenced on the "A" train of the containment spray system. This test satisfies the testing requirements for the containment spray system as defined in the Technical Specifications or the ASME Boiler and Pressure Vessel Code, Section XI, "Rules For Inservice Inspection Of Nuclear Power Plant Components." When Containment Spray Pump P-14A was started, the operator stationed at the pump, noted the suction pressure oscillating. The pump was secured and vented. A small amount of air was released from the pump casing. The pump was restarted and did not develop discharge pressure. The pump was again secured and vented. When P-14A was started for the third time, abnormal noise was heard emanating from the pump and the pump was secured. P-14A was disassembled and a foam rubber plug was found blocking the impeller suction. The plug was removed and the pump reassembled. IT-06 was completed successfully at 1210 on September 19, 1992. P-14A was declared operable following successful completion of the test.					
Attachment QP 16-5.1					

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F330) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

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YEAR SEQUENTIAL REVISION  
NUMBER NUMBER NUMBER

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TEXT (IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC Form 286A 2/17)

EVENT DESCRIPTION

On September 17, 1992, Annual Test IT-545A, "Leakage Reductions and Preventive Maintenance Program Test of Containment Spray System, Unit 2," was performed on the Point Beach Nuclear Plant (PBNP) Unit 2, containment spray system. This test stipulates a series lineup of a residual heat removal (RHR) system train and the containment spray system train, with the containment spray pump (P-14) suction aligned to the same trains' residual heat removal pump (P-10) discharge. During this test, the residual heat removal pump takes suction from the refueling water storage tank (RWST) and the discharge from the containment spray pump recirculates to the RWST. The test was completed satisfactorily on both the "A" and "B" trains of the RHR and containment spray systems.

After completing the "B" train test, the operators reported a significant difference in the discharge pressures of the "A" train (P-14A) and "B" train (P-14B) containment spray pumps. The recorded discharge pressure for P-14A was approximately 270 psig. The recorded discharge pressure for P-14B was approximately 400 psig. No other abnormalities were noted that would indicate an operational problem with Containment Spray Pump P-14A. A maintenance work request (MWR) was issued on September 17, 1992, to check the calibration of the pressure gauges associated with Containment Spray Pump P-14A. Instrumentation and Control technicians performed the calibration check and found the gauges to be indicating accurately. The next shift of Operations personnel followed up by verifying that the gauge sensing lines were clear. ASME Section XI Quarterly Test IT-06, "Containment Spray Pumps and Valves, Unit 2," was previously scheduled to be performed on the morning of September 18, 1992. Further investigation of the difference in the pressure reading was deferred pending performance of this test.

On September 18, 1992, IT-06 was commenced on Unit 2 Containment Spray Pump P-14A at 0804. A 48-hour Limiting Condition of Operation (LCO) was entered for Containment Spray Pump P-14A in accordance with Technical Specification Section 15.3.3, "Emergency Core Cooling System, Auxiliary Cooling Systems, Air Recirculation Fan Coolers, and Containment Spray," Specification B.2.b, at the start of the test. This test consists of testing each train of the containment spray system individually, with the spray pump suction aligned to the RWST and the discharge recirculating back to the RWST. When Pump P-14A was started, an operator stationed at the pump noted the pump suction pressure was oscillating. The operator contacted the control room and directed them to secure the pump so that the pump casing could be vented. Spray Pump P-14A was secured and a small amount of air was removed from the pump during venting. Following completion of the venting, the control room was contacted and the pump restarted. The operator stationed at Pump P-14A noted that the pump discharge pressure was zero. He again

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TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-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

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TEXT (IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC FORM 368A's) (17)

contacted the control room and the pump was secured for venting. No air was removed from the pump casing during this second venting operation. The pump was subsequently started for the third time. The operator noted abnormal noise emanating from the pump. Test IT-06 was aborted at 1130 and system lineups returned to normal. Pump P-14A was secured and declared inoperable effective 0804.

EQUIPMENT DESCRIPTION

The purpose of the containment spray system is to provide water spray to the containment atmosphere following a design basis loss of coolant accident. This water spray serves to cool the containment atmosphere, thereby controlling the internal containment pressure, and to remove elemental iodine from the containment atmosphere should it be released to the containment atmosphere from damaged reactor fuel. The system is actuated on a Hi-Hi containment pressure signal.

The containment spray system consists of two pumps, one spray additive tank, spray ring headers and nozzles inside containment and the necessary pumps and valves. The spray pumps normally take suction directly from the RWST. The spray pumps can be aligned to take suction from the discharge of the RHR pumps during the long-term recirculation phase of containment cooling. During this phase, the RHR pumps take suction from the containment sump and discharge through the RHR heat exchangers back to the reactor coolant system. A portion of this flow can be directed to the containment spray pump and safety injection pump suctions.

The containment spray pumps are horizontally mounted, single stage, centrifugal pumps designed to provide 1200 gpm at 300 psig. The pumps are manufactured by Ingersoll-Rand.

CAUSE

The spray pump impeller suction was blocked by a foam rubber plug. The origin of the plug could not be conclusively identified by the incident investigation team formed to investigate and recommend corrective actions following this event. However, the investigation team determined that the plug was most likely installed in a portion of the piping between the Unit 2 RHR Pump P-10A discharge and the Containment Spray Pump P-14A and Safety Injection Pump P-15A suctions as a temporary cleanliness barrier during system modifications performed during the Unit 2 Fall 1991 refueling outage, and subsequently not removed. This modification installed test lines allowing full flow testing of the RHR pumps. We committed to install this modification in response to potential concerns with operating pumps at less than manufacturer's recommended minimum flows identified in NRC Bulletin 88-04, "Potential Safety-Related Pump Loss."

Attachment QP 16-5.2



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F&D), 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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CORRECTIVE ACTION

## A. Immediate

1. The pump was declared inoperable. The 48-hour LCO in Technical Specification 15.3.3.B.2.b for Containment Spray Pump P-14A had been entered at the 0804 on September 18, 1992, at the start of Test IT-06.

## B. Short-Term

1. Maintenance Work Request (MWR) 924946 was initiated to investigate the failure of Containment Spray Pump P-14A. The "B" train containment spray pump, P-14B, was tested in accordance with the requirements of Technical Specification 15.3.3.B.2.b prior to initiating maintenance on P-14A. The test was successful.
2. Containment Spray Pump P-14A was disassembled and a foam rubber plug found in the impeller suction. The plug was removed, and the pump reassembled. IT-06 was completed satisfactorily and the pump declared operable at 1210 on September 19, 1992.
3. The Unit 2 Train B Containment Spray Pump P-14B was tested utilizing IT-06 on September 18, 1992. The test was successful.
4. Additional tests of Unit 2 Containment Spray Pumps P-14A and P-14B were performed on September 19 and 20, 1992, utilizing a modified test procedure, to test the ability of the pumps to develop full flow with water supplied to the pump suction from the RHR system. The tests were completed satisfactorily.
5. On September 20, 1992, Test IT-06 was completed on Unit 2 Containment Spray Pumps P-14A and P-14B. The tests were completed satisfactorily.
6. A quorum of the Manager's Supervisory Staff (MSS) met on September 21, 1992, to review the event, the results of system testing, and to define additional necessary actions to ensure the operability of the containment spray, RHR and safety injection systems in both PBNP units. The staff determined that there was reasonable assurance that failure of the Unit 2, Train A containment spray pump did not indicate a common-mode failure problem and that these other systems remained operable. Similar modifications had been performed on the Unit 1 systems during the Unit 1 Spring 1992 refueling outage. Additional controls were implemented in the installation work plan (IWP) for this

Attachment QP 16-5.2

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 800 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F430), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Point Beach Nuclear Plant Unit 2	0160603011	92	003	001	05	07

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modification that were not included in the IWP for the Unit 2 modifications. These controls included additional sign-offs by Wisconsin Electric personnel ensuring system cleanliness.

7. The MSS prescribed a testing plan for the containment spray, RHR and safety injection systems in both units to provide additional assurance of the operability of these systems. The following tests were conducted and results achieved:
- Radiography was performed, on September 21, 1992, on a section of piping from the Unit 2 Train A RHR pump discharge to the Train A safety injection pump suction. No foreign material was detected.
  - On September 21 and 22, 1992, Unit 2 Safety Injection Pumps P-15A and P-15B were tested with water supplied to the pump suction from the RHR system. The tests were completed satisfactorily.
  - On September 23 and 24, 1992, testing was performed on the Unit 1 Containment Spray Pumps P-14A and P-14B with water supplied to the pump suction using the Unit 1 RHR system. The tests were completed satisfactorily.
  - On September 24, 1992, testing was performed on the Unit 1 Safety Injection Pumps P-15A and P-15B with water supplied to the pump suction using the Unit 1 RHR system. The tests were completed satisfactorily.
8. An incident investigation team was chartered to investigate the event in order to determine the root cause. The team completed its investigation and reported to the MSS on October 5, 1992. The team could not conclusively identify the origin of the foreign material. The foam rubber plug was most likely placed into the piping during modifications performed during the Unit 2 fall refueling outage to install full flow test lines in the RHR, containment spray and safety injection systems.
9. Inspections are being performed during the present Unit 2 refueling outage, which commenced September 26, 1992, of portions of the Unit 2 containment spray, RHR and safety injection systems to identify any additional foreign material in these systems. The inspections will include, to the extent practicable, the portions of the systems affected by the full flow test line modifications as well as piping dead legs and flow restrictions. The inspections will be completed during the presently ongoing refueling outage.

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F530) 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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10. The interior of the Unit 2 RWST has been inspected using a remote controlled minisub and video camera. Minor debris was found. The debris included small pieces of tape, herculite, and other material. The debris will be removed prior to the end of the present refueling outage. The debris has been determined to not be safety significant. The MSS has concurred with this determination.

## C. Long-Term

1. To address the root cause of foreign material introduction into a system during modification and maintenance, the incident investigation team recommended corrective actions in the areas of improved foreign material control and cleanliness inspections prior to system closing. Maintenance and engineering personnel are evaluating these recommendations to determine the specific actions needed.

A supplemental report will be submitted following the evaluation and determination of appropriate actions to satisfy the long-term corrective action recommendations to prevent recurrence. We expect to submit this report by November 6, 1992.

REPORTABILITY

This event is being reported on a voluntary basis as an event with potential serious consequences of generic interest to other licensees. This event does not meet any of the reporting requirements as defined in 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors," or 10 CFR 50.73, "Licensee Event Report System" since only one safety system train was affected. The event could not have rendered both trains of containment spray inoperable nor rendered multiple safety-related systems in the same train inoperable.

SAFETY ASSESSMENT

Following a design basis event in which the reactor core's residual heat is released as steam to the containment atmosphere, the containment spray system and containment recirculation fan coolers function to maintain containment pressure less than the design pressure. Two trains of the containment spray system, four containment recirculation fan coolers or one train of containment spray in conjunction with two containment recirculation fan coolers are sufficient to limit containment pressure to less than the containment design pressure. One train of the containment spray system and four containment recirculation fan coolers remained operable at the time of this event. Therefore, sufficient containment cooling was available to limit containment pressure to less than the design pressure.

Attachment QP 16-5.2

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST ADD HRS. FORWARD COMMENTS REL. INDIC. BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330) 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 266A (1-85)

Containment spray is also used to remove elemental iodine from the containment atmosphere in the event of a loss of coolant accident resulting in fuel failure and a release of iodines to the containment atmosphere. This limits the off-site radiation exposure should a breach in the containment structure occur. One train of containment spray remained operable to perform this function. In addition, as discussed above, sufficient heat removal capacity remained available to limit containment pressure, thereby reducing the potential for a breach in containment.

Due to the suspected origin of the foam rubber plug, if the RHR system was used to provide suction to the safety injection system, the potential existed for the plug to block flow to the Train A safety injection pump (P-15A), thereby rendering Train A inoperable. Both trains of safety injection could not have been rendered inoperable due to train independence. One train of safety injection would have remained available to provide water to the reactor coolant system. Therefore, the health and safety of plant personnel and the public was not jeopardized.

GENERIC IMPLICATIONS

Foreign material exclusion from systems which are opened for routine or non-routine maintenance and during modifications systems is essential to ensure system operability. Foreign material introduced into a system during modification and maintenance must be controlled and the appropriate testing and inspections performed during and following modification and maintenance to ensure system operability.

SIMILAR OCCURRENCES

A review for similar occurrences at PBNP has identified other incidents of foreign material intrusion into systems including the secondary side of the steam generators and the reactor coolant system. Evaluations which were performed for these previous events concluded that a safety concern did not result.