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VPNPD-93-050

NRC-93- 027

February 26, 1993

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

Gentlemen:

DOCKET 50-301

LICENSEE EVENT REPORT 93-001-00

FAILURE OF STEAM GENERATOR SAMPLE ISOLATION VALVE TO FULLY SHUT
POINT BEACH NUCLEAR PLANT, UNIT 2

Enclosed is Licensee Event Report 93-001-00 for Point Beach Nuclear Plant, Unit 2. This report is provided in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plant's Technical Specifications." This report describes the failure of a steam generator blowdown sample isolation valve to fully shut on January 27, 1993.

Please contact us if there are any questions.

Sincerely,

Bob Link
Vice President
Nuclear Power

KVA/jg

Attachment

cc: NRC Resident Inspector
NRC Regional Administrator

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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)

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TITLE (4)

Failure of Steam Generator Sample Isolation Valve to Fully Shut

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)							
0	1	2	7	9	3	9	3	0	0	1	0	5	0	0	0		
0	1	2	7	9	3	9	3	0	0	1	0	5	0	0	0		
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)															
N																	
POWER LEVEL (10)		1 10 10															
		20.402(b)															
		20.406(a)(1)(i)															
		20.406(a)(1)(ii)															
		20.406(a)(1)(iii)															
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		20.406(c)															
		50.36(c)(1)															
		50.36(c)(2)															
		50.73(a)(2)(iv)															
		50.73(a)(2)(v)															
		50.73(a)(2)(vi)															
		50.73(a)(2)(vii)(A)															
		50.73(a)(2)(vii)(B)															
		50.73(a)(2)(x)															
		73.71(b)															
		73.71(c)															
		OTHER (Specify in Abstract below and in Text, NRC Form 366A)															

LICENSEE CONTACT FOR THIS LER (12)

NAME

Jim C. Reisenbuechler, Operations Manager

TELEPHONE NUMBER

AREA CODE

4 1 4 7 1 5 1 - 1 2 1 3 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
	X				

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

ABSTRACT:

On Wednesday, January 27, 1993, while performing maintenance on a radiation monitoring system data acquisition module, flow was observed in the blowdown sample line for the Unit 2, "B" steam generator. The blowdown sample isolation valves for both steam generators receive an automatic signal to close when the data acquisition module is removed from service for maintenance. However, the blowdown sample isolation valve for the "B" steam generator (2MS-2084) did not fully shut. This valve is the automatic containment isolation valve in the blowdown sample line for the Unit 2, "B" steam generator. A three hour Limiting Condition for Operation was entered based on loss of containment integrity. 2MS-2084 was immediately shut and verified shut by operations personnel. The manual isolation valve (2MS-317) upstream of 2MS-2084 was also shut, thereby restoring containment integrity. The valve was repaired and satisfactorily tested two days later. There was no release of radioactive liquid to the environment as a result of this event.

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TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

EVENT DESCRIPTION:

On Wednesday, January 27, 1993, PBNP Unit 2 was operating at 100% power. Preparations were being made to remove Radiation Monitoring System (RMS) Data Acquisition Module (DAM) #6 from service for corrective maintenance. As part of these preparations, the continuous blowdown for Unit 2 steam generators was secured at 9:30 a.m. At approximately 9:31 a.m., an alert status was received on the Unit 2 Steam Generator Blowdown Process Monitor, 2RE-219. The output of 2RE-219 is supplied to DAM-6. Therefore, actions to remove DAM-6 from service were suspended while Unit 2 steam generator samples were obtained to research the alert status on 2RE-219.

The Unit 2 steam generator samples were obtained at 9:40 a.m. At 9:55 a.m., DAM-6 was removed from service by securing power to the DAM. 2RE-219 has a control function which shuts the steam generator blowdown isolation valves (2MS-5958/5959), steam generator blowdown sample isolation valves (2MS-2083/2084), and blowdown tank outlet valve (2MS-2040) if radiation levels in the steam generator blowdown line exceed the alarm setpoint. Securing DAM-6 from service causes these control functions to take place. Since the blowdown isolation valves were already shut, the other 3 valves stroked shut when the DAM was secured. The valve position lights in the control room for all five valves indicated that the valves were closed.

At approximately 11:00 a.m., a chemistry technician noted that the rotameter at the Unit 2 secondary system sample panel indicated flow in the steam generator blowdown sample line and notified the control room of the indication. Because the blowdown sample isolation valve (2MS-2084) indicated closed, troubleshooting was commenced to determine the source of the flow in the sample line. At 12:02 p.m., it was determined that 2MS-2084, which is also the automatic containment isolation valve in the blowdown sample line, was not fully shut. The operating supervisor touched the top of the valve which caused the valve to shut approximately an additional 1/8 of an inch, stopping the flow in the sample line.

A 3 hour Limiting Condition for Operation (LCO) was entered at 12:02 p.m., January 27, 1993, in accordance with PBNP Technical Specification 15.3.0.A, "General Considerations." Technical Specification 15.3.6, "Containment System," states that the containment integrity shall not be violated when a nuclear core is installed in the reactor unless the reactor is in the cold shutdown condition. Because Technical Specification 15.3.6 does not contain specific actions or a time period for restoring containment integrity, the requirements of Technical Specification 15.3.0.A apply.

The 3 hour LCO was exited at 12:03 p.m., January 27, 1993, when 2MS-2084

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

and 2MS-317 (the upstream manual isolation valve) were shut and it was verified by operations personnel that there was no leak-through. The closing of these valves restored containment integrity.

At 12:04 p.m., the Duty and Call Superintendent (DCS) and Duty Technical Advisor (DTA) were notified of the event. The NRC Resident Inspector was notified of the event at 12:37 p.m. A 4 hour NRC notification was completed by the DTA at 12:49 p.m. in accordance with 10 CFR 50.72(b)(2)(iii)(C).

DAM-6 was returned to service, with the exception of the Unit 2, "B" steam generator input to 2RE-219, at 1:25 p.m. Continuous steam generator blowdown on the Unit 2 steam generators was reestablished at 1:40 p.m.

COMPONENT AND SYSTEM DESCRIPTION:

Each steam generator is provided with two bottom blowdown connections for shell side chemical and solids concentration control. The piping from the two connections joins to form a 2" blowdown line which is routed from each steam generator through individual containment penetrations and air-operated isolation valves, heat exchangers, and manual flow control valves to the steam generator blowdown tank. The continuous blowdown rate is determined by the results of analyses of water samples taken from the steam generators.

The steam generator water samples are taken through a blowdown sample line that taps off one of the blowdown connections. The sample lines are routed through containment penetrations, containment isolation valves, heat exchangers, a radiation monitor, several chemistry instruments and a continuously flowing grab sample. Drains are routed to the retention pond via the turbine hall drains. Flow from 2RE-219 is collected in a drain tank and is either pumped to the blowdown tank or overflows to the waste hold-up tank. Grab samples are taken as required in accordance with Technical Specifications and Chemistry Analytical Methods and Procedures (CAMP) 101, "Daily Routine Sampling Schedule for Operating, Refueling, or Shutdown Units."

2MS-2084 is a 3/4" Copes Vulcan, air-operated, normally open, fail closed, globe valve. The valve is held open by air pressure on the diaphragm which acts against spring pressure. When the associated solenoid valve (2MS-2084-S) receives a shut signal, it releases air from the operator diaphragm of 2MS-2084, allowing spring pressure to close the valve.

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Valve 2MS-2084 receives automatic closure signals from two sources:

1) a containment isolation signal because 2MS-2084 serves as the containment isolation valve for the steam generator blowdown sample line, and 2) an automatic close signal from the steam generator blowdown process monitor as discussed below.

The radiation monitoring system at PBNP is a microprocessor based radiation detection system. Eight data acquisition modules (DAMs) and four special particulate, iodine, and noble gas monitors (SPINGs) provide the necessary microprocessing capability for the plant's radiation detectors.

DAM-6 receives input from nine radiation monitors, one of which is 2RE-219, the Unit 2 Steam Generator Blowdown Process Monitor. 2RE-219 provides indication of steam generator blowdown activity and steam generator tube leak rates. It provides control signals to shut the steam generator blowdown isolation valves (2MS-5958/5959), steam generator blowdown sample isolation valves (2MS-2083/2084), and blowdown tank outlet valve (2MS-2040) if radiation levels in the steam generator blowdown line exceed the alarm setpoint. These control functions are also actuated when power is lost to the DAM.

CAUSE AND CORRECTIVE ACTION:

The cause of the failure of 2MS-2084 to fully shut was inadequate compression in the operator spring which closes the valve when air is bled from the operator diaphragm. The valve had stroked to within 1/8" of fully shut, enough to cause the valve position indication lights in the control room to indicate that the valve was closed. Maintenance Work Request (MWR) 930479 was initiated to repair the valve.

Prior to commencing repair work, diagnostic testing of the valve was performed, including a stroke test. The valve fully shut during the testing and open/close stroke times were consistent with measurements from quarterly stroke tests. A pre-maintenance, 10 CFR 50 Appendix J seat leakage test was also performed, in accordance with Operations Refueling Test (ORT) 52, "'B' Steam Generator Sample Isolation Unit 2." The test was successful.

It is believed that there was a slight buildup of corrosion products on the valve stem of 2MS-2084. For the initial closure of 2MS-2084, in response to the de-energization of 2RE-219, operator spring compression was enough to "clean" the stem of the corrosion products, but not to fully shut the valve. Once the corrosion products were removed, the operator spring compression was sufficient to fully shut the valve, as evidenced by the pre-maintenance diagnostic testing results. In order to prevent recurrence of this event, operator spring compression was increased by turning the

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adjustment screw approximately one turn. We believe this increased spring force (approximately 50 lbs.) will be enough to overcome increased friction due to buildup of corrosion products and fully shut the valve.

For post-maintenance testing, an ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," full stroke exercise and position indication test was performed in accordance with Inservice Test Procedure (IT) 85, "Main Steam Valves (Quarterly)." In addition, a post-maintenance 10 CFR 50 Appendix J seat leakage test was performed, again using ORT 52. Both tests were successful. Valve repair and post maintenance testing was satisfactorily completed at approximately 5:30 p.m. on Friday, January 29, 1993.

The 10 CFR 50 Appendix J seat leakage test was last performed during the Unit 2 maintenance and refueling outage in the Fall of 1992. The test was successful. IT-85, a quarterly test, was last performed satisfactorily on December 1, 1992. The purpose of this test is to perform a full stroke shut exercise and position indication test of the valve. Successful completion of the test is based on local position indication and remote valve position status lights indicating that the valve is closed, not a measure of through leakage. No maintenance was performed on 2MS-2084 since the completion of the 10 CFR 50 Appendix J testing in 1992. The failure 2MS-2084 to fully shut is, therefore, believed to have occurred at the time of discovery at 12:02 p.m. on January 27, 1993.

REPORTABILITY:

This Licensee Event Report is being submitted in accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plant's Technical Specifications."

SAFETY ASSESSMENT:

The health and safety of the public and plant personnel were not impacted by this event.

Valve 2MS-2084 is normally open to provide continuous flow from the steam generator, through the steam generator sample line, to the sample sink. If Valve 2MS-2084 receives a containment isolation signal and fails to fully shut, contaminated liquid or gas may be released to the atmosphere if the valve failure occurred simultaneously with a steam generator tube rupture, which is highly unlikely. A probability safety analysis of a steam generator tube rupture occurring simultaneously with a failure of 2MS-2084 to fully shut yielded a probability of $2.6E-5$ per year. If a steam generator tube rupture event were to occur, the release associated with the

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failure of Valve 2MS-2084 to fully shut would not significantly increase the total quantity of radioactivity released directly from the steam generator. Thus, the impact of this event on the event already analyzed in the Point Beach Nuclear Plant Final Safety Analysis Report (FSAR) accident analyses would be insignificant.

This event does not impact the loss of coolant accident as analyzed in the FSAR because the steam generators are assumed to remain intact during this accident. Without a steam generator tube rupture, the failure of 2MS-2084 to fully shut on receipt of a containment isolation signal would not result in the release of radioactive liquid or gas to the environment.

The valve has been repaired and tested satisfactorily. There was no release of radioactive liquid or gas to the environment as a result of this event.

GENERIC IMPLICATIONS:

No generic implications were identified.

SIMILAR OCCURRENCES:

The following LERs submitted by PBNP are related to potential loss of containment integrity due to failure of a containment isolation valve to fully shut:

UNIT 1:

- | | |
|-------------------|-------------------------------------------------------------------------------------------------------|
| LER 266/73-000-00 | Failure of the Containment Purge Inlet Valve to Close on Initiation of a Containment Isolation Signal |
| LER 266/75-016-00 | Failure of RC Drain Tank Vent Line Containment Isolation Valve to Close |
| LER 266/75-017-00 | Failure of Containment Isolation Valve 3200A to Close on Receipt of a Safety Injection Signal |
| LER 266/82-016-00 | Failure of Containment Isolation Valve 1CV-3200C to Shut |
| LER 266/83-007-00 | Failure of Containment Isolation Valve 1CV-3200C to Shut |

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LER 266/83-008-00 Failure of Containment Isolation Valve 1CV-3200C to Shut

LER 266/88-006-01 Suspected Inoperability of Containment Isolation Valve

LER 266/89-003-00 Blowdown Sample Isolation Valve Failure to Close on High Radiation Signal

LER 266/92-009-00 Component Cooling Water System Surge Tank Vent Valves Outside Design Basis

UNIT 2:

LER 301/73-000-00 Auxiliary Charging Line Containment Isolation Valve Failed to Fully Shut Without Manual Force.

LER 301/77-005-00 Containment Isolation Valve 2CV-2042 Leaked clean Secondary Side Water

LER 301/77-008-00 Failure of Steam Generator Blowdown Sample Isolation Valve to Shut

LER 301/81-003-00 Failure of Steam Generator Blowdown Sample Isolation Valve to Shut

LER 301/85-002-01 Failure of Containment Isolation Valve 2-755A

LER 301/87-006-00 Potential Loss of Containment Integrity Due to Misadjusted Valve

LER 301/92-002-00 Radioactive Waste Disposal System Component Cooling Water Isolation Valves Outside Design Basis