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VPNPD-92-044 10 CFR 50.73
NRC-92-008

January 23, 1992

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

Gentlemen:

DOCKET 50-266
LICENSEE EVENT REPORT 91-015-01
"A" STEAM GENERATOR MAIN STEAM
ISOLATION BYPASS VALVE LEFT OPEN
POINT BEACH NUCLEAR PLANT, UNIT 1

Enclosed is Licensee Event Report 91-015-01 for Point Beach Nuclear Plant, Unit 1. This report is provided in accordance with 10 CFR 50.73(a)(2)(v)(D), "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."

This supplemental report is being submitted in order to clarify statements made in the "Safety Assessment" portion of the report. The changes made to the original report are annotated with a revision bar.

If any further information is required, please contact us.

Sincerely,

James Zach

James J. Zach
Vice President
Nuclear Power

FDP/dpg

Enclosure

Copies to NRC Resident Inspector
NRC Regional Administrator

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 4/30/92

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.

LICENSEE EVENT REPORT (LER)

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TITLE (4): "A" Steam Generator Main Steam Isolation Bypass Valve Left Open

EVENT DATE (5) MONTH	DAY	YEAR	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	REPORT DATE (7) MONTH	DAY	YEAR	OTHER FACILITIES INVOLVED (8) FACILITY NAMES	DOCKET NUMBER(S)
1 1	2 7	9 1	9 1	0 1 5	0 1	0 1	2 3	9 2		0 5 0 0 0
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OPERATING MODE (9): N

POWER LEVEL (10): 0 0 0

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

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
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 (AREA CODE)
N. L. Hoefert, Manager - Operations	414 755-2321

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)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

ABSTRACT

On November 28, 1991, Unit 1 was in hot shutdown; and Operating Procedure OP-13B, "Secondary Systems Shutdown," was in progress. This procedure was being performed in order to conduct a condenser inspection following a 17 gallon per minute condenser tube leak. After shutting both main steam isolation valves (MSIV), per the procedure, the operators noticed that the main steam header was still pressurized to approximately 200 psig. An investigation revealed that 1MS-234, the main steam isolation bypass valve for the "A" steam generator, was open. The valve was immediately shut, correcting the problem.

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

EVENT DESCRIPTION

On November 27, 1991, at 0330, while operating at 100% power, Unit 1 received numerous secondary system and steam generator sample panel alarms associated with sodium and cation conductivity. At 0514, Chemistry personnel reported that the cation conductivity in both steam generators was >7µmhos/cm. By procedure, this level necessitated the shutdown of Unit 1. This load reduction commenced at 0514.

Following the load reduction and prior to the reactor shutdown, TS-39, "Unit 1 Main Steam Isolation Valve Operability With Non-Return Check Valve Observation" was performed. The test has control room personnel remotely shut and time the Unit 1 main steam isolation valves. TS-39 was successfully completed at 1022. In the process of conducting the test, the normally shut bypass valve is opened procedurally to allow the pressures across the MSIV to equalize so the valve can be opened. It was also closed. Once the MSIV is open, the main steam isolation bypass valve should be shut. IT-280 was completed at 1439.

Following the completion of TS-39, Inservice Test IT-280, "Main Steam Stop Valves (Cold Shutdown), Unit 1" was performed. This test requires both main steam isolation valves to be locally shut and timed. Although there are no procedural steps to open and close the bypass valves, practically speaking, the valve must be opened to allow the MSIV to be reopened. The test also measures the valve operator air pressure required to stroke the valves. During the test, the "B" steam generator MSIV was tested satisfactorily and reopened. The "A" steam generator MSIV was then tested satisfactorily, but after reopening the valve following the test, the "A" steam generator main steam isolation bypass valve was inadvertently left open.

The reactor shutdown and cool-down was commenced at 1343 on November 27, 1991, with a reactor coolant system (RCS) temperature of 400°F being reached at 2050.

The source of the leak was found to be a broken condenser tube in the Unit 1, #2 waterbox. This tube was plugged to correct the problem and approximately fifty additional condenser tubes were also plugged as a preventative measure. Once the plugging of the tubes was completed, an inspection of the condenser side of the circulating water system was to be performed.

In order to perform this inspection, a shutdown of the Unit 1 secondary plant had to be performed. Operating Procedure OP-13B, "Secondary Systems Shutdown" was used to accomplish this shutdown. At 0100 on November 28, 1991, as directed by the procedure, both MSIVs were shut. Following the shutting of these valves, it was noted that the main steam header was still pressurized to approximately 200 psig. An inspection

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

revealed that 1MS-234, the "A" steam generator main steam isolation bypass valve, was open. The valve was shut, correcting the problem. The positions of the remaining main steam isolation bypass valve for Unit 1 and the two valves for Unit 2 were also checked. All three valves were found to be shut. A courtesy call to the NRC Operations Officer was made at 0330, informing them of the event.

The secondary systems shutdown was completed and the inspection of the Unit 1 condenser was completed at 0930. Secondary plant chemistry was returned to within specification at 1530, and the primary plant heatup was commenced ten minutes later. The reactor start-up commenced at 0330 on November 30, 1991, with criticality being reached at 0428. The Unit 1 turbine generator was placed on line at 1302 on November 30, 1991. Full load was reached at 0810 on December 1, 1991.

COMPONENT AND SYSTEM DESCRIPTION

The main steam system for each unit consists of the steam generators, main steam headers, steam supply to the reheat section of the moisture separator reheaters, steam dump system, and steam supply to various auxiliary systems.

This system transfers steam in a thirty-inch pipe from the two steam generators within the containment structure through the associated main steam isolation valve and non-return check valve. These valves are located outside containment. From this point, the steam is directed through individual twenty-four-inch lines to each of the two turbine stop valves and to the moisture separator reheater tube sections, auxiliary steam systems, and steam dump system.

A three-inch bypass line exists around each main steam isolation valve to allow the equalization of steam pressure across the disc prior to opening the valve. Each bypass line contains a three inch, manually operated globe valve. This valve is normally closed during plant operation.

CAUSE AND CORRECTIVE ACTION

When the operators realized that the main steam header was still pressurized following the shutting of both main steam isolation valves, an inspection was conducted. This inspection revealed that the "A" steam generator main steam isolation bypass valve, 1MS-234, had been inadvertently left open. The valve was immediately shut to correct the problem. The positions of the three remaining main steam isolation bypass valves, one other for Unit 1 and two for Unit 2, were also checked. These three valves were all found to be shut.

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

The primary cause of this event was determined to be a procedural inadequacy with Inservice Test IT-280, "Main Steam Stop Valves (Cold Shutdown), Unit 1." This procedure is inadequate because it does not direct the opening of the main steam isolation bypass valve prior to the opening of the MSIV or the subsequent shutting of the main steam isolation bypass valve once the MSIV has been opened. Without these steps in the test procedure, there was nothing to remind the operator to shut the valve once the MSIV was open. A review of IT-285, the identical test procedure for the Unit 2 MSIVs, also revealed that this procedure does not have steps directing the manipulation of the main steam isolation bypass valves.

A review of TS-39, the other MSIV test procedure, was also performed. TS-39 did have the required steps that directed the opening and shutting of the main steam isolation bypass valves, but these steps did not have initial blocks included. These blocks are required to be initialed following the satisfactory completion of each step. This ensures that the operator performs the test without missing any of the steps. While the majority of the steps in TS-39 do have initial blocks, the steps that direct the opening and shutting of the main steam isolation bypass valves do not possess any initial blocks. While this procedure has been performed in the past without incident, including initial blocks for these steps will further ensure that this procedure is always performed without incident. TS-40A, the identical test procedure for Unit 2, also does not have initial blocks included following these same steps.

Having a main steam isolation bypass valve open in error could delay isolation of a steam generator in the event of an accident. The two accidents of concern in this case are a steam generator tube rupture and a steam line rupture. In response to this event, a review of the two associated emergency operating procedures was also performed.

Emergency Operating Procedure, EOP-3, "Steam Generator Tube Rupture," provides direction to terminate the leakage of reactor coolant into the secondary system following a steam generator tube rupture. Step 3 of this procedure requires the shutting of the MSIV to isolate the steam generator. Verification of the position of the bypass valve is not performed. If the MSIV fails to shut, the follow-up actions direct the shutting of numerous valves as an alternate method to isolate the steam generator.

Emergency Operating Procedure, EOP-2, "Faulted Steam Generator Isolation," is another procedure that directs the isolation of the steam generator. This procedure is used whenever steam generator pressure is decreasing in an uncontrollable manner, or whenever the steam generator is completely depressurized and has not been isolated. There is also no mention of the shutting or verification of the position of the main steam isolation bypass valves in the steam generator isolation portion of this procedure.

A review of the Westinghouse Owners Group Emergency Response Guidelines (ERG) for "Steam Generator Tube Rupture" and "Faulted Steam Generator Isolation" was performed. These guidelines were used as the basis for the Point Beach Nuclear Plant Emergency Operating Procedures during their development. This review revealed that both procedures in the ERG direct the verification or shutting of the main steam isolation bypass valves. These requirements were not included in our EOPs because the possibility of having a main steam isolation bypass valve open was considered at that time to be remote because these valves are manual valves without indication in the control room at Point Beach Nuclear Plant and because of the administrative controls in place. Additionally, we expected that, if a bypass valve were left open, this condition would be readily apparent once the MSIV was shut. The operator would then check the position of the bypass valve and shut it, if necessary, in order to complete the isolation of that steam generator. These are the exact actions that took place on November 28, 1991, when the main steam header remained pressurized after the MSIVs were shut.

In order to prevent this event from occurring in the future, several procedural revisions will be performed. IT-280 and IT-285 will be revised to include procedural steps that direct the required manipulation of the main steam isolation bypass valves. Additionally, both TS-39 and TS-40A will have initial blocks added to all the steps directing the opening or shutting of the main steam isolation bypass valves. This will ensure that no steps in these two procedures are missed in the future. Finally, a review of EOP-2 and EOP-3 will be performed. This review will specifically address the adequacy of the steam generator isolation portions of these two EOPs. If required, revisions to these two EOPs will be made. The revisions to IT-280, IT-285, TS-39, and TS-40A, as well as any necessary changes resulting from the EOP review, will be completed by April 1, 1992.

REPORTABILITY

This Licensee Event Report is being submitted in accordance with 10 CFR 50.73(a)(2)(v)(D), "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." On November 28, 1991, at 0330, the NRC was informed of the event, but it was not originally determined to be a reportable event under 10 CFR 50.72. However, after further review, based on recent discussions with NRC Region III regarding the reportability of single MSIV failures, this event was determined to be reportable under 10 CFR 50.72. The required

NRC notification was made at 1809 on December 4, 1991. The NRC Resident Inspector was also informed.

SAFETY ASSESSMENT

A steam line rupture and a steam generator tube rupture are two accidents that require the isolation of the affected steam generator during the accident response. If a main steam isolation bypass valve is left open, the isolation of a steam generator cannot be performed remotely from the control room.

The Point Beach Nuclear Plant Final Safety Analysis Report (FSAR) discusses the consequences of these two events and the assumptions used in the safety analysis. For a steam line rupture, the FSAR states that a steam line break in any location will result in the blow-down of only one steam generator because both steam lines possess a main steam isolation valve and a non-return check valve. These four valves will prevent the blow-down of more than one steam generator even if one of these valves fails to shut. However, it is possible for a single failure of an MSIV or a non-return check valve, with a main steam isolation bypass valve open to result in the limited blow-down of both steam generators. This would result in more heat being removed from the primary system than is assumed in the FSAR analysis. The safety assessment in LER 87-003-00, "Main Steam Isolation Valves Open Without Trip Power Available," presents the results of an analysis of the simultaneous blow-down of both steam generators. The analysis concludes that the resultant reactivity excursion for this event remains within the analyzed reactivity bounds contained in the FSAR analysis of a Steam Line Break accident. The Safety Injection System provides boron injection into the primary system prior to the occurrence of the power excursion caused by the steam generator blow-down. For this event, the boron injection capacity is sufficient to ensure that the resultant reactivity excursion is still within the bounds of the FSAR analysis. Additionally, Point Beach has a procedure in place, Emergency Contingency Actions (ECA) 2.1, "Uncontrolled Depressurization of Both Steam Generators," that can be used should this event take place.

In the event of a steam generator tube rupture, the FSAR assumes that isolation of the affected steam generator can be achieved in approximately ten minutes. It further states that, should the affected steam generator main steam isolation valve fail to shut, an alternate course of action should be taken. This alternate course of action would require the closing of the main steam line dump valves and the use of the atmospheric relief of the unaffected steam generator as the method for plant cool-down. Having a main steam isolation bypass valve open would prevent the remote isolation of the affected steam generator, but the alternate method for plant cool-down could still be used. Additionally, we expect that if a bypass valve were left open, this condition would be readily apparent once the associated MSIV was shut. The operator would then check the position of the bypass valve and shut it, if necessary, in order to complete the steam generator isolation. The FSAR also states that the exposure to the public associated with a 500 gallons per day primary to secondary leak rate with 1% defective fuel would not be significant, and the levels postulated would be less than the limits of 10 CFR 100. Technical Specification 15.3.1.D.4 prohibits reactor operation if the primary to secondary leak rate exceeds 500 gallons per day. This event did not endanger the health and safety of plant personnel or the general public.

SIMILAR OCCURRENCES

A review of previous Licensee Event Reports for Point Beach Nuclear Plant was conducted. No similar events were identified.