



Point Beach Nuclear Plant  
6610 Nuclear Rd., Two Rivers, WI 54241

(920) 755-2321

NPL 99-0700

December 2, 1999

10 CFR 50.73

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

Ladies/Gentlemen:

DOCKET NO. 50-266  
LICENSEE EVENT REPORT 1999-011-00  
MAIN STEAM SAFETY VALVE LIFT SETPOINT  
EXCEEDS ACCEPTANCE CRITERIA  
POINT BEACH NUCLEAR PLANT UNIT 1

Enclosed is Licensee Event Report 1999-011-00 for Point Beach Nuclear Plant Unit 1. This report is provided in accordance with 10 CFR 50.73(a)(2)(ii)(B), as a condition that was outside the design basis of the plant; and with 10 CFR 50.73.(a)(2)(i) as any operation or condition that was prohibited by the plant Technical Specifications. This report describes the discovery that the plant had operated with the lift set point pressure for two of eight main steam safety valve in excess of the licensee's acceptance criteria.

There are no new commitments identified in this report.

Please contact us if you require additional information.

Sincerely,

A handwritten signature in cursive script that reads 'A. J. Cayia'.

A. J. Cayia  
Manager,  
Regulatory Services & Licensing

CWK/tat

Enclosure

cc: NRC Resident Inspector PSCW  
NRC Regional Administrator INPO Support Services  
NRC Project Manager

IE22

APL ARDA 05000260

A subsidiary of Wisconsin Energy Corporation

**LICENSEE EVENT REPORT (LER)**

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT

**FACILITY NAME (1)**

Point Beach Nuclear Plant, Unit 1

**DOCKET NUMBER (2)**

05000266

**PAGE (3)**

1 of 5

**TITLE (4)**

Main Steam Safety Valve Lift Set Point Exceeds Acceptance Criteria

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																														
11	04	1999	1999	011	00	12	02	1999		05000																														
<p><b>OPERATING MODE (9)</b> N</p> <p><b>POWER LEVEL (10)</b> 000</p>																																								
<p><b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b></p> <table border="1"> <tr> <td>20.2201(b)</td> <td>20.2203(a)(2)(v)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(i)</td> <td>50.73(a)(2)(viii)</td> </tr> <tr> <td>20.2203(a)(1)</td> <td>20.2203(a)(3)(i)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(ii)</td> <td>50.73(a)(2)(x)</td> </tr> <tr> <td>20.2203(a)(2)(i)</td> <td>20.2203(a)(3)(ii)</td> <td></td> <td>50.73(a)(2)(iii)</td> <td>73.71</td> </tr> <tr> <td>20.2203(a)(2)(ii)</td> <td>20.2203(a)(4)</td> <td></td> <td>50.73(a)(2)(iv)</td> <td>OTHER</td> </tr> <tr> <td>20.2203(a)(2)(iii)</td> <td>50.36(c)(1)</td> <td></td> <td>50.73(a)(2)(v)</td> <td>Specify in Abstract below or in NRC Form 366A</td> </tr> <tr> <td>20.2203(a)(2)(iv)</td> <td>50.36(c)(2)</td> <td></td> <td>50.73(a)(2)(vi)</td> <td></td> </tr> </table>											20.2201(b)	20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)	20.2203(a)(1)	20.2203(a)(3)(i)	<input checked="" type="checkbox"/>	50.73(a)(2)(ii)	50.73(a)(2)(x)	20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71	20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER	20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A	20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vi)	
20.2201(b)	20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)																																				
20.2203(a)(1)	20.2203(a)(3)(i)	<input checked="" type="checkbox"/>	50.73(a)(2)(ii)	50.73(a)(2)(x)																																				
20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71																																				
20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER																																				
20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A																																				
20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vi)																																					

**LICENSEE CONTACT FOR THIS LER (12)**

**NAME**  
Charles Wm. Krause, Senior Regulatory Compliance Engineer

**TELEPHONE NUMBER (include Area Code)**  
(920) 755-6809

**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

**SUPPLEMENTAL REPORT EXPECTED (14)**

**YES**  
(If yes, complete EXPECTED SUBMISSION DATE).

**NO**

**EXPECTED SUBMISSION DATE (15)**

**MONTH DAY YEAR**

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

This report describes the discovery during routine Technical Specification surveillance testing that two main steam safety valves (MSSVs), MS-2012 and MS-2013, had lift set points which exceeded the licensee's acceptance criteria. The lift set point for MS-2012 also exceeded the ASME B&PV Section XI acceptance criteria. This condition was reported to the NRC by ENS telephone call on November 4, 1999, in accordance with 10 CFR 50 72(b)(2)(i). This condition probably existed since 1995 when these MSSVs were last tested and adjusted while installed using a lift assist device. The valves are now tested off site at a vendor facility using full pressure boiler testing. The PBNP Technical Specifications required additional MSSV testing as a result of this failure to meet acceptance criteria. This resulted in all eight MSSVs being sent off site for testing. The lift set points for the rest of the MSSVs were found to be acceptable. The lift set points for MS-2012 and MS-2013 were reset to the specified 1125 psig.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Point Beach Nuclear Plant, Unit 1	05000266	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		1999	- 011	- 00	

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

**Event Description:**

Point Beach Nuclear Plant (PBNP), Unit 1, was shutdown on October 16, 1999, for a refueling and maintenance outage. During this outage, four of the eight installed main steam safety valves (MSSVs) were removed and shipped off-site for set point testing at a vendor's facility in accordance with the PBNP Technical Specifications (Table 15.4.1-2 Item 11).

MSSV MS-02013 was set point tested on November 3, 1999. The initial relief valve lift occurred at 1152 psig, which is 2.4% above the nameplate set point of 1125 psig. The Licensee's established acceptance criteria for this valve is 1.93%, which was established by licensee's calculation 98-0103 based on PBNP accident analysis assumptions of a 3% allowance for set point tolerance, an allowance of 6.6 psi for ambient temperature effects on valve set point, and test equipment uncertainty of 0.25%.

A second MSSV, MS-02012, was tested on November 4, 1999. The initial relief lift on this MSSV occurred at 1167 psig, which is 3.7% above the nameplate set point of 1125 psig. This valves set point therefore also exceeded the Licensees established acceptance criteria (CR 99-2705). The other two MSSVs of the initial four sent to the vendor had lift set points within the licensee's acceptance criteria.

This event was reported to the NRC at 1829 CST on November 4, 1999, in accordance with the provisions of 10 CFR 50.72(b)(2)(i) as a condition discovered while the reactor was shutdown which, if discovered while the reactor was operating, would have resulted in the nuclear power plant, including its principal safety barriers, being seriously degraded. This LER is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B) as a condition that was outside the design basis of the plant. Technical Specification 15.3.4.A.1 requires, "A minimum steam-relieving capability of eight main steam safety valves available, except for low power physics testing," when the reactor is critical and the reactor coolant heated above 350°F. Since the non-conservative set point of MSSV MS-2013 resulted in two of the eight MSSVs being considered inoperable during the previous operating cycles, this event is also reportable in accordance with 10 CFR 50.73(a)(2)(i) as any operation or condition prohibited by the plant Technical Specifications.

**Component and System Description:**

The Main Steam Safety Valves protect the steam generators from overpressurization. This is accomplished with four self-actuated valves per steam generator that are located on a 30-inch branch line from the associated main steam header upstream of the Main Steam Isolation Valve. The safety valves are designed in accordance with ASME Section III. The four valves per steam generator are set to relieve at 1085, 1100, 1125, and 1125 psig, respectively (FSAR Table 14.1.9-2 lists the nominal set pressure as 1100, 1115, 1140, and 1140 psia). The staggered settings minimize the effects of simultaneously opening and closing the valve on the protected system. The eight MSSVs per unit have a combined rated capability of 6,664,000 lbs/hr. The total full power steam flow is 6,620,000 lbs/hr; therefore the eight MSSVs will be able to relieve the total full-power steam flow if necessary.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Point Beach Nuclear Plant, Unit 1	05000266	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5
		1999	- 011	- 00	

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

The MSSVs are six inch, high capacity nozzle type relief valves manufactured by Crosby Valve and Gage Co., Model HA65W. Spring compression maintains the valves closed against normal system pressure. The spring compression is adjusted to alter the relief set point. The valves will open when the set point pressure is exceeded with very little simmer or warning. The MSSVs will continue to relieve until the pressure under the valve decreases; at which time the valve will close sharply. The MSSVs and safety relief header are located outside the containment structure in the Unit 1 façade.

In addition to the safety relief valves, each main steam line is provided with one six inch power operated relief valve (atmospheric steam dump). These valves are automatically controlled by pressure (set point of 1050 psig) or may be manually operated from the Control Room for releasing sensible and core decay heat to the atmosphere. The two atmospheric steam dumps are capable of passing no less than 10% of the maximum calculated steam flow at no-load steam pressure.

The MSSVs are located outside containment in the environment of the vented facade which experiences ambient temperatures not much different from external temperatures. Temperature monitoring indicates that the facade ambient temperature is generally 20°F higher than that of the outside environment. The facade temperature data indicates the valves have been subjected to ambient temperatures between 11°F and 75°F. The valves are set to lift within 1% of their nominal set point.

### Cause:

The probable cause for the higher set points on these two valves is that they were last tested and adjusted in 1995 using a lift assist testing rig. The lift assist testing rig had been used in the past to perform in-situ set point testing of the MSSVs. As mentioned previously, the MSSVs are now normally sent to a vendor laboratory for full pressure boiler testing.

Accuracy problems were identified with the lift assist testing rig during the fall 1996 PBNP Unit 2 refueling outage. The lift assist device consistently gave lower set point results than the full pressure lift tests. This would result in a higher than expected set point if the set point is adjusted upwards based on the lift assisted test results. Both IMS-02012 and IMS-02013 had their set points adjusted upwards after being tested by the lift assist device in 1995.

When the concerns with the lift assist device were first identified in 1996, an operability determination (OD) was generated to address all six MSSVs that had previously been tested in this manner. The OD used data from a side-by-side comparison of the two test methods to determine the expected effect on the six valves. This OD determined that all of the valve set points would be acceptable based on the average difference between the two test methods. In addition, during the same outage, two of the valves that had been tested with the lift assist device were sent for testing on a boiler. Both valves passed with only slight increases from their previous as-left set point values. This comparative testing provided greater assurance that the actual set points for the remaining four lift assist tested valves were satisfactory.

Two additional MSSVs that had been lift assist tested were boiler tested during the Unit 1 1998 refueling outage. These valves were also found to have relief set points within acceptance tolerance. Based on this experience, and the side-by-side testing

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Point Beach Nuclear Plant, Unit 1	05000266	1999	011	00	4 OF 5

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

done in 1996, there was no evidence to suspect that the two remaining valves, 1MS-02012 and 1MS-02013, were significantly affected.

The reason for suspecting that the lift assist testing was in fact the cause of the out of specification set points are that both valves had to be adjusted downwards by the same amount that they were adjusted upwards following the lift assist testing. The lift assist test results are also dependent on operator action and can be very inconsistent, even from one lift to the next. This sensitivity to testing technique could also have contributed to larger differences in lift set points for these valves than that which was observed during the side-by-side comparisons mentioned above. In addition, the other two valves originally sent out for testing during the current outage, 1MS-02006 and 1MS-02008, have been installed, undisturbed, longer than 1MS-02012 and 1MS-02013. These valves did not exhibit the elevated set points. 1MS-02006 lifted 0.9% below the nameplate set point, 1MS-02008 lifted 1.2% above the nameplate set point. This suggests that the higher set points were not the result of service conditions that would affect all MSSVs in a similar manner.

Given that the cause of the high set points was determined to be the use of the lift assist device during the previous set point test, and all six of the MSSVs that were tested in this manner have since been tested on a boiler, there is no impact on any of the MSSVs other than 1MS-02012 and 1MS-02013.

**Corrective Actions:**

ASME Section XI requirements contained in OM-1-1981 only requires the testing of two additional MSSVs, however; PBNP Technical Specifications requires an additional number of valves to be tested equal to the number of MSSVs originally tested. Since four MSSVs were initially sent for testing this outage, the remaining four MSSVs have been tested. The relief set points for the other six MSSVs were found to be within their set point acceptance criteria.

The lift pressure for MS-2012 and MS-2013 have been reset to their nominal 1125 psig set point.

**Safety Assessment:**

The PBNP FSAR accident analysis for "Loss of External Electrical Load" is presented in Section 14.1.9. That analysis provides assumptions for MSSV characteristics in Table 14.1.9-2. The lift pressure assumed for the MSSVs with a nominal set pressure of 1125 psig is 1180 psig (1195 psia). The lift pressure is listed as the nominal set pressure, plus 3% allowance for set point tolerance, plus 20 psi allowance for frictional pressure drop between the steam generator shell and the MSSVs location. Under these conditions the conclusion of the analysis is that the capacity of the pressure relieving devices, the MSSVs, are adequate to limit the maximum steam generator shell pressure to within the code requirements of 110% of the design pressure (110% of 1085 psig is 1194 psig). In this event, the as found initial lift pressures for MS-2013 and MS-2012 was 1152 psig and 1167 psig respectively. Adding an allowance of 6.6 psi for temperature effects, and +0.25% of set point for measuring tolerance (2.8 psi), and applying the 20 psi allowance for the pressure drop between the steam generator shell and the valve; the peak steam generator pressure under the postulated conditions for a loss of load from 100% power could have been as high as 1196.4 psig.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Point Beach Nuclear Plant, Unit 1	05000266	1999	011	00	5 OF 5

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

This pressure slightly exceeds the test acceptance criteria for the maximum steam generator pressure of 1194 psig. However, considering that the steam generators were subjected to a pre-service secondary side hydrostatic test pressure of 1356 psia, this difference is not significant and the conclusion of the analysis that the accident presents no hazard to the integrity of the main steam system is still applicable.

As a practical matter, it is likely that the maximum steam system pressure would be lower than that assumed in the analysis because no credit is taken in the accident analysis for operation of the steam dump system or steam generator power operated relief valves. Therefore, we conclude that even in the event of a postulated loss of external electrical load accident, the safety significance of operating with these MSSVs at the as found lift set points was minimal.

Both the Loss of Normal Feedwater (FSAR 14.1.10) and Loss of All AC (FSAR 14.1.11) analyses also take credit for MSSV relief and assume the same relief valve parameters. However, the analysis results for main steam peak pressure are bounded by the loss of external load results

**System and Component Identifiers:**

The Energy Industry Identification System component function identifier for each component/system referred to in this report are as follows:

<u>Component/System</u>	<u>Identifier</u>
Main Steam System	SB
Steam Generator	SG
Relief Valve	RV

**Similar Occurrences:**

A review of past LERs identified the following events which involved the set points for main steam safety valves:

<u>LER NUMBER</u>	<u>Title</u>
LER 266/96-015-00	Main Steam Safety Valve Lift Set Points Exceed Design Basis Values
LER 266/90-002-00	Main Steam Safety Valve Set Point Non-conservative