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September 15, 1992

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

Gentlemen:

DOCKETS 50-2
LICENSEE EVENT REPORT 92-007-00
FAILURE OF UNIT 1 CONTROL ROOM INSTRUMENTATION
CABINETS TO MEET SEISMIC DESIGN CRITERIA
POINT BEACH NUCLEAR PLANT, UNIT 1

Enclosed is Licensee Event Report 92-007-00 for Point Beach Nuclear Plant, Unit 1. This report is provided in accordance with 10 CFR 50.73(a)(2)(ii)(B), "Any event or condition that resulted in the condition of the nuclear plant, including its principal safety barriers, being seriously degraded, or that resulted in the nuclear power plant being in a condition that was outside the design basis of the plant."

This report describes the events leading up to and following the determination that certain instrumentation cabinets for Unit 1 did not meet seismic design criteria.

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

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A subsidiary of Wisconsin Energy Corporation

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NRC FORM 204 (8-89)				U.S. NUCLEAR REGULATORY COMMISSION				APPROVED OMS NO 21500104 EXPIRES 4/30/92							
LICENSEE EVENT REPORT (LER)												ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 30.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-30), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (2150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.			
FACILITY NAME (1): Point Beach Nuclear Plant, Unit 1										DOCKET NUMBER (2): 0 5 0 0 0 2 6 1 6		PAGE (3): 1 OF 0 6			
TITLE (4): Failure of Unit 1 Control Room Instrumentation Cabinets to Meet Seismic Design 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 (5):				
0 8	1 8	9 2	9 2	0 0 7	0 0	0 8	1 5	9 2			0 5 0 0 0				
OPERATING MODE (9): N			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11):												
POWER LEVEL (10): 1 0 0			<input type="checkbox"/> 20.402(b)			<input type="checkbox"/> 20.406(a)			<input type="checkbox"/> 20.736(a)(2)(iv)			<input type="checkbox"/> 20.736(b)			
			<input type="checkbox"/> 20.406(a)(1)(iii)			<input type="checkbox"/> 20.30(a)(1)			<input type="checkbox"/> 20.736(a)(2)(v)			<input type="checkbox"/> 20.736(c)			
			<input type="checkbox"/> 20.407(a)(1)(ii)			<input type="checkbox"/> 20.30(a)(2)			<input type="checkbox"/> 20.736(a)(2)(vi)			OTHER (Specify in Abstract below and in Text, NRC Form 204A):			
			<input type="checkbox"/> 20.406(a)(1)(iii)			<input type="checkbox"/> 20.736(a)(2)(i)			<input type="checkbox"/> 20.736(a)(2)(viii)(A)						
			<input type="checkbox"/> 20.406(a)(1)(iii)			<input checked="" type="checkbox"/> 20.736(a)(2)(ii)			<input type="checkbox"/> 20.736(a)(2)(viii)(B)						
<input type="checkbox"/> 20.406(a)(1)(ii)			<input type="checkbox"/> 20.736(a)(2)(iii)			<input type="checkbox"/> 20.736(a)(2)(v)									
LICENSEE CONTACT FOR THIS LER (12):															
NAME: R. K. Hanneman - Manager of Nuclear Safety										TELEPHONE NUMBER: 4 1 4 2 1 1 - 1 2 0 1 0 9					
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13):															
CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NRC						
SUPPLEMENTAL REPORT EXPECTED (14):										EXPECTED SUBMISSION DATE (15):					
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE:) <input checked="" type="checkbox"/> NO															
ABSTRACT (16) (Limit to 1400 words) (If applicable, identify single word typewritten word) (18):															
ABSTRACT: During system and component reviews that were performed as part of an auxiliary feedwater system upgrade to safety-related status, the Unit 1 control room instrumentation cabinets were found not to meet the original seismic design criteria. As a result, the Reactor Protection System, Engineered Safeguards System, and process instrumentation within these cabinets were declared inoperable at 5:05 p.m. on August 18, 1992. This declaration invoked the requirements of Technical Specification 15.3.0, which would have required placing Unit 1 in hot shutdown within 3 hours and in cold shutdown within 48 hours if the condition could not be corrected. A 72-hour regional waiver of compliance was requested and granted, allowing sufficient time to modify the cabinet mountings. A modification was subsequently performed on the affected cabinets to upgrade them to their seismic design criteria. This modification was completed at 9:08 a.m. on August 21, 1992, restoring the Unit 1 control room instrumentation cabinets to an operable status.															

Attachment QP 16-5.1

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 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

FACILITY NAME (1)

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Point Beach Nuclear Plant, Unit 1

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TEXT IF MORE SPACE IS REQUIRED use additional NRC Form 366A (5-89)

EVENT DESCRIPTION:

During system and component reviews that began in May 1992 that were being performed to support the upgrade of portions of the AFW system to safety-related status, a seismic review of control room instrumentation cabinets 1C-105 through 1C-133 was performed. Cabinets 1C-105 through 1C-133 contain Reactor Protection System, Engineered Safeguards System, and process instrumentation for Unit 1. The cabinets are arranged such that 1C-105 through 1C-114 form one continuous integral row and cabinets 1C-115 through 1C-133 form a separate row. The cabinet rows are parallel to each other and are located on the south side of the control room behind the main control boards. Cabinet 1C-105, the Secondary System Power Supply Panel, contains the power supplies for the controllers associated with AF-4012 and AF-4019.

This seismic review was performed using the methodology described in the "Seismic Qualification User's Group (SQUG) Implementation Procedure for Verification of Nuclear Plant Equipment." The Unit 1 cabinets did not meet the SQUG criteria. A similar SQUG review of the control room instrument cabinets for Unit 2 was also performed. The Unit 2 cabinets were determined to be seismically adequate. These results were presented to the Manager's Supervisory Staff on June 16, 1992. The staff directed a comprehensive seismic evaluation to be performed to determine the adequacy of the Unit 1 instrumentation cabinets.

The comprehensive seismic evaluation and associated calculation was completed, with the exception of the verification and approval of the calculation, on August 17, 1992. The preliminary results of the evaluation were presented to the Manager's Supervisory Staff on August 18, 1992. The evaluation concluded that the Unit 1 cabinets were not seismically adequate. The Manager's Supervisory Staff discussed the issue and decided to evaluate the need for a 72-hour waiver of compliance. The final review and verification of the calculation was subsequently performed. The Manager's Supervisory Staff then decided to request a 72-hour waiver period to provide the time necessary to restore the instrumentation cabinets to their design basis for seismic events.

An informational notification was made to the NRC Operations Duty Officer based on the preliminary calculations at 4:03 p.m. on August 18, 1992. At this time, NRR and Region III staff were also informed of the likely need for a waiver of compliance. The calculation was reviewed and verified and the instrumentation was declared inoperable at 5:05 p.m. on August 18, 1992. A one-hour NRC notification was made in accordance with 10 CFR 50.72(b)(1)(i)(a) at 5:57 p.m.

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-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)

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YEAR SEQUENTIAL REVISION

NUMBER NUMBER

Point Beach Nuclear Plant, Unit 1 0 5 0 0 0 2 6 6 9 2 - 0 0 7 - 0 0 0 3 OF 0 6

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

Declaring the Unit 1 Reactor Protection System and Engineered Safeguard Features instrumentation inoperable invoked the requirements of Technical Specification 15.3.0, the general considerations for Technical Specification 15.3, "Limiting Conditions for Operation." This required Unit 1 to be in hot shutdown within 3 hours and in cold shutdown within 48 hours. At the time of the declaration, Unit 1 was operating at 100% power. Verbal approval for the 72-hour waiver of compliance from Technical Specification 15.3.0 was received from Region III and NRR at 6:05 p.m. on August 18, 1992 with written authorization being provided in NRC letter dated August 20, 1992. As a result, Unit 1 continued operating at 100% power.

In order to upgrade the affected instrument cabinets to their design basis for seismic events, a modification, MR 92-122, was initiated on August 18, 1992. The modification design included calculations to ensure seismic adequacy. The design was completed and actual work on the cabinets commenced on August 19, 1992. The seismic upgrade was completed at 9:08 a.m. on August 21, 1992. At that time, the control room cabinets and associated instrumentation was declared operable and Point Beach Unit 1 exited the limiting condition for operation.

COMPONENT AND SYSTEM DESCRIPTION:

The Unit 1 control room instrumentation cabinets, 1C-105 through 1C-133, are located on the south side of the 44 foot elevation of the control building in the control room, behind the Unit 1 control boards. The cabinets are typically 90 inches tall x 22 inches wide x 30 inches deep. The cabinets are arranged such that 1C-105 through 1C-114 form one continuous integral row located parallel to cabinets 1C-115 through 1C-133 which also form a separate, continuous integral row. The cabinets are manufactured by Foxboro, Magnetics, and Westinghouse. Cabinets 1C-105 through 1C-133 contain the following instrumentation:

- analog reactor protection instrumentation
- rod position indication instrumentation
- incore instrumentation
- chemical volume control system instrumentation
- feedwater control instrumentation
- reactor coolant system instrumentation
- nuclear instrumentation
- rod insertion limit instrumentation
- steam dump control instrumentation
- rod speed control instrumentation
- secondary plant power supplies
- safety injection and auxiliary coolant control instrumentation

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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 (7-530) 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)

DOCKET NUMBER (2)

LER NUMBER (6)

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Point Beach Nuclear Plant, Unit 1

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TEXT IF MORE SPACE IS REQUIRED: use additional NRC Form 365A (1)

CAUSE AND CORRECTIVE ACTION:

The Leismic review of the Unit 1 instrumentation cabinets identified that adjacent cabinets are fastened together with bolting along the front and back vertical members. The base of each cabinet consists of a four-inch internal channel frame. The cabinet rows were anchored to the floor using friction clips positioned at several locations along the bottom of the cabinet channel frame. Each friction clip assembly consists of a .25-inch x 1.5-inch x 5.25-inch steel plate with a .375-inch ϕ expansion anchor bolt attached to the floor. Cabinet row 1C-10⁵ through 1C-114 was anchored to the floor by a total of seven friction clip assemblies. Cabinet row 1C-115 through 1C-133 was anchored to the floor by a total of thirteen friction clip assemblies.

The subsequent evaluation and calculation determined that during a postulated safe-shutdown earthquake the friction clip assemblies for cabinet row 1C-105 through 1C-114 were loaded beyond their yield point by approximately a factor of three. A similar evaluation was not performed on cabinet row 1C-115 through 1C-133, but it was believed that this row was in the same condition because of the similar mounting configurations.

The modification performed to upgrade the instrumentation cabinets involved bolting 24 lengths of ASTM A36, 4 inch-x 3-inch x .375-inch angle iron to the internal channel frame in the front and back of each cabinet base using ASTM A193, .5-inch x 2-inch hex head cap screws. The cap screws are spaced such that a cap screw is attached to the front and back of each cabinet. The angle iron pieces are also fastened to the 16-inch thick reinforced concrete floor slab with either .625-inch ϕ x 7-inch or .375-inch ϕ x 3.75-inch concrete expansion anchor bolts. The different anchor bolts were used to eliminate the need for reinforcing bar cuts by minimizing the required anchor embedment in critically reinforced areas of the concrete floor slab.

In order to maintain the maximum level of reactor safety during the performance of the modification, no Reactor Protection System, Engineered Safeguards Features, or associated components were removed from service. Additionally, no maintenance was allowed on any portion of the alternate shutdown system during this same time period.

REPORTABILITY:

This Licensee Event Report is provided pursuant to the requirements of 10 CFR 50.73(a)(2)(ii)(B), "Any event or condition that resulted in the condition of the nuclear plant, including its principal safety barriers, being seriously degraded, or that resulted in the nuclear power plant being in a condition that was outside the design basis of the plant." Additionally, an informational 1-hour NRC notification was made at

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 (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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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Point Beach Nuclear Plant, Unit 1	0500026692	00	07	00	05 OF 06

TEXT (if more space is required, use additional NRC Form 302A's) (17)

4:03 p.m. on August 18, 1992 in accordance with 10 CFR 50.72(b)(1)(ii)(B) with the official notification being made at 5:57 p.m. on August 18, 1992, in accordance with 10 CFR 50.72(b)(1)(i)(A). The NRC Resident Inspector was also informed of this event.

SAFETY ASSESSMENT:

A seismic event is not considered an initiator for any design basis accident analysis described in the Point Beach Nuclear Plant Final Safety Analysis Report, Chapter 14, "Safety Analyses." The Reactor Protection and Engineered Safeguards Features instrumentation and equipment is designed to remain operable for all conditions, including a seismic event.

The design basis safe-shutdown earthquake (SSE) for Point Beach Nuclear Plant assumes a horizontal ground acceleration of 0.12g. The cabinets were determined not to meet seismic design criteria because if they were subjected to the SSE acceleration, calculations showed that some of the components of the cabinet mountings would be overloaded by approximately a factor of three. Thus, in general, these components would have withstood a horizontal ground acceleration on the order of one third the SSE level, or 0.04g. The annual mean probability of exceeding a peak ground acceleration of 0.04g at Point Beach is approximately 1×10^{-3} per year. This estimate was obtained from EPRI Report NP-6395-D, "Probabilistic Seismic Hazard Evaluations at Nuclear Plant Sites in the Central and Eastern United States: Resolution of the Charleston Earthquake Issue," dated April 1989. This report was developed by EPRI, in conjunction with the Seismicity Owners Group, using a seismic hazard methodology described in a generic topical report submitted to the NRC in July 1986 (Technical Report NP-4726-A, EPRI, July 1986).

On the basis of the annual seismic event frequency, an estimate of the probability for a seismic event equivalent to or exceeding one third of the Point Beach Nuclear Plant SSE, occurring during the duration of the waiver of compliance, was calculated. The probability of this event is on the order of 8×10^{-6} . Therefore, the probability of a seismic event rendering the instrument cabinets inoperable during the three-day waiver of compliance was extremely small.

If these cabinets had been rendered inoperable by a seismic event, Point Beach Nuclear Plant still possesses the capability to place and maintain the reactor in a safe shutdown condition using remote shutdown panels. These panels were installed to meet the requirements for 10 CFR 50, Appendix R. Switches on these remote shutdown panels can be used to isolate the remote instrument indication from the control room instrumentation. The loss of the control room instrumentation will not

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F630) 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)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)
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TEXT IF more space is required use additional NRC Form 366A (17)

prevent a reactor from being placed and maintained in a safe shutdown condition. Therefore, the health and safety of plant personnel and the public were not endangered.

SIMILAR OCCURRENCES:

A review of previous Licensee Event Reports was conducted. There are no reports that discuss seismic concerns. However, LER 91-001-00 for Point Beach Nuclear Plant, Units 1 and 2, "Minimum AFW Flow During Automatic Actuation," discusses concerns described in QA Audit Finding Report A-P-90-12-075. This is the same report that initiated the AFW system upgrade discussed in this LER.