

NRC 2003-0052

10 CFR 50.73

June 5, 2003

U. S. Nuclear Regulatory Commission  
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Washington, DC 20555-0001

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2  
DOCKETS 50-266 AND 50-301  
LICENSEE EVENT REPORT 266/2003-001-00  
AS FOUND CONDITION OF DEGRADED GRID VOLTAGE RELAYS  
NOT WITHIN TECHNICAL SPECIFICATION LIMITS

Enclosed is Licensee Event Report (LER) 266/2003-001-00 for the Point Beach Nuclear Plant Units 1 and 2. This LER discusses the discovery that the 4160 VAC degraded grid voltage relays were calibrated with a volt meter that did not meet the accuracy tolerance specified in the setpoint calculation. This resulted in the relays settings not meeting the Technical Specification limits. This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) for, "Any operation or condition which was prohibited by the plant's Technical Specifications."

Corrective actions, completed and proposed, have been identified in the enclosed report. There are no new commitments in this report.

If you have any questions concerning the information provided in this report, please contact Mr. C. W. Krause at (920) 755-6809.

  
A. J. Cayia  
Site Vice President  
CWK/kmd

Enclosure

cc: NRC Regional Administrator  
NRC Project Manager

NRC Resident Inspector  
PSCW

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-8 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to [bjst1@nrc.gov](mailto:bjst1@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**LICENSEE EVENT REPORT (LER)**

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

FACILITY NAME (1) POINT BEACH NUCLEAR PLANT UNIT 1	DOCKET NUMBER (2) 05000266	PAGE (3) 1 OF 4
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TITLE (4)  
AS FOUND CONDITION OF DEGRADED GRID VOLTAGE RELAYS NOT WITHIN TECHNICAL SPECIFICATION LIMITS

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	06	2003	2003	- 001 - 00		06	05	2003	Point Beach Unit 2	05000301
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check all that apply) (11)									
	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
POWER LEVEL (10) 100	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)						
	20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)						
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)						
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER						
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A						
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)							
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)							
	20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)							

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

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) This report discusses the discovery that the Point Beach Nuclear Plant was operated for an extended period with the set points for the degraded voltage relays less than the Technical Specification setting. This was a condition prohibited by the Technical Specifications and is reportable under 10 CFR 50.73. The set points were incorrectly set because the surveillance procedures for the relays had been revised to specify a test instrument with an accuracy tolerance greater than the accuracy tolerance of the test instrument assumed in the set point calculation. The cause of this event was that the Nuclear Management Company (NMC) staff did not adequately consider and evaluate the differences in accuracy tolerance of the measuring instruments. Upon identification of the potential for this event, the surveillances for the degraded grid relays were declared to be missed and the surveillances were redone using the proper test instruments. Although all of the degraded grid voltage relay set points were found to be less than the Technical Specification limit of 3937 volts, only two of the 12 relays were found with set points potentially less than the analytical limits. These relays were both on the 1A-05 bus. The limiting equipment potentially impacted by these relays were an emergency diesel generator exhaust fan and a standby swing battery charger. A PRA risk assessment of the delay in performing the degraded voltage relay surveillance determined that the surveillance delay was not risk significant.

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

**Event Description:**

During performance of an engineering department assessment by a contractor group, an observation was made that the current revisions of procedures 1(2)RMP 9056-1, "Calibration and Testing of Safety Related Protective Relays A-05," and 1(2)RMP 9056-2, "Calibration and Testing of Safety Related Protective Relays A-06," required the use of a Fluke 8060A or equivalent multimeters [MTR]. This requirement was observed to be inconsistent with Calculation N-93-098, "Degraded Grid Voltage Relay Setting," which assumes the use of a Fluke 8505A voltmeter. This condition was documented in the corrective action program (CAP 31310). These referenced procedures are used to comply with Technical Specification Surveillance Requirement SR 3.3.4.3.b for channel calibration of the 4.16KV degraded grid voltage relays [27] with an allowable value of  $\geq 3937$  V. The purpose of the degraded grid voltage relays is to detect a sustained degraded voltage condition on the 4.16KV A05 and A06 safety related [EA] buses [BU]. The minimum voltage setpoint for these relays assures that a voltage greater than the minimum running and starting voltage ratings for safety related equipment attached to or supplied by these buses will be available to ensure the equipment will operate as designed, if required. When the bus voltage reaches the relay setpoint, the relays will cause the incoming feeder breakers to the A-05 or A-06 bus to open. This, in turn, will result in the loss of voltage on that bus and cause the emergency diesel generators [EK] to start and pick up the loads on the safety related buses.

An engineering investigation of this discrepancy completed on April 3, 2003, identified that the accuracy tolerance of the Fluke 8505A meter assumed in the set point calculation was 0.1% plus 0.012% of full scale, while the nominal accuracy tolerance of the Fluke 8060A in the voltage range of interest (200 VAC) is 0.5%. Based on this review of the calculation N-93-098, NMC engineers concluded that there was not enough margin in the calculation uncertainties to accept a less accurate meter without performing a new calculation to justify a revised calibration setpoint for the RMPs. Since the surveillances of the degraded grid voltage relays last performed (June 2002 for Unit 2 and August 2002 for Unit 1) were performed with the less accurate Fluke 8060A volt meters, on April 3, 2003, we declared SR 3.3.4.3.b for both units to be missed surveillances and issued work orders to reperform the now missed RMPs with the proper instruments (CAP 32002).

In accordance with Technical Specification SR 3.0.3, if it is discovered that a surveillance was not performed within its specified frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified frequency, whichever is greater. This delay period is permitted to allow performance of the surveillance. A risk evaluation shall be performed for any surveillance delayed greater than 24 hours and the risk impact shall be managed. Due to the severe weather conditions occurring at the plant on April 4, 2003, which included a winter storm warning and high winds, the decision was made to provide justification for extending the delay period beyond the 24 hours. An evaluation was completed by engineering (2003-0010) that calculated the potential relay settings based on the as left reading of the most recent surveillance and including the accuracy tolerance of the Fluke 8060A voltmeters actually used to calibrate the degraded voltage relays. This calculation concluded that the as-left relay settings from the last surveillance were potentially less than the Technical Specification set point, but would maintain the minimum voltage required for continuous operation of safety related motors above the analytical limit. Therefore, no equipment would be affected due to the relay settings being lower than expected.

A risk assessment considering an increase in the surveillance interval for an additional 18 months was also conducted. This assessment concluded that delaying the performance of the missed surveillance for up to 18 months did not significantly degrade safety. Therefore, delaying the performance of the surveillance until the weather improved and challenges to the grid stability were lessened was reasonable, because there was no immediate threat to plant safety. The duration of the delay in performing SR 3.3.4.3 provided sufficient time to establish the prerequisite conditions required to perform the surveillance, and allowed the performance of the surveillance during improved weather conditions.

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On April 6, 2003, the 2RMP 9056-1 and 2RMP 9056-2 procedures were completed for the Unit 2 A-05 and A-06 degraded grid voltage relays using the Fluke 8505A voltmeter (CAP 32052). The as-found relay settings were determined to be outside the Technical Specification set point limit. Accordingly, we declared the surveillance failed for each relay as they were tested. The drop out voltage set points were corrected and the relays returned to operable condition within the completion time of the required actions. NMC also acknowledged that the as-found condition of these relays constituted a condition which was prohibited by the Technical Specification since there was firm evidence that the out of tolerance as found relay settings were the result of using testing equipment with insufficient accuracy during the previous surveillance. The Unit 1 relays were tested on April 7 and also determined to have as found settings outside the Technical Specification set point limit. All the relays in both units were returned to operation with the drop out voltage settings within the Technical Specification limits.

**Cause:**

An apparent cause evaluation (ACE 1275) was completed to determine why the RMP procedure no longer identified use of the proper test equipment. Investigation of the condition revealed that the RMP maintenance procedures referencing the use of the FLUKE model 8505A meters were revised beginning on April 6, 2001 at the request of an electrical systems engineer. This recommendation was based on the fact that the FLUKE model 8505A multimeters were being "decommissioned" by the plant due to imminent obsolescence of this model. The engineer was aware of the difference in instrument inaccuracies but did not perform any specific analyses to evaluate the impact of these differences. He assumed that since the inaccuracies were very close to each other, the differences were not significant. He was unaware that this change in test equipment created a potential problem scenario due to the fact that calculation N-93-098, "Degraded Grid Voltage Relay Settings" assumed the use of a specific test instrument. He was also not aware of the sensitivity of that calculation to the accuracy tolerance of the measuring equipment. When questioned by the maintenance procedures group regarding the instrument change, the engineer replied that the accuracy of the new instrument was adequate.

**Corrective Actions:**

Calculation N-93-098 Revision 6 was reviewed to determine the sensitivity of the degraded relay set points to measuring equipment accuracy. This review concluded that there is insufficient margin in the set point uncertainties to accept use of a less accurate voltmeter.

The calibration and testing procedures for the bus A05 and A06 safety related protective relays, 1(2) RMP-9056-1 and 1(2) RMP 9056-2, were revised under the temporary change process that specifies use of the Fluke 8505A volt meter.

As discussed above, the affected relays were recalibrated using the revised procedures on April 6, 2003 (Unit 2) and April 7, 2003 (Unit 1). The relay drop out voltages were adjusted, as needed, to comply with the Technical Specification SR 3.3.4.3.b set point requirements.

*An extent of condition assessment will be performed with support from engineering and maintenance resources. This assessment will identify and evaluate a sampling of maintenance and I&C procedures that use metering and testing equipment to determine if discrepancies similar to those identified in this event exist.*

**Safety Assessment:**

As mentioned previously, the purpose of the degraded grid voltage relays is to sense the voltage on the safety related A-05 or A-06 4.16KV buses and open the incoming feeder breakers before the sustained low voltage condition could result in potential damage to safety related equipment. The minimum running and starting voltage ratings for the safety related equipment on a specific bus, with allowances for various uncertainties, is used to determine the set point

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for actuation of the degraded grid voltage relays. Each of the four 4.16KV buses has three relays and a 2 of 3 logic is needed to actuate the degraded grid voltage protection. After performing the surveillance for these relays on April 6, 2003, for Unit 2 and April 7, 2003, we found that the as found relay drop outs for all of the twelve degraded grid voltage relays were less than the Technical Specification required setting; however, only two of the 12 relays potentially had an as found set point (drop out voltage) that was less than the analytical minimums established by Calculation N-93-002. These relays (1-274/A05 and 1-275/A05) are both associated with bus 1A-05. As established in the N-93-002 calculation, the limiting safety related equipment supplied through this bus is the W-12A "G-01 Emergency Diesel Generator Room Exhaust," and the D-109, "Swing Station Battery Charger."

For the following reasons, NMC believes that the safety impact of the as found conditions of these relays was minimal. The D-109 battery charger is an alternate supply for safety related batteries D-105 and D-106. The normal supply to these batteries are battery chargers D-107 and D-108 respectively. Charger D-109 would typically only be in service to one of these batteries during maintenance of the normal battery charger. NMC further believes that, based on engineering judgment, the W-12A fan would have been able to start or continue to run since the as-found relay trip point is only slightly lower (0.23 volts on the 480 volts bus) than the 10% degraded voltage limit of 414 volts specified in NEMA Standard MG-1. In addition, an alternate train exhaust fan (W-12B) would have remained available and would have been capable of performing the heat exhaust function.

On April 4, 2003, a PRA evaluation (CALC 2003-0015) for the missed surveillance of the A-05 and A-06 degraded grid voltage relays was completed to provide a risk justification for delaying the missed surveillances for greater than 24 hours. The upper bound for change in core damage probability considering an increase in the surveillance interval of an additional 18 months would result in 2.04E-07 probability of core damage per unit. This was an upper bound determination using conservative assumptions. The best estimate increase would be expected to be substantially lower than that. Accordingly, we believe the safety and welfare of the public and plant staff were not significantly impacted by this event.

Even though the degraded voltage relays were set at less than the technical specification limits during this period, there was not a complete loss of any safety related function.

**Similar Occurrences:**

A review of recent LERs (past three years) identified the following events that were reported as conditions prohibited by the Technical Specifications:

<u>LER NUMBER</u>	<u>Title</u>
301/2003-003-00	Failure To Place Instrument Channel In Trip As Specified By LCO 3.3.1 Required Action D.1
301/2002-002-00	Pressurizer Safety Valve Failed to Lift at test Pressure
266/2001-004-00	Failure to Comply with LCO to Start Standby Emergency Power Supply
301/2000-003-00	Failure to Comply with LCO Action Statement to Start Redundant Emergency Power Supply