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October 26, 1992

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

Gentlemen:

DOCKET 50-301
LICENSEE EVENT REPORT 92-004-00
MANUAL REACTOR TRIP DURING
HOT CONTROL ROD DROP TESTING
POINT BEACH NUCLEAR PLANT, UNIT 2

Enclosed is Licensee Event Report 92-004-00 for Point Beach Nuclear Plant, Unit 2. This report is provided in accordance with 10 CFR 50.73(a)(2)(iv), "The licensee shall report...any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)."

This report describes a manual reactor trip which was initiated during performance of Reactor Engineering Surveillance Procedure RESP 1.1, "Rod Control System: Rod Drop Testing." The cause of this event has been attributed to a lack of clear communication between the Test Coordinator and shift operating personnel.

Please contact us if any further information is required.

Sincerely,

Bob Link
Vice President
Nuclear Power

DAW/jg

Enclosure

cc: NRC Resident Inspector
NRC Regional Administrator

IE22 1/1

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

LICENSEE EVENT REPORT (LER)

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-630), 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)	PAGE (3)
Point Beach Nuclear Plant, Unit 2	0 5 0 0 0 3 0 1	1 OF 0 5

TITLE (4)

Manual Reactor Trip During Hot Control Rod Drop Testing

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 9	2 6	9 2	9 2	- 0 1 4	- 0 0	1 0	2 6	9 2		0 5 0 0 0
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OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 1 0		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
W. J. Herrman, Manager--Technical Services	4 1 4 7 5 1 5 1 - 2 1 3 1 2 1

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)

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

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

ABSTRACT

At 0940 on September 26, 1992, while Point Beach Nuclear Plant Unit 2 was subcritical in hot shutdown in preparation for the upcoming Unit 2 cycle 18 refueling outage, end-of-cycle rod drop tests were being conducted in accordance with Reactor Engineering Surveillance Procedure RESP 1.1, "Rod Control System: Rod Drop Testing," Revision 3. In the pre-job briefing, the Test Coordinator explained to the shift operating crew the precautions set forth in the procedure as well as the sequence of events expected to occur. However, the shift operating crew misunderstood instructions from the Test Coordinator regarding the control board indications the Unit 2 Control Operator would receive during the test. Consequently, when rod bottom bistable lights illuminated, the shift operating crew believed control rods had dropped and subsequently took the proper conservative action of immediately initiating a manual reactor trip. The rod bottom bistable lights illuminated because the rod position indication test switches were placed in the "TEST" position in accordance with RESP 1.1. The control rods had not dropped as indicated. The misunderstanding between the Test Coordinator and shift operating crew was the primary cause of this event. Reactor shutdown was completed at 1000 and normal refueling outage evolutions continued. Procedure RESP 1.1 will be revised to include an explicit step advising the control room personnel of the indications which will be received when performing this procedure. This event involved an actuation of the reactor protection system. Therefore, a four-hour notification to the NRC was made in accordance with 10 CFR 50.72(b)(2)(ii).

Attachment QP 16-5.1

EVENT DESCRIPTION

At 0940 on September 26, 1992, while Point Beach Nuclear Plant Unit 2 was subcritical in hot shutdown in preparation for the upcoming Unit 2 cycle 18 refueling outage, end-of-cycle control rod drop tests were being conducted in accordance with Reactor Engineering Surveillance Procedure RESP 1.1, "Rod Control System: Rod Drop Testing," Revision 3. The control rod drop tests were being conducted as required by PBNP Final Safety Analysis Report (FSAR) Section 14.2, "Standby Safety Features Analysis." PBNP FSAR Section 14.2 requires the verification of complete control rod insertion prior to performing refueling operations and ensures that the control rod drive shafts are disengaged from the control rod drive mechanisms before the reactor vessel head is raised. RESP 1.1 had been revised on September 24, 1992, to include the use of a new computer-based control rod test system (CRTS) which is capable of collecting test data from all rods simultaneously. Previous rod drop timing tests required each rod to be dropped and timed individually.

The September 24, 1992, revision of the procedure also incorporated the requirements of Point Beach Administrative Control Procedure PBNP 3.4.19, "Infrequently Performed Tests or Evolutions (IPTEs)," Revision 3, which provides guidance for identifying IPTEs which have the potential to significantly degrade the plant's margin of safety and specifies the special controls needed to successfully accomplish these tests and evolutions. Included in PBNP 3.4.19 is guidance on personnel responsibilities, procedure review and screening, procedure validation, risk assessment, training, pre-job briefings, and possible temporary assignment of additional personnel.

The pre-job briefing between the Test Coordinator and the shift operating crew consisted of the Test Coordinator explaining the precautions set forth in the procedure as well as an overview of the sequence of events expected to occur. The Test Coordinator informed the Control Operator that he would lose his rod position indication (RPI) when the RPI test switches were placed in the "TEST" position. The Control Operator asked the Test Coordinator to clarify the operability of the rod bottom light indication. The Test Coordinator responded that rod bottom indication would be operable. At that point a misunderstanding of the operability and expected rod bottom light indication existed between the Test Coordinator and shift operating crew.

The shift operating crew believed that the rod bottom bistable lights would illuminate when the rods actually dropped. However, the Test Coordinator meant that the lights would illuminate when the RPI test switches were placed in the "TEST" position. The control rods would not have actually dropped at that time. When procedure step 5.7 was reached, the Test Coordinator informed the Control Operator that he was about to place the RPI test switches in "TEST." After the Control Operator acknowledged the Test Coordinator, the Test Coordinator proceeded to reposition the test switches. The Test Coordinator repositioned one test switch to "TEST" which caused one rod bottom bistable light to illuminate and the associated main control board annunciator to activate. The Test Coordinator waited momentarily, expecting the Control Operator to acknowledge and silence the annunciator, then proceeded to reposition the remaining test switches. The Control Operator did not silence the annunciator.

Based on the information discussed in the pre-job briefing, the shift operating crew did not expect the rod bottom bistable light to illuminate or the annunciator to activate. When one of the rod bottom bistable lights illuminated, it initially appeared that one control rod may have dropped. As the remaining test switches were repositioned by the Test Coordinator, it appeared that additional rods were dropping randomly. In response to the unexpected rod bottom indications, the Duty Shift Superintendent ordered the Unit 2 Control Operator to manually trip the reactor in accordance with Abnormal Operating Procedure AOP-6D, "Uncontrolled Insertion of

RCCA(s)." The Test Coordinator had intended to place all 33 test switches in the "TEST" position, then direct the Control Operator to manually trip the reactor. However, due to the unexpected control rod bottom indications, the Duty Shift Superintendent ordered the Unit 2 Control Operator to trip the reactor before all of the RPI test switches were placed in the "TEST" position.

The rod drop test was terminated without collecting control rod drop time data. RESP 1.1 is conducted at the beginning of each plant refueling outage to determine if any control rods require further examination and also to verify that the control rod drive shafts have been released from the control rod drive mechanism grippers. The control rods were verified to have dropped satisfactorily by observing the illuminated control rod bottom lights after the reactor trip. The RPI test switches which had previously been placed in the "TEST" position were subsequently returned to their normal operating positions to verify that those control rods had also dropped satisfactorily after the reactor trip . Verifying that all rods dropped after the reactor trip met the requirements of the FSAR and no further testing was necessary.

Reactor shutdown was completed at 1000 and normal refueling outage evolutions commenced. This event is an actuation of the reactor protection system. Therefore, a four-hour notification to the NRC was made in accordance with 10 CFR 50.72(b)(2)(ii). The NRC Resident Inspector was also notified.

EQUIPMENT DESCRIPTION

The function of the control rod drive system is to move the 33 full-length control rods to control the fission rate in the reactor in response to either Control Operator actions (manually) or reactor control system signals (automatically). Each control rod drive mechanism consists of an internal latch (gripper) assembly, a pressure vessel, an operating coil stack, a drive shaft assembly, and a control rod position indicator (RPI) coil stack.

The latch (gripper) assembly contains the working components which withdraw and insert the drive shaft and attached control rod. It is located within the pressure housing and is operated by three electromagnets. The electromagnets actuate two sets of latches which engage the grooved section of the control rod drive shaft to hold the control rod in place. When the electromagnets become deenergized (as in the case of a reactor trip signal), the latch assembly no longer engages the drive shaft and the control rod is completely inserted into the reactor core. When the base of the control rod reaches the core bottom, the associated rod bottom bistable light illuminates, indicating to shift operating personnel that a control rod has dropped.

The individual control rod position indication system receives a position signal from the magnetic coupling of separate electrical windings. An electrical coil stack is located in the upper region of the control rod drive mechanism external to the pressure housing. When the associated control rod is moved, the magnetic coupling between primary and secondary windings varies and a voltage is induced. The induced voltage creates a signal which is proportional to control rod position. The resulting control rod position indication for each of the 33 control rods is displayed in the control room.

The Control Rod Test System (CRTS) is a computer-based system which can be used to measure control rod drop times and verifies control rod position, control rod position indicator alignment, and proper control rod stepping.

CAUSE

This event was caused by a lack of clear communication between the Test Coordinator and the shift operating crew resulting in an inadequate pre-job briefing. Shift operating personnel questioned the Test Coordinator on the expected indications as a result of the test. However, the miscommunication between the two parties resulted in the shift operating crew taking action to mitigate a perceived event which was artificially induced by the Test Coordinator when performing the control rod drop test procedure.

CORRECTIVE ACTIONS

A. Immediate

1) The Unit 2 reactor was manually tripped.

2) Reactor shutdown was completed in accordance with Emergency Operating Procedure EOP 0, "Reactor Trip or Safety Injection," and EOP 0.1, "Reactor Trip Response."

3) Control rod drop testing was terminated.

B. Long Term:

1) This event will be included in the next licensed operator training cycle as an example of the importance of effective communications in plant activities and will be completed by March 31, 1993. Technical Services personnel will review this event by November 9, 1992, prior to Unit 2 startup physics testing. In addition, this event will be reviewed by all PBNP Training Advisory Committees to assess the need for training for the remaining Nuclear Power Department personnel by January 15, 1993.

2) Procedure RESP 1.1 will be revised to include an explicit step advising shift operating personnel of the indications which will be received and the conditions which will result when the rod position indication test switches are placed in "TEST." This procedure will be revised by Technical Services personnel and will be issued by December 31, 1992.

REPORTABILITY

This event is being reported under the requirements of 10 CFR 50.73(a)(2)(iv), "The licensee shall report...any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)." A four-hour notification to the NRC was made in accordance with 10 CFR 50.72(b)(2)(ii). The NRC Resident Inspector was also notified.

SAFETY ASSESSMENT

All systems functioned as designed during this event. The safety of the plant and the health and safety of the public and plant employees were not jeopardized.

GENERIC IMPLICATIONS

Proper communication is vital in all aspects of nuclear power plant operations. Personnel must ensure that all parties involved in an evolution understand the actions being taken and understand the expected sequence of events.

S. SIMILAR OCCURRENCES

A review of events since 1986 revealed two events in which inadequate communication was a contributing factor and six events in which inadequate procedures contributed to an actuation of an engineered safety feature or the reactor protection system. These events are summarized as follows:

Inadequate Communication

LER #	Event Date	Title
266/89-006-00	05/05/89	Auxiliary Feedwater Pump Start
266/92-005-01	05/27/92	Excessive Cool-Down Transient

Inadequate Procedures

LER #	Event Date	Title
301/86-001-00	04/29/86	Reactor Trip During Logic Test
266/86-003-00	06/03/86	Reactor Trip Due to Loss of White Instrument Bus
301/86-003-00	06/03/86	Turbine Runback Due to Loss of Instrument Bus
301/88-001-00	04/07/88	Reactor Trip Due to Malfunction of Instrument Bus Power Supply Mechanical Interlock
301/89-007-00	10/27/89	Unanticipated Safety Injection Signal
266/91-012-01	09/24/91	Nuclear Instrumentation Turbine Runback