NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 LICENSEE CODE: W I P B H 2 (2) LICENSE NUMBER: 0 0 - 0 0 0 0 0 - 0 0 (3) LICENSE TYPE: 4 1 1 1 1 (4) CAT (5)

CON'T 01 REPORT SOURCE: L (6) DOCKET NUMBER: 0 5 0 0 0 3 0 1 (7) EVENT DATE: 0 7 2 7 8 2 (8) REPORT DATE: 0 9 2 8 8 2 (9)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 During an engineering evaluation of a wiring change, it was discovered
03 that 2 of the 3 level instruments on the "C" boric acid storage tank (BAST)
04 were powered from a common source. During initiation of safety injection
05 coincident with a loss of instrument bus 2Y04, no high concentration
06 boric acid from the BAST would be available to high head safety injection
07 without operator action. Refueling water storage tank water was available.
08 This event is reportable in accordance with TS 15.6.9.2.A.2.

09	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
	E C (11)	X (12)	X (13)	Z Z Z Z Z Z (14)	Z (15)	Z (16)

(17) LER/RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 2	—	0 0 5	/	0 1	T	—	1

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
X (18)	X (19)	Z (20)	Z (21)	0 0 0 0	Y (23)	N (24)	Z (25)	Z 9 9 9 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 The cause of this event cannot be accurately determined due to the docu-
11 mentation of early plant maintenance. The Unit 2 safety injection suction
12 was transferred to the "B" boric acid storage tank at 1526 hours on
13 07/27/82. Following approval of a special maintenance procedure, the
14 wiring problem was corrected on 08/10/82.

15 FACILITY STATUS: E (28) % POWER: 0 9 8 (29) OTHER STATUS (30): N/A METHOD OF DISCOVERY: Z (31) DISCOVERY DESCRIPTION (32): N/A

16 ACTIVITY RELEASED: Z (33) CONTENT OF RELEASE: Z (34) AMOUNT OF ACTIVITY (35): N/A LOCATION OF RELEASE (36): N/A

17 PERSONNEL EXPOSURES NUMBER: 0 0 0 (37) TYPE: Z (38) DESCRIPTION (39): N/A

18 PERSONNEL INJURIES NUMBER: 0 0 0 (40) DESCRIPTION (41): N/A

19 LOSS OF OR DAMAGE TO FACILITY (43) TYPE: Z (42) DESCRIPTION: N/A

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20 PUBLICITY ISSUED: N (44) DESCRIPTION (45): N/A

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GPO 917-926

Revised Report - Original Report Date 08/10/82

ATTACHMENT TO LICENSEE EVENT REPORT NO. 82-005/01T-1

Wisconsin Electric Power Company
Point Beach Nuclear Plant, Unit 2
Docket No. 50-301

During a planned engineering evaluation for the purpose of verification of the instrument rack drawings for the instrument module power supplies and the field wiring for those power supplies on both units, it was discovered that two of the three level instruments on the "C" boric acid storage tank (BAST) were powered from a common source. Both instruments 2LC-190 and 2LC-172 received power from the Unit 2 yellow instrument bus 2Y04. During normal operating conditions, this would not have a detrimental effect. However, during initiation of safety injection coincident with a loss of the yellow instrument bus, high concentration boric acid would not be available to the suction of the high head safety injection pumps without operator action. The loss of the yellow instrument bus would cause both associated level instruments to fail low and prevent the two parallel "C" BAST isolation valves from opening. The false low-level alarm (two of three logic) would then cause the refueling water storage tank (RWST) to high-head safety injection isolation valves to open, allowing 2000 ppm boric acid rather than 12% concentrated boric acid to be injected into the reactor coolant system (RCS).

The purpose of the BAST's is to minimize reactor power after the predicted return to criticality in a postulated steam line break accident (SLBA) assuming the most reactive control rod is stuck out. In the "as found" condition described above, high concentration boric acid would not have been immediately available from the BAST's in the event of a loss of power to the yellow instrument bus. Operator action, either transferring safety injection pump suction to the "B" BAST or manually opening the "C" BAST isolation valve to the safety injection pump suction, could have provided high concentration boric acid to the RCS. It should be noted that the operator would also have had to close the RWST isolation valves to the high-head safety injection system to prevent diluting the concentrated boric acid.

Upon discovery and verification of the common power source for the "C" BAST level instruments, immediate corrective action was taken. Switching the Unit 2 safety injection pump suction to the "B" BAST was completed at 1526 hours on July 27, 1982. On August 10, 1982, following completion of a special maintenance procedure, the wiring was corrected to prevent a loss of two level channels from a loss of the yellow instrument bus.

Two of the three level instruments were powered from a single AC source for each of the three BAST's in the original plant design. This problem was recognized prior to plant start-up and an additional inverter was installed to allow two of the three level instruments for each BAST to be powered from separate battery busses. It is believed that at some time in the early 1970's inverter 2MQ-400 failed and the instruments supplied by this inverter were reconnected as in the original plant design while waiting for repair parts. Once the repair parts were received and installed the level instruments were to have been reconnected to the 2MQ-400 inverter. Power supplies for the "A" and "B" BAST level instruments were reconnected properly but for some reason the power supply for level instrument 2LC-172 for the "C" BAST was apparently not reconnected to the proper inverter.

The actual cause of this event cannot be accurately determined due to lack of documentation of maintenance in the early days of plant operation. Documentation of repaired equipment and its return to service has greatly improved since the early days of operation and this increased effort should prevent future occurrences of this type.

The engineering review which found this wiring error involved tracing the field wiring of all control room instrument rack power supplies. This review was completed for both Units 1 and 2 and no further wiring problems were found. Therefore, the above condition is believed to be an isolated event.

The potential adverse consequences of the "as-found" condition of the BAST level instrument power supplies have been reviewed and are judged to be minimal. The BAST's contain approximately 20,000 ppm boric acid solution which is pumped into the RCS by the safety injection pumps following a design-basis SLBA. This is done to reduce the peak core power level following a return to criticality resulting from the rapid plant cooldown. If the contents of the RWST's containing only 2,000 ppm boric acid solution were pumped into the RCS following a design-basis SLBA instead of the 20,000 ppm BAST contents, a somewhat higher peak core power could occur following a return to criticality. The acceptance criterion for a design-basis SLBA, which is a Condition IV event not expected to occur during the life of the plant, is to maintain the core essentially intact and to prevent significant cladding rupture. Even though the acceptance criteria may be met with departure from nucleate boiling (DNB) and clad perforations, the PBNP accident analyses have shown that no DNB or clad perforations occur even for the worst-case SLBA. This implies a large conservative margin in the acceptability of these results. In addition, the peak core power is more sensitive to the time for the boron to reach the core rather than the boron concentration.

Furthermore, the accident analyses contain a number of conservative assumptions which would be unlikely to exist simultaneously in the unlikely event of a SLBA including:

1. A minimum shutdown reactivity margin is assumed.

2. The most reactive rod is assumed stuck in the fully withdrawn position.

3. The highest hot channel factors for one stuck rod are assumed.

4. The most negative moderator temperature coefficient for the rodded core at end of life is assumed.

5. Only one train of safety injection is assumed to function.

6. Initial steam pressure and temperature corresponding to hot, no load (i.e., maximum energy) conditions are assumed.

7. A high value of steam generator heat transfer is assumed (resulting in maximum RCS cooldown).

8. Closure time of the main steam isolation valves is assumed to be a high value of five seconds.

9. No credit is taken for the 2,000 ppm boron solution entering the RCS while sweeping out the safety injection piping.

10. Pipe ruptures are assumed to be double-ended, offset shear breaks.

To determine the realistic consequences of a SLBA during the period the level detectors were incorrectly wired would require a definition of plant conditions which actually existed rather than those listed above. It should be noted that some of these conditions (i.e., assumptions) vary with plant operation. Therefore, it can be concluded that if a SLBA had actually occurred, and the reactor had returned to criticality, a higher reactor power level might have been reached with the miswiring than if the detectors had been correctly wired. The precise power level would, of course, have depended on actual plant conditions at the time. There were actually no consequences of the miswiring since no accident occurred.

Further indirect evidence that the failure of the BAST suction valves to open would not lead to unacceptable consequences was provided by engineers from the Transient Analysis Group of the Nuclear Safety Department of Westinghouse. Several three and four-loop Westinghouse plants were analyzed for a similar situation in which SLBA analyses were performed assuming the bypass of the high boron concentration boron injection tanks (BIT's) on the Turkey Point, Comanche Peak, and McGuire plants. The BIT's on these plants perform essentially the same function as the BAST's at Point Beach although they are located in the discharge piping of the safety injection system rather than in the suction piping. The worst-case SLBA analyses for each of the three plants under the above scenario were acceptable and no DNB occurred in the core. Peak core power from these analyses was only seven to ten percent higher than for analyses assuming the use of the BIT's. The probability of a design-basis SLBA at Point Beach Unit 2 over the past several years was extremely low. However, it is our judgment that even the occurrence of a worst-case SLBA in Unit 2, with a simultaneous loss of the yellow instrument bus, would not have resulted in significant core damage or any adverse effect on the health and safety of the public.

This event is reportable in accordance with Technical Specification 15.6.9.2.A.2.

The Resident Inspector has been notified of this event.