Wisconsin Electric
POWER COMPANY
231 W. Michigan, P.O. Box 2046, Milwaukee, WI 53201 (414) 221-2345

VPNPD-89-583
NRC-89-141

November 8, 1989

Document Control Desk
U. S. Nuclear Regulatory Commission
Mail Stop P1-137
Washington, DC 20555

REQUEST FOR DISCRETIONARY ENFORCEMENT RELATED TO
TECHNICAL SPECIFICATION 15.3.0.A
POINT BEACH NUCLEAR PLANT UNITS 1 AND 2
DOCKET NOS. 50-266 AND 50-301

Gentlemen:

This letter provides documentation of the discussion and actions taken on November 7, 1989, concerning Wisconsin Electric's verbal discretionary enforcement request.

On November 7, 1989, Wisconsin Electric verbally requested discretionary enforcement for the Point Beach Nuclear Plant Units 1 and 2 Technical Specification 15.3.0.A. This Limiting Condition for Operation states:

> "15.3.0.A: Many of the Limiting Conditions for Operation (LCO) presented in these specifications provide a temporary relaxation of the single failure criterion, consistent with overall reliability considerations, to allow time periods during which corrective action may be taken to restore the system to full operability. If the situation has not been corrected within the specified time period, and the LCO prescribes no other specification action, an affected unit, which is critical, shall be placed in the hot shutdown condition within three hours. In the event an LCO cannot be satisfied because of equipment failures or limitations beyond those specified in the permissible conditions of the LCO, the affected unit, which is critical, shall be placed in the hot shutdown condition within three hours of discovery of the situation."

On November 7, 1989, it was discovered that the Point Beach Nuclear Plant was in a condition which was outside of the requirements of TS 15.3.7.B.1.f and 15.3.7.B.1.g. These TS state:

IE01
1/1

> "15.3.7.B.1.f: One of the batteries D05 or D06 may be inoperable for a period not exceeding 24 hours provided the other three batteries and four battery chargers remain operable with one charger carrying the DC loads of each DC main distribution bus."

> "15.3.7.B.1.g: One of the batteries D105 or D106 may be inoperable for a period not exceeding 72 hours provided the other three batteries and four battery chargers remain operable with one charger carrying the DC loads of each DC main distribution bus."

The requested discretionary enforcement provides for the completion of charging battery D106 with the D05 and D06 batteries having been declared technically inoperable in lieu of taking Unit 1 to the hot shutdown condition as required by TS 15.3.0.A. At the time of the discretionary enforcement request was made to NRC Region III representatives, Unit 2 was and remains in the cold, refueling shutdown condition.

On November 6, 1989, at 2029 hours, a 72-hour LCO was entered when battery D106 was removed from service for its five-year service test. At 0120 hours on November 7, the service test was successfully completed and the battery was placed on a float charge. It was anticipated that charging of this battery would be completed within the 72 hour LCO (i.e., well before 2029 hours on November 9, 1989.) It should be noted that D106, although being service tested, had its DC loads served by the charger and a qualified battery utilizing cables which were not seismically qualified. This DC bus, therefore, had both normal and emergency power. Nonetheless, the 72 hour LCO was entered conservatively.

On November 9, 1989, at 1600 hours, the PBNP Manager's Supervisory Staff determined that the D05 and D06 station batteries were technically inoperable as a result of the discovery of an original plant design deficiency which could render one or both of the two plant main DC systems inoperable as a result of a single bus fault. The potential problem had been reported to the Manager-PBNP at 1200 hours by our corporate-headquarters Nuclear Engineering group. Upon arrival at the plant site approximately two hours, the issue was presented to the Manager's Supervisory Staff.

Subsequently, the MSS concluded that at the time of this determination, PBNP was operating outside of Technical Specification requirements for the DC power system.

Background

An independent safety system functional inspection (SSFI) was performed by a contractor in 1988. During this audit, the team reviewed the adequacy of protection of the main DC systems at Point Beach Nuclear Plant (PBNP). One of the audit findings (SSFI WE 88-14) stated that the available short circuit current at the main DC buses D01 and D02 was 15,700 amps and that the UL rating for the main battery breaker (Westinghouse HMA 1200 amp) was only 10,000 amps. During the audit, verbal confirmation was obtained from the manufacturer that a Type HMA breaker was capable of interrupting up to 20,000 amps when applied on a 125 V DC system. This verbal information was subsequently confirmed in a letter, which also stated that testing had been done to confirm this level of interrupting capability.

Our response to the audit finding was that we would obtain test data from Westinghouse and compare its acceptability for use in place of the UL rating. In the course of our followup to obtain the Westinghouse test data, it was confirmed on November 7, 1989, that the data originally discussed was not applicable to the type of breaker installed at PBNP.

The original design of the PBNP DC systems utilized circuit breakers exclusively in the distribution panel portions of the system. This includes breakers in D01 and D02 which have thermal but not magnetic trip elements. Such breakers include the main input breaker from the system battery (Westinghouse Type HMA 1200 amp), the supply breakers to panels D12 and D13 (Westinghouse Type HLA 400 amp) and the supply breakers to panels D11 and D13 (Westinghouse Type HLA 300 amp). It also includes the use of similar breakers in Panels D11 and D12 (Westinghouse Type HFA 70 amp). This design is shown on Bechtel drawing 6118-E-6 (Sheet 1). This type of breaker is also specified in the original specification for these panels (Bechtel specification 6118-E-37).

Recent discussions with both Bechtel and Westinghouse have not resulted in a definition of the reason for utilization of this special type of breaker (thermal overload only) in this application. One possible explanation is that it provides for selectivity between successive breakers and between breakers and fuses in some of the equipment supplied by these circuits. It is usually not possible to obtain proper selective coordination between two molded-case circuit breakers which both have magnetic trip elements. This is because the magnetic element in each breaker will operate almost instantaneously to interrupt any fault in excess of a specified fault current for the breaker. As such, it is indeterminate as to which breaker in a series combination will operate first to clear a fault or whether or not such operation will prevent the second breaker from also operating.

The use of circuit breakers in the main portions of the DC systems was discussed with the NSSS supplier (and breaker manufacturer) the architect-engineer who designed the system, as well as with a contractor performing our electrical system coordination study, and with other utilities. It appears the design of our DC system is unique to this facility. Most other nuclear units utilize fuses or fuse disconnects in this type of application. Because fuses only have a thermal characteristic over their entire operating range, it is generally not difficult to obtain selective coordination between series devices. Fuses, however, have relatively high interrupting capacity unlike the thermal trip only breakers installed at PBNP.

Several of the circuit breakers in main DC buses D01 and D02 and most of those in buses D11 and D13 are of a type which do not have the magnetic trip function. This results in these breakers having only a thermal trip function. Thus, the breakers are not capable of interrupting fault currents of magnitudes in excess of approximately ten times the trip rating. Fault currents of such magnitudes are possible on some of the nonsafety-related circuits protected by these breakers. A fault on one of these nonsafety-related circuits could result in currents which would not be interrupted by any of the breakers in the DC system. This could result in the fault current being sustained until one of the components in the DC system catastrophically fails or until the battery supplying the system is discharged to a point where it no longer can provide sufficient energy.

Most of the circuits protected by such breakers, which originate at either D01 or D02, are considered safety-related. As such, sufficient physical and electrical separation exists between these circuits such that simultaneous failure of both DC systems (or any part thereof) due to a single incident is not considered probable. In addition, the fact that these components are nuclear safety related required that they be QA. On the other hand, some of the circuits originating at distribution panel D11 and D13 run to common pieces of equipment or in common raceways.

For each of the 4160 V and 480 V buses, a separate DC control power supply is provided from D11 and D13. In each of these buses, the two supplies are connected to a knife switch which allows for selection of one of the two supplies as that which provides control power for the bus.

Several of the same circuits supplied from D11 and D13 are classified as nonsafety-related. As such, these circuits in some cases are not physically separated from each other. This results in the possibility that simultaneous faults on both DC systems could occur due to the location of these circuits in a common raceway. This situation could also potentially result in failure of both plant DC systems.

Problem Description

1. The supply to each bus D01 and D02 from the associated battery is protected by a Westinghouse HMA 1200 amp thermal trip only breaker. The manufacturer has stated it is their opinion that this breaker will not interrupt fault currents in excess of about 8000 amps. Preliminary calculations indicate that a bus fault on either of these buses could result in a fault current of up to 16,000 amps. A failure to interrupt such a fault may result in total loss of the DC system which has been faulted. While this is not a desirable situation, a single bus fault on either D01 or D02 will result in failure of only one of the two plant main DC systems. This is due to the physical and electrical separation of these buses.

2. The supplies to DC distribution panels D11 and D12 (from D01) and D13 and D14 (from D02) are protected by Westinghouse Type HLA thermal only breakers. Westinghouse has stated that it is their opinion that these breakers will not interrupt fault currents in excess of about 5000 amps. Preliminary calculations indicate that faults on these circuits could result in a fault current of up to 16,000 amps. A failure to interrupt such a fault may result in total failure of the DC system faulted. While this is not a desirable situation, a single bus or cable fault at D11, D12, D13, D14, or any of the cables supplying them will result in failure of only one of the two plant main DC systems. This is due to the fact these buses and the supplies to them are considered safety-related and are therefore adequately physically and electrically separated.

3. Failure on circuits supplied from D12 and D14 are not of concern since all of the breakers in these panels are of a thermal-magnetic type and will adequately interrupt faults on circuits protected by them.

4. Most of the breakers in panels D11 and D13 are Westinghouse Type HFA thermal trip only. Westinghouse has stated that it is their opinion that these breakers will not interrupt fault currents in excess of 2000 amps. Preliminary calculations indicate that fault currents of up to 12,000 amps may occur on

the circuits protected by these breakers. As previously described, such faults could result in the failure of the DC system on which the fault occurs. Unlike the situations described in (1) and (2) above, there is not always adequate separation between the circuits supplied by D11 ("A" train, D05 battery) and D13 ("B" train, D06 battery). Breakers 1 through 20 in each of these panels provide control power to a single 4160 V or 480 V bus section. Corresponding breakers from each panel provide a normal and alternate source of control power (e.g., breaker #1 in D11 provides normally supply to 4160 V bus section 1A01 and breaker #1 in D13 provides an alternate supply to the same bus). These pairs of circuits are connected to a knife switch arrangement in each bus. It is possible that a casualty or failure in the vicinity of this switch could potentially result in a fault on both circuits simultaneously and subsequent failure of both DC systems due to lack of a breaker anywhere in the supply path from the battery capable of interrupting the fault current. In addition, many of these same circuits are not considered safety-related. This has resulted in circuits originating at D11 and circuits originating at D13 being run in common raceways. Therefore, simultaneous faults may occur in selected raceway sections which could ultimately result in failure of both plant DC systems.

Conclusion

It was concluded by the Manager's Supervisory Staff at 1600 hours on November 7, 1989, that to prevent the possibility of a single fault rendering both main DC systems inoperable, nonsafety-related loads must be shifted from one station battery to the other while maintaining the maximum degree of redundancy possible. The decision to shift nonsafety-related loads to battery D05 was based upon the following considerations:

1. Switching of the Unit 2 nonsafety-related loads from their normal to alternate supply (D05 battery) results in no possibility of a trip signal being generated to Unit 2 which is shut down for refueling. Whereas if Unit 1 nonsafety-related loads would be switched to their alternate supply (D06 battery), there could be a finite probability of generating a trip signal to Unit 1.

   The above results in all nonsafety-related loads (1&2A01, 1&2A02, 1&2B01, and 1&2B02) being carried by battery D05. This removes the potential of a single fault affecting both batteries.

Assuming the ultraconservative, unanalyzed condition of a simultaneous Unit 1 and Unit 2 safeguards initiation, the switching of Unit 2 nonsafety-related loads to D05 adds a total of 108 amps maximum discharge for the first five seconds and 68 amps between five to ten seconds. This is within the load analysis for D05, which assumes 1001 amps for the first minute.

2. There is a concern for safety-related loads about the interconnection of their respective breaker panels, D11 and D13. The alternate supply breakers to those knife switches were opened to preclude the possibility of faults affecting both DC trains due to the presence of the circuits in common equipment.

In addition to the above, it was determined that these type of breakers also supply DC power to the turbine crossover steam dump system. Thus, potential short circuits affected by the cabling to this system should be addressed by removing the crossover steam dump system from service and opening the affected breakers. Since the turbine crossover steam dump system is enabled at power levels exceeding 92%, it was determined that Unit 1 power level should be reduced such that control power to the crossover steam dump system need not be supplied by the DC system.

Corrective Actions

1. NRC Region III representatives were contacted at 1600 hours by the Manager-PBNP and informed of the situation. Neither of the resident inspectors was available at the plant at this time.

2. At 1620 hours an orderly power reduction of Unit 1 to below the 92% power level commenced such that enabling of the turbine crossover steam dump system for overspeed protection would not be required. As Unit 2 was in the refueling shutdown condition, the unit was not impacted by this issue.

3. At approximately 1620 hours the NRC resident inspector was reached at his home and notified of the matter.

4. At 1637 hours an ENS notification of the event to the NRC Operations Center was accomplished.

5. Between 1600-1730 hours, the following actions were accomplished:

a. A work plan for shifting nonsafety-related loads (2A01, 2A02, 2B01, 2B02) from D06 to D05 was developed.

b. A work plan was developed for opening safety-related load alternate control power breakers. The work plan contained provisions for performing this action in a methodical and sequential manner, with safety-related loads being carried by Unit 2 being accomplished first.

The work plan also contained provisions for verifying alternate DC control power supplies prior to opening the alternate DC control power breakers with subsequent verification that control power is available following the shift. It was recognized that an emergency diesel generator start could occur if DC control power would be lost during this activity. Accordingly, a precaution was included in the work plan regarding this issue.

In conjunction with development of the work plan, an evaluation of potential Appendix R concerns was performed. It was concluded that for the purposes of Appendix R there is some redundancy in the backup DC control power circuitry from D106 to D06 and from D105 to D05. Thus, with D06 and D105 fully operable, Appendix R concerns are satisfied.

c. Although it was determined that the D05 battery would be considered to be the inoperable battery, it was acknowledged this battery would be carrying nonsafety-related loads. Accordingly, a safety evaluation was performed to ensure that the battery could accommodate the additional loading. The safety evaluation concluded the additional loading would be within the load analysis for that battery.

d. A search was conducted for replacement dc control breakers which possess the magnetic trip element. Although several breakers of this type were located in our company storerooms, it was determined that they could not be installed because of concerns associated with NRC IE Bulletin 88-10.

e. An evaluation was conducted of the effect of the proposed short-term corrective actions upon Unit 2 was conducted. A check valve in the "B" train of residual heat removal was out of service for maintenance, thus rendering "B" train inoperable. It was pointed out that since fuel was being reloaded in the core, decay heat removal capability was requir[illegible] in accordance with

TS 15.3.8. It was acknowledged that if station battery D05 failed, there would be certain conditions when the "A" train of residual heat removal would not be remotely started from the control room. The "A" train of residual heat removal has been in operation since the initiation of the fuel reload and therefore, is therefore considered to be operable.

f. Additional corrective action planning for restoring D05 to an operable status was initiated.

g. An evaluation of potential Appendix R concerns was performed.

6. Between 1700-1730 hours NRC Region III representatives (Messrs. DeFayette and Jackiew) were again contacted by the Manager-PBNP and informed of the current status of the issue. A third conversation, with Messrs. DeFayette and Jackiew was held from 1740-1755 hours.

7. At 1800 hours, the discretionary enforcement request was granted by NRC Region III personnel based upon WE adequately shifting all nonsafety-related loads to D06 and opening all breakers providing alternate supply from both D05 and D06.

8. At 1900 hours, all nonsafety-related DC loads had been shifted to battery D05 and all alternate power supply breakers for safety-related loads had been opened.

9. On November 8, 1989, at 0920 hours, battery D106 was functionally restored to operability and the interim battery was removed from the D106 bus. Completion of associated work activities followed and the battery was declared to be fully operable at 1007 hours. This cleared the Technical Specification issue of operating Unit 1 in a "condition prohibited by Tech Specs."

10. A modification request is in progress to restore battery D05 to full operational status. There are a total of eight nonsafety related breakers which must be replaced; however, priority is being devoted to the four Unit 1 loads (1A01, 1A02, 1B01, 1B02). Replacement breakers having the magnetic trip element have been identified as being available within the facility. These replacement breakers were located in spare breaker positions. A 10 CFR 50.59 safety evaluation which will be conducted for this modification will address the replacement breakers with magnetic trip elements.

11. The 2A01, 2A02, 2B01, and 2B02 connections to D11 and D13 will have their breakers opened. This results in the nonsafety-related loads to D11 and D13 being disconnected and making it impossible for fault currents from those loads causing failure of the plant and DC buses.

12. Appropriate breakers with sufficient fault current capabilities will be procured and installed to supply 2A01, 2A02, 2B01, and 2B02. This will restore operability to these loads and allow restart of Unit 2 in accordance with the PBNP Technical Specifications.

13. The breakers for the turbine crossover steam dump system will be replaced before the steam dump system is declared operable and Unit 1 power level increased.

It should be noted that service testing of D105 is planned and will occur during the next few days as allowed by TS 15.3.7.B.1.g.

Very truly yours,

CW Fay

C. W. Fay
Vice President
Nuclear Power

smp

Copies to NRC Regional Administrator - Region III
NRC Resident Inspector