May 7, 2007

NRC 2007-0030
10 CFR 50.54(f)

U.S. Nuclear Regulatory Commission
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Rockville, MD 20852

Point Beach Nuclear Plant, Units 1 and 2
Dockets 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

Response to Generic Letter 2007-01,
Inaccessible or Underground Power Cable Failures that Disable
Accident Mitigation Systems or Cause Plant Transients

Generic Letter (GL) 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," (ML00703606650) was issued on February 7, 2007. The GL discusses moisture-induced degradation or failure of safety-related cables that are routed through underground conduits, concrete duct banks, cable trenches, cable troughs, underground vaults, or are directly buried. A 90-day response to the GL was requested.

The guidance provided in Enclosure 2 to NRC letter dated April 13, 2007 (ADAMS Accession No. ML070940311), to the Nuclear Energy Institute was used by Nuclear Management Company, LLC (NMC) in preparing the response to the GL.

The attached information is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended and 10 CFR 50.54(f).

The enclosure to this letter provides the NMC response to GL 2007-01. This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on May 7, 2007.

Dennis L. Koehl
Site Vice-President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC

ENCLOSURE

RESPONSE TO GENERIC LETTER 2007-01
INACCESSIBLE OR UNDERGROUND POWER CABLE FAILURES
THAT DISABLE ACCIDENT MITIGATION SYSTEMS
OR CAUSE PLANT TRANSIENTS

Background

Generic Letter (GL) 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," (ML00703606650 was issued on February 7, 2007). The GL discusses moisture-induced degradation or failure of safety-related cables that are routed through underground conduits, concrete duct banks, cable trenches, cable troughs, underground vaults, or are directly buried. A 90-day response to the GL was requested.

The Nuclear Management Company, LLC (NMC) response to the GL follows.

NRC Request 1: Provide a history of inaccessible or underground power cable failures for all cables that are within the scope of 10 CFR 50.65 (the Maintenance Rule) and for all voltage levels. Indicate the type, manufacturer, date of failure, type of service, voltage class, years of service, and the root causes for the failure.

NMC Response: A search was performed to identify power cable (480 VAC, 4.16 kVAC and 13.8 kVAC) failures at Point Beach Nuclear Plant (PBNP). One potential failure was identified as described below:

Cable Identification:	1A12A
Type of Cable:	1-Conductor 350 KCMIL, Shielded, Jacketed (Neoprene), Butyl Rubber Insulation
Manufacturer:	Okonite
Date of Failure:	10/04/97
Type of Service:	4.16 kVAC power cable running in cable tray and underground duct bank
Voltage Class:	5000 VAC
Years of Service:	27 Years (10/07/70 – 10/04/1997)
Root Cause for Failure:	Cable was undersized and compounded by a history of being submerged in water. The cable should have been 500 KCMIL for the connected load current. Cables to all four Circulating Water Pump motors were subsequently replaced with 500 KCMIL cables.

Cable 1A12A is the power cable to circulating water pump 1P30B. The potential failure was identified when the cable had been deenergized for an extended period of time. Corrective actions included meggering the motor windings and associated power cables (insulation resistance checked to ground) prior to re-energization. Low resistance to ground was measured and subsequent checks isolated the failure in the power cables to the circulating water pump motor. Had the cable been energized at the time, it would have failed.

NRC Request 2: Describe inspection, testing and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators (EDGs), offsite power, essential service water (ESW), service water, component cooling water and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule).

NMC Response:

NMC recognized the need to establish plans which would detect, inspect and monitor power cables in underground or submerged applications in 2003. Accordingly, there were two PBNP Excellence Plans developed at that time as follows:

> EQ-15-012, Manhole and Cable Vault Flooding
> EQ-15-016, Determine Condition of Underground Cables Which Have Been Submerged

The objective of EQ-15-012 was to develop and implement a solution to keep cables contained in Maintenance Rule scope manholes from becoming submerged. In support of this objective, a modification was installed to dewater the manholes containing the safety-related service water pump motor cables. Call-ups are in place to routinely inspect the manholes to minimize the amount of time cables are submerged.

The objective of EQ-15-016 was to identify underground medium voltage cables that may have degraded by being frequently submerged in water, to define a method of assessing these cables and to establish periodic cable assessment call-ups. The plan has been implemented by the establishment of routine maintenance procedures or periodic call-ups to conduct testing.

The following cables were identified as being within the scope of GL 2007-01 and 10 CFR 50.68 (the Maintenance Rule):

- Emergency Diesel Generators (EDGs) and Associated Power Cables: EDG stator and rotor windings, including associated power cables, for the four EDGs are megger tested every two years during performance of routine maintenance.

- Offsite Power Cables: 13.8 kVAC and 4.16 kVAC offsite power cables (one train for each unit) that run in underground duct banks/manholes are tested every two or three years (depending upon vendor recommendations) using energized partial discharge condition assessments (EPDCA).

- Service Water (SW) Motor Cables: 480 VAC power cables that run in cable trays and underground duct banks/manholes to the SW pump motors (6) are tested every three years during motor condition evaluation (MCE) testing.

- Circulating Water (CW) Pump Motor Cables: 4.16 kVAC power cables that run in cable trays and underground duct banks/manholes to the CW pump motors (two per unit) are tested every three years when the motors are MCE tested.

- "B" Train Safety Injection (SI) Pump Motor Cables: 4.16 kVAC power cables that run in cable trays and underground duct banks/cable vaults to the SI pump motors (two per unit) are tested every three years when the motors are MCE tested. (Only "B" train motor (one per unit) cables run in underground duct banks.)

- "B" Train Safety-Related 4.16 kVAC/480 VAC Transformer Cables: 4.16 kVAC power cables that run in underground duct banks/cable vaults to the transformers (one per unit) are tested every three years using EPDCA. (Only "B" train transformer cables run in underground duct banks.)

- Gas Turbine Generator Cables Between Circuit Breaker H52-10 in the 13.8 kVAC Building and the H52-G05 Circuit Breaker in the Gas Turbine Building: These 13.8 kVAC cables are normally energized and run in underground duct banks between buildings. This cable was identified as being within the scope of GL 2007-01 during preparation of this response. A testing activity has been initiated to monitor the condition of these cables every three years; however, no testing has been conducted to date.

The following testing and assessment methods are used for power cables at PBNP:

- Basic Insulation Resistance to Ground (Megger) Testing: An insulation resistance measuring device is electrically connected between the conductor of the cable being tested and an electrical ground connection. A voltage is then applied to the connections and the measuring device indicates the value of insulation resistance.

- Motor Condition Evaluation (MCE) Testing: MCE testing involves computer program-driven electrical parameter testing of motors and associated cables. Output data from MCE testing includes: step megger, polarization index (PI), phase-to-phase resistance, phase-to-phase inductance, and capacitance to ground.

- Energized Partial Discharge Condition Assessment (EPDCA): Power cables are tested for partial discharge emission while in a normally energized state. This method is only used for 4.16 kVAC and 13.8 kVAC power cables.