January 19, 2005

LICENSEE: Nuclear Management Company, LLC

FACILITY: Point Beach Nuclear Plant, Units 1 and 2

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE HELD ON JANUARY 10, 2005, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND NUCLEAR MANAGEMENT COMPANY, LLC, CONCERNING REQUESTS FOR ADDITIONAL INFORMATION PERTAINING TO THE POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION

The U.S. Nuclear Regulatory Commission staff (the staff) and representatives of Nuclear Management Company, LLC (NMC) held a telephone conference on January 10, 2005, to discuss and clarify the staff's requests for additional information (RAIs) concerning the Point Beach Nuclear Plant, Units 1 and 2, license renewal application. The conference call was useful in clarifying the intent of the staff's RAIs.

Enclosure 1 provides a listing of the meeting participants. Enclosure 2 contains a listing of the RAIs discussed with the applicant, including a brief description on the status of the items. Enclosure 3 contains draft responses provided by the applicant.

The applicant had an opportunity to comment on this summary.

/RA/
Verónica M. Rodríguez, Project Manager
License Renewal Section A
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-266 and 50-301

Enclosures: As stated

cc w/encls: See next page

January 19, 2005

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Enclosure 1 provides a listing of the meeting participants. Enclosure 2 contains a listing of the RAIs discussed with the applicant, including a brief description on the status of the items. Enclosure 3 contains draft responses provided by the applicant.

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Docket Nos. 50-266 and 50-301

Enclosures: As stated

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TO DISCUSS THE POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION

JANUARY 10, 2005

Participants	Affiliations
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M. Morgan	Nuclear Regulatory Commission
G. Suber	Nuclear Regulatory Commission
V. Rodriguez	Nuclear Regulatory Commission

Enclosure 1

DRAFT REQUESTS FOR ADDITIONAL INFORMATION (RAI)
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION

January 10, 2005

The U.S. Nuclear Regulatory Commission staff (the staff) and representatives of Nuclear Management Company, LLC (NMC) held a telephone conference call on January 10, 2005, to discuss and clarify the staff's requests for additional information (RAIs) concerning the Point Beach Nuclear Plant, Units 1 and 2, license renewal application (LRA). The following RAIs were discussed during the telephone conference call.

Section 2.5 - Scoping/Screening Electrical & Instrumentation and Controls

RAI-2.5.1

In section 2.5 the screening results listed Panels and junction boxes as a system within the scope of license renewal. In addition, the Panel and junction boxes are described under commodity group as a commodity that includes control boards, electrical panels, switchgear, cabinets, junction boxes, and other electrical enclosures. However, in table 2.5-1 the Panel and junction boxes is not listed as a component subject to an AMR. Are there any electrical passive components such as connections, wiring and hardware that could degrade because of aging mechanisms due to moisture and corrosion within the cabinets, junction boxes and other electrical enclosures? Discuss and provide justification why the passive components in panels and junction boxes are not subject to an AMR.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

Section 3.6 - Aging Management of Electrical and Instrumentation and Controls

RAI-3.6.2.1.1

According to Table 3.6.2-1 of the LRA, "Electrical Components - Electrical Commodity Groups - Summary of Aging Management Evaluation" Aging Management Programs (AMPs) are not required for the following component types:

- High-voltage insulators (Offsite Power System)
- Phase bus (480 VAC, 4160 VAC, and 13.8 KVAC Power Systems)
- Transmission conductors (Offsite Power Systems)
- Electrical connections not subject to 10 CFR 50.49 EQ requirements that are exposed to borated water leakage (Some Electrical and I&C systems), Environment - Containment (External), Indoor - No Air-conditioning

The reason given for not including in the AMPs per note J of the Table 3.6.2-1 is that neither the component nor the material and environment combination is evaluated in NUREG-1801.

A component type not presently listed in NUREG-1801 (GALL Report) is not a sufficient reason to exclude it from an Aging Management Program. Please explain why an Aging Management Program for the above components is not required or specifically needed as discussed in the following subsections:

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RAI-3.6.2.1.2

High-voltage insulators (Offsite Power System): Various airborne materials such as dust, salt, and industrial effluents can contaminate insulator surfaces. Airborne particles can buildup on the insulators and cause flashover or otherwise adversely impact the intended function. Therefore, please explain why an Aging Management Program for High-voltage insulators is not needed.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RAI-3.6.2.1.3

Phase bus (480 VAC, 4160 VAC, and 13.8 KVAC Power Systems): Information Notices 89-64, 98-36, and 2000-14 provide examples that underscore the safety significance of bus ducts and the potential problems that can arise from age-related bus component failures. Please explain why the aging management program (AMP) for bus ducts is not necessary. If needed, the AMP must address the following aging effects: oxidation, loosening of bolted connections due to thermal cycling, corrosion due to moisture, embrittlement, cracking, melting, discoloration, swelling or loss of dielectric strength of bus duct insulating materials (if applicable) leading to reduced insulation resistance and dielectric strength. The AMP should check bolted connections for proper torque. A periodic visual inspection of the bus duct is needed to inspect for signs of insulation cracking, corrosion, debris, excessive dust buildup, evidence of moisture and water intrusion, or discoloration of insulation which may indicate overheating. The internal bus supports should also be inspected for structural integrity and signs of cracks. If visual inspection of the whole bus assembly can not be performed, appropriate electrical tests should be conducted on a periodic basis to assess its condition for aging degradation.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RAI-3.6.2.1.4

Transmission conductors (Offsite Power Systems): Section 2.5.1, under the sub-heading "Transmission Conductors", states that the transmission conductor connections to active disconnect switches, power circuit breakers and transformers are inspected using thermography and maintained along with and as part of disconnect switch, power circuit breaker or transformer and, therefore, meet the definition of an active component as discussed in the Statement Of Considerations (SOC) that accompanied the License Renewal Rule. The reason provided in Table 3.6.2-1 (note J) for not including transmission conductors in an AMP is

different from the explanation provided in Section 2.5.1 of LRA. Provide an explanation for the discrepancy between Table 3.6.2-1 and Section 2.5.1 for Transmission conductors.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RAI-3.6.2.1.5

It is possible that some in-scope electrical components located indoor but outside containment may also be subjected to borated water leakage causing degradation of the components. Provide justification why in Table 3.6.2-1, Boric Acid Corrosion Program is not required for components located indoors but outside of containment.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RAI-3.6.2.1.6

In Table 3.6.2-1, it is indicated that "Switchyard buses and connections (Offsite Power System)" will be covered under Cable Condition Monitoring Program. However, Cable Condition Monitoring Program in Section B2.1.8 of Appendix B does not include Switchyard buses and connections. Section 2.5.1, under the sub-heading "Switchyard Bus", states that the review of switchyard bus includes the switchyard bus and the hardware used to secure the bus to a high-voltage insulator. This includes corona rings and other similar fixtures that are standard design features of the switchyard bus. It further states that the bus connection to an active disconnect switch is inspected using thermography and maintained along with and as part of disconnect switch and, therefore, meets the definition of an active component as discussed in the SOC that accompanied the License Renewal Rule. Provide explanation for the discrepancy between Table 3.6.2-1 and Section 2.5.1 for the Switchyard buses and connections.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RAI-3.6.2.1.7

Cable Condition Monitoring Program, explained in Section B2.1.8 of Appendix B, indicates an exception to NUREG-1801 AMP regarding the scope of inaccessible Non-EQ Medium-Voltage cables. The Cable Condition Monitoring Program requires periodic testing of a representative sample of inaccessible medium-voltage cables not designed for submergence, subject to prolonged exposure to significant moisture and significant voltage, while the NUREG-1801 program implies all such cables are to be tested. Identify basis as to how the representative sample will be selected.

The number of inaccessible medium-voltage cables not designed for submergence subject to prolonged exposure to significant moisture and significant voltage is generally very low, and the testing is needed only once in 10 years. Therefore, provide an explanation why testing of all in-scope, inaccessible medium-voltage cables for detecting any deterioration of the insulation

system due to prolonged exposure to moisture and voltage fluctuations is not required under the subject program.

Discussion: The applicant clarified their draft response. The applicant will provide their formal response in writing.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2
LICENSE RENEWAL APPLICATION

The following information is provided in response to the Nuclear Regulatory Commission (NRC) staff's request for additional information (RAI) regarding License Renewal Application.

The NRC staff's questions are restated below, with Nuclear Management Company (NMC) response following.

Section 2.5 - Scoping/Screening Electrical & Instrumentation and Controls

NRC Question RAI-2.5.1

In section 2.5 the screening results listed panels and junction boxes as a system within the scope of license renewal. In addition, the panel and junction boxes are described under commodity group as a commodity that includes control boards, electrical panels, switchgear, cabinets, junction boxes, and other electrical enclosures. However, in Table 2.5-1 the panel and junction boxes is not listed as a component subject to an AMR. Are there any electrical passive components such as connections, wiring and hardware that could degrade because of aging mechanisms due to moisture and corrosion within the cabinets, junction boxes and other electrical enclosures? Discuss and provide justification why the passive components in panels and junction boxes are not subject to an AMR.

NMC Response:

The Point Beach Nuclear Plant (PBNP) License Renewal Application (LRA), Section 2.5.1 (page 2-244) discusses “Panels and Junction Boxes.” From a structural perspective the panel and junction boxes are addressed and age managed in the Component Supports Commodity Group (CSUP), LRA Sections 2.4.10, 3.5.2.1.10, and Table 3.5.2-10. The material and environment for these component types is encompassed by carbon steel in an indoor environment. The aging effects are managed by the Boric Acid Corrosion Program and the Structures Monitoring Program as presented in Table 3.5.2-10 on page 3-466.

Panels and junction boxes were evaluated regarding whether they contain any active components or have only passive components within them. If they contain any active components, then the contents are exempt from an AMR per NEI 95-10, Appendix B, items 83 and 103. If they contain only passive components, such as cable connections (e.g., connectors or splices) or terminal strips, these components are subject to an AMR within the scope of those specific commodities. PBNP does not have any junction boxes that only contain fuse holders, which are considered a passive component subject to an AMR. If a panel or junction box is not sealed, typically a weep hole is provided to drain moisture, including boric acid, to minimize or eliminate any moisture or boric acid related operational or aging effects.

Section 3.6 - Aging Management of Electrical and Instrumentation and Controls

NRC Question RAI-3.6.2.1.1:

According to Table 3.6.2-1 of the LRA, "Electrical Components - Electrical Commodity Groups - Summary of Aging Management Evaluation" Aging Management Programs (AMPs) are not required for the following component types:

- High-voltage insulators (Offsite Power System)
- Phase bus (480 VAC, 4160 VAC, and 13.8 KVAC Power Systems)
- Transmission conductors (Offsite Power Systems)
- Electrical connections not subject to 10 CFR 50.49 EQ requirements that are exposed to borated water leakage (Some Electrical and I&C systems), Environment - Containment (External), Indoor - No Air-conditioning

The reason given for not including in the AMPs per note J of the Table 3.6.2-1 is that neither the component nor the material and environment combination is evaluated in NUREG-1801.

A component type not presently listed in NUREG-1801 (GALL Report) is not a sufficient reason to exclude it from an Aging Management Program. Please explain why an Aging Management Program for the above components is not required or specifically needed as discussed in the following subsections:

NMC Response:

GENERAL - Note J states, "Neither the component nor the material and environment combination is evaluated in NUREG-1801." That is true for the components and the material and environment combinations for Phase Bus, Switchyard Buses and Connections, and Transmission Conductors. Note J is simply a statement of fact that no GALL program exists for these components and does not imply a reason for excluding a particular material and environment combination from an aging management review (AMR). Individual evaluations of the components and material – environment combinations were performed during the AMR process. These are summarized in the text and reach the conclusions that no aging effects requiring management (AERM) were identified, as summarized in Table 3.6.2-1.

Note J could be omitted if that adds clarity to these entries.

NRC Question RAI-3.6.2.1.2

High-voltage insulators (Offsite Power System): Various airborne materials such as dust, salt, and industrial effluents can contaminate insulator surfaces. Airborne particles can buildup on the insulators and cause flashover or otherwise adversely impact the intended function. Therefore, please explain why an Aging Management Program for High-voltage insulators is not needed.

NMC Response:

Various airborne materials such as dust, winter road-salt, and industrial effluents can contaminate insulator surfaces. Due to the location of PBNP in a rural environment with no major industry or roads in close proximity, minimal contamination from industrial effluents is possible and no traffic runs near the switchyard to make winter road-salt airborne. The buildup of other surface contaminants is gradual and in most cases washed away by rain. The glazed insulator surface aids this contamination removal. Operating experience of over thirty years at PBNP has shown that this is true. Therefore, surface contamination of high-voltage insulators is not an AERM at PBNP.

NRC Question RAI-3.6.2.1.3

Phase bus (480 VAC, 4160 VAC, and 13.8 KVAC Power Systems): Information Notices 89-64, 98-36, and 2000-14 provide examples that underscore the safety significance of bus ducts and the potential problems that can arise from age-related bus component failures. Please explain why the aging management program (AMP) for bus ducts is not necessary. If needed, the AMP must address the following aging effects: oxidation, loosening of bolted connections due to thermal cycling, corrosion due to moisture, embrittlement, cracking, melting, discoloration, swelling or loss of dielectric strength of bus duct insulating materials (if applicable) leading to reduced insulation resistance and dielectric strength. The AMP should check bolted connections for proper torque. A periodic visual inspection of the bus duct is needed to inspect for signs of insulation cracking, corrosion, debris, excessive dust buildup, evidence of moisture and water intrusion, or discoloration of insulation, which may indicate overheating. The internal bus supports should also be inspected for structural integrity and signs of cracks. If visual inspection of the whole bus assembly cannot be performed, appropriate electrical tests should be conducted on a periodic basis to assess its condition for aging degradation.

NMC Response:

The phase bus in-scope for license renewal at PBNP is fully enclosed and installed in the control building, turbine building, 13.8K VAC switchgear building, gas turbine building, and outdoors (weatherproof enclosures). Where enclosure vents are part of the design, filters are provided to ensure cleanliness. No phase bus is installed in the containment, facade, or the PAB. Thus, no phase bus is installed in an area where it is exposed to debris or dust, radiation, or high temperatures. The environments for phase bus in the control building and 13.8K VAC switchgear buildings are indoors, with air conditioning. Phase bus between non-vital switchgear in the turbine building is routed beneath the ceiling of the control building. Thus exposure to moisture is eliminated in these locations. Phase bus located outdoors is weatherproof designed for those locations, integral to the switchgear connections to the high-voltage and low-voltage station auxiliary transformers for each unit, and inspected and maintained as part of those active components, which includes periodic inspections and cleaning.

Steel hardware (bolts, washers, nuts and clamp screws) was factory coated (plated or galvanized) to inhibit corrosion and is used only in the bus duct enclosure assembly. Stainless steel hardware used in bus electrical connections (copper bus bar and fittings) has no age-related degradation due to moisture in either indoor or outdoor environments. Bolting is typically done using Belleville or lock washers to maintain contact pressure. After more than 33 years in these service environments, minimal or no signs of corrosion and loss of material have

been observed and no functional loss has been observed. Therefore, loss of material for steel hardware, oxidation, and loosening of connecting hardware are not applicable aging effects that would lead to a loss of intended function for the phase bus for the period of extended operation.

Phase bus is supported by static structural components such as concrete foundations, building steel, and switchgear cabinets. Structural support and enclosures are considered part of the Component Support Commodity Group for aging management.

Phase bus is connected to static equipment that does not normally vibrate such as switchgear, transformers and disconnect switches. Vibration is not an applicable stressor for these connections to non-moving and non-vibrating equipment and supports and aging effects due to vibration are not applicable. The one section of phase bus connected to a potential source of vibration connects to the non-vital gas turbine generator through flexible conductors. These flexible conductors prevent generator vibrations from propagating into the rigid phase bus. Internal to the enclosures the bus is supported by porcelain insulators, which have no aging effects in their controlled environments. Flexible connectors are used throughout the plant in connections between phase bus and different sections of switchgear. In addition this equipment is only run for testing and as a (typically) summer peaking unit. Therefore the associated bus will have far less than 40 years of actual operation at the end of the period of an extended license. Therefore, vibration is not an applicable stressor even for phase bus that is connected to equipment that may move, and aging effects due to vibration are not applicable.

All of the bus and flexible connections are copper, silver-plated and/or coated with anti-oxidant grease. Copper bus, solid and flexible connectors and ground straps are highly conductive and make a good contact surface. To prevent the formation of oxide on connection surfaces, the connections were factory silver plated, cleaned to remove any existing oxide, and covered with grease to prevent air from contacting the surface before assembly. The grease excludes air from the connection after assembly, precluding oxidation of the surface, thereby maintaining good conductivity between the bus connecting surfaces. The grease is a consumable that is replaced during each routine maintenance of the bus.

The NRC referenced Information Notices were re-examined during the RAI phase of the NRC review of the PBNP LRA based on questions asked by NRC reviewers regarding PBNP not proposing a bus bar aging management program. IN 89-64 was previously examined and included in the Operating Experience (OE) section of the electrical AMR. Combined with the bus bar environments at PBNP, no aging effects from this IN were applicable. IN 98-36 was examined and excluded from the AMR since it addresses faults caused by inadequate maintenance activities, including an event at PBNP. IN 2000-14 was examined and excluded from the AMR since it addresses a fault caused by overloading and inadequate design on an aluminum bus with some copper materials. Proper assembly and using all copper bus mainly solved problems for this event. An all copper bus that was assembled to original vendor specifications and installed in a dry environment would most appropriately match the PBNP bus bar configurations and would not require an AMP.

Therefore, there are no applicable aging effects for the copper bus, solid and flexible connectors, insulators, connecting hardware, and ground straps when exposed to their service conditions for the extended period of operation.

NRC Question RAI-3.6.2.1.4

Transmission conductors (Offsite Power Systems): Section 2.5.1, under the sub-heading "Transmission Conductors", states that the transmission conductor connections to active disconnect switches, power circuit breakers and transformers are inspected using thermography and maintained along with and as part of disconnect switch, power circuit breaker or transformer and, therefore, meet the definition of an active component as discussed in the Statement Of Considerations (SOC) that accompanied the License Renewal Rule. The reason provided in Table 3.6.2-1 (note J) for not including transmission conductors in an AMP is different from the explanation provided in Section 2.5.1 of LRA. Provide an explanation for the discrepancy between Table 3.6.2-1 and Section 2.5.1 for Transmission conductors.

NMC Response:

Note J states, "Neither the component nor the material and environment combination is evaluated in NUREG-1801." The note is a statement of fact that there is no GALL program for this component and was not entered as a reason for any determination of needing or not needing an AMP. The total length of transmission conductor in-scope for license renewal consists of short sections of a few feet in length that connect each phase of the high-voltage station auxiliary transformers to the circuit switchers. Therefore, the evaluation provided in the text and conclusions reached that no AERM was identified for transmission conductors after a thorough AMR was performed, as summarized in Table 3.6.2-1 is valid. Note J could be omitted if that adds clarity to this entry.

NRC Question RAI-3.6.2.1.5

It is possible that some in-scope electrical components located indoor but outside containment may also be subjected to borated water leakage causing degradation of the components. Provide justification why in Table 3.6.2-1, Boric Acid Corrosion Program is not required for components located indoors but outside of containment.

NMC Response:

Piping systems containing borated water are located in three physical areas of the plant: the Unit 1 containment, the Unit 2 containment, and the Primary Auxiliary Building. The environment of Borated Water Leaks (External) in Table 3.6.2-1 applies to any location in all three areas where in-scope electrical and Instrumentation and Controls (I&C) cables and connections are located and may be exposed to borated water leakage, both in and out of containment. Therefore, Table 3.6.2-1 denotes that the Boric Acid Corrosion Program applies to the in-scope electrical components in all of these locations.

The connections in these physical locations are identified in Table 3.6.2-1 as also having normal environments away from sources of borated water, Containment (External) and Indoor - No Air-Conditioning (External) in the Primary Auxiliary Building, where no AERM is expected. These materials and environments were considered in our AMR, and for the locations away from boric acid leaks no AERMs were identified. NUREG-1801 does not have a specific program for these components, except as part of XI.E1; therefore, Note J was referenced. Both the non-boric acid environments and Note J could be omitted if that eliminates the confusion in this entry.

NRC Question RAI-3.6.2.1.6

In Table 3.6.2-1, it is indicated that "Switchyard buses and connections (Offsite Power System)" will be covered under Cable Condition Monitoring Program. However, Cable Condition Monitoring Program in Section B2.1.8 of Appendix B does not include Switchyard buses and connections. Section 2.5.1, under the sub-heading "Switchyard Bus", states that the review of switchyard bus includes the switchyard bus and the hardware used to secure the bus to a high-voltage insulator. This includes corona rings and other similar fixtures that are standard design features of the switchyard bus. It further states that the bus connection to an active disconnect switch is inspected using thermography and maintained along with and as part of disconnect switch and, therefore, meets the definition of an active component as discussed in the SOC that accompanied the License Renewal Rule. Provide explanation for the discrepancy between Table 3.6.2-1 and Section 2.5.1 for the Switchyard buses and connections.

NMC Response:

The circuit switchers are the boundary components between in-scope and not-in-scope components in the switchyard. The Cable Condition Monitoring Program covers the aging management of the connecting control cabling for the switchgear, transformers, and circuit switchers located in the switchyard that are in-scope for license renewal. The only switchyard bus and fixtures in-scope are directly connected to the circuit switchers and are maintained as part of these active components. High-voltage insulators were separately evaluated as supports for these components. All switchyard bus, fixtures, supports, and other components beyond the circuit switchers are not-in-scope. The description of the types of inspection used are typical of normal plant component condition monitoring activities and do not constitute an AMP. No aging is expected for these components. Operating experience of over thirty years at PBNP has shown that this is true.

NRC Question RAI-3.6.2.1.7

Cable Condition Monitoring Program, explained in Section B2.1.8 of Appendix B, indicates an exception to NUREG-1801 AMP regarding the scope of inaccessible Non-EQ Medium-Voltage cables. The Cable Condition Monitoring Program requires periodic testing of a representative sample of inaccessible medium-voltage cables not designed for submergence, subject to prolonged exposure to significant moisture and significant voltage, while the NUREG-1801 program implies all such cables are to be tested. Identify basis as to how the representative sample will be selected.

The number of inaccessible medium-voltage cables not designed for submergence subject to prolonged exposure to significant moisture and significant voltage is generally very low, and the testing is needed only once in 10 years. Therefore, provide an explanation why testing of all in-scope, inaccessible medium-voltage cables for detecting any deterioration of the insulation system due to prolonged exposure to moisture and voltage fluctuations is not required under the subject program.

NMC Response:

PBNP has been proactive and already tested all in-scope inaccessible Non-Environmentally Qualified (EQ) Medium-Voltage cables. This testing was performed in 2002 and 2003 and no

significant deterioration of the cables was found to exist. On a ten-year testing interval, the next test will occur just after the end of the current license for Unit 1, but prior to the start of the period of the extended license for PBNP Unit 2. This will yield one additional test period versus if PBNP had waited until just prior to the end of the current licensed period for Unit 1 to perform the initial testing. PBNP intends to perform additional testing prior to the next scheduled ten-year test, as deemed prudent by our system engineering personnel, to ensure continued awareness of the condition of our aged medium-voltage cables.

Since the program has not yet been developed, selection of the sample of medium-voltage cables to be tested is yet to be determined, but will be based upon the criteria noted in B2.1.8 Cable Condition Monitoring Program, Parameters to be Monitored or Inspected, on page B87. The cable sample selection for testing will be “based on the severity of prolonged exposure to significant moisture and significant voltage, and the age of the cable.” For example, for cables of the same size, construction, voltage and ampere loading, and age run in parallel conduit in the same underground duct bank, the sample may consist of only those cables in the lowest conduits, since they are more likely to be exposed to water.