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

Response to Request for Additional Information
Regarding the Point Beach Nuclear Plant License Renewal Application
(TAC Nos. MC2099 and MC2100)

By letter dated February 25, 2004, Nuclear Management Company, LLC (NMC), submitted the Point Beach Nuclear Plant (PBNP) Units 1 and 2 License Renewal Application (LRA). On November 16, 2004, the Nuclear Regulatory Commission (NRC) requested additional information regarding 10 CFR 54.4(a)(2), non-safety affecting safety scoping clarifications (Section 2.1 of the LRA). The enclosure to this letter contains NMC's response to the staff's questions.

On December 1, 2004, the NRC staff verbally provided additional time for NMC to respond to this request for additional information in order for further clarifications to be provided. The clarifications allowed for the NRC staff and the PBNP License Renewal project staff to clearly understand the information needed.

Should you have any questions concerning this submittal, please contact Mr. James E. Knorr at (920) 755-6863.

Summary of Commitments

This letter makes the following new commitment:

> NMC will remove the "Exposure Duration" discussion from Section 2.1.2.1.2 of the PBNP LRA and will summarize the response to RAI 2.1.1 in the "Components Qualified/Designed for Environment" discussion as part of the LRA annual update.

A093

I declare under penalty of perjury that the forgoing is true and correct. Executed on January 31, 2005.

For
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
PSCW

ENCLOSURE

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 the Point Beach Nuclear Plant (PBNP) License Renewal Application (LRA).

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

NRC Question RAI-2.1.1 Short Term Exposure Duration Definition - 10 CFR 54(a)(2):

The PBNP LRA and page 13 of LR-TR-514 did not adequately define short term exposure duration for low and moderate energy piping failures covered under 10 CFR 54.4(a)(2) that could affect safety-related electrical equipment under the scope of 10 CFR 54.4(a)(1). Specifically, the staff found that some safety-related electrical equipment may exist in the turbine building or other parts of the plant and may be subject to harsh environments from low or moderate energy pipe breaks but are not environmentally qualified (EQ). Since this equipment may not be EQ, they could fail due to 10 CFR 54.4(a)(2) piping failures.

The staff requests additional information to adequately define short term exposure duration for low and moderate energy piping failures and how it relates to scoping and screening of 10 CFR 54.4(a)(2) piping that could cause these types of failures.

NMC Response:

Based on additional information from the NRC staff, NMC will remove the "Exposure Duration" discussion from Section 2.1.2.1.2 of the PBNP LRA and will summarize the following discussion in the "Components Qualified/Designed for Environment" section as part of the LRA annual update. This response provides the technical justification as to why the safety-related (SR) systems, structures, and components (SSCs) are capable of withstanding the effects of spray/leakage (i.e., designed or qualified for that environment).

Active SR electrical equipment is reviewed to determine if its enclosure is able to withstand a low or moderate energy leakage or spray without loss of function of the SR component. If the electrical component/enclosure could not be shown to reasonably assure that it could withstand this potential environment, then that component would be considered vulnerable. Vulnerable equipment would then be reviewed to identify any non-safety related (NSR) piping systems in that proximity whose failure could potentially affect the function of the SR component. NSR SSCs that are in proximity to these vulnerable SR electrical components and have the potential to affect their function are included in-scope and subject to aging management. Industry and plant specific operating experience reviews showed that failures of electrical equipment due to moisture intrusion do not often occur. When they do occur, it is typically event-driven (due to improper installation of enclosures/covers/gaskets). No failures (i.e., due to moisture intrusion) of components that NMC considers to be non-vulnerable were identified. This provides reasonable assurance that non-vulnerable electrical equipment identified for PBNP is designed to withstand the potential leakage or spray environment without loss of intended function.

Passive SR components (i.e., piping, fittings, valves, walls, floors, supports, etc.) are also designed for a potential leakage environment. SR components are constructed of stainless steel, copper alloys, concrete, cast iron or carbon/low-alloy steel. Liquids contained in NSR SSCs in and around SR areas are treated water, treated/borated water, raw water, or raw water drainage (which is either ground water, or a potential combination of leakage from any or all these sources). SR passive components are considered to be designed for the potential leakage environment based on the following:

- External surfaces of stainless steel and copper alloys are considered to be inherently resistant to corrosion. Leakage or spray from NSR SSCs would have to include aggressive chemical species (chlorides, fluorides, etc.) to have potential to cause accelerated aging effects. These aggressive chemical species are not present in liquids in SR areas at PBNP. Therefore, leakage or spray from NSR SSCs onto SR stainless steel or copper alloy components will not cause aging effects that will affect the intended function of these SR SSC. The only known industry operating experience has been leakage of salt water onto SR stainless steel piping that caused through-wall cracking in the stainless steel. PBNP is not in a salt water environment, and therefore this would not apply at PBNP. Therefore, there is reasonable assurance that SR stainless steel or copper alloy components are designed to withstand the potential leakage/spray environment without loss of intended function.

- Concrete is inherently rugged, and its intended function is not affected by spray or leakage from any potential sources. Therefore, concrete is designed for the potential leakage/spray environment.

- External surfaces of cast iron and carbon/low alloy steel are susceptible to corrosion. However, SR cast iron or carbon/low alloy steel SSCs do have aging management programs already in place to manage any potential aging effects on their external surfaces. This is performed primarily by the System Monitoring Program, which provides for a minimum inspection frequency of one fuel cycle. Leakage or spray from fluid sources other than borated water would not cause loss of intended function of the SR carbon/low alloy steel

SSC. Minor leakage or spray would create a corrosion rate on bare metal of only a few mils per year, and the external surface aging management program would identify this and take corrective action prior to any loss of intended function. Major leakage or spray (i.e., more than a gallon per minute) would be readily identified by plant personnel, either by sump trends, system parameters, or area walkdowns. Once identified, the leakage would be isolated and corrective actions taken. Loss of material during the short time of major leakage or spray will not be substantial enough to affect the intended function of these SR components. Plant-specific operating experience shows that when leakage has occurred, it has been readily identified (within a couple of weeks or less). Leak rates of less than one gallon per minute can be identified, and corrective actions are taken before there is any effect on surrounding equipment. The only age-related failures (other than flow accelerated corrosion) identified at PBNP have been pin-hole leaks in the Service Water or Fire Protection piping, which do not lead to substantial leakage or spray. Note that the Service Water supply piping is already managed by the Open Cycle Cooling Water Program and the Fire Protection piping is already managed by the Fire Protection Program. Therefore, there is reasonable assurance that SR carbon/low alloy steel components are designed to withstand the potential leakage/spray environment from non-borated systems without loss of intended function.

- A major concern, however, may be the potential for leakage of boric acid solution onto carbon/low alloy steel components where, if undetected, significant loss of material could occur over a short period of time. Reasonable assurance is provided that boric acid wastage will not occur to the level of loss of intended function of the SR component based on the following:

    - All SR carbon/low alloy steel (including cast iron) components are already included in the Boric Acid Corrosion Program. Recent industry experience (e.g., Davis Besse) has heightened awareness of this issue and resulted in enhancements to this program. The Boric Acid Corrosion Program is an aggressive program that identifies leakage of boric acid solution from any source and evaluates any potential affect on surrounding materials/components that may get leaked on. Information on boric acid leakage comes from a number of sources including deconning personnel, system engineer walkdowns, quarterly containment walkdowns, and work order documentation. This information is evaluated and trended within the Boric Acid Corrosion Program. Plant-specific operating experience has shown that while minor boric acid leakage has been identified (mostly at packing glands), the program is effective at readily identifying and controlling this leakage so that it does not affect other components, and preceding any loss of intended function of nearby passive components.

- Carbon/low alloy steel components are either painted or insulated (sometimes both), and as such, any boric acid leakage or spray would not be in direct contact with the carbon/low alloy steel surface. Painted surfaces have proven to hold up well, even in boric acid leakage environments, which in turn protects the underlying carbon/low alloy steel from the boric acid attack. Insulation will also prevent the boric acid leakage from directly contacting the carbon/low alloy steel components. Evidence of leakage (boric acid residue) on insulation would lead to removal of the insulation to evaluate the underlying metal surface.

- NSR systems containing boric acid solutions are all fabricated from stainless steel. The NSR portions of borated systems are typically below the temperature threshold for cracking and have had excellent operating experience with respect to loss of material. Leakage that has been identified is normally at packing glands or bolted connections. Leakage at these locations is seldom more than a few drops per minute. Through-wall leakage due to age-related degradation on these systems has not been identified at PBNP. The chemistry controls that are applied to the in-scope borated systems are the same chemistry controls that are used for the out-of-scope borated systems. Therefore, there is reasonable assurance that significant leakage or spray from NSR borated systems will not occur.

This information provides reasonable assurance that SR passive carbon/low alloy steel components are also designed to withstand the potential leakage or spray environment from borated systems without loss of intended function.

The above discussions provide reasonable assurance that SR SSCs are capable of withstanding low to moderate energy leakage or spray without loss of intended function. In cases where reasonable assurance could not be concluded, the NSR SSCs in proximity to SR SSCs are included in-scope and are subject to aging management.

NRC Question RAI-2.1.2 First Equivalent Anchor Definition - 10 CFR 54(a)(2):

The PBNP LRA Section 2.1.2.1.2, page 2-19 states under NSR SSCs Directly Connected to SR SSCs, "For NSR SSCs directly connected to SR SSCs (typically piping systems), the NSR piping and supports, up to and including the first equivalent anchor beyond the safety/non safety interface, are within the scope of license renewal per 10 CFR 54.4(a)(2). Although these piping segments are not uniquely identified on the LR boundary drawing, applicable aging effects on these piping segments are managed along with the adjoining SR piping."

The staff requests additional information to adequately describe and define what is meant by the first equivalent anchor and how it relates to the scoping and screening of 10 CFR 54.4(a)(2) NSR piping and supports.

NMC Response:

The concept of "first equivalent anchor" is associated with the Non-Safety Related attached to Safety-Related concern identified in draft Interim Staff Guidance ISG-09 regarding implementation of 10 CFR 54.4(a)(2). The staff has requested additional detail/clarification of the PBNP definition of first equivalent anchor.

PBNP LRA Section 2.1.2.1.2, p. 2-19 states, "For NSR SSCs directly connected to SR SSCs (typically piping systems), the NSR piping and supports, up to and including the first equivalent anchor beyond the safety/non-safety interface, are within the scope of license renewal per 10 CFR 54.4(a)(2). Although these piping segments are not uniquely identified on the LR boundary drawings, applicable aging effects on these piping segments are managed along with the adjoining SR piping."

The NSR pipe supports are addressed in a commodity "spaces" approach, wherein all supports in the areas of concern are included in-scope. The directly connected NSR piping will be age-managed using the same programs that manage the SR piping. This process conforms to the requirements for the NSR SSCs directly connected to SR SSCs per 10 CFR 54.4(a)(2) and draft Interim Staff Guidance ISG-09.

As background, first equivalent anchor refers to a piping stress analysis modeling practice wherein a piping system's analysis boundary cannot be properly defined by physical anchors, or when a large piping system needs to be broken down into smaller and more manageable piping subsystems. In these cases, an overlapping analysis technique is used whereby the main portion of the piping analysis that is being evaluated is extended beyond the boundaries of interest sufficiently far to ensure the effects of the overlapped portions of piping are adequately transmitted to the main piping of interest and piping beyond the overlap region is effectively isolated from the main piping.

Current piping stress analysis practice at PBNP with respect to the use of the overlapping technique and equivalent anchors is described in Design Installation Guideline DG-M09 "Design Requirements for Piping Stress Analysis." Section 5.2.9 of DG-M09 states, "...the use of overlapping techniques is not encouraged for PBNP analyses and should only be used where justified. An informal evaluation of the desirability of adding a structural anchor is recommended prior to initiating an overlap analysis." When the overlap technique is used, current guidance states, "...the boundaries of the overlapped portions shall include at least two supports acting in each orthogonal restraint direction. (With properly documented justification, the overlapped portion may be restrained with less than two separate restraints in each orthogonal direction)." The guideline goes on to state "...the treatment of the Seismic Category I non-seismic interface in a piping system is handled in a similar manner. The piping in the overlapped portion shall be restrained in such a way that it contains at least two supports acting in each orthogonal restraint direction. This is done to include the effects of non-seismic piping on Seismic Category I piping in cases where a physical anchor does not exist to separate the lines. In cases where a physical anchor does exist, the Category III piping up to the anchor shall be included in the Seismic Category I model." This guidance ensures that truncated piping beyond the overlap region (or anchor) is effectively isolated from the main piping while ensuring the integrity of the SR main piping stress and support analyses.

A majority of the PBNP pipe stress analyses of record were reanalyzed in the early 1990s in response to IE Bulletin 79-14 using the criteria discussed above. The remaining analyses were validated as part of this effort and therefore were not revised. These reanalyzed and validated analyses are part of PBNP's existing design basis and are the qualifying stress analyses of record.

In summary, PBNP has included all the attached NSR piping and supports up to and including the first equivalent anchor beyond the safety/non-safety interface into the scope of License Renewal. The NSR pipe supports will be managed in a commodity "spaces" approach and the attached NSR piping will be managed using the same programs that manage the SR piping. This meets the requirements for the NSR attached to safety-related requirements of 10 CFR 54.4(a)(2) and draft Interim Staff Guidance ISG-09.

NRC Question RAI-2.1.3 Flow Accelerated Corrosion affect on Piping Section Scoping - 10 CFR 54(a)(2):

The PBNP LRA Section 2.1.2.1.2, pages 2-20 & 21, under Piping Supports states, "All NSR supports for non-seismic or Seismic II/I piping systems with a potential for spatial interaction with safety related SSC, will be included within the scope of license renewal per 10 CFR 54.4(a)(2). These supports will be addressed in a commodity fashion, within the civil/structural area review. As long as the effects of aging on the supports for these piping systems are managed, falling of piping sections, except for flow accelerated corrosion (FAC) failures, is not considered credible, and the piping section itself would not be in-scope for 10 CFR 54.4(a)(2) due to physical impact hazard (although the leakage or spray may still apply)."

The staff requests additional information to adequately describe why the falling of piping sections is not considered credible, and why the piping section itself would not be in-scope for 10 CFR 54.4(a)(2) due to physical impact hazard. Please describe how the management of FAC relates to the scoping and screening of 10 CFR 54.4(a)(2) Seismic II/I piping systems that could cause these types of failures.

NMC Response:

NSR pipe segments, for the purposes of Criterion 2 scoping, have essentially three potential failure modes.

1) NSR low or moderate energy piping, regardless of seismic classification, could also fall on or otherwise physically impact SR SSCs. However, earthquake experience data has shown that pipe (even aged pipe) does not fall during earthquakes as long as its supports stay intact. If aged pipe does not fall during earthquakes as long as its supports stay intact (bounding condition), it is assumed that aged pipe will stay intact and not fall when the pipe is subject only to the aging process. Therefore, all NSR supports for piping systems with any potential spatial interaction with SR SSCs, will be included in-scope and age managed. The managing of the NSR supports will ensure that these supports remain intact, thereby also ensuring that the NSR pipe will not fall or otherwise impact SR SSCs. This then eliminates the need to include the low or moderate energy NSR piping section in-scope for potential physical impacts.

2) A NSR high energy piping segment could fail due to Flow Accelerated Corrosion (FAC), and such a failure could result in pipe whip or other physical impact on SR pipe or components in proximity to the failure. A failure is assumed to occur at any point along the high energy piping run. NSR high energy piping, in proximity to SR components, would be considered in-scope as long as, a FAC failure in that line and, impact on SR components is considered credible. (Note that the effect of spray, leakage, or harsh environment will still be considered for NSR high energy lines. See #3 below).

3) NSR piping (either high, moderate, or low energy) could fail and result in leakage or spray on nearby SR components. High energy piping has an additional potential of creating a harsh environment (high humidity and high temperatures) that some SR components may not be designed for. Sections of NSR piping that could have spray, leakage, or harsh environment effects on vulnerable SR equipment, are considered in-scope.