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U S Nuclear Regulatory Commission
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Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Supplement to License Amendment Request (LAR) For Extension Of Technical Specification (TS) 3.8.1, "AC Sources-Operating," Emergency Diesel Generator Completion Time (TAC Nos. MC9001 and MC9002)

By letter dated November 21, 2005, Nuclear Management Company (NMC) submitted an LAR to revise the Emergency Diesel Generator (EDG) Completion Time in TS 3.8.1 Condition B.4 from 7 days to 14 days. By letters dated June 16, 2006 and August 31, 2006, NMC provided supplemental information to this LAR. This letter supplements the LAR to provide additional information on the quality of the Prairie Island Nuclear Generating Plant (PINGP) probabilistic risk assessment (PRA) model which includes Unit 2 risk metrics. NMC submits this supplement in accordance with the provisions of 10 CFR 50.90.

Enclosure 1 provides the NRC request for additional information (RAI) and the NMC response.

The supplemental information provided in this letter does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the November 21, 2005 submittal as supplemented June 16, 2006 and August 31, 2006.

In accordance with 10 CFR 50.91, NMC is notifying the State of Minnesota of this LAR by transmitting a copy of this letter and enclosure to the designated State Official.

Summary of Commitments

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 **SEP 29 2006**



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Nuclear Management Company, LLC

Enclosures (1)

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota

Enclosure 1

NRC Question:

During a September 5, 2006 conference call, the NRC Staff requested additional basis for the quality of the Prairie Island Nuclear Generating Plant (PINGP) probabilistic risk assessment (PRA) model used for the Emergency Diesel Generator (EDG) Completion Time Extension license amendment request (LAR), since this model now includes Unit 2 risk metrics not previously reviewed during the Peer Review Certification.

Nuclear Management Company, LLC (NMC) response:

As part of the basis for its request for an extension of the Technical Specifications-required Completion Time for its EDGs at PINGP, NMC has provided supporting information based on its plant-specific PRA model. NRC Regulatory Guide (RG) 1.200 (Reference 1) provides guidance in determining the PRA quality required for such submittals. Section 3 covers technical adequacy of the PRA used for the submittal, and contains the guidance that pertains to the specific question asked by the NRC Staff. Therefore, NMC has evaluated the PINGP model quality against Section 3 of RG 1.200 guidance for the purposes of response to this NRC request for additional information (RAI).

Section 3.3 of RG 1.200 provides guidance in demonstrating the technical adequacy of a PRA used in a regulatory application (such as in Reference 2). Other topics within Section 3 (Identification of Parts of a PRA Used to Support the Application, and Scope of Risk Contributors Addressed by the PRA) are considered to have been addressed by the original submittal and follow-on RAI response submittals (References 2, 3, and 4).

Peer-Reviewed PRA Model

According to RG 1.200, Section 3.3, in order to demonstrate the technical adequacy of the parts of the PRA used by NMC to support the EDG Completion Time Extension application, NMC must provide assurance that the parts of the PRA used in the application have been performed in a technically correct manner, and that the assumptions and approximations used in developing the PRA are appropriate. To support this obligation, NMC provided (Reference 2) documentation of the results of the Westinghouse Owners group (WOG) Peer Review Certification of the PINGP PRA model, performed in September 2000. The most current PRA model at the time (Revision 1.1) was reviewed, which included only Unit 1 core damage frequency (CDF) and large early release frequency (LERF) model results. The Unit 2 CDF and LERF risk metrics had not yet been incorporated in the model and therefore were not included in the peer review process. However, the expansion of the model to include Unit 2 risk metrics has not invalidated the peer review findings, and the results of the peer

review process have been incorporated into the Unit 2-specific portions of the modeling that were not available at the time of the peer review. The expansion of the model is discussed below; however, the following considerations regarding the peer reviewed PRA model are also relevant to this conclusion:

1) The PRA model that was reviewed did include modeling of the equipment shared between the units. This includes the following plant systems:

- 4160 VAC Power
- Cooling Water (known as Service Water at other plants)
- Instrument Air
- Auxiliary Feewater (AFW) crossties
- Safeguards Chilled Water
- Ventilation supporting shared equipment

2) The NMC EDG Completion Time Extension LAR is for an extension to the Technical Specification's Completion Time for the EDGs for both units. The Unit 2 AC power model was a complete model at the time of the peer review and included in the PRA model that was reviewed. Therefore, PRA modeling of the following Unit 2 AC power equipment was included in the peer review that was performed in September, 2000:

- Unit 2 safeguards 4160 V buses,
- Emergency diesel generators
- Manual and automatic voltage restoration (Safeguards load sequencers)
- Support systems required for the Unit 2 safeguards AC power system and EDGs

The logic models added to the PRA model since the peer certification review have not included any significant changes to these core portions of the PRA model. The most significant changes to the PRA model have been those required to address peer certification review issues (described in Reference 2).

Expansion of Existing PRA Model to Include Unit 2 Risk Metrics

After the peer review was completed, the PINGP PRA model was expanded to include Unit 2 quantification of CDF and LERF risk metrics. NMC considers this to be a significant enhancement to its in-house risk analysis capability. This expansion allows PINGP to more accurately model the impact to Unit 2 risk due to physical and operational differences that exist between the units. These differences include different EDG set designs, safeguards AC bus and electrical system location (spatial) differences, cooling water pump power supply differences and steam generator replacement. In addition, availability of straightforward Unit 2 model risk metrics greatly improves configuration risk

assessments for Maintenance Rule (MR) evaluations (10 CFR 50.65(a)(4)), and other Unit 2 risk evaluations, since the operators and scheduling personnel are not required to translate Unit 1 results (while accounting for differences between the units) to perform those evaluations.

The Unit 2-specific portions of the PINGP PRA model are essentially a mirror-image of the corresponding Unit 1 model portions (which were peer reviewed), with plant-specific differences included as necessary to make sure that Unit 2 risk is accurately modeled. The only differences between the Unit 1 and Unit 2 symmetric system fault trees are the basic event names, descriptions (which reflect Unit 2 equipment), and support system linkages such as power supplies that are specific to Unit 2 equipment. Examples of Unit 2-specific fault tree modeling include the Safety Injection, Residual Heat Removal, Component Cooling, and Chemical and Volume Control systems, and secondary systems such as Main Feedwater, Condensate and Main Steam systems.

The methodology and assumptions used in the Unit 1 portion of the model, not driven by physical differences between the units, are applied in the same way in the Unit 2 portion of the model. In addition, the updates that have been performed to address peer review issues have been applied to modeling for both units.

Upon expansion to include Unit 2 CDF and LERF risk metric quantification, the model was subjected to a series of reviews intended to identify incorrect modeling assumptions and errors in modeling. Due to the symmetry of design and similar operation between the units, one of the best ways to identify model problems is to compare the quantified output from one unit to the other, and verify any unexpected results to be accurate. Results from the model for Unit 2 were consistent with the results for Unit 1 risk metrics (which were peer reviewed), including similar cutsets with similar frequencies, similar importance measure results, and so forth. In addition, clear quantification differences between the units appeared where they were expected (where dissimilarities between the units exist, as described above, and as described in detail in Reference 3, response to RAI 15). Some of the evaluations performed on the results for both units include:

- Cutset Review (CDF and LERF)
- Initiating Event Distribution (CDF and LERF)
- Dominant Accident Sequences
- Model Asymmetry Review
- Accident Class Definition and LERF Calculation
- Important Operator Actions
- Importance Measures (Component, train and system level)
- Important Equipment Failures and Unavailability
- Important Common Cause Failures

The quantification review was also documented in accordance with the PRA Calculation File System process (see below).

NMC and PINGP PRA Calculation File System Process

The inclusion of the Unit 2 CDF and LERF portions into the PINGP model was documented using the PRA Calculation File System process. This process consists of a preparer (who is responsible for performing the model revisions and providing documentation that supports the changes), and a reviewer (who is responsible for performing a verification of the revisions to ensure assumptions and input and output data are correct, and to ensure that documentation is accurate). The PRA Calculation File System process ensures the quality and completeness of the modeling changes and the documentation. The peer certification team reviewed the PRA Calculation File System process and (together with the other elements of the maintenance and update process) found it to be adequate for risk informed applications, contingent on closeout of recommendations related to the maintenance and update process (MU). As noted in Reference 1 Exhibit F, the Findings and Observations (F&O) related to the MU element have been resolved.

As described above, the PRA Calculation File System process was also used during the expansion of the model to include Unit 2 risk metrics. In addition, although not required for all PRA calculations, many portions of the expanded, dual-unit PRA model evaluation were reviewed and approved by the NMC Fleet Lead PRA engineer and PINGP PRA Supervisor.

Per RG 1.200, Section 3.3.1, applicants are required to demonstrate that the model used for a submittal is up to date in that it represents the current plant design and configuration and represents current operating practices to the extent required to support the submittal. This demonstration can be achieved through a PRA maintenance plan that includes a commitment to update the model periodically to reflect changes that impact the significant accident sequences. The NMC Fleet PRA program requires that the PRA model receive an update regularly, with a frequency approximately once every other operating cycle (for PINGP that is every three to four years). Model elements updated during a periodic update include data (may be limited to a subset of the most risk significant equipment), selected initiating events, and incorporation of model changes based on required review of procedures for changes to Human Error Probability (HEPs) and testing intervals, review of internal and external plant operating experience, review of changes to Technical Specifications, design bases or other calculations that may affect assumptions in the model, and an assessment of open industry and NRC issues that may affect the PRA and its use for applications.

RG 1.200, Section 3.3.2 requires that applicants identify the key assumptions and approximations relevant to their submittal that will be used to identify sensitivity studies as input to the decision making associated with the submittal. The peer certification review included a focus on the key model assumptions. In addition, in the original submittal and RAI responses (References 2, 3, and 4) NMC provided the results of a number of sensitivity studies that exercise the assumptions key to the Completion Time extension LAR, and demonstrated that the Completion Time extension, if granted, will not increase plant risk in any significant manner.

Additional Assurance of PRA Quality

At PINGP, the PRA program is controlled by the NMC fleet Program Engineering group, and is subject to internal and external assessment to ensure fleet program standards are met and program health is maintained. Since the WOG Peer Certification review, the PINGP PRA model has been reviewed twice as part of the self-assessment process. The MR program, which relies on the quality of the PRA model underlying the assessment of online maintenance risk, was reviewed by the site Nuclear Oversight group in 2003. In addition, an Engineering Self Assessment of the PRA by PRA staff from other NMC facilities was conducted in 2004. Both of these assessments included the completed 2-unit PRA model as input.

References

1. NRC Regulatory Guide 1.200, "An Approach For Determining The Technical Adequacy Of Probabilistic Risk Assessment Results For Risk-Informed Activities", February 2004.
2. Letter to the NRC from NMC titled, "License Amendment Request (LAR) for Extension of Technical Specification (TS) 3.8.1, 'AC Sources-Operating,' Emergency Diesel Generator Completion Time", dated November 21, 2006, Accession No. ML053260088.
3. Letter to NRC from NMC titled, "Supplement to License Amendment Request (LAR) for Extension of Technical Specification (TS) 3.8.1, 'AC Sources-Operating,' Emergency Diesel Generator Completion Time (TAC Nos. MC9001 and MC9002)", dated June 16, 2006, Accession No. ML062050567.
4. Letter to NRC from NMC titled, "Supplement to License Amendment Request (LAR) for Extension of Technical Specification (TS) 3.8.1, 'AC Sources-Operating,' Emergency Diesel Generator Completion Time (TAC Nos. MC9001 and MC9002)", dated August 31, 2006, Accession No. ML062430624.