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U S Nuclear Regulatory Commission
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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

**Understanding of Required Analyses in Support of
License Amendment Request Dated January 29, 1997
Amendment of Cooling Water System Emergency Intake Design Bases**

NSP and its consultants met with the NRC Staff on December 11, 1997 to discuss the finite element dynamic seismic analysis of the Prairie Island intake canal submitted to the NRC in Supplement 9 dated June 30, 1997. In that meeting and subsequent conference calls with the NRC Staff, an understanding was developed of the analyses required to resolve the intake canal seismic stability issue. This letter is submitted to document the results of those discussions.

The following three analyses were identified for resolution of the evaluation of Prairie Island's Intake Canal:

1. *NSP will perform an analysis to determine the minimum volume of water needed in the Intake Canal to provide time for operator action to manage cooling water system loads. The time frame will be based upon normal control room staffing, as used in previous validation tests.*
2. *NSP will revise the Intake Canal Liquefaction Analysis Report, previously submitted in Supplement 9 dated 6/30/97, to use the Idriss 1990 damping*

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curve in place of the Idriss 1970 damping curve. NSP proposes to make this report the design basis calculation for the intake canal structure. The results of this analysis will be the basis for classifying the intake canal as a Design Class 1 structure, as defined in the Prairie Island USAR, Section 12.2.1.*

3. *The NRC expressed concern with the variability in the blow count data and NSP's use of median values of soil data in its analysis. At the NRC request, NSP will perform an additional conservative bounding analysis of the canal slope utilizing the 16th percentile values of the SPT Corrected Blow Count, $(N_1)_{60}$ data, instead of the median values for the various stratigraphic layers. This analysis will also include the use of Idriss 1990 damping curve.*

For the post-earthquake slope stability analysis, assignment of residual shear strength for triggered elements ($FS_L < 1.1$, using methodology described in Section 11 of the June 24, 1997 analysis report) will be based on the Idriss curve or equation shown in Figure 48 of the June 24, 1997 analysis report using the 16th percentile $(N_1)_{60}$ blow count values.

A computed stability factor of safety (FS) < 1.0 for a critical circle or a wedge, using the above reduced strengths in the elements, would represent a post-earthquake slope failure and its effect on the available canal volume would be determined.

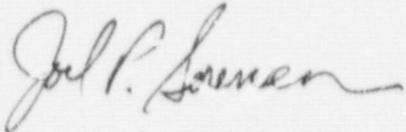
A minimum slope stability factor of safety (FS) ≥ 1.0 would indicate that there will be no slope failure. However, for this bounding analysis, the critical circle/wedge corresponding to the lowest factor of safety would then be chosen to define a soil volume. This soil volume then would be utilized to compute the remaining water volume in the canal and compared against the minimum required water volume in the canal.

Two evaluations will be made following completion of the analyses.

1. The first compares the minimum water volume required for operator action (Item 1) to the remaining water, following a Design Basis Earthquake (DBE), calculated in the Analysis (Item 2). This demonstrates the margin between what is calculated to occur and the limiting value. This is the Prairie Island design basis.
2. The second compares the minimum water volume required for operator action (Item 1) to the remaining water, following a DBE, in a bounding analysis (Item 3). This demonstrates the margin between what a worst case scenario could be and the limiting value.

In both analyses, the non-seismic intake greenhouse is assumed to fail, thereby blocking flow of all water from the river.

Items 1, 2, and 3 above, typed in italic, are new NRC commitments. If you have any questions related to this letter, please contact myself or Dale Vincent at 612-388-1121.



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