From: Mahesh Chawla
To: Dale Vincent
Date: 12/8/04 11:09AM
Subject: Prairie Island -LAR-MC3043/MC3044-Unresolved Items related to Methods of Evalulation of Cooling Wtr

With respect to the above amendment request, please arrange a telephone conference to discuss the following with the NRC staff. In my absence (12/10/04 - 1/10/05), please work with Ms Deirdre Spaulding to set up this call. She is available @ 301-415-2928.

Request For Additional Information

1. In your proposed methodology on page 6, you indicated that the cooling water (CL) system hydraulic analysis following a seismic event will be evaluated assuming the rupture of an un-analyzed non-seismic pipe without automatic isolation capability at the worst case location. It should be noted that the "worst case location" might not be the largest line. Flow from the rupture of a smaller line may be more limiting if the system pressure is sufficiently higher at the location of the smaller line break. Provide information regarding which piping systems you selected to ensure the structural and pressure integrity following a seismic event. Also, confirm whether and how these selected piping systems are considered to be the " worst case locations."

2. Your also indicated that the evaluation applies acceptance criteria from ASME Section III, Subsection ND, Service Level D when performing stress analyses of the CL system non-Class I piping with design basis seismic loads. The proposed methodology and acceptance criteria provide a conservative approach for demonstrating that the CL system will perform its safety function following a design basis seismic event. Provide a description of analysis including the methodology, LOCA loads for the faulted condition, load combinations, input response spectra to the seismic analysis, modeling and computer code used, assumptions and resulting stresses in comparison against the code allowable limits.

3. Though NRC is reviewing the criteria for analyzing cooling water system non-seismic piping, address how the piping will be protected from the failure of non-seismic SSCs.

4. The licensee proposes to credit automatic isolation valves for excluding cooling water system non-seismic piping from consideration. In addition to the information referred to in No. 1 above, clarify how these valves are seismic Category I, safety-related valves, which actuate to close during a seismic event, and how the single-failure criterion will be satisfied.

5. Address the impact of postulated seismic events on both units, demonstrating that the capability of shared systems is adequate.

6. Explain in sufficient detail specific operator actions being relied upon for postulated pipe break conditions for NRC assessment of human factors considerations.

7. Clarify how except for system functionality considerations, pipe failures for other review considerations will continue to be postulated in accordance with the plant licensing basis (e.g., pipe failures associated with flooding and its adverse effects).

8. Page 4, Exhibit A, indicates that, "During a seismic event, without an SI signal, all of the valves (both the motor operated Turbine Building isolation valves and the manual valves [for the non-safety-related lines from the safety-related supply headers] would remain open unless closed by operator action." What are the specific operator actions required to close all these valves? Are all of the proposed actions performed from the main control room or are any actions local? Please describe how these actions are performed and who performs them. Are there any environmental hazards (e.g., radiation, temperature, humidity, toxic gas, etc.) that could adversely affect the performance of the actions? If so, how have these hazards been taken into consideration in the licensee's analysis? Also, page 6, Exhibit A, states that the

"limiting case" to reduce flow demand on the CL pumps to within the manufacturer's recommended continuous operation flow rate requires closing a safety related motor operated valve from the control room. Please explain how this "limiting case" relates to the scenario described on page 4, which requires not only the motor operated valve to be closed manually but also non-safety-related valves.

9. What are the time requirements for all these activities (identification, isolation, flow reduction) related to the CL system? How have the time requirements been determined, e.g., were these times within the criteria set forth in ANSI/ANS 58.8, "Time Response Design Criteria for Safety-Related Operator Actions," 1994/2001; have demonstrations been performed with operating crews to determine that the actions (those from the control room and locally performed) can be completed within the required times (if demonstrations were performed, please describe how they were conducted, including number of crews used, whether participants were aware of the actions they needed to take or naive to the scenario, etc.)? How is the licensee certain that the actions are not only feasible (can be successfully achieved) but that the actions are also reliable (i.e., can be achieved by all personnel required to perform them)?

10. Are these actions proceduralized? The staff will need to review related procedures. For the equipment that is to be operated, is this equipment safety grade? Powered from safety grade power? Will this equipment (valves/pumps) have the necessary motive force and/or electrical power available?

11. What other activities will the operating crew be performing during an earthquake? Is crew staffing sufficient to perform all these activities AND address leak identification and isolation on the CL system?

12. What alarms/instrumentation will alert the crew of a CL leak? What alarms/instrumentation will be used to locate the CL leak? What alarms/instrumentation will be used to identify that the CL leak has been successfully isolated? Are all of these alarms/instruments safety grade/Class 1? Powered off safety grade power supplies? Are all the alarms located in the main control room or are there also local alarms? If there are local alarms, where are they located and how will plant personnel recognize the need to take action?

13. What training have operators received regarding earthquake response, and in particular, operating the CL system during an earthquake, including response to CL system pipe ruptures? Will training on earthquakes/CL pipe ruptures be a part of continuing training? How often will this training be given?

14. What are the credible errors that may occur under conditions where the manual actions are required, how will operators recover from the errors, and what are the times required to successfully recover from the errors?

15. What accident scenarios were analyzed, and which scenario was most limiting with regard to operator action times? An earthquake occurs and the plant is required to reach safe shutdown, but what else happens?

a. Does an SI occur? This will auto isolate key valves in the CL system.
b. Does Loss of Offsite Power occur? This will also cause a loss of instrument air, which increases required CL flow due to failed open control valves? And a loss of Main Feedwater and a SI on low SG levels?
c. Location of worst case line break? Is this limited to a line without auto SI closure? Maybe NOT having an SI is WORSE, since a more limiting pipe break can occur?
d. Single active failure? Perhaps the worst case is to assume an SI, but a single active failure fails to isolate the ruptured CL line?

16. In identifying the limiting scenario, the limiting concerns seem to be:

1. How high is CL flow, including flow out the break?
2. How much CL flow is needed to reach safe shutdown?
3. What is the available amount of time for operators to IDENTIFY and CORRECT any problems with CL? (i.e. to identify the leak, identify the leak location, isolate the leak, and ensure proper CL flow).

17. Are these limiting concerns used by the licensee in its analysis? If not, what are they?

CC: Cheng-Ih Wu; Deirdre Spaulding; James Bongarra; James Tatum; Ron Young

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