UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 7, 2009

Mr. Larry Meyer
Site Vice President
FPLE Point Beach
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2 - GSI-191/GL 2004-02 REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MC4705/4706)

Dear Mr. Meyer:

By letters dated February 29, 2008 and June 9, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML080630613 and ML081620337), FPL Energy (the licensee) submitted a supplemental response to Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," for the Point Beach Nuclear Plant.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittals. The process involved detailed review by a team of approximately 10 subject matter experts, with a focus on the review areas described in the NRC's "Content Guide for Generic Letter 2004-02 Supplemental Responses" (ADAMS Accession No. ML073110389). Based on these reviews, the staff has determined that additional information is needed in order to conclude there is reasonable assurance that GL 2004-02 has been satisfactorily addressed for the Point Beach Nuclear Plant. The enclosed document describes these requests for additional information (RAIs).

The NRC requests that the licensee respond to these RAIs within 90 days of the date of this letter. However, the NRC would like to receive only one response letter for all RAIs with exceptions stated below. If the licensee concludes that more than 90 days are required to respond to the RAIs, the licensee should request additional time, including a basis for why the extension is needed.

If the licensee concludes, based on its review of the RAIs, that additional corrective actions are needed for GL 2004-02, the licensee should request additional time to complete such corrective actions as needed. Criteria for such extension requests are contained in SECY-06-0078 (ADAMS Accession No. ML053620174), and examples of previous requests and approvals can be found on the NRC's sump performance website, located at: http://www.nrc.gov/reactors/operating/ops-experience/pwr-sump-performance.html.

Any extension request should also include results of contingency planning that will result in near term identification and implementation of any and all modifications needed to fully address GL 2004-02. The NRC strongly suggests that the licensee discuss such plans with the staff before formally transmitting an extension request.

The exceptions to the above response timeline are RAIs 4-12 and RAI 20 in the enclosure. Because the final head loss and vortexing evaluation has not yet been transmitted to the NRC, the head loss and vortexing-related topics in RAIs 4-12 should be addressed in a supplemental response that provides the evaluation results. The supplemental response for RAIs 4-12 should be submitted no later than the June 30, 2009.

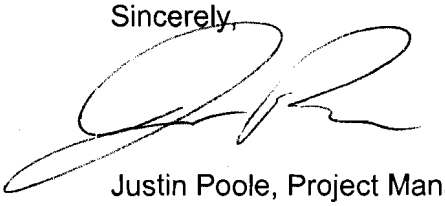
The NRC staff considers in-vessel downstream effects, discussed in RAI 20, to not be fully addressed at the Point Beach Nuclear Plant, as well as at other pressurized-water reactors. The licensee's submittal refers to draft WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid." At this time, the NRC staff has not issued a final safety evaluation (SE) for WCAP-16793.

The licensee may demonstrate that in-vessel downstream effects issues are resolved for the Point Beach Nuclear Plant, by showing that the licensee's plant conditions are bounded by the final WCAP-16793 and the corresponding final NRC staff SE, and by addressing the conditions and limitations in the final SE. The licensee may also resolve RAI 20 by demonstrating, without reference to WCAP-16793 or the NRC staff SE, that in-vessel downstream effects have been addressed at the Point Beach Nuclear Plant. The specific issues raised in RAI 20 should be addressed regardless of the approach the licensee chooses to take.

The licensee should report how it has addressed the in-vessel downstream effects issue and the associated RAI referenced above within 90 days of issuance of the final NRC staff SE on WCAP-16793. The NRC staff is currently developing a Regulatory Issue Summary to inform licensees of the staff's expectations and plans regarding resolution of this remaining aspect of Generic Safety Issue 191, "Assessment of Debris Accumulation on PWR Sump Performance."

If you have any questions, please contact me at (301) 415-1424.

Sincerely,



Justin Poole, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-266 and 50-301

Enclosure:
As stated

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REQUEST FOR ADDITIONAL INFORMATION (RAI)
REGARDING SUPPLEMENTAL Responses TO GENERIC LETTER (GL) 2004-02

1. Please provide the insulation material(s) for the reactor vessel. Please state whether the debris quantities generated by breaks at reactor vessel nozzles that reach the strainer are bounded by the debris that transports from other breaks that have already been evaluated. If the debris quantities from previously breaks are not bounding, please evaluate the effects of the reactor vessel nozzle break on strainer head loss.

2. Please provide the information concerning the debris characteristics analysis that was requested in the U.S. Nuclear Regulatory Commission (NRC) staff revised content guide.

3. Please provide the information concerning the debris transport analysis that was requested in the NRC staff revised content guide.

Because the licensee's final head loss and vortexing evaluation has not yet been transmitted to the NRC, the following head loss and vortexing-related topics (numbers 4 - 12 below) should be addressed in a supplemental response, no later than June 30, 2009.

4. Please provide the following head loss and vortexing testing-related information.

    a. Information requested by the NRC staff's revised content guide that was not previously submitted due to the testing being incomplete, or that changed during subsequent testing
    b. Flow rates in the flume
    c. Scaling factors
    d. Debris amounts added to the testing apparatus, and debris size distributions for added fibrous debris
    e. Debris preparation and introduction methods which ensure prototypical debris transport and bed formation

5. At the beginning of recirculation for a small-break loss-of-coolant accident (SBLOCA), the strainer stacks are submerged by about two inches. The supplemental response stated that buoyant debris would not be present following a loss-of-coolant accident (LOCA) (based on the first tests performed at Alden Research Laboratory (ARL)) and that, therefore, air ingestion through the debris on the strainer screens would not occur. However, NRC staff present at the ARL testing noted that the debris was added after being mixed together and then mixed with water. This test may have not been a prototypical test to determine whether buoyant debris can occur. The phenomenon of buoyant debris should be addressed.

6. The supplemental response did not consider the potential effects of water from the break or from spray drainage falling near the strainer. Especially during the period of relatively small submergence, and possibly at times for which there are other sump pool levels, the falling water could entrain air near the strainer resulting in the air being drawn through the strainer and into the emergency core cooling system pump suction header. This potential post-LOCA phenomenon should be considered and addressed.

7. The supplemental response stated in one place that observations for vortexing will be accomplished during the head loss testing for the future. In another area, the

supplemental response stated that the assessment of vortexing was based on empirical observations rather than a calculation (presumably during testing which had already been conducted). These two statements appear to be contradictory. The final vortexing assessment should provide the test conditions under which the observations occurred and discuss how these conditions are either prototypical or conservative with respect to expected plant conditions.

8. The clean strainer head loss (CSHL) value provided in the submittal was stated to be for hot sump conditions. A value for CSHL for the postulated minimum sump temperature should be provided.

9. The licensee assumed that all debris generated by a LOCA transports to the sump. However, no size distributions for the various debris types expected to arrive at the strainer was provided. Size distribution is an important factor in debris bed formation and is therefore required to perform and document a valid head loss test. Size distributions for debris expected to arrive at the strainer should be provided.

10. Based on recent testing, it was reported that a debris interceptor would be installed that will prevent 75 percent of the debris from reaching the strainer. The amount of debris passing the interceptor should have been, or should be, evaluated considering the potential water levels above the interceptor, debris sizes, debris types, etc. The debris used in testing should match the characteristics of the debris that is expected to pass the interceptors. Therefore, the validity of the 75 percent efficiency value for the debris interceptor should be addressed and also stated to be reflected in debris quantities used in strainer testing, if applicable.

11. The supplemental response did not provide an adequate response to the revised content guide question on the ability of the strainer to accommodate the maximum debris load. The supplemental response stated that debris beyond that collecting on the strainer would collect in the free volume in the lower level of the containment. The intent of the question is to ensure that the strainer either has a large enough area to prevent circumscribed bed formation, or that the formation of a circumscribed bed will not result in excessive head loss. Alternatively, a properly conducted test could show that a circumscribed bed will not result even from the maximum potential debris load. Please re-address this content guide question, given the above guidance.

12. The supplemental response indicated in several places that a thin bed would not likely form on the complex Performance Contracting Incorporated (PCI) strainer. Based on several tests of PCI strainers that have resulted in a relatively thin filtering bed, and the licensee's potentially challenging debris loads in terms of thin bed formation, the staff believes that the thin bed should be evaluated for the new Point Beach strainer configuration. Please justify the conclusion that such a bed would not form.

13. The submittal references 38 inches as the maximum allowable head loss. Based on recent test results described to the NRC in a phone call with the Point Beach licensee, it appears that this value may be too low. Please state the final maximum allowable head loss and reflect this value in net positive suction head calculations and structural evaluations.

14. Please list the quantity and debris characteristics of unqualified coating debris in containment.

15. The supplemental response indicated that the quantity of coatings debris from steel structures is represented by the surface area of a 10 diameter (D) "half sphere." This approach is not consistent with the NRC safety evaluation (SE) dated December 6, 2004, on Nuclear Energy Institute (NEI) 04-07 "Pressurize Water Reactor Sump Performance Methodology," which calls for all of the coatings within a 10D ZOI of a pipe break to fail. Please provide the surface area of the coated steel structures in the 10D zone of influence (ZOI). Is this surface area bounded by the surface area of a 10D half sphere?

16. The supplemental response indicated that the quantity of coatings debris from concrete structures is represented by the surface area of a 4D "sphere." This approach is not consistent with the NRC SE on NEI 04-07, which calls for the surface area of all coated concrete surfaces within a representative ZOI. Please provide the surface area of the coated concrete surfaces in a 4D ZOI around the limiting pipe break. Is this surface area bounded by the surface area of a 4D sphere?

17. Considering your responses to the foregoing two RAIs, please provide the total quantities of qualified coatings in the respective ZOIs for concrete and steel surfaces, as well as the total quantities of degraded qualified coatings and unqualified coatings in containment. Are the quantities from your initial GL 2004-02 response (ML052500302) still accurate?

18. Please describe the debris characteristics and transport percentage (size, shape, density, and thickness) of the qualified, degraded qualified and unqualified coating debris.

19. Please provide the information requested under item (m) in the Revised Content Guide for GL 2004-02 Supplemental Response dated November 2007.

20. The NRC staff considers in-vessel downstream effects to not be fully addressed at Point Beach Nuclear Plant (PBNP). The licensee's supplemental response refers to draft WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid." The NRC staff has not issued a final SE for WCAP-16793-NP. The licensee may demonstrate that in-vessel downstream effects issues are resolved for PBNP by showing that the licensee's plant conditions are bounded by the final WCAP-16793-NP and the corresponding final NRC staff SE, and by addressing the conditions and limitations in the final SE. The licensee may alternatively resolve this item by demonstrating, without reference to WCAP-16793-NP or the staff SE, that in-vessel downstream effects have been addressed at PBNP. In any event, the licensee should report how it has addressed the in-vessel downstream effects issue within 90 days of issuance of the final NRC staff SE on WCAP-16793-NP. The NRC staff is developing a Regulatory Issue Summary to inform the industry of the staff's expectations and plans regarding resolution of this remaining aspect of GSI-191.

21. The maximum aluminum concentration in the containment sump has been revised from a former calculation. The updated calculations show that less than 20 parts per million (ppm) will be the maximum aluminum concentration. Please provide the calculations used to determine final aluminum concentration, highlighting the differences in the revised calculations that show why a less than 20 ppm aluminum concentration is more

representative of the post-LOCA sump environment. Please identify any important assumptions (e.g., pH) that significantly affect the calculation.

22. Please provide a table that shows how the mass of precipitate formed varies as a function of sump pH and sump volume.

23. Please discuss why dissolution of concrete surfaces will not contribute significantly to the precipitate loading in the sump.

24. Aluminum coatings are present on the reactor vessel as well as other components inside the containment. The supplemental response states that these coatings are formulated to withstand high temperatures and would therefore not be expected to fail during a LOCA. Operating experience at several US plants indicates that high-temperature aluminum coatings can disbond under normal operating conditions. These coatings are unqualified coatings and as such are expected to fail in pigment sized particles (including coatings outside of the ZOI). The aluminum would be separated, at least partially, from the silicone resin. These fine particles could then be readily exposed to either containment spray or sump fluid and would be available to contribute to chemical effects. For any aluminum coatings that are not covered with insulation materials that would remain intact and hold the coatings in place, please provide justification for not including the aluminum mass in the chemical effects evaluation.

The NRC staff considers in-vessel downstream effects, discussed in RAI 20, to not be fully addressed at the Point Beach Nuclear Plant, as well as at other pressurized-water reactors. The licensee's submittal refers to draft WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid." At this time, the NRC staff has not issued a final safety evaluation (SE) for WCAP-16793.

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Sincerely, /RA/

Justin Poole, Project Manager
Plant Licensing Branch III-1
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