From: Poole, Justin
Sent: Monday, March 15, 2010 11:39 AM
To: 'Hale, Steve'; 'COSTEDIO, JAMES'
Subject: Draft - Request for Additional Information from Electrical Engineering RE: EPU

Steve

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated April 7, 2009 (Agencywide Documents Access and Management System Accession No. ML091250564), FPL Energy Point Beach, LLC, submitted a request to increase each unit's licensed core power level from 1540 megawatts thermal (MWt) to 1800 MWt reactor core power, and revise the technical specifications to support operation at this increased core thermal power level.

The Electrical Engineering Branch has reviewed the information provided, and determined that in order to complete its evaluation, additional information is required. We would like to discuss the questions, in draft form below, with you in a conference call.

This e-mail aims solely to prepare you and others for the proposed conference call. It does not convey a formal NRC staff position, and it does not formally request for additional information.

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"Additional detailed analysis will be performed to qualify the following components for EPU conditions or they will be replaced with qualified components prior to the implementation of the proposed EPU:

- EQCK-HONEYW-001: Four (4) Honeywell Microswitches; Containment Façade, -10' EL, [1(2) POS-00850A, 1(2) POS-00850B], RHR Pump Sump B Suction Position Switch

- EQCK-PANEL-001: One (1) Nutherm Panel; PAB, outside charging pump cubicle. [1 N-11], Charging Pump/PZR Heater Local Control Station"

Provide reasonable assurance that these components will be replaced with qualified components prior to implementation of the proposed of EPU or show that they are qualified for EPU conditions.

EEEB-3: On page 2.3.1-6 of Attachment 5 of the EPU application, the licensee stated the following:

"For the EPU LOCA temperature and pressure impact, the post-accident operating time has been evaluated and found acceptable."

Describe how the post-accident operating time has been evaluated and provide the acceptance criteria that were used to find this evaluation acceptable.

EEEB-4: On page 2.3.1-6 of Attachment 5 of the EPU application, the licensee stated the following:

"The submergence level inside containment increases only slightly due to increased temperature at EPU, but is essentially unchanged from the pre-EPU evaluation of 15'-2" (Elevation of Sump B is El.8') and no EQ equipment is affected by this slight change."

Table 2.3.1-1 of Attachment 5 of the EPU application shows the pre-EPU accident submergence elevation to be 14'-10" and the EPU level to be 15'2". Explain the apparent discrepancy.

EEEB-5: On page 2.3.1-6 of Attachment 5 of the EPU application, the licensee stated the following:

"Based on the resulting environmental conditions for HELB events at EPU, all equipment currently in the EQ program remains qualified."

Provide a summary of the evaluation that shows that all equipment currently in the EQ program remains qualified for environmental conditions for HELB events at EPU.

EEEB-6: On page 2.3.1-6 of Attachment 5 of the EPU application, the licensee stated the following:

"Review of these items indicates that they are the same model type as those presently in the EQ files, and as such, can be qualified to the reconstituted HELB

conditions and will be documented in the EQ program prior to EPU implementation."

Describe how these components have been maintained in accordance with your 10 CFR 50.49 program and demonstrate that the qualification of the similar components envelops the qualification requirements of these components.

2.3.2 Offsite Power System

EEEB-7: On page 2.3.2-3 of Attachment 5 of the EPU application, the licensee stated the following:

"Updates to the study will be evaluated if a revised grid study analysis is received. Subject to completion of required interim or final grid system upgrades being identified by PBNP and ATC, EPU evaluations have determined that after implementing the modifications and 345kV grid upgrades identified above, the offsite power system will continue to have sufficient capacity and capability to supply power to all safety loads and other preferred operating equipment."

Provide a summary of your review of the grid stability study that you sent to the NRC on November 13, 2009 (ADAMS Accession No. ML093200067). Describe the impact of the latest grid study on the original application and identify any modifications that are necessary as a result of the proposed EPU.

EEEB-8: On page 2.3.2-4 of Attachment 5 of the EPU application, the licensee stated the following:

"The 345kV circuit breakers F52-122 and F52-142, their associated 345kV disconnect switches (F89-112B and F89-142B) were evaluated and proved to be acceptable at EPU conditions."

Describe how these circuit breakers and associated disconnect switches were evaluated and determined to be acceptable at EPU conditions.

EEEB-9: On page 23 of the grid stability study that was provided by the licensee in letter dated November 13, 2009, the American Transmission Company (ATC) (the transmission operator for Point Beach Nuclear Plant) stated the following:

"The results of this study are subject to change. The results of the study are based on data provided by the Generator and other ATC system information that was available at the time the study was performed, and the injection study does not guarantee deliverability to the MIS energy market. If there are any significant changes in the generator and controls data, earlier queue Generator Interconnection Requests, related Transmission Service Requests, or ATC transmission system development plans, then the results of this study may also change significantly. Therefore, this request is subject to restudy. The Generator is responsible for communicating any significant generating facility data changes in a timely fashion to MIS0 and ATC prior to commercial operation.
Describe how changes that can impact the grid study are coordinated between Point Beach Nuclear Plant and the transmission operator.

Provide assurance that the proposed EPU will not adversely impact the grid stability and reliability at the Point Beach Nuclear Plant.

EEEB-10: On page 27 of the grid stability study that was provided by the licensee in letter dated November 13, 2009, the American Transmission Company (ATC) (the transmission operator for Point Beach Nuclear Plant) stated the following:

"The Point Beach nuclear units are presently undergoing design development to support the inclusion of generator breakers in their Iso-phase Bus connections. The generator breaker(s) will be positioned so as to enable a generating unit trip at the generator output voltage level/position without the need to de-energize the main transformers. Since the high voltage side breakers will remained closed, the power plant auxiliary buses are intended to be powered via the backfeed Main Transformers and the Iso-phase bus direct-connected Unit Auxiliary Transformers. This arrangement eliminates the presently needed high speed transfer of auxiliary busses to the grid connected Startup Transformer upon a generating unit trip, and will also serve to resolve present marginal bus voltage issues. For purposes of the grid studies, the generator breakers are considered to be in place and operable at the time of startup of the generating units at their increased levels of output."

Provide assurance that the new generator breakers will be in place and operable prior to implementation of the proposed of EPU.

EEEB-11: Explain how you plan to address each recommendation that was described in the grid study that was provided in letter dated November 13, 2009.

EEEB-12: Describe the impact of the delayed implementation of the proposed EPU has on the grid impact study that was provided in letter dated November 13, 2009.

EEEB-13: Describe the impact of increasing the maximum grid voltage to 360 kV has on the plant and at which per unit (pu) is this voltage assumed.

EEEB-14: On page 13 of the grid stability study that was provided by the licensee in letter dated November 13, 2009, the American Transmission Company (ATC) (the transmission operator for Point Beach Nuclear Plant) notes that a new high voltage (maximum permissible) limit of 360 kilo-Volts (kV) has been proposed by Point Beach Nuclear Plant and incorporated this new limit into this study.

However, Appendix A, "Power Flow Analysis Results," of the grid stability study used a maximum permissible grid voltage range of 348.5 kV to 362 kV. Explain the apparent discrepancy.

2.3.3 AC Onsite Power System

EEEB-15: Describe the impact of the proposed EPU on the loading requirements for the emergency diesel generators (EDGs). In your response, provide a comparison of the existing EDG loads and those expected during EPU conditions.

EEEB-16: On page 2.3.3-5 of Attachment 5 of the EPU application, the licensee stated the following:

"Therefore, the EPU voltage level requirements of the running motors are bounded by equipment design ratings and will be confirmed by the modification design process."

Provide assurance that the voltage level requirements of the running motors will continue to be bounded by equipment design ratings at EPU conditions.

EEEB-17: On page 2.3.3-6 of Attachment 5 of the EPU application, the licensee stated the following:

"The protective relay settings for the condensate pump and main feedwater pump motors will be revised to protect the replacement motors and provide coordination. The RCP motor overcurrent protection settings are impacted by cold-loop conditions and will be revised to prevent nuisance alarming during these conditions while providing adequate protection for the motors, electrical penetrations and cables. The necessary protective relay setting changes will be determined and implemented as part of the plant modification process."

Provide assurance that the above stated actions will be completed prior to implementation of the proposed EPU at Point Beach Nuclear Plant.

EEEB-18: On page 2.3.3-6 of Attachment 5 of the EPU application, the licensee stated the following:

"The safety-related system experiences improved voltage levels and lower short circuit currents under these modifications. The impact on the 480 V system will be confirmed for all additional EPU modifications by the modification process."

Provide assurance that the voltage level and short circuit current requirements will continue to be bounded by equipment design ratings at EPU conditions.

EEEB-19: On page 2.3.3-7 of Attachment 5 of the EPU application, the licensee stated the following:

"The load changes on the 480 V system are due to the IPB duct cooling system and new main transformers cooling systems which affects the non safety 480 V motor control center buses. The load changes in the AC load flow/short circuit analysis will be confirmed that they do not adversely impact the loading requirements upstream on 480 V load center buses and breakers under EPU conditions and the load center buses and breakers will remain bounded by equipment design ratings. This will be confirmed as part of the modification design process."

Provide assurance that the design requirements will continue to be bounded by equipment design ratings at EPU conditions.

EEEB-20: On page 2.3.3-7 of Attachment 5 of the EPU application, the licensee stated the following:

> "The short circuit currents (interrupting and momentary) at affected 480 V load center buses and circuit breakers during operation at EPU conditions will be confirmed that they are within the equipment short circuit ratings. The EPU short circuit requirements of load center buses and breakers will remain within the equipment design ratings. This will be confirmed as part of the modification process."
>
> Provide assurance that the short circuit design requirements will continue to be bounded by equipment design ratings at EPU conditions.

EEEB-21: On page 2.3.3-7 of Attachment 5 of the EPU application, the licensee stated the following:

> "The load changes on the 480 V system are due to IPB duct cooling system and new main transformers cooling systems. The loads in the AC load flow/short circuit analysis will be confirmed that they do not adversely impact the loading requirements on the affected 480 V motor control center (MCC) buses and breakers under EPU conditions. The continuous current requirements for motor control center buses and circuit breakers at EPU conditions will be confirmed by AC load flow/short circuit analysis. This will be confirmed as part of the modification design process."
>
> Provide assurance that continuous current requirements for MCC buses and circuit breakers at EPU conditions will continue to be bounded by equipment design ratings.

EEEB-22: On page 2.3.3-7 of Attachment 5 of the EPU application, the licensee stated the following:

> "The short circuit currents (interrupting and momentary) at affected 480 V motor control center buses and circuit breakers during operation at EPU conditions will be confirmed that they remain within the equipment short circuit ratings. The EPU short circuit requirements of motor control center buses and breakers will remain within the equipment design ratings in the AC load flow/short circuit analysis. This will be confirmed as part of the modification process."
>
> Provide assurance that EPU short circuit requirements of MCC buses and breakers will remain within the equipment design ratings in the AC load flow/short circuit analysis.

EEEB-23: On page 2.3.3-8 of Attachment 5 of the EPU application, the licensee stated the following:

> "Power supply requirements have been analyzed and there is no adverse impact on the 480 V system from these modifications, as determined in the AC load flow/short circuit analysis. Modifications to the isolated phase bus duct and main transformers will be implemented prior to EPU operation. This will be confirmed as part of the modification design process."

Provide assurance that modifications to the isolated phase bus duct and main transformers will be implemented prior to EPU operation and that there will be no adverse impact on the 480 V system as a result of these modifications.

EEEB-24: On page 2.3.3-8 of Attachment 5 of the EPU application, the licensee stated the following:

> "The new load additions from these modifications are expected to be minor and the effect on the non safety-related 120 V AC instrument power system is expected to be small. Therefore, the voltage levels and short circuit current requirements for the 120 V AC instrument system equipment will not be adversely affected by EPU conditions, and equipment ratings are expected to remain bounded by the existing equipment design ratings. The new load additions will be confirmed and their effects on the system will be verified as part of the plant modification process."

Provide a summary of the evaluation that shows impact of these modifications on the 120 V AC instrument power system. Also provide assurance that equipment ratings will remain bounded by the existing equipment design ratings and that modifications to the 120 V AC system will be implemented prior to EPU operation.

EEEB-25: On page 2.3.3-9 of Attachment 5 of the EPU application, the licensee stated the following:

> "Three other VFDs and motors associated with 1P-2A, 2P-2A, and 2P-2B with or without the VFD modifications have been evaluated to demonstrate that Train A and B EDGs will continue to operate within design ratings after installation."

Provide a summary of the evaluation that shows that Train A and B EDGs will continue to operate within design ratings after installation of the modifications. Also provide assurance that the modifications will be in place prior to implementation of the proposed EPU and that Train A and B EDGs will continue to operate within design ratings after installation of the modifications.

EEEB-26: On page 2.3.3-9 of Attachment 5 of the EPU application, the licensee stated the following:

> "The generator rating will be confirmed and the rewind implemented as part of the design modification process."

Provide assurance that the main generator rating will be adequate to support operation at EPU including machine lagging reactive power requirements.

EEEB-27: On page 2.3.3-11 of Attachment 5 of the EPU application, the licensee stated the following:

> "The LVSAT protection has been evaluated, and it has been determined that no changes are required."

Provide a summary of the evaluation that shows that no changes are required for the LVSAT protection under EPU conditions.

EEEB-28: On page 2.3.3-11 of Attachment 5 of the EPU application, the licensee stated the following:

> "The new generator output circuit breaker protection scheme requires changes to the main generator, main transformer and UAT protection settings. These changes will be addressed as part of the plant modification process for the main generators."
>
> Provide assurance that the new generator output circuit breaker protection scheme will be modified to address any adverse impact as a result of operating under EPU conditions.

EEEB-29: Provide a detailed discussion on any changes in the timing sequence for loads supplied by the emergency diesel generators and the describe impact on the capability and capacity of the emergency diesel generators to perform their design function.

2.3.4 Direct Current (DC) Power System

EEEB-30: On page 2.3.4-3 of Attachment 5 of the EPU application, the licensee stated the following:

> "The load changes resulting from these modifications are small and the effect on the 125V DC system has been found to be acceptable. The design of these modifications are in process and the effect on EPU will be evaluated as part of the modification progress. This includes determining the impact on the licensing basis using the 10 CFR 50.59 screening and evaluation process."
>
> Provide a summary of the evaluation that shows that load changes that result from modifications will remain within the equipment design ratings under EPU conditions. Also provide assurance that the modifications will be completed prior to implementation of the proposed EPU.

EEEB-31: Provide a detailed discussion on any changes in the timing sequence for loads supplied by the safety-related batteries and the impact on the capability and capacity of the DC power system to perform its design function.

2.3.5 Station Blackout (SBO) Section

EEEB-32: Describe the impact of the proposed EPU on the capability and capacity of the alternate AC (AAC) sources. In your response, provide a comparison of the load requirements pre and post EPU. Provide assurance that the AAC sources will remain capable of performing their design function under EPU conditions.

EEEB-33: On page 2.3.5-5 of Attachment 5 of the EPU application, the licensee stated the following:

> "The Unit 1 and 2 CST required level per unit to support one hour of decay heat removal at the EPU is 15,410 gallons. This volume maintains approximately the

same additional time margin for switchover of the Auxiliary Feedwater supply that was committed to as a result of the original PBNP SBO rule safety evaluation."

Provide a summary of the evaluation that shows that the new required condensate storage level needed is adequate to support one hour of decay heat removal under EPU conditions. Also provide assurance that the time margin for switchover of the Auxiliary Feedwater supply will be bounded by the time committed to as a result of the original Point Beach Nuclear Plant SBO rule safety evaluation.

EEEB-34: On page 2.3.5-5 of Attachment 5 of the EPU application, the licensee stated the following:

"EPU does not require SBO-related equipment to be added or changed which would require additional DC power during an SBO event. There are no significant additional loads added to the safety-related battery during an SBO at EPU conditions."

Identify all loads that are being added to the safety-related batteries during an SBO event at EPU conditions. Provide assurance that the safety-related batteries will remain capable of performing their design function during an SBO event under EPU conditions

EEEB-35: On page 2.3.5-6 of Attachment 5 of the EPU application, the licensee stated the following:

"Changes due to EPU result in negligible increases in room temperatures during an SBO from those previously evaluated."

Provide a summary of the evaluation that shows that the negligible increases in room temperatures during an SBO event will not adversely impact the capability and capacity of structures, systems, or components.