NEXTera ENERGY POINT BEACH

July 29, 2010

NRC 2010-0086
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Point Beach Nuclear Plant, Units 1 and 2
Dockets 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

License Amendment Request 261
Extended Power Uprate
Response to Request for Additional Information

References: (1) FPL Energy Point Beach, LLC letter to NRC, dated April 7, 2009, License Amendment Request 261, Extended Power Uprate (ML091250564)

(2) NRC electronic mail to NextEra Energy Point Beach, LLC, dated May 26, 2010, Draft – Request for Additional Information from Mechanical and Civil Branch on HELB RE: EPU (ML101481059)

NextEra Energy Point Beach, LLC (NextEra) submitted License Amendment Request (LAR) 261 (Reference 1) to the NRC pursuant to 10 CFR 50.90. The proposed amendment would increase each unit's licensed thermal power level from 1540 megawatts thermal (MWt) to 1800 MWt, and revise the Technical Specifications to support operation at the increased thermal power level.

Via Reference (2), the NRC staff determined that additional information is required to enable the staff's continued review of the request. Enclosure 1 provides the NextEra response to the NRC staff's request for additional information.

This letter contains no new Regulatory Commitments and no revisions to existing Regulatory Commitments.

The information contained in this letter does not alter the no significant hazards consideration contained in Reference (1) and continues to satisfy the criteria of 10 CFR 51.22 for categorical exclusion from the requirements of an environmental assessment.

In accordance with 10 CFR 50.91, a copy of this letter is being provided to the designated Wisconsin Official.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on July 29, 2010.

Very truly yours,

NextEra Energy Point Beach, LLC

Larry Meyer
Site Vice President

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC
PSCW

**ENCLOSURE 1**

**NEXTERA ENERGY POINT BEACH, LLC**
**POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2**

**LICENSE AMENDMENT REQUEST 261**
**EXTENDED POWER UPRATE**
**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

The NRC staff determined that additional information was required (Reference 1) to enable the Mechanical and Civil Engineering Branch to complete the review of License Amendment Request (LAR) 261, Extended Power Uprate (EPU) (Reference 2). The following information is provided by NextEra Energy Point Beach, LLC (NextEra) in response to the NRC staff's request.

**RAI-1**

*Does the proposed EPU have an effect on the high energy line break (HELB) methodology and does it affect existing postulated pipe failures or does it result in new ones?*

**NextEra Response**

The EPU postulated pipe ruptures utilize the relaxation contained in Generic Letter (GL) 87-11 concerning the elimination of the arbitrary intermediate breaks. It also utilizes the break and crack stress thresholds contained in Branch Technical Position (BTP) Mechanical Engineering Branch (MEB) 3-1, Revision 2 (attached to GL 87-11), for those piping systems with a dynamic analysis and the guidance for those piping systems that do not have a dynamic analysis.

For the High Energy Line Break (HELB) evaluations at EPU conditions, additional high energy piping systems were identified that were not addressed in Final Safety Analysis Report (FSAR) Appendix A.2, High Energy Pipe Failures Outside Containment. The newly identified systems, or portions of systems, include:

- Extraction Steam System
- Condensate System
- Heater Drain Pump Discharge
- Feedwater (FW) Heater and Moisture Separator Reheater (MSR) Vents and Drains
- Chemical and Volume Control Letdown

For those systems with a dynamic analysis, arbitrary intermediate and numerous other postulated breaks were eliminated and no new break locations were identified. Additional detail for breaks in systems with a dynamic analysis can be found in the following calculations:

- PBNP-994-21-05-P01, Unit 1 Main Steam Piping GL 87-11 Break Location Determination
- PBNP-994-21-05-P02, Unit 2 Main Steam Piping GL 87-11 Break Location Determination
- PBNP-994-21-05-P03, Unit 1 Main Feedwater Line GL 87-11 Break Location Determination
- PBNP-994-21-05-P04, Unit 2 Main Feedwater Line GL 87-11 Break Location Determination
- PBNP-994-21-05-P05, Unit 1 Steam Supply Piping to AFW Pump GL 87-11 Break Location Determination
- PBNP-994-21-05-P06, Unit 2 Steam Supply Piping to AFW Pump GL 87-11 Break Location Determination

Copies of these calculations were provided to the NRC via Reference (3). The NextEra Response to the NRC staff's request EPU EMCB RAI-3c contains additional information regarding HELB methodology changes.

**RAI-2**

*EPU licensing report, Section 2.2.1, states that:*

> *"The determination of stress values for rupture postulation evaluations were calculated using ASME Section III, 1986 edition requirements".*

*And that:*

> *"The stress thresholds for identifying break and crack locations from MEB 3-1 (Postulated Rupture Locations In Fluid System Piping Inside And Outside Containment, Revision 2, dated June 1987) were also adopted."*

*Section 2.2.1 also indicates that code cases N-318-5, N-392-1 and the 1979 PVP Spring Conference Paper 79-PVP-51 were utilized to determine local stresses due to pipe welded attachments.*

*PBNP UFSAR App A.2.2, "Criteria", states that:*

> *"Break locations are selected in accordance with [the AEC, December 19, 1972, Giambusso letter and consequent Schwencer errata (herein refer to as the "Giambusso letter".]"*

*The pipe stress requirements and equations are also stated in A.2.2(9), "Piping Stress Analysis". UFSAR Appendix A.5 provides the requirements for seismic calculations. The UFSAR indicates that pipe stresses are in accordance with ANSI B31.1, 1967 and that pressure, deadweight, seismic and thermal stresses are combined in accordance with the equations of ASME Section III, 1965.*

*The EPU licensing report also lists two equations for postulating breaks and cracks. These equations are neither in conformance with the Giambusso letter requirements nor with the PBNP licensing and design basis for pipe stress evaluations.*

*The PBNP current licensing and design bases for HELB evaluation in postulating high energy piping failures is neither the SRP nor the BTP MEB 3-1 of SRP 3.6.2 but that of the Giambusso letter and the PBNP UFSAR which provide the requirements, equations and stress limits for postulating piping failures. The proposed EPU uses different stress limits, equations and different piping code. In addition, it is implied that PBNP is seeking relief from postulating breaks due to thermal expansion stresses (which is a "Giambusso letter" requirement) by leaving out the thermal expansion stresses requirement of $0.8S_A$ limit.*

*GL 87-11 states that "arbitrary intermediate pipe ruptures" are "no longer mentioned or defined in MEB 3-1." This is not to be confused in that the Giambusso letter criteria can be mixed with MEB 3-1 criteria. GL 87-11 also states that "requirements for postulated terminal end pipe ruptures, postulated intermediate pipe ruptures at locations of high stress and high usage factor and for leakage cracks are retained in the revision to MEB 3-1." Relief from the $0.8S_A$ limit on thermal expansion stresses is not included nor is the postulation of leakage cracks. PBNP need not postulate arbitrary intermediate pipe rupture locations based on GL 87-11, but without further justification, it is required to postulate intermediate pipe rupture locations when thermal expansion stresses exceed $0.8S_A$.*

a) *Please confirm that the proposed EPU changes in HELB evaluations utilize the ANSI B31.1, 1967 power piping code stress allowable values.*

b) *What is the PBNP current design basis for calculating local stresses due to integral piping attachments on straight runs of pipe and elbows?*

c) *Provide a detailed technical justification which reconciles the above mentioned code and HELB criteria differences. For each deviation of the Giambusso letter criteria, provide a detailed comparison of the Giambusso letter criterion to the PBNP proposed EPU LAR HELB criterion. In addition, for each deviation, provide a corresponding technical justification. Or use the PBNP current licensing basis for HELB analyses in postulating piping failures.*

d) *Provide a submittal which shows that pipe breaks have been postulated where the expansion stress exceeds $0.8S_A$ as defined by your current licensing basis (item 2.b.2 of the Giambusso letter).*

**NextEra Response**

GL 87-11 only eliminated the arbitrary intermediate break criteria. However, it did attach BTP MEB 3-1, Revision 2, to inform all licensees of the current NRC positions on other HELB topics. EPU has adopted several of those positions as part of the HELB evaluations at EPU conditions. These are included in the various Licensing Report sections.

a) The proposed EPU evaluations utilized the United States of America Standard (USAS) B31.1, Power Piping Code, 1967 Edition, stress allowable values for piping code compliance, but used the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, 1986 Edition, allowable values for determining break and crack locations. This edition of the ASME Section III code is referenced in the Branch Technical Position MEB 3-1, Revision 2, which was attached to GL 87-11.

b) The localized stresses developed in the pipe pressure boundary due to integral welded attachments (IWA) shall be superimposed on the stresses calculated by the computer analysis to address the Code stress equation acceptability and such acceptability shall be documented in the stress report. The specific methodology used to address IWAs may use as a guide any applicable Code Case (such as N-318 and 392), Welding Research Council Bulletins or Finite Element Analysis, as appropriate. This is the current design basis for Point Beach Nuclear Plant (PBNP).

c) See NextEra Response to BTP 3-3, Appendix B, Question 2 (Reference 3, Enclosure 1).

d) The expansion stress break location criteria was eliminated by the HELB evaluations at EPU conditions' use of BTP MEB 3-1, Revision 2, which does not contain this requirement.

**RAI-3**

*a) Provide a background which contains the PBNP HELB history.*

*b) Provide the PBNP HELB methodology and evaluation criteria.*

*c) Provide the evaluation of the PBNP to the HELB regulatory requirements (i.e. the 21 Giambusso letter items and show in extensive detail how PBNP has met these requirements. Include reference to calculations. This should be a lengthy document.*

*d) Provide a section which contains a list of generated plant controlled HELB calculations with a brief description for each one of them.*

*e) For each system analyzed provide a description of the HE lines, the HE line boundaries and HELB locations. Graphically show HE line boundaries and HELBs on P&IDs or flow diagrams.*

**NextEra Response**

a) Bechtel Power Corporation issued a document dated May 15, 1973, entitled "Report on Analyses for Six Postulated Pipe Breaks Outside Containment at Point Beach Nuclear Plant." The summary section addresses the consequences of hypothetical high energy pipe breaks. It states that the scope of the analyses was initially limited to main steam, main feedwater and main steam supply to the auxiliary feedwater pump turbine. Based on piping stress analyses and site inspections, the scope of the analyses was further limited to six locations in the main steam and steam supply lines.

PBNP responded to the HELB requirements by submitting FSAR Appendix E. The HELB outside containment information was subsequently entitled FSAR Appendix A.2, High Energy Pipe Failure Outside Containment.

FSAR Appendix E provided details concerning the actions taken, modifications performed and design features provided to respond to HELB events outside containment.

The NRC transmitted a Safety Evaluation Report (SER) documenting their review of these analyses of the effects of postulated high line breaks outside containment at PBNP (Reference 4). The conclusion stated "We conclude that with these changes, the plant structure, systems, and components important to safety will accommodate the effects of a postulated high-energy pipe failure to the extent necessary to assure that a safe shutdown condition of the reactor could be accomplished and maintained."

For PBNP, "safe shutdown" is typically defined as hot shutdown for those accidents that terminate at hot shutdown. Hot shutdown must be achieved automatically or by operator action. The plant may remain at hot shutdown for an extended time while the plant equipment availability is determined and the safest process for reaching cold shutdown is determined. No time limit for achieving cold shutdown is defined.

GL 87-11 eliminated the requirement for postulating arbitrary intermediate breaks without prior NRC approval. The attached BTP MEB 3-1, Revision 2, presented newer pipe stress threshold equations for determining break and crack locations and did not mention the crack at the most adverse location issue. It also eliminated the longitudinal break at the terminal ends. NRC Information Notice (IN) 2000-20 reinstated the NRC position that the crack be at the most adverse location (Reference 5).

b) The PBNP EPU HELB methodology and evaluation criteria are identified in the calculations identified in response to RAI 3.d below. These calculations were provided to the NRC via Reference (3).

c) The NextEra response to RAI 3.c was provided to the NRC via Reference (3). The pipe break locations of main steam, main feedwater, and steam supply to AFW pump piping with dynamic analyses are described in calculations PBNP-994-21-05-P01 through P06, which were provided to the NRC via Reference (3). As described in those calculations, HELB break locations were determined using stresses calculated with the ASME Section III, 1986 Edition, against the criteria of BTP MEB 3-1, Revision 2, for Class 2 piping. This is a change in the PBNP HELB licensing basis from the Giambusso letter requirements for which NRC approval is requested in the LAR (Reference 2). The ASME Section III, 1986 Edition, was only used for HELB evaluations and not utilized for

the pipe stress analyses for pipe and pipe support design at EPU conditions, so no code reconciliation is necessary.

d) The HELB calculations generated for EPU conditions are summarized below. The calculations were submitted as attachments to Enclosure 1 of Reference (3)

- PBNP-994-21-02, High Energy System Selection

  This calculation identified those systems that met the design pressure and operating temperature criteria to be identified as "high energy."

- PBNP-994-21-05-P01 through P06, Implementation of GL 87-11, Unit 1 and 2 Main Steam, Main Feedwater, and Steam Supply Piping to AFW Pump GL 87-11 Break Location Determination

  This series of calculations eliminated the arbitrary intermediate breaks and also utilized some of the information contained in BTP MEB 3-1, Revision 2, for the main steam, feedwater and steam supply to auxiliary feedwater pump turbine lines.

- PBNP-994-21-06, Break & Crack Size/Location Selection

  This calculation utilized the stress information contained in calculations PBNP-994-21-05 above to identify which locations, if any, exceeded the break and crack stress threshold values. In addition, a single crack must be postulated at the most adverse location along the pipe regardless of its stress value. For piping that did not have the benefit of a dynamic analysis, a break was postulated to occur in any room the line traversed. Isometric drawings showing the routing and postulated break locations for the main steam, feedwater and steam supply to the auxiliary feedwater pump turbines were developed.

- PBNP-994-21-07, Mass & Energy Releases for Pressure Limiting Cases

  This calculation generated the mass and energy releases for the identified high energy lines at hot shutdown or EPU full-power conditions as appropriate. These releases were used by subsequent tasks.

- PBNP-994-21-09, GOTHIC Models

  This calculation developed GOTHIC computer models for the facade, primary auxiliary building (PAB) and turbine hall. These models were used by subsequent tasks to perform the pressure and temperature time histories for the various rooms in the model due to the various postulated HELB events.

- PBNP-994-21-10, GOTHIC Pressure Analyses

  This calculation determined the peak pressure for the various rooms in the models due to the various postulated HELB events.

- PBNP-994-21-12, Jet Impingement Calculations

This calculation developed jet centerline pressure and temperature versus distance from the various postulated high energy breaks and cracks.

- PBNP-994-21-13, Building Recovery (GOTHIC Temperature Analyses)

  This calculation determined the peak temperature and temperature time histories for the various rooms in the models based on the mass and energy releases developed in calculation PBNP-994-21-07, Mass & Energy Releases for Pressure Limiting Cases, above. The results were presented in both tabular and graphical formats.

- PBNP-994-21-15, Required Equipment List

  This calculation identified the equipment necessary to detect, mitigate and monitor each of the postulated HELB events. Two lists were developed: one with a detailed level of information about the components and one at a level commensurate for inclusion in FSAR Appendix A.2, High Energy Pipe Failure Outside Containment.

e) Flow diagrams for analyzed pipe systems (i.e., Unit 1 and 2 Main Steam, Main Feedwater, and Steam Supply to AFW Pump) are provided in the following calculations:

- PBNP-994-21-05-P01, Unit 1 Main Steam Piping GL 87-11 Break Location Determination
- PBNP-994-21-05-P02, Unit 2 Main Steam Piping GL 87-11 Break Location Determination
- PBNP-994-21-05-P03, Unit 1 Main Feedwater Line GL 87-11 Break Location Determination
- PBNP-994-21-05-P04, Unit 2 Main Feedwater Line GL 87-11 Break Location Determination
- PBNP-994-21-05-P05, Unit 1 Steam Supply Piping to AFW Pump GL 87-11 Break Location Determination
- PBNP-994-21-05-P06, Unit 2 Steam Supply Piping to AFW Pump GL 87-11 Break Location Determination

Copies of these calculations, which contain line break isometric drawings, and copies of safety classification drawings for these pipe systems were provided via Reference (3). The routing and postulated break locations for other high energy lines (i.e., chemical and volume control system, steam generator blowdown, extraction steam system, condensate system, and feedwater heater and moisture separator reheater drains) are described in calculation PBNP-994-21-06, Break and Crack Size/Location Selection, which was also provided via Reference (3).

**EMCB AFW RAI 4-1**

*Provide a list and description of modifications required to mitigate the postulated high energy piping failures.*

**NextEra Response:**

There was only one plant modification required for each unit as a result of the HELB evaluations at EPU conditions. The cables for the main steam pressure transmitters located in the PAB HVAC equipment rooms for each unit are to be replaced to meet their environmental qualification requirements.

**References**


1. NRC electronic mail to NextEra Energy Point Beach, LLC, dated May 26, 2010, Draft – Request for Additional Information from Mechanical and Civil Branch on HELB RE: EPU (ML101481059)

2. FPL Energy Point Beach, LLC letter to NRC, dated April 7, 2009, License Amendment Request 261, Extended Power Uprate (ML091250564)

3. NextEra Energy Point Beach, LLC letter to NRC, dated July 8, 2010, License Amendment Request 261, Extended Power Uprate, Response to Request for Additional Information (ML101940363)

4. NRC letter from George Lear to Wisconsin Electric Power Company, dated May 7, 1976, with enclosed Safety Evaluation Report, High Energy Line Failure Outside Containment, Point Beach Nuclear Plant Units 1 and 2

5. NRC Information Notice, Potential Loss of Redundant Safety-Related Equipment Because of the Lack of High Energy Line Break Barriers, dated December 11, 2000 (ML003760571)