



December 21, 2010

NRC 2010-0189  
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 Clarification

- 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 November 22, 2010, FW: Request for a teleconference with the applicant re: Point Beach EPU / HELB (TAC Nos. ME1044 and ME1045)
  - (3) NRC electronic mail to NextEra Energy Point Beach, LLC, dated December 9, 2010, Point Beach Nuclear Plant, Units 1 and 2 – Request for Additional Information re: LAR 261: EPU HELB – Mechanical and Civil Engineering Branch Review

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 References (2) and (3), the NRC staff determined that clarification is required to enable the staff's continued review of the request. Enclosure 1 provides the NextEra response to the NRC staff's request.

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

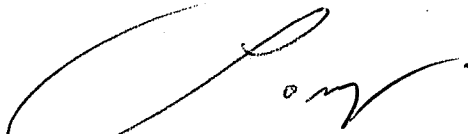
The information contained in this letter does not alter the no significant hazards consideration contained in Reference (1) and continues to satisfy the criteria of 10 CFR 51.22 for categorical exclusion from the requirements of an environmental assessment.

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 December 21, 2010.

Very truly yours,

NextEra Energy Point Beach, LLC

A handwritten signature in black ink, appearing to read 'Larry Meyer', with a stylized flourish at the end.

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 CLARIFICATION

The NRC staff determined that clarification was required (References 1 and 2) to enable the Mechanical and Civil Engineering Branch to complete its review of License Amendment Request (LAR) 261, Extended Power Uprate (EPU) (Reference 3). The following information is provided by NextEra Energy Point Beach, LLC (NextEra) in response to the NRC staff's request.

#### **RAI 2.c**

*Provide a detailed 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.*

#### **RAI 2.c Clarification**

*The basic concern is that the licensee did not adequately respond to our previous RAI 2c which requested the applicant to provide technical justification which reconciles the later codes and later HELB criteria which they are now proposing to use, with respect to their existing licensing basis codes and HELB criteria. Also, we need to understand with regards to applying the proposed criteria what protective barriers is the licensee planning to remove and what breaks were postulated.*

#### **NextEra Response**

In accordance with the December 2, 2010, conference call between the Mechanical and Civil Engineering Branch and NextEra, NextEra proposes to utilize the Giambusso Letter High Energy Line Break (HELB) criteria for break location determination with the following exceptions:

1. The full size break criteria at intermediate locations based on stress equations are compared for the LAR 261 HELB analysis to the Final Safety Analysis Report (FSAR) criteria (i.e., the Giambusso Letter HELB criteria) as given in Appendix A.2, High Energy Pipe Failure Outside Containment, and the justifications for the deviations are provided:

#### **EPU LAR HELB Criteria**

Full size breaks are postulated at the intermediate locations along the seismically analyzed high energy lines (main steam, main feedwater and auxiliary feedwater (AFW) steam supply

for Units 1 and 2). Breaks are postulated where the combined stress of Equations 9 and 10 in Paragraph NC-3652 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, Subsection NC, 1977 Edition, including the Winter 1978 Addenda (ASME 1977 Code) and local stresses due to integral welded attachments exceeds the break threshold stress limit of  $0.8 (1.2S_h + S_A)$ . The  $S_h$  and  $S_A$  allowable stress limits are the same as those given in the original Point Beach Nuclear Plant (PBNP) piping code of record, United States of America Standard (USAS) B31.1.0-1967 (B31.1-1967).

Note that the ASME 1977 Code, Equations 9 and 10, including the stress intensification factors, are identical to those given in American National Standards Institute (ANSI) B31.1, 1973, Summer 1973 Addendum (B31.1-S73). The B31.1-S73 Code is utilized for the piping stress analysis for the EPU Project. Therefore, reference to either code Equations 9 and 10 (ASME 1977 Code or B31.1-S73) is interchangeable. Specifically, the following equation is used to postulate full size intermediate breaks based on stresses, where  $k=1.2$  for Operating Basis Earthquake (OBE) load condition (for occasional loads acting less than 1% of the operating period).

$$\frac{PD_o}{4t_n} + \frac{0.75i(M_A + M_B)}{Z} + \frac{iM_C}{Z} + Local\ Stresses \geq 0.8(kS_h + S_A) \quad \text{Equation 1}$$

Other terms used in Equation 1 are the same as those used in the ASME 1977 Code, Equations 9 and 10.

The terms  $M_A$ ,  $M_B$  and  $M_C$  for moments due to dead weight, OBE load and thermal expansion conditions, respectively, are the square-root-of-the-sum-of-squares of the two bending moments and the torsional moment at a location along the pipe for these load conditions. Therefore, all three moments of a load case in Equation 1 are intensified. The local stresses due to integral welded attachments are added at locations where they occur along the pipe.

The B31.1-S73 code and the stress components of Equation 1 are the same as those utilized for the piping stress analyses for the LAR 261 HELB analyses and have been reconciled to the PBNP piping code of record, B31.1-1967.

#### PBNP FSAR HELB Criteria

FSAR Section A.2.2, Item 9 states for high energy line break analysis, the piping stresses for lines outside containment are computed based on:

- Thermal, longitudinal pressure stress and weight stress calculation based on B31.1-1967.
- Seismic calculations per methods of Appendix A.5.
- The stresses are computed (Table A.2-3 to Table A.2-6) and combined with the design loading (weight, thermal, internal pressure, seismic) in accordance with ASME Section III.

The weight stresses were determined using the Note 3 to B31.1-S73, Table 121.1.4, maximum weight stress of 1,500 psi. A uniform weight stress of 1,500 psi is added un-intensified to the pressure, thermal and seismic stresses at all locations.

Based on the available information regarding the original piping stress analysis and load combinations, the following statements are applicable:

- a) Although FSAR Appendix A.5.7, Seismic Analysis of Piping Systems, states the seismic stresses are in accordance with ASME B&PV Code, Section III, 1971 Edition, the particular Addenda of the Code applied is not given. However, given the fact that the Giambusso Letter specifically requires Winter 1972 Addenda to be used and that the original HELB calculations are dated January 1973, it is likely that the seismic stresses conform to Equation 9 of the Winter 1972 Addenda or later Addenda of the 1971 Edition.

$$S_{OBE} = 0.75i \frac{M_R}{Z}, \text{ in which } M_R = \sqrt{M_x^2 + M_y^2 + M_z^2}$$

This approach is therefore equivalent to the  $M_B$  term of Equation 1.

- b) The thermal expansion longitudinal stresses were computed by adding the intensified stresses due to the in-plane and out-of-plane bending moments with the un-intensified torsional moment. This approach is less conservative than that utilized in Equation 1, where all three moments are intensified.
- c) The HELB criteria given in the Giambusso Letter and errata do not include the local stresses due to integral welded attachments.

#### Justification for the Use of Equation 1 to Determine Full Size Break Locations for LAR 261

The combined stresses due to deadweight, thermal expansion and OBE are calculated based on intensified values of the stresses due to all three components of moments (two bending and one torsional moment) at each location along the high energy line and added to the pressure and local stresses due to integral welded attachments in accordance with the B31.1-S73. The newer code has been reconciled to B31.1-1967. The ASME 1977 Code, Section III, Subsection NC-3652 has the same equations as the B31.1-S73 Code, which was reconciled to the B31.1-1967 Code. Therefore, reconciliations to B31.1-1967 were performed for Equation 1, which was used in the determination of the full size intermediate breaks for the LAR 261 HELB analyses, as revised in the HELB calculation summaries provided below.

These code reconciliations and discussions given above show that the determination of intermediate full size break location based on Equation 1 is more conservative than the current HELB criteria given in Appendix A.2 of the FSAR.

Modifications to the existing main steam, main feedwater and AFW steam supply lines necessitated the re-analysis of these lines to the reconciled B31.1-S73 Code. The resulting code stresses were utilized for the determination of full size intermediate breaks with the addition of local stresses due to integral welded attachments, to maintain consistency between the piping design criteria and the HELB criteria and to re-baseline the HELB program.

2. Full size breaks are postulated where the thermal expansion stress,  $\frac{iM_C}{Z}$ , exceeds the threshold break limit of  $0.8S_A$ . This criterion is the same as that given in the Giambusso Letter except that the  $\frac{iM_C}{Z}$  term is more conservative in the B31.1-S73 Code than the B31.1-1967 Code because all three moment (two bending and one torsional) components of  $M_C$  are intensified in the newer code, as opposed to only the two bending components which are intensified in the B31.1-1967 Code.
3. The LAR 261 HELB criteria for leakage cracks includes the single open crack at the most adverse location(s) provision of the Giambusso Letter criteria and does not deviate from it.
4. Arbitrary intermediate full size breaks postulated in the Giambusso Letter were relaxed by Generic Letter 87-11, Relaxation in Arbitrary Intermediate Pipe Rupture Requirements (Reference 4). These breaks are eliminated in the LAR 261 HELB criteria. Removal of these arbitrary break locations does not require prior NRC approval.
5. Where branch piping is included in the main piping analysis, breaks at the branch end of the branch connections are not postulated if the combined stresses are less than the break threshold limit given in Equation 1.

The LAR 261 HELB criteria and the Giambusso Letter criteria for break postulation are the same for terminal end breaks and other provisions, such as but not limited to, full size longitudinal breaks for piping four-inch nominal pipe size and larger, circumferential breaks in piping runs and branch piping runs exceeding one-inch nominal pipe size.

Additionally, no whip restraints or protective barriers will be removed as a result of the proposed LAR 261 HELB criteria.

Six calculations (one main steam, one main feedwater and one AFW steam supply for each Unit), PBNP-994-21-05-P01 through -P06, are revised to incorporate the LAR 261 HELB criteria as described above. The results show additional 24-inch and 30-inch main steam line breaks below the turbine hall operating floor (Elevation 44') for each unit, no additional breaks in the main feedwater lines for Units 1 and 2 and additional breaks in the three-inch nominal AFW steam supply lines at locations near the terminal ends of the lines, where breaks were previously identified as terminal end breaks.

The break size and locations for each of the six lines are summarized and analyzed in the revision to Calculation PBNP-994-21-06, HELB Reconstitution Program – Task 6, Break and Crack Size/Location Selection. These additional break locations do not result in unacceptable environmental conditions for qualification of electrical equipment. In addition, no additional adverse effects from pipe whip or jet impingement result from the additional break locations.

Calculation PBNP-994-21-10, HELB Reconstitution Program Task 10 – GOTHIC Pressure Analyses, is revised to include the larger main steam line breaks below the turbine hall operating floor. The mass and energy release for this new break is the same as that for a similar size main steam line break above the turbine hall operating floor. A new pressure case for the HELB below the turbine hall operating floor is performed. The resulting maximum pressure distribution for this new case does not alter the peak pressure that was previously analyzed for the turbine hall. The additional breaks noted in the Unit 1 AFW steam supply lines in the component cooling water heat exchanger (CCW HX) room are of the same size (three-inch nominal) and have the same steam properties as the breaks previously identified at

the terminal ends of the high energy lines. Therefore, these new postulated breaks do not alter the pressure distribution in the CCW HX Room from that previously evaluated.

Calculation PBNP-994-21-13, HELB Reconstitution Program Task 13 – Building Recovery, is revised to include larger main steam line breaks below the turbine hall operating floor. The mass and energy release for this new break is the same as that for a similar size main steam line break above the turbine hall operating floor. The maximum temperature below the turbine hall operating floor is increased to 292.3°F and the asymptotic temperature is now 193.4°F. Note that environmental qualification (EQ) of electrical equipment exposed to the harsh environment below the turbine hall operating floor is not adversely impacted by this new break location. Therefore, the temperature rise in this region due to this new break does not result in an EQ impact. The temperature effects above the turbine hall operating floor are not affected by the new break, since a similar size break above the Operating Floor analyzed previously is bounding. The additional breaks noted in the Unit 1 AFW steam supply lines in the CCW HX room are of the same size (three-inch nominal) and have the same steam properties as the breaks previously identified at the terminal ends of these high energy lines. Therefore, these new postulated breaks do not alter the temperature effects in the room from those previously evaluated.

#### **HELB Reconstitution Supplemental Requests for Additional Information**

##### **1) PBNP-EMCB-HELB-RAI-10**

*In Calculation No. PBNP-994-21-12, the licensee indicates that this calculation which uses ANSI/ANS 58.2-1988 supersedes the jet impingement methodology provided in FSAR Appendix A.2 to reflect changes in methodologies used to determine HELB parameters. As indicated in Section III.3 of the NUREG-0800, Standard Review Plan (SRP), Section 3.6.2, some assumptions related to jet expansion modeling in the ANSI/ANS 58.2 Standard may lead to non-conservative assessments of the jet impingement loads on the neighboring structures, systems and components (SSCs) from postulated pipe breaks. In the context of new reactor combined license applications, the NRC staff reviews the analyses of jet impingement forces on a case-by-case basis. In light of the identified non-conservatism, the licensee is requested to justify the acceptability of the proposed ANSI/ANS 58.2 methodology as an adequate approach for jet impingement evaluation in lieu of the original conservative licensing basis methodology.*

#### **NextEra Response**

Based on the concerns expressed in PBNP-EMCB-HELB-RAI-10 regarding the jet impingement methodology of ANSI/ANS 58.2 may lead to non-conservative assessments of the jet impingement loads, NextEra rescinds the use of this methodology and reverts back to the original licensing basis methodology. Calculation No. PBNP-994-21-12, Task 12 – Jet Impingement Calculations, previously submitted in Reference (5), is rescinded. NextEra has evaluated the HELB jet impingement effects at EPU conditions in the revised Calculation PBNP-994-21-06, HELB Reconstitution Program – Task 6, Break and Crack Size/Location Selection, and has concluded that current licensing basis results as described in FSAR Appendix A.2 are not affected.

## **2) PBNP-EMCB-HELB-RAI-11**

*In the Point Beach HELB Criteria White Paper, dated November 28, 2010, the licensee indicated that Point Beach is classified as a Giambusso plant, however, it intends to use Branch Technical Position MEB 3-1, Rev. 2.*

- (a) If the licensee is not planning to use MEB 3.1, in its entirety, it is requested to provide justification for all departures from the Giambusso Letter for using selected portions from MEB 3.1.*
- (b) In Attachment C to Calculation PBNP-994-21-05-P03, the licensee indicated that the section of MEB 3-1 pertaining to moderate energy lines does not apply. The licensee is requested to provide justification for using selected sections only of MEB 3-1 and not postulating leakage cracks in moderate energy lines.*

### **NextEra Response**

See the NextEra response to the RAI 2.c clarification request above. NextEra is not planning to use Branch Technical Position (BTP) Mechanical Engineering Branch (MEB) 3.1, Postulated Break and Leakage Locations in Fluid System Piping Outside Containment, Revision 2. Therefore, references to this MEB are no longer valid and should be ignored in all previous LAR 261 submittals.

## **3) PBNP-EMCB-HELB-RAI-12**

*Page 2.2.1-4 of the PBNP EPU Licensing Report provides an equation for break locations outside containment based on piping local stresses (utilizing ASME Code Cases N-318-5 or N-392-1) at integral welded attachments (IWA) combined with piping stresses and comparing with a threshold stress limit of  $0.8(1.8Sh+SA)$ . As described in the Point Beach HELB Criteria White Paper, dated November 28, 2010, the threshold limit is correctly changed to  $0.8(1.2Sh+SA)$ , to be consistent with the ASME B&PV Code, Section III, Subsection NC, 1977 Edition including W78 Addenda reconciled for use at PBNP. However, the Code Cases N-318-5 and N-392-1 use B stress indices for local stresses, while ASME Code 1977 Edition including W78 Addenda uses stress intensification factor (SIF) in pipe stress calculation. The licensee is requested to provide justification for the inconsistency in combining local stresses using IWA Code Case versions that use B indices versus piping stresses using the Section III 1977 Code including the W78 Addenda that use SIF for computation of equation (9) portion of stresses.*

### **NextEra Response**

See the NextEra response to the RAI 2.c clarification request above. Note that only the local stress formulas for the integral welded attachments are extracted and evaluated from the above cited code cases. The overall pipe stresses formulas that utilize the B indices are ignored. Therefore, B indices are not used and the Equation 1 formulation is used for the overall stresses. The local stresses are then added to the overall stresses as shown in Equation 1.



## **References**

- (1) NRC electronic mail to NextEra Energy Point Beach, LLC, dated November 22, 2010, FW: Request for a teleconference with the applicant re: Point Beach EPU / HELB (TAC Nos. ME1044 and ME1045)
- (2) NRC electronic mail to NextEra Energy Point Beach, LLC, dated December 9, 2010, Point Beach Nuclear Plant, Units 1 and 2 – Request for Additional Information re: LAR 261: EPU HELB – Mechanical and Civil Engineering Branch Review
- (3) FPL Energy Point Beach, LLC letter to NRC, dated April 7, 2009, License Amendment Request 261, Extended Power Uprate (ML091250564)
- (4) U.S. Nuclear Regulatory Commission, "Relaxation in Arbitrary Intermediate Pipe Rupture Requirements," Generic Letter 87-11, dated June 19, 1987 (ML031150493)
- (5) 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)