November 21, 2009

NRC 2009-0115
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 letter to NextEra Energy Point Beach, LLC, dated October 22, 2009, Point Beach Nuclear Plant, Units 1 and 2 – Request for Additional Information From Mechanical and Civil Engineering Branch Re: Auxiliary Feedwater (TAC Numbers ME1081 and ME1082) (ML092930516)

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.

The NRC staff determined that additional information is required (Reference 2). Enclosure 1 provides the NextEra response to the NRC request for additional information (RAI). Enclosure 2 provides auxiliary feedwater system information in response to RAI Question 3.

Summary of Regulatory Commitments

The following new Regulatory Commitment is made via this response:

> NextEra will supplement the response to RAI Questions 2 and 3 to the NRC by January 8, 2010. The supplement will contain: (1) The results of the pipe stress analysis for the Unit 1 tie-in locations. (2) The summary of loads compared to specific allowable values for the nozzles. (3) Confirmation that all AFW piping and pipe supports have been evaluated and are demonstrated to remain structurally adequate.

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 November 21, 2009.

Very truly yours,

NextEra Energy Point Beach, LLC

Larry Meyer
Site Vice President

Enclosures

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 is required (Reference 1) to enable the Mechanical and Civil Engineering Branch to continue the review of the auxiliary feedwater (AFW) system portion of License Amendment Request (LAR) 261, Extended Power Uprate (Reference 2). The following information is provided by NextEra Energy Point Beach, LLC (NextEra) in response to the NRC request for additional information.

Question 1

Identify the code utilized in qualifying the structural integrity of the new and redesigned piping sections of the auxiliary feedwater (AFW) piping and pipe supports for extended power uprate (EPU) conditions. If different from the plant design basis code of record, provide an acceptable justification.

NextEra Response

AFW system piping analysis is being performed in accordance with Point Beach Nuclear Plant (PBNP) Final Safety Analysis Report (FSAR) Appendix A.5.2 criteria for Seismic Class I piping.

All components, systems, and structures classified as Class I are designed in accordance with the following criteria:

1. Primary steady state stresses, when combined with the seismic stresses resulting from a response spectrum normalized to a maximum ground acceleration of 0.04 g in the vertical direction and 0.06 g in the horizontal direction simultaneously, are maintained within the allowable stress limits set forth in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, USAS B31.1, Code for Pressure Piping.

2. Primary steady-state stresses when combined with the seismic stress resulting from a response spectrum normalized to a maximum ground acceleration of 0.08 g acting in the vertical direction and 0.12 g acting in the horizontal direction simultaneously, are limited so the function of the component, system or structure shall not be impaired as to prevent a safe and orderly shutdown of the plant.

The codes being used for this work are consistent with the codes used for the PBNP as-built reconciliation program for NRC Bulletin 79-14, Seismic Analysis for As-Built Safety-Related Piping Systems (Reference 3).

Question 2

Provide loadings and load combinations used for the AFW piping design and analysis, which include seismic and fluid transient loads, and a quantitative summary of the maximum pipe stresses and fatigue usage factors with a comparison to code of record allowable stresses which shows that the acceptance criteria have been met for EPU conditions. Include data at critical locations. For equipment nozzles provide a summary of loads compared to specific allowable values.

NextEra Response

The loadings and load combinations used for the AFW piping and design analysis must be shown to meet the following criteria:

Pipe Stress Limits:

Since USAS B31.1-1967 did not expressly identify how to incorporate earthquake effects, the original design at PBNP used ASME Section III rules as a guide. The terms and equations identified in this section are based on those used in ASME Section III and apply to Seismic Class I and II piping.

Allowable Piping Stress Combinations

CODE EQUATION	LOAD CONDITION	STRESS COMBINATION
Eq. 8	Normal	$S_{lp}+S_{dw} \leq S_h$
Eq. 9B	Upset	$S_{lp}+S_{dw}+S_{obe} \leq 1.2S_h$ or $S_{lp}+S_{dw}+S_{obe}+S_{sam} \leq 1.2S_h$
Eq. 9C	Emergency	$S_{lp}+S_{dw}+S_{sse} \leq 1.8S_h$ or $S_{lp}+S_{dw}+S_{sse}+S_{sam} \leq 1.8S_h$
Eq. 10	Thermal	$S_E+S_{sam} \leq S_A$ or $S_E \leq S_A$
Eq. 11		$S_{lp}+S_{dw}+S_E+S_{sam} \leq S_A+S_h$ or $S_{lp}+S_{dw}+S_E \leq S_A+S_h$

Where:

S_{lp} = Longitudinal pressure stress
S_{dw} = Deadweight stress
S_{obe} = Operating Basis Earthquake stress
S_{sse} = Maximum Safe Shutdown earthquake stress
S_E = Maximum stress due to thermal expansion (including thermal anchor displacement)
S_{sam} = Seismic anchor movement stress due to OBE
S_h = Hot Allowable stress from the code (B31.1-1967)
S_c = Cold Allowable stress from the code (B31.1-1967)
S_A = $f\,(1.25S_c + 0.25S_h)$
f = Stress range reduction factor for cyclic loads (1.0 for 7000 cycles or less)

Stresses due to operating basis earthquake (OBE) seismic anchor movements shall be combined with either Equations 9B and 9C or Equations 10 and 11.

Support Load Combinations:

Combined piping support loads are to be calculated to assess the qualifications of the piping support. The following support combinations are required as input to the support, nozzle, equipment, and penetration qualifications.

Support Load Combinations

LOAD CASE	LOAD COMBINATION
Normal	DW DW+THMx HYD (if applicable)
Upset	DW+OBE+SAM_{obe} DW+OBE+SAM_{obe}+THMx
Faulted	DW+SSE+SAM_{sse} DW+SSE+SAM_{sse}+THMx

Where:

DW = Support load due to dead weight
HYD = Where the piping system normally holds only steam, and hydro testing of the system is required, a separate deadweight run including the weight of the system filled with water shall be made.
THMx = The thermal mode that produces the largest total load in either the positive or negative direction, including the thermal expansion loads and loads imposed by the thermal anchor displacements
SAM_{obe} = Support load due to Seismic Anchor Movements (OBE)
SAM_{sse} = Support load due to Seismic Anchor Movements (SSE)
OBE = Support load due to Seismic OBE
SSE = Support load due to Seismic SSE (= 2 x OBE)

The Normal, Upset and Faulted load cases may alternatively be referred to as the Service Level A, B and D load cases, respectively.

Fatigue analysis is not performed on the AFW piping as USAS B31.1 Code requirements assume a stress range reduction factor to provide conservatism in the piping design to account for the effects of thermal fatigue due to thermal cycling.

The motor-driven AFW (MDAFW) pumping system piping analysis has been completed and support evaluations for the new piping are approximately 20% complete. The piping and support qualification calculations are scheduled to be completed by December 15, 2009.

The following summarizes results of pipe stress analysis completed for the Unit 2 MDAFW tie-ins. Unit 1 information for tie-in locations to the existing AFW system is not available at the time of this letter. The results of the pipe stress analysis for the Unit 1 tie-in locations will be provided by January 8, 2010.

- Unit 2 MDAFW pump discharge to existing AFW discharge header to A steam generator (SG) outside containment

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	280	5,260	15,000	0.351
Equation 9B	135	11,900	18,000	0.661
Equation 9C	135	19,600	27,000	0.726

- Unit 2 MDAFW pump discharge to existing AFW discharge header to B SG outside containment

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	280	7,290	15,000	0.486
Equation 9B	440	9,510	18,000	0.528
Equation 9C	440	17,000	27,000	0.630

The following summarizes results of pipe stress analysis for the design configuration of the new MDAFW pumping system:

- Common MDAFW suction piping from condensate storage tank (CST) to pipe anchor

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	55	2,000	18,800	0.106
Equation 9B	245	5,550	22,560	0.246
Equation 9C	245	10,600	33,840	0.313

- Common MDAFW recirculation piping from pipe anchor to CST

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	265	2,520	18,800	0.134
Equation 9B	325	6,040	22,560	0.268
Equation 9C	325	11,300	33,840	0.334

- Unit 1 and Unit 2 MDAFW pump suction piping from pipe anchor to pumps including service water (SW) supply

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	55	11,700	15,000	0.780
Equation 9B	525	18,000	22,560	0.798
Equation 9C	710	29,800	33,480	0.881

- Unit 1 MDAFW pump discharge piping from pump to pipe anchors including cross-tie piping and common test/recirculation line

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	1,845	7,590	18,800	0.404
Equation 9B	685	11,800	18,000	0.656
Equation 9C	570	25,000	33,840	0.742

- Unit 2 MDAFW pump discharge piping from pump to pipe anchors

Table of Maximum Stresses

	NODE	STRESS (psi)	ALLOWABLE STRESS (psi)	RATIO
Equation 8	325	6,650	15,000	0.443
Equation 9B	260	16,200	22,560	0.607
Equation 9C	260	26,300	33,840	0.694

The following nozzle loads are used in the qualification of the new MDAFW pumps. These loads are used to evaluate the results of the ongoing piping system qualification analyses. Additional supports may be added or vendor requalification of the nozzles for the calculated loads may be performed, if required. The support addition or nozzle requalification will be completed prior to commissioning of the new MDAFW pumping system. The summary of loads compared to specific allowable values for the nozzles will be provided by January 8, 2010.

LOADING	DISCHARGE	SUCTION
Level B – Operating Basis Earthquake	M_a = 250	M_a = 250
	M_b = 50	M_b = 50
	M_c = 700	M_c = 700
	F_a = 200	F_a = 200
	F_b = 350	F_b = 350
	F_c = 75	F_c = 75
Level C – Safe Shutdown Earthquake	M_a = 500	M_a = 500
	M_b = 100	M_b = 100
	M_c = 1,300	M_c = 1,300
	F_a = 300	F_a = 300
	F_b = 550	F_b = 550
	F_c = 150	F_c = 150

Moments (M) are expressed in ft-lbs and Forces (F) are expressed in lbs.

Directions of loading are as follows:

a – axial
b – vertical
c – lateral

The calculated stresses for the CST nozzles are as follows:

	LOCAL STRESS AT NOZZLE TO TANK JUNCTURE (psi)	ALLOWABLE STRESS (psi)	RATIO
8-inch nozzle (MDAFW pump suction line)	46,022	55,000	0.837
4-inch nozzle (MDAFW pump recirculation line)	27,904	55,000	0.507

The nozzle loads for the turbine-driven AFW pumps are not changing.

<u>Question 3</u>

Confirm that all AFW piping and pipe supports have been evaluated and shown to remain structurally adequate to perform their intended design function and provide description of all pipe system and pipe support modifications to the existing AFW that are required to meet design basis at EPU conditions. In addition, provide the schedule of completion of all AFW work.

<u>NextEra Response</u>

The MDAFW pumping system piping analysis has been completed and support evaluations for the new piping are approximately 20% complete. The piping and support qualification calculations are scheduled to be completed by December 15, 2009. The confirmation that all AFW piping and pipe supports have been evaluated and shown to remain structurally adequate will be provided by January 8, 2010.

The results of these analyses indicate that piping and evaluated supports will remain adequate to perform their intended design function following completion of AFW modifications.

Enclosure 2 provides a graphic representation of the AFW system modifications being installed.

The following pipe system and pipe support modifications are being installed to existing piping systems for the AFW system:

MDAFW Mechanical Tie-In Activities During Unit 2 Refueling Outage (Fall 2009):

- Install a 6-inch tap on the southwest (SW) north supply header, a manual isolation valve and blank flange. This tap supports future installation of the safety related SW supply to the new MDAFW pumps from the north SW supply header.
- Install a 3-inch by 3-inch tee on the existing Unit 2 AFW supply lines to Unit 2 SGs with two manual isolation valves, pipe cap, manual drain valve, piping and supports. This tap supports future installation of the discharge piping for the new Unit 2 MDAFW pump.
- Move flow elements 2FE-04037 and 2FE-04036 and the associated flow transmitters 2FT-04037 and 2FT-04036 to a location down stream of the new 3-inch by 3-inch tees on the existing Unit 2 AFW supply lines to Unit 2 SGs. Moving this flow measurement location ensures that the control room indicators display the total flow to a steam generator, thus maintaining the Regulatory Guide (RG) 1.97 function for this indication.
- Install an 8-inch tap on CST T-024A/B, manual isolation valves, pipe caps and drain valves. These taps support future installation of the normal water supply to the new Unit 1 and Unit 2 MDAFW pumps.
- Install a 4-inch tap on CST T-024A/B, manual isolation valves, pipe caps and drain valves. These taps support future recirculation water flow paths for the new Unit 1 and Unit 2 MDAFW pumps.

MDAFW Mechanical Tie-In Activities During Unit 1 Refueling Outage (Spring 2010):

- Install a 6-inch tap on the SW south supply header. This tap provides the safety related SW supply to the new MDAFW pumps from the south SW supply header.
- Install a 3-inch by 3-inch tee on the existing Unit 1 AFW supply lines to Unit 1 SGs. This tap supports future installation of the discharge piping with two manual isolation valves, pipe cap, manual drain valve, piping and supports for the new Unit 1 MDAFW pump.
- Move flow elements 1FE-04037 and 1FE-04036 and the associated flow transmitters 1FT-04037 and 1FT-04036 to a location down stream of the new 3-inch by 3-inch tees on the existing Unit 1 AFW supply lines to Unit 1 SGs. Moving this flow measurement location ensures that the control room indicators display the total flow to a SG, thus maintaining the RG 1.97 function for this indication.

The following modifications are also being installed for the AFW system:

Replacement MDAFW Pump and Piping Installation (Non-Outage):

- Common to Units 1 and 2:
    - o Install foundations for the new MDAFW pumps in the boric acid evaporator rooms.
    - o Set the new MDAFW baseplates on the foundations, level, and grout the base plate.
    - o Install two new pumps (1P-053 and 2P-053) and two new electric motors (1P-053-M and 2P-053-M) on their respective base plates.
    - o Install ½-inch pipe vents and ¾-inch pipe drains and route to floor drains for each pump in the pump rooms.

- Install 6-inch SW cross-tie piping and supports and one 6-inch gate valve from valve SW-00497 at the north SW supply header (previously installed to a termination point near the south SW supply heater).
- Install 8-inch common condensate supply piping and associated supports between the termination points to the Unit 1 and Unit 2 MDAFW areas.
- Install 3-inch MDAFW pump discharge cross-tie piping and supports and three gate valves.
- Install 2-inch test line/recirculation piping and supports from the termination points to the Unit 1 and Unit 2 MDAFW pump areas.

- Unit 1:

  - Install 6-inch condensate supply piping and supports, one gate valve, one check valve, one safety relief valve, and two instrument root valves between the common header and the Unit 1 MDAFW pump suction.
  - Install 4-inch SW piping and supports and one motor-operated gate valve from the SW cross-tie header.
  - Install 3-inch pump discharge piping and supports, two instrument root valves, one flow orifice, four associated instrument root valves, and a check valve.
  - Install 3-inch pump discharge piping and supports, two flow orifices with four instrument root valves each, two air-operated globe valves, two check valves, two cavitating venturis, and four gate valves.
  - Install 1-inch and 2-inch recirculation piping and supports, one check valve, two air-operated globe valves, two restriction orifices, one flow orifice with two instrument root valves, and one 2-inch gate valve to the common test/recirculation header.
  - Install 2-inch test piping and supports, one globe valve, and two gate valves to the common test/recirculation header.
  - Install 2-inch SW blowdown piping and supports, one sight glass, and two gate valves to a point near the tie-in location on the SW south return header.
  - Install two pneumatic supplies. The pneumatic supply will consist of a normal supply from the instrument air system plus a backup pneumatic supply with associated pressure regulators, relief valves, pressure indicators, check valves, and isolation valves.

- Unit 2:

  - Install 6-inch condensate supply piping and supports, one gate valve, one check valve, one safety relief valve, and two instrument root valves between the common header and the Unit 2 MDAFW pump suction.
  - Install 4-inch SW supply piping and supports and one motor-operated gate valve from the SW cross-tie header.
  - Install 3-inch pump discharge piping and supports, two instrument root valves, one flow orifice with associated instrument root valves, and one check valve.
  - Install 3-inch pump discharge piping and supports, two flow orifices with four instrument root valves each, two air-operated globe valves, two cavitating venturis, and two check valves to termination points previously installed.
  - Install 1-inch and 2-inch recirculation piping and supports, two air-operated globe valves, two restriction orifices, one flow orifice with two instrument root valves, and one gate valve to the common test/recirculation header.
  - Install 2-inch test piping and supports, one globe valve and two gate valves to the common test/recirculation headers.

- Install 2-inch SW piping and supports, one sight glass, and two gate valves to the termination point previously installed.
- Install two pneumatic supplies. The pneumatic supply will consist of a normal supply from the instrument air system plus a backup pneumatic supply with associated pressure regulators, relief valves, pressure indicators, check valves and isolation valves.

The current planned schedule for installation and implementation of the upgraded AFW system is to implement the proposed AFW Technical Specifications by the end of the PBNP Unit 1 spring 2010 refueling outage. Activities that are currently planned to be implemented for the new AFW system include the following:

- Unit 1 AFW system tie-in work
- Unit 2 AFW system tie-in work
- Retrain Unit 1 TDAFW pump
- Retrain Unit 2 TDAFW pump
- Install new AFW system piping and instrumentation for Units 1 and 2
- Install new MDAFW pumps
- AFW system testing
- Implement new AFW configuration and new AFW Technical Specifications

Question 4

Confirm that the AFW piping, according to the current licensing basis, is not considered high energy line, and provide a justification.

NextEra Response

AFW pipes are not high energy lines. High energy piping systems are defined in PBNP FSAR, Appendix A.2 as systems where the combined pressure and temperature condition of the fluid exceeds 275 psig and 200ºF.

Reference (2), Attachment 5, Section 2.5.4.5, Table 2.5.4.5-3, Auxiliary Feedwater System Pressure/Temperature Comparision, lists the design and EPU conditions for AFW system piping. Discharge lines from the TDAFW pumps and MDAFW pumps have design and operating pressures greater than 275 psig. However, the design and operating temperature of fluid in AFW piping is less than or equal to 100ºF. Since the fluid temperature in the AFW lines is less than 200ºF, the AFW pump suction and discharge lines do not meet the criteria for high energy piping systems, as defined in PBNP FSAR Appendix A.2.

Steam supply lines for the TDAFW pumps are normally pressurized from the main steam (MS) system up to the normally closed TDAFW pump steam supply motor-operated valves (MOVs) and are high energy lines. The pressurized portions of the steam supply lines are located in the facade structures and PAB. High energy line break (HELB) analyses have been completed for the pressurized lines and demonstrate acceptable response to a HELB event. The normally depressurized TDAFW pump steam supply lines downstream of the MOVs are not considered high energy lines in accordance with PBNP FSAR Appendix A.2, Section A.2.2, High Energy Line Break Outside Containment Criteria, because they are normally depressurized lines that are pressurized only for periodic testing of the TDAFW pumps.

References

(1) NRC letter to NextEra Energy Point Beach, LLC, dated October 22, 2009, Point Beach Nuclear Plant, Units 1 and 2 – Request for Additional Information From Mechanical and Civil Engineering Branch: Re: Auxiliary Feedwater (TAC Numbers ME1081 and ME1082) (ML092930516)

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

(3) NRC Bulletin 79-14, Seismic Analysis for As-Built Safety-Related Piping Systems (ML031220050)

ENCLOSURE 2

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

AFW SYSTEM MODIFICATIONS DRAWING

1 page follows

AFW System - Major Flow Paths Per Unit
With Shared Standby Steam Generator (SSG) pump System