POINT BEACH

November 12, 2010

NRC 2010-0178
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) NextEra Energy Point Beach, LLC, and NRC Electrical Branch Meeting held October 27, 2010, – Follow-up Questions from Electrical Engineering Branch Re: Emergency Diesel Generator Dynamic Analysis

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.

During the Reference (2) meeting, the NRC staff determined that additional information was 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.

NextEra Energy Point Beach, LLC, 6610 Nuclear Road, Two Rivers, WI 54241

I declare under penalty of perjury that the foregoing is true and correct.
Executed on November 12, 2010.

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 held a meeting with NextEra Energy Point Beach, LLC (NextEra) (Reference 1) to enable the Electrical Engineering Branch to continue the review of the auxiliary feedwater (AFW) portion of License Amendment Request (LAR) 261, Extended Power Uprate (EPU) (Reference 2). The following information is provided by NextEra in response to the NRC staff's request for additional information (RAI).

EEEB-1

In response to Electrical Branch RAI 1.a, transmitted via email dated May 19, 2010, NextEra presented the results of the A EDG transient voltage analysis performed utilizing the ETAP dynamic model in NextEra letter dated August 9, 2010. Please provide the basis for all the large pump motor loads (BHP) utilized in the ETAP dynamic model. Specifically, indicate if the BHPs used in the model are conservative considering that initial pump flow rates may be higher than steady state flows due to the lower system resistance seen by the pump while piping fills with water.

NextEra Response

High Head and Low Head Safety Injection Pumps

Technical Specification (TS) surveillance requirement (SR) 3.5.2.2 requires monthly verification that the emergency core cooling system (ECCS) piping is full of water. The established surveillances have been augmented by a Point Beach Nuclear Plant (PBNP) program implemented in response to GL 2008-01. Therefore, there is reasonable assurance that the ECCS piping is nominally full of water and that over-power transients due to filling voided pipe in the high head and low head safety-injection pump systems are not credible.

The electrical transient analysis program (ETAP) dynamic model used the maximum brake horse power (BHP) that the pumps are capable of drawing. Therefore, the BHP used in the analyses reasonably bounds all accident scenarios.

Containment Spray Pumps

The manufacturer's containment spray pump curves exhibit a monotonic rise in BHP requirements to the end of the tested range. However, the dropping head curve and the efficiency curve show that the maximum BHP will be reached at approximately 1700 gallons per minute (gpm), just beyond the tested range of the pumps. Flows above this run-out condition will cause a drop off in the BHP of the pumps.

Hydraulic analyses conservatively calculated the spray pump flow rates based on discharging to a depressurized containment (containment spray starts automatically on a containment high-high pressure signal), and those flow rates were used to determine the BHP loading for the ETAP dynamic model.

The difference in the BHP at the conservative calculated flow conditions and maximum run-out conditions amounts to approximately 5 horsepower (HP). This difference is considered minimal due to the conservatism utilized in the calculated high flow-rate.

Component Cooling Pumps

ACCIDENT UNIT

In the event of a loss of offsite power (LOOP) concurrent with a safety-injection (SI) signal, the component cooling (CC) pumps are stripped off of the electrical bus and do not automatically re-load on the EDG buses. The CC pumps are manually loaded by the operators when directed by site procedures, after verifying that there is adequate margin on the EDGs to accommodate additional load. Manual loading of these pumps occurs well beyond the period of consideration for the ETAP dynamic model.

NON-ACCIDENT UNIT

If the LOOP also affects the non-accident unit, the running CC pump will remain closed in on the associated electrical bus (does not strip), and re-starts when the EDG output breaker closes. The same EDG that is aligned to the non-accident unit may also carry the accident unit loads. Therefore, a conservatively high value was used for the flow through the non-accident unit pump.

The CC system is a closed loop system that operates with a single pump during normal operating conditions. The system is vented to the atmosphere via the expansion / surge tank vent at the system high point. As such, the system will not lose inventory and become voided in the event of a LOOP, and there will not be a refill transient upon resumption of power.

Various CC system valves can automatically isolate from normal operating alignments (e.g. reactor coolant pump thermal barrier isolation valves, rad-waste system isolation valves, and the excess letdown heat exchanger cooling water outlet isolation valve). If isolation occurs, the CC system valves isolation serves to reduce system flows. There are no automatic valves that reposition open to increase system flow in response to an accident.

Normal continuous operating flow is limited to a range of 1650 gpm to 3650 gpm per pump by procedure. The governing procedure also recommends starting a second pump if system flows are to exceed 3000 gpm.

The pump BHP curve characteristics showed a monotonic increase with increasing flow. The analysis of power usage used the upper end of allowable continuous pump flow (3650 gpm). Therefore, the BHP used in the ETAP dynamic analysis reasonably bounds the expected operating conditions and emergency loadings.

Service Water Pumps

The service water (SW) pumps have a very flat BHP curve with a retrograde pump characteristic curve. The highest power draw requirement occurs when operating at minimum flow.

The SW system is common to both units, with 6 pumps supplying a continuous ring header distributing water to both units.

Accordingly, the maximum SW pump BHP requirements were conservatively determined using inputs and assumptions that minimized the total system flow and maximized the number of operating pumps.

These assumptions / inputs utilized in the ETAP dynamic analysis ensure that the calculated BHP requirements for the SW pumps, conservatively bound the worst-case emergency power loading conditions for the system.

Auxiliary Feedwater Pumps

The turbine-driven auxiliary feedwater (AFW) pumps do not require power from the EDGs.

The modification to install new larger capacity motor-driven AFW pumps includes an automatic flow control valve set to limit flow to 297 gpm or less, corresponding to a BHP of 350 HP. A value of 350 HP was used as an input to the ETAP dynamic analysis.

Therefore, the ETAP dynamic analysis appropriately accounts for the maximum attainable pumped flow rate.

EEEB-2

During the meeting on October 27, 2010, NextEra indicated that EDG output frequency is set monthly and assumed to be +/- 0.3 Hz. Please provide details of the calibration and loop accuracies for the EDG frequency loop and calculated loop uncertainties.

NextEra Response

The frequency outputs of the EDGs are verified during their monthly TS surveillance. The calibration of the “A” Train EDGs output frequency is performed utilizing the Weschler HR3-252 frequency monitor by adjusting the Woodward 9903-470 digital reference unit. PBNP operators verify that the EDG frequency is adjusted to 60 Hz and is within the frequency monitor remote indicator readability effect of +/- 0.05 Hz (The frequency monitor meter’s minor divisions are 0.1 Hz).

The total loop uncertainty for the EDG frequency is determined by an instrument uncertainty calculation. The methodology in the instrument uncertainty calculation uses the square root of the sum of the squares (SRSS) method to combine random and independent errors, and algebraic addition of non-random or bias errors. The instrument uncertainty calculation evaluates each type of uncertainty included in the instrument loop and establishes the individual uncertainty value, as applicable.

The total loop error for the EDG frequency was determined to be +/- 0.25 Hz with a 95/95 confidence level. This total loop error for the EDG frequency was rounded up to +/- 0.3 Hz during the evaluation of the electrical distribution system when supplied by the EDGs. The EDG remote frequency indication has a total loop error of +/- 0.117 Hz with a 75/75 confidence level. The following is the summary of the uncertainty for each component with a non-zero instrument loop:

TABLE EEEB 2-1

Woodward Governor:

Parameter	Uncertainty (Hz)
Controller Accuracy	+/- 0.150 (Hz)

TABLE EEEB 2-2

Frequency Monitor (Meter):

Parameter	Uncertainty (Hz)
Remote Indicator Accuracy	+/- 0.093
Remote Indicator Drift	+/- 0.093
Remote Indicator M &TE	+/- 0.062
Remote Indicator Setting Tolerance	+/- 0.1
Remote Indicator Power Supply Effect	+/- 0.056
Remote Indicator Temperature Effect	+/- 0.056
Remote Indicator Readability Effect	+/- 0.050

EEEB-3

In response to Electrical Branch RAI EEB1.C transmitted via email dated September 13, 2010, NextEra provided additional details regarding the evaluation for heating effect on the thermal protective devices in NextEra letter dated September 28, 2010. Please correct response to RAI 1.C, Part 2 to address Limitorque 92-01 Maintenance Update.

NextEra Response

The following is a revision to NextEra's response to EEEB-1.C (Reference 3) to clarify the original response. This revised response replaces the response to EEEB 1.C of Reference (3).

Thermal protective devices for motor control centers (MCC) motors, not including motor-operated valves (MOVs), were evaluated to ensure the protective device would be capable of starting the MCC motor two consecutive times with one start occurring immediately after the previous start. The evaluation used locked rotor current at nameplate voltage data for the full duration of the motor acceleration time. For evaluation purposes, the motor acceleration times were doubled and compared to the thermal protective device characteristic curve using the locked rotor current at nameplate voltage data for the entire motor acceleration time. This approach is conservative because the motors do not remain at locked rotor conditions for the full duration of the motor start. Additionally, motor starting will not occur immediately after the previous start. The MCC motors will start no more than two times. This means that there will be an initial MCC motor start and a potential second MCC motor start if the containment spray pump motor starts concurrently with another large switchgear motor (i.e., during a non-large break loss of coolant accident (LBLOCA) event) because the voltage dips to a point where the contactor drops out and picks up when the voltage is restored to re-start the MCC motor. The evaluation of the protective devices for the MCC motor loads determined that the protective devices will not operate inadvertently during under and over voltage conditions. The conservative approach used in the evaluation bounds uncertainties that might result from the effects of heating due to the voltage transient or residual heat.

The evaluation of thermal protective devices for MOV's conservatively assumed that the motor was at locked rotor current at nameplate voltage during each stall period and at running current during MOV stroke periods, since there are two different values of heating experienced by the MOV thermal overload (TOL) relays. Note that the TOL relay bounds the response of the molded case circuit breaker for each MOV.

The total heating effect of both stall and running operation was summed to determine the TOL relay heating for the entire valve stroke. Therefore, the TOL total heating effect included both stalls during the voltage transients and the heat from the normal stroke of the valve. This total TOL relay heating effect was compared to the heating required to trip the TOL using the TOL relay time characteristic curves. This method was conservative and bounds any uncertainties. The results of the evaluation showed that MOV loads would not actuate their TOL relay based on the total heating effect including stall conditions.

The approach used is conservative and bounds the effects of heating during the voltage transient and residual heating prior to the excursion based on:

1. The typical load step is composed of an initial undershoot (dip) in voltage, recovery and an overshoot in voltage. Based on Manufacturer data and Limitorque Maintenance Update 92-1, MOV current draw is consistent with a constant impedance load. As the voltage decreases, the current would decrease and as the voltage increases the current would increase. The net effect on the TOL heating is that the voltage and current increases and decreases during the load steps approximately cancel each other out. This results in no net TOL heating effect and are bounded by the heating affect by utilizing locked rotor current at nameplate voltage. In addition, the changes in running current have a negligible impact to the total heating effect because the running current is below the 100% trip setpoint of the TOL relay.

2. During stall conditions, an induction motor (MOV) responds as a constant impedance load based on Manufacturer data and Limitorque Maintenance Update 92-1. As the voltage decreases, the current would also decrease. Therefore, the evaluation performed utilized the locked rotor current at nameplate voltage, which would result in a conservative value in evaluating the TOL. This is because the motor will not stall until the voltage drops below 100% of nameplate voltage, which would result in lower stall current than the value utilized in the analysis. The locked rotor current was not increased for overvoltage conditions because the MOV would fully accelerate in less than 0.1 cycles (as stated in EEEB-2E of Reference 3), which would be before the overvoltage condition existed.

Accordingly, the evaluation of the heating effect on the thermal protective devices included the effects of heating during the voltage transient and residual heating prior to the excursion based on the conservative approach that was utilized. The result of the evaluation showed that the equipment was capable of performing the required safety-related function and would not prematurely trip its protective device.

EEEB-4

In response to Electrical Branch RAI I, J, and K transmitted via email dated September 13, 2010, NextEra provided additional details regarding the evaluation for the limiting MOV in NextEra letter dated September 28, 2010. Clarify the stroke time margin of the limiting valve. NextEra letter dated September 28, 2010 indicates a stroke time margin of 3.47 seconds for the limiting valve versus a margin of 0.77 seconds provided in previous correspondence. Also, identify any additional margins (i.e., hydraulic margin-specifically valve opening margin to achieve flow and piping fill time, etc.) not included in the 3.47 second margin.

NextEra Response

The stroke time margin for the most limiting motor-operated valves, (SI-860 MOVs), is 3.47 seconds based on the minimum voltage criteria of the MOVs and supported by design basis calculations. The basis for the margin of 0.77 seconds provided in NextEra letter to NRC dated the August 9, 2010 (Reference 4) included additional unnecessary conservatisms as described in NextEra letter to NRC dated September 28, 2010 (Reference 3).

The following additional margins for the "A" Train not included within the 3.47 seconds are:

(1) The design basis calculation takes into consideration that the containment spray header is empty and the associated fill time is 40 seconds. This is based on the maximum piping volume requirements of the "B" Train. The "A" Train containment spray header piping volume is smaller than the "B" Train. This results in an additional 8 seconds of available margin in the overall containment spray functional time. To support the 32 second piping fill time, 1085 gpm flow from the spray pump is required. A detailed review of the available flow rate at pump start shows that 1168 gpm will be available for piping fill, which provides additional margin.

(2) The design basis calculation takes into consideration that the containment spray pump motor will accelerate in 3.3 seconds and the flow into the containment spray header will not occur until motor is at 100% speed. The results of the EDG ETAP transient analysis show that the containment spray pump starts within 2 seconds. This results in an additional 1.3 seconds (3.3 seconds – 2 seconds) of available margin in the overall containment spray functional time.

(3) The design basis calculation takes into consideration that 1135 gpm of flow will be supplied by the containment spray pump after the motor has started. The calculation considers this flow to occur 13.93 seconds after the EDG output breaker closure. This requires the MOVs to be open to sufficiently allow a flow of 1135 gpm. The detailed evaluation performed for EEEB-5 shows that the SI-860 valves can open enough to allow 1135 gpm of flow in equal to or less than 8.5 seconds. This provides a valve stroke time margin of 5.43 seconds to support the containment spray header fill time requirements. The SI-860's are required to be fully open within 54 seconds to support the containment spray function inside containment. Although the MOV will open to

sufficiently provide the required flow, this will not directly lead to increasing the overall containment spray functional time margin because the containment spray pump motor start will be more limiting. However, the MOV will be open to sufficiently provide the required flow of 1135 gpm prior to the containment spray pump motor starting.

In conclusion, the most limiting MOV for stroke time margin is associated with the SI-860 valves, which have a margin of 3.47 seconds. In addition, there is an additional 9.3 seconds in overall containment spray functional time based on hydraulic margin and a total stroke time margin of 5.43 seconds for the SI-860 valves to provide sufficient flow for containment header fill time.

EEEB-5

In response to Electrical Branch RAI H transmitted via email dated September 13, 2010, NextEra indicates that some MOVs experience voltages lower than their minimum evaluated voltage referred to as an MOV stall in NextEra letter dated September 28, 2010. Confirm that either the MOVs will complete their full stroke prior to stall, or that the MOV stall events occur sufficiently far along in the MOV stroke such that the MOV has sufficient excess torque capability to complete its stroke once voltage is restored. Additionally, if an MOV is predicted to stall prior to the contactor dropping out, confirm that the MOV motors will not be damaged or that no significant stall time exists prior to the contactor dropping out. Please ensure that the following concerns are adequately addressed as part of the response:

(1) the margin for the stroke time of the limiting MOVs,

(2) the output capability of the MOV to deliver the operating requirements for the valve, and

(3) the capability of the MOV to perform its safety function with the predicted voltage reduction that might cause the MOV motor to stall or the contactor to drop out.

NextEra Response

NextEra performed a detailed evaluation of the MOVs included in the ETAP EDG dynamic analysis. The result of the evaluation confirm that either the MOVs will complete their full stroke prior to a stall, or that if MOV stall events occur, the MOV has sufficient excess torque capability to complete its stroke once the voltage is restored and no damage to the MOV will occur. This evaluation was performed for each affected MOV stroke during the load sequencing on the EDG. The evaluation considered the following attributes:

- Open or close percentage of the valve disc
- Flow coefficient (Cv) of the valve based on open close percentage of the valve disc
- Differential pressure across the valve disc
- Piston effect force on valve stem loading
- Differential pressure effect force
- Packing friction

- Required thrust or torque
- Available thrust/torque at reduced voltage
- Motor torque reduction due to temperature

Summary of the Evaluation:

The results of the evaluation show that the MOVs fall into three valve groups as follows:

(1) Group 1 MOVs will complete the desired stroke prior to the stall voltage being reached.

(2) Group 2 MOVs will reach stall voltage once if a containment spray pump motor starts concurrently with another large switchgear motor for a duration of equal to or less than 1.5 seconds during the valve stroke.

(3) Group 3 MOV will reach stall voltage twice; once if a containment spray pump motor starts concurrently with another large switchgear motor for a duration of equal to or less than 1.4 seconds during the valve stroke, and a second time if higher minimum voltage is required during the high load period on the valve for a duration equal to or less than 1.0 second.

The evaluation considered a torque output reduction due to motor temperature increases taking into account the motor temperature increase due to stall conditions for each MOV to ensure that; (1) the motor would produce sufficient torque to complete stroke and (2) the motor would not be damaged. Additionally, when projected to drop out, the motor contactor was conservatively assumed to not drop out during the reduced voltage period. The most limiting valves for motor temperature were the SW valves (SW-2907) from the containment accident fan coolers, which had a temperature rise of 34°C due to the motor stalling for 1.4 seconds. The analysis showed that a final motor temperature rise of up to 74°C would produce sufficient torque to stroke the MOV. Additionally, temperature rise was within the manufacturer's allowable temperature rise of 75°C and therefore the motor would not be damaged.

The evaluation demonstrated that the torque output capability of the MOVs is sufficient to stroke the valves, and there is sufficient torque capability to stroke the valves once voltage is restored. The motor temperature and temperature rise remained within the capability of the MOVs considering stall and running conditions based on manufacturer data. Therefore, the affected MOVs are capable of performing their safety functions and no MOV motors will be damaged as a result of stall conditions.

Conclusions:

The results of the evaluation demonstrated that the MOVs were capable of changing position to support system design basis flow requirements within the time requirements of the accident analysis. The results of the evaluation also demonstrated that the MOVs will not be damaged by potential motor heating as a result of stall conditions when voltage drops occur during operation. Finally, the evaluation results showed that motor control center voltage will recover to a sufficient level to enable restart and finish of MOV strokes following motor stalls due to contactor dropouts in mid stroke or stalls caused by prolonged low voltage conditions. Therefore, all MOVs will be capable of performing their safety functions based on the voltage profile during load sequencing on the "A" Train EDGs.

Table EEEB-5 below provides the available stroke time margin for each valve group including the worst-case possible stall time for each MOV. The time margins are based on the original analysis, which were based on the minimum voltage requirements to operate at pull-out torque and the time penalty associated with these requirements. The stall time is based on the results of the evaluation considering the minimum voltage requirements at pull-out torque, the time penalty and also conservatively taking into consideration that the contactors do not drop out.

TABLE EEEB 5-1

Valve	Design Basis Predicted Stroke Time (sec)	Design Basis Required Stroke Time (sec)	Margin (sec)	Maximum Stall Time (sec)	Valve Group
Low Head Safety-Injection Core Deluge Isolation (SI-852's)	10.56	20	7.24	0	1
Reactor Coolant Pump Seal Return Isolation (Unit 1) (1CV-313)	12.09	No Required Stroke Time	N/A	0	1
Reactor Coolant Pump Seal Return Isolation (Unit 2) (2CV-313)	11.03	No Required Stroke Time	N/A	0	1
Containment Spray Pump Discharge A(B) (SI-860's)	11.73	16.5	3.47	0 (LBLOCA)	1
		No Required Stroke Time	N/A	1.5 (Non-LBLOCA)	2
Service Water Return from Containment Fan Coolers (SW-2907's)	28.92	63.3	30.68	1.4	2
Spent Fuel Pool Heat Exchanger Isolation (SW-2927B and SW-2930A)	19.30	63.3	40.60	1.4	2
Water Treatment Service Water Isolation (SW-4478)	14.95	63.3	42.95	1.4	2
Auxiliary Building A/C Condenser Isolation (SW-2816)	20.22	63.3	37.48	2.4	3

References

(1) NextEra Energy Point Beach, LLC, and NRC Electrical Branch Meeting held October 27, 2010, – Follow-up Questions from Electrical Engineering Branch Re: Emergency Diesel Generator Dynamic Analysis

(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 September 28, 2010, License Amendment Request 261, Extended Power Uprate (ML102710364)

(4) NextEra Energy Point Beach, LLC letter to NRC dated August 9, 2010, License Amendment Request 261, Extended Power Uprate (ML102220146)