December 10, 2010

NRC 2010-0188
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 November 23, 2010, Point Beach Nuclear Plant, Units 1 and 2 - Request for Additional Information Re: Auxiliary Feedwater Modification and Extended Power Uprate License Amendment Requests (TAC NOS. ME1081, ME1082, ME1044, and ME1045) (ML103270224)
(3) NextEra Energy Point Beach, LLC letter to NRC, dated November 30, 2010, License Amendment Request 261, Extended Power Uprate, Response to Request for Additional Information (ML103340421)

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 was 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 regarding Post-LOCA Boron Precipitation. NextEra previously responded to the NRC staff's request for additional information regarding Auxiliary Feedwater/Main Steam Line Break via Reference (3).

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 10, 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 Reactor Systems 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.

Post-LOCA Boron Precipitation

Question 1

Please provide copies of administrative procedures pertaining to Reactor Coolant System (RCS) boration.

NextEra Response

As discussed with the NRC during a teleconference on December 1, 2010, only summary descriptions of the associated administrative procedures need to be provided as discussed below:

The reactivity management procedure in the Point Beach Nuclear Plant (PBNP) operations manual provides administrative guidance for the conservative control of reactor core reactivity, including direct supervision and control of reactivity during different plant operating conditions. This procedure provides requirements for at power shift based reactivity management, including shift briefings, specific plans for reactivity changes (including boration), use of peer checking, and direct Senior Reactor Operator oversight. Boration amounts are determined for required temperature changes, load reductions, or load ramp rates.

The PBNP blender operation/dilution/boration operating procedure describes the chemical and volume control system (CVCS) blender operations required to maintain the required boron concentration in the reactor coolant system (RCS). This procedure describes the specific requirements for normal RCS boration via the blender. A specific reactivity management plan is developed and used. The required quantity of boric acid to be added to the RCS is set into the Boric Acid Flow Counter (i.e., integrator or totalizer) and this quantity is automatically added to the RCS when starting reactor makeup with the Reactor Makeup Mode Selector Switch in "BORATE." Once the desired amount of boron is added, the boration is verified to be secured.

Question 2

Please describe the boration flowpath from the boric acid storage tank to the RCS when aligned for boration.

NextEra Response

Boration during normal power operation is a manually initiated operation that requires selecting the amount of boric acid to be injected, the rate of injection, and then repositioning the Reactor Makeup Mode Selector Switch from "AUTO" to "BORATE." The PBNP Final Safety Analysis Report (FSAR) contains the following description of both the flow path and the sequence of operations that occurs when borating:

> The "borate" mode of operation permits the addition of a preselected quantity of concentrated boric acid solution at a preselected flow rate to the reactor coolant system. The operator sets the mode selector switch to "borate," the concentrated boric acid flow controller set point to the desired flow rate, and the concentrated boric acid batch integrator to the desired quantity. Upon manual start of the system, the stop valve to the charging pumps opens, the selected boric acid transfer pump starts, if not already running, and the concentrated boric acid is added to the charging pump suction header. The total quantity added in most cases is so small that it has only a minor effect on the volume control tank level. When the preset quantity of concentrated boric acid solution has been added, the batch integrator causes the boric acid transfer pump to stop, the boric acid control valve to close and the makeup stop valve to the charging pump suction to close.

The point of boric acid injection for normal charging to the RCS is into the "A" loop cold leg.

Question 3

Please address the possibility of this flowpath existing during a LOCA with offsite power available.

NextEra Response

The CVCS blender controls do not receive a safety injection (SI) or containment isolation (CI) signal, and would remain in service if a LOCA occurred and power to the components was not interrupted.

It is possible for a normal boration to be in progress at the time a LOCA initiates. However, raising RCS boron concentration during normal power operation is an infrequent occurrence. It is only performed when conducting controlled downpower evolutions or, rarely, to compensate for xenon burnout. Therefore, it is unlikely that a boration would be in progress at the time a LOCA occurs.

In practice, borations are either performed incrementally, or with a slow injection rate so that positive control is maintained and the reactor response to the reactivity change can be monitored for the expected results. Additionally, since normal boration requires pre-selecting the amount of boric acid to be injected, and is automatically terminated without operator action, the amount of boric acid that could be introduced into the RCS would be significantly limited.

The point of injection on the "A" cold leg is adjacent to the high head (HH) SI connection for that loop. Injected HHSI flow would mix with the relatively small volume concentrated boric acid, diluting the boric acid at the point of injection. In the event of a break in the "A" loop cold leg, the concentrated boric acid would be spilled to the containment sump where it would mix and be further diluted.

If the break were in the opposite cold leg, the diluted boric acid would be carried by the injected HHSI flow through the core inlet down-comer, bypass the core, and be spilled to the containment sump out of the break. Similarly, if the break were in either hot leg, the diluted boric acid would be carried by the injected HHSI flow through the core, and be spilled to the containment sump out of the break.

In no case is it credible that a high concentration of boric acid would be deposited in the reactor vessel and reside there to be further concentrated by pool boiling. By the time the HHSI pumps are secured due to refueling water storage tank (RWST) depletion, the boration would have ceased, and no additional concentrated boric acid would be injected.

Question 4

Please provide Emergency Operating Procedures to show that the LOCA procedures provide for securing RCS boration from the boric acid storage tank early in the accident sequence.

NextEra Response

There are no steps in the Emergency Operating Procedures (EOPs) for response to a LOCA, which provide for the manual isolation of normal RCS boration from the boric acid storage tanks early in the accident sequence. However, in the transfer to containment sump recirculation – low head injection EOP, the CVCS reactor makeup control is manually aligned to "AUTO," with makeup set to ensure no dilution of the RCS boron concentration and at least one charging pump is checked running with suction aligned to the volume control tank. This step would secure any RCS boration.

Question 5

Please provide reference to the licensing report or request for additional information response providing justification of a 20 minute delay in boric acid accumulation at a recently uprated plant of similar design to Point Beach.

NextEra Response

Justification of a 20 minute delay in boric acid accumulation at a recently uprated plant of similar design to PBNP can be found in Reference (3). An equivalent analysis was performed for PBNP to justify a 20 minute delay in boric acid accumulation as described below:

During the injection phase, with both cold leg HHSI flow and upper plenum injection (UPI) (RHR) flow, the liquid level in the core rises rapidly to the point where the liquid finds its way out the break. To demonstrate this, a WCOBRA/TRAC (WC/T) run that modeled a hot leg break for the injection phase after a LOCA was investigated. The WC/T core hydraulic model consists of four core channels each divided into 12 axial cells. The four core channels represent the hot assembly, two average power regions, and a low power (core periphery) region. For the purpose of this demonstration analysis, the data from the hot assembly and average power regions are combined and referred to as the 'high power channels' and the low power region is referred to as the 'low power channel.' The following observations were made:

1. From the beginning of reflood onward, there is significant liquid flow out of the hot leg break (Figure 5-1).

2. After 100 seconds, UPI water travels down into the low power, outer core regions. At the same time, there is significant upward flow in the center, high power core region (Figure 5-2). This indicates sufficient circulation such that the core and upper plenum are well mixed. These core flow patterns are consistent with those observed in the CCTF Core-II large scale tests (Reference 4).

3. With one HHSI pump injecting to both cold legs, the SI flow to the cold leg is approximately six times the net core boil-off rate (Figure 5-3).

Because there are high amounts of liquid flow out the break, and because the core and upper plenum regions are well mixed, there is no potential for significant boric acid buildup in the core during the injection phase following a large break LOCA in the hot leg. Cold leg injected flow is much greater than boil-off during this time and this will also promote core dilution by forcing flow into the core region from the lower plenum.

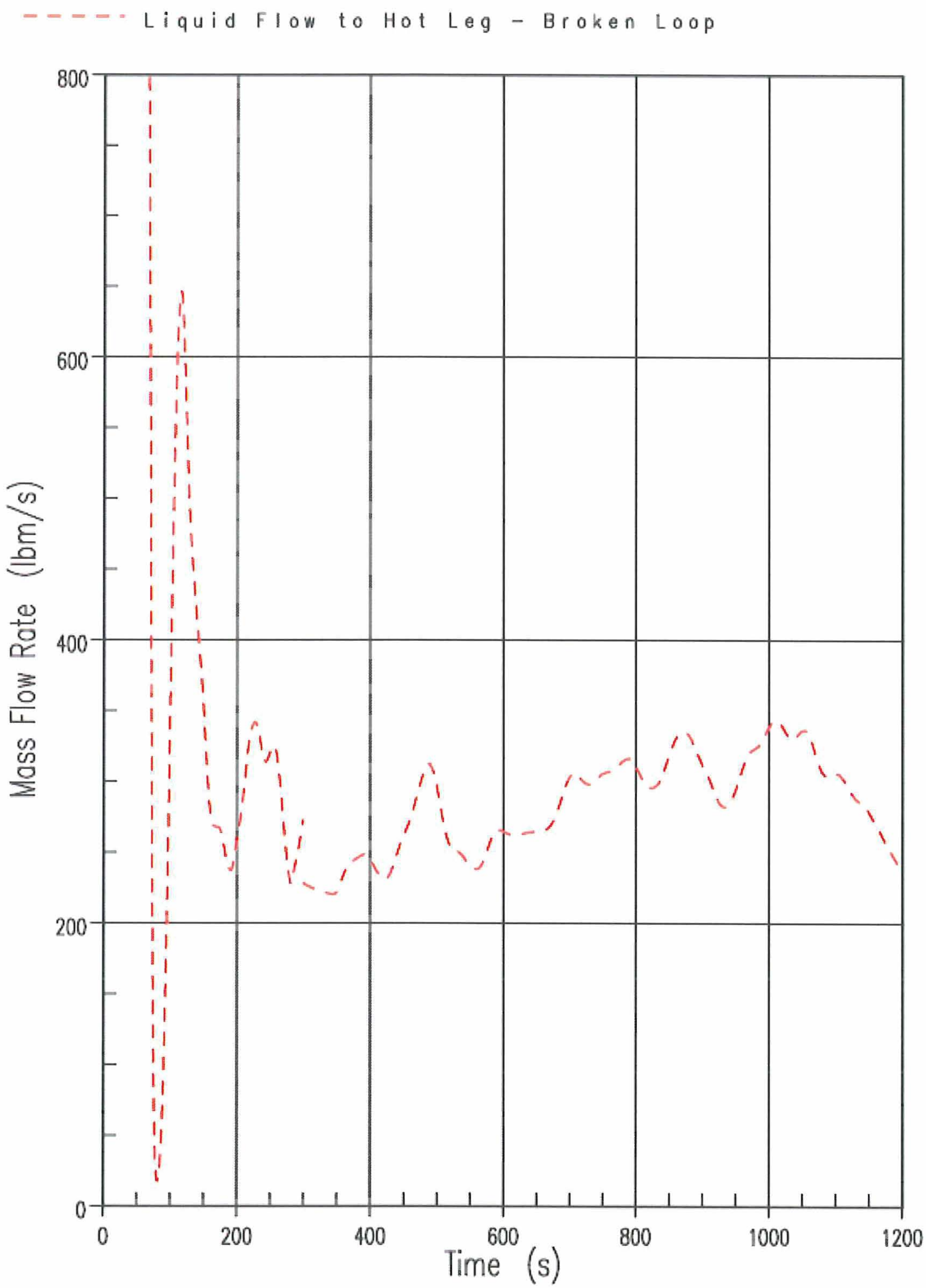

Figure 5-1: Broken Loop Hot Leg Liquid Mass Flow Rate

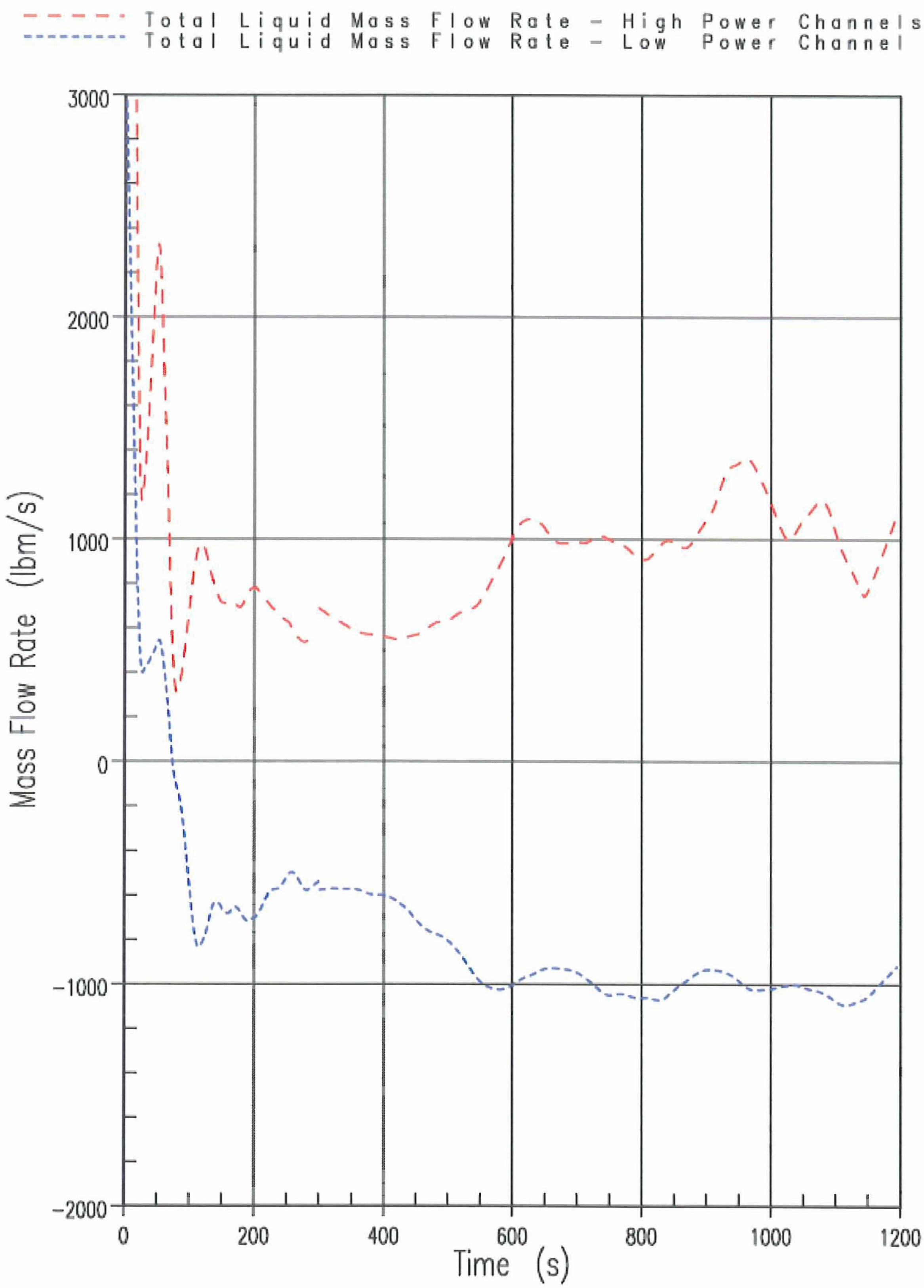

Figure 5-2: Axial Liquid Mass Flow Rate at Top of Core

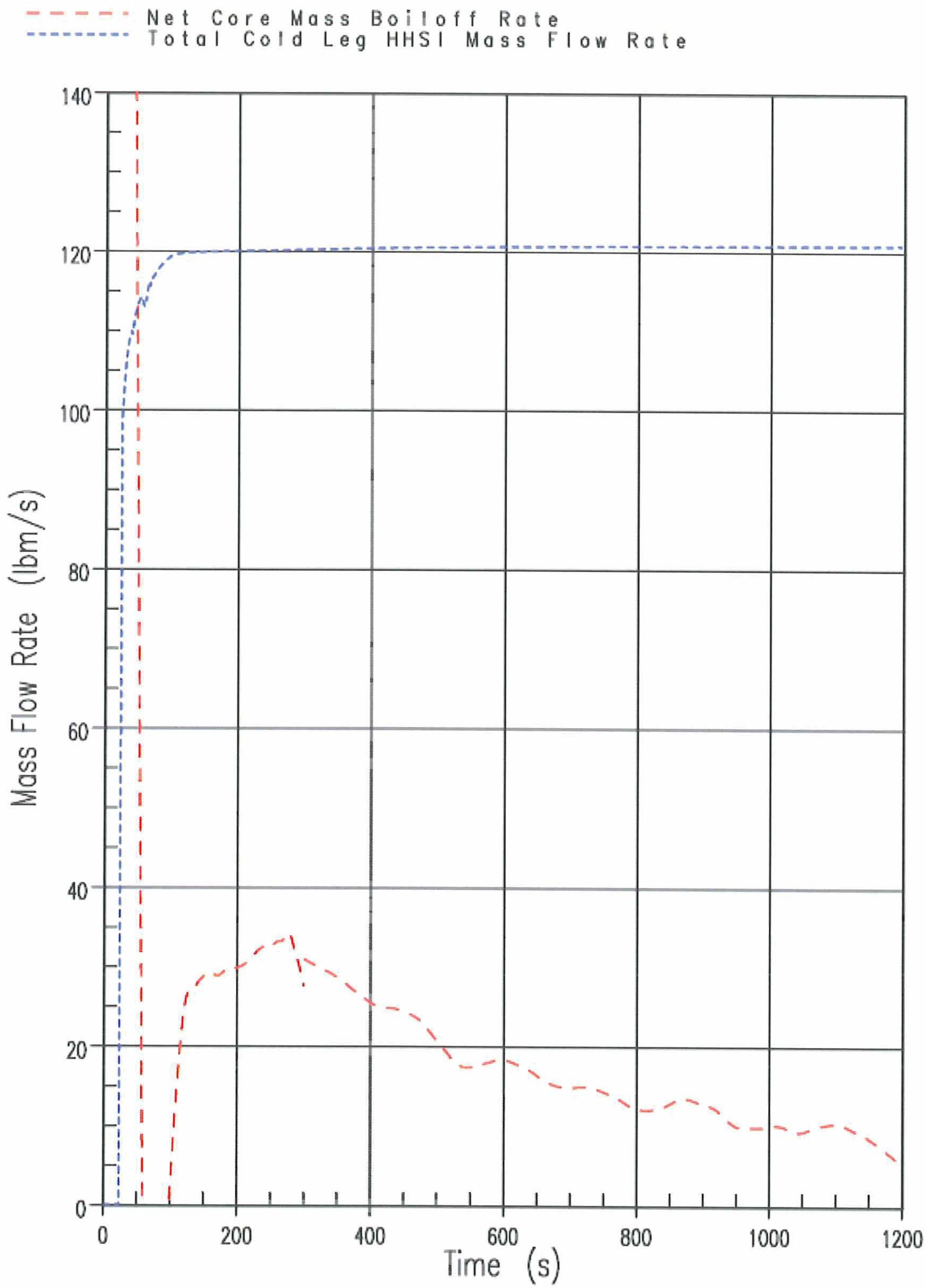

Figure 5-3: Core Boil-off Rate Compared to Cold Leg High Head SI Injection Flow

Question 6

Provide a limiting bottom-peaked axial power distribution.

NextEra Response

The limiting bottom skewed power shape data is tabulated in Table 6-1 and graphically depicted in Figure 6-1.

Table 6-1: Limiting Bottom-Peaked Axial Power Distribution

z (ft)	Normalized Power	z (ft)	Normalized Power
0.00	0.9874	6.25	0.8971
0.25	1.0509	6.50	0.8905
0.50	1.1087	6.75	0.8898
0.75	1.1606	7.00	0.8951
1.00	1.2068	7.25	0.9063
1.25	1.2472	7.50	0.9233
1.50	1.2817	7.75	0.9464
1.75	1.3106	8.00	0.9750
2.00	1.3336	8.25	0.9987
2.25	1.3508	8.50	1.0117
2.50	1.3623	8.75	1.0140
2.75	1.3679	9.00	1.0054
3.00	1.3667	9.25	0.9862
3.25	1.3521	9.50	0.9561
3.50	1.3233	9.75	0.9154
3.75	1.2801	10.00	0.8638
4.00	1.2229	10.25	0.8016
4.25	1.1630	10.50	0.7285
4.50	1.1090	10.75	0.6448
4.75	1.0610	11.00	0.5502
5.00	1.0189	11.25	0.4449
5.25	0.9827	11.50	0.3289
5.50	0.9524	11.75	0.2021
5.75	0.9280	11.9375	0.1000
6.00	0.9096		

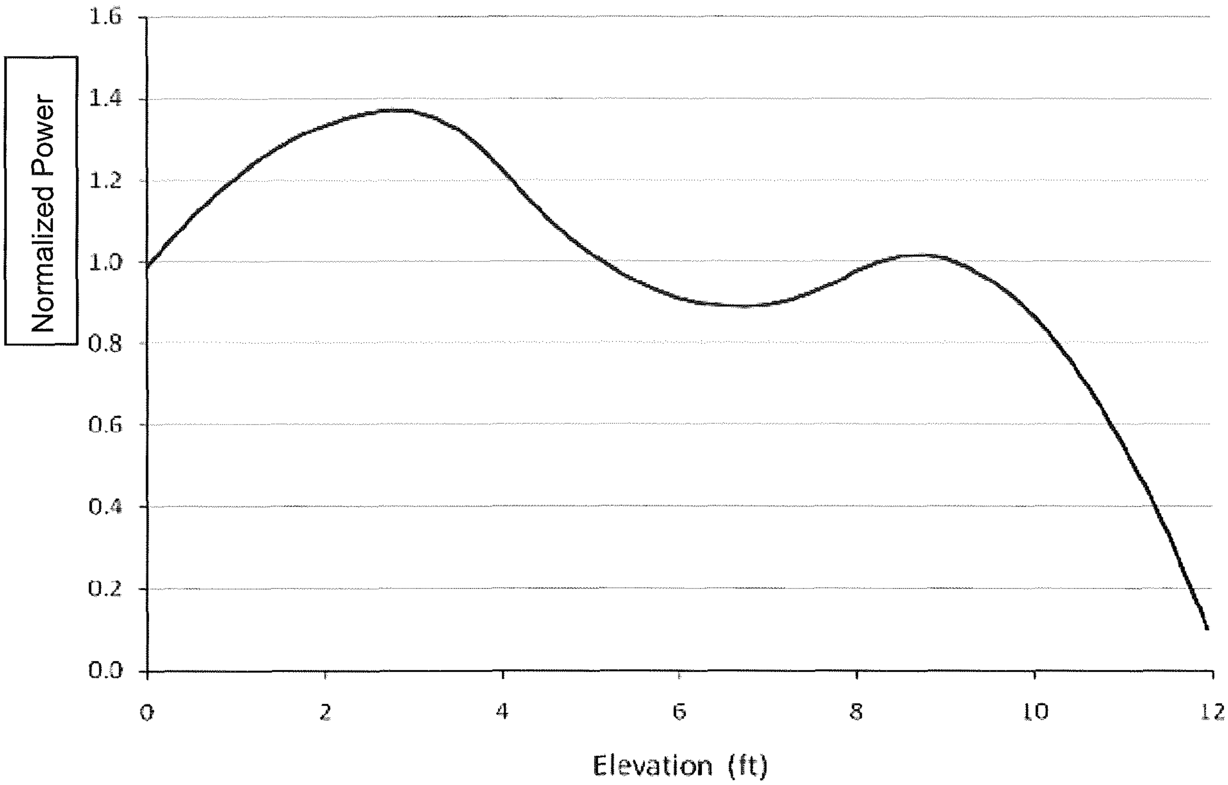

Figure 6-1: Limiting Bottom-Peaked Axial Power Distribution for Average Power Rod

References

(1) NRC letter to NextEra Energy Point Beach, LLC, dated November 23, 2010, Point Beach Nuclear Plant, Units 1 and 2 - Request for Additional Information Re: Auxiliary Feedwater Modification and Extended Power Uprate License Amendment Requests (TAC NOS. ME1081, ME1082, ME1044, and ME1045) (ML103270224)

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

(3) Constellation Energy Generation Group letter to NRC, dated May 9, 2006, R. E. Ginna Nuclear Power Plant, Docket No. 50-244, Response to Requests for Additional Information Regarding Topics Discussed on Conference Calls for Extended Power Uprate (EPU) (ML061350375)

(4) MPR-933, "Report by MPR Associates, Inc., CCTF-II Research Information Report for Tests Related to Upper Plenum Injection (UPI)," March 1987