



**FPL Energy**  
**Seabrook Station**

**FPL Energy Seabrook Station**  
**P.O. Box 300**  
**Seabrook, NH 03874**  
**(603) 773-7000**

September 23, 2005

Docket No. 50-443  
SBK-L-05200

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555-0001

**Seabrook Station**  
**Facility Operating License NPF-86**  
**Response to Request for Additional Information Regarding**  
**Seabrook Station, Unit No. 1, License Amendment Request 05-01**  
**Recapture of Zero-Power and Low-Power Testing Time**

References:

1. FPL Energy Seabrook, LLC letter (NYN-05072) to NRC, "Seabrook Station License Amendment Request 05-01 Request for Amendment to Facility Operating License NPF-86 Recapture of Zero-Power and Low-Power Testing Time," dated March 28, 2005.
2. NRC letter to FPL Energy Seabrook, LLC, "Draft Request for Additional Information Related to Recapture of Zero-Power and Low-Power Testing Time, Seabrook Station, Unit No. 1, dated July 12, 2005.

By letter dated March 28, 2005 (Reference 1) FPL Energy Seabrook, LLC submitted License Amendment Request 05-01, Request for Amendment to Facility Operating License NPF-86 Recapture of Zero-Power and Low-Power Testing Time.

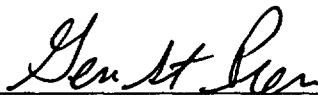
In Reference 2, the NRC requested additional information in order to complete its evaluation. Enclosed herein is the FPL Energy Seabrook, LLC response to the requested additional information.

Should you have any questions regarding this information, please contact Mr. James Peschel, Regulatory Programs Manager, at (603) 773-7194.

A001

Very truly yours,

FPL Energy Seabrook, LLC



Gene St. Pierre  
Site Vice President

Enclosure

cc: S. J. Collins, NRC Region I Administrator  
V. Nerses, NRC Project Manager, Project Directorate I-2  
G. T. Dentel, NRC Resident Inspector

Mr. Bruce G. Cheney, ENP, Director, Division of Emergency Services  
N.H. Department of Safety  
Division of Emergency Services, Communications, and Management  
Bureau of Emergency Management  
33 Hazen Drive  
Concord, NH 03305

#### OATH AND AFFIRMATION

I, Gene St. Pierre, Site Vice President of FPL Energy Seabrook, LLC, hereby affirm that the information and statements contained within this response to the request for additional information to License Amendment Request 05-01 are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

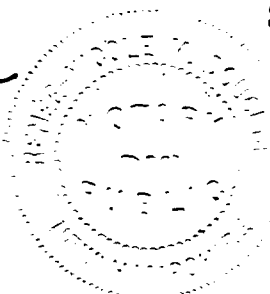
Sworn and Subscribed  
before me this

23<sup>rd</sup> day of September, 2005



Gene St. Pierre  
Site Vice President

  
Notary Public



**Enclosure to Letter SBK-L-05200**

**Seabrook Station  
Facility Operating License NPF-86  
Response to Request for Additional Information Regarding  
Seabrook Station, Unit No. 1, License Amendment Request 05-01  
Recapture of Zero-Power and Low-Power Testing Time**

**RAI 1.**

The proposed amendment would revise the expiration date of the SS operating license to recapture zero- and low-power testing time. In the Technical Analysis section of the license amendment request, the licensee discussed neutron embrittlement effects on the reactor vessel materials. Title 10 of the *Code of Federal Regulations*, Section 50.61, Paragraph (b)(1), (10 CFR 50.61(b)(1)) requires: "For each pressurized water nuclear power reactor for which an operating license has been issued, other than a nuclear power reactor facility for which the certifications required under Sec. 50.82(a)(1) have been submitted, the licensee shall have projected values of  $RT_{PTS}$  accepted by the NRC, for each reactor vessel beltline material for the EOL (End of License) fluence of the material." Additionally, 10 CFR 50.61(b)(1) requires: "This assessment must be updated...upon request for a change in the expiration date for the facility."

- a. Please identify the portion of the License Amendment Request that describes the update required by 10 CFR 50.61. If this information is not included or identified in your March 28, 2005 License Amendment Request, provide an assessment of the  $RT_{PTS}$  value for each beltline material at the proposed license expiration date. This assessment should include sufficient information to demonstrate how  $RT_{PTS}$  was calculated from materials property data for the SS beltline materials and the projected neutron fluence ( $E > 1.0$  MeV) at the proposed license expiration date.

**FPLE Response: RAI No. 1**

The Seabrook Station reactor vessel beltline materials  $RT_{PTS}$  values were recalculated in support of the Power Uprate Project. The Power Uprate License Amendment was submitted on March 17, 2004 and was approved by the NRC as License Amendment No. 101 on February 28, 2005. The  $RT_{PTS}$  values were based upon uprated fluence values at the end-of-license (40 EFPY) per 10 CFR Part 50.61. The use of 40 EFPY at the end-of-license is a conservative assumption because it assumes 100% power for the entire life of the plant (no shutdowns). This assumption results in fluence projections that are higher than normal or achievable. All of the  $RT_{PTS}$  values meet the screening criteria of 270°F for longitudinal welds and plates, and 300°F for circumferential welds. The updated  $RT_{PTS}$  values were determined in Calculation C-S-1-28048 (Westinghouse Calculation CN-RCDA-03-68) and are documented in Table 6.3-7. Therefore, the updated  $RT_{PTS}$  values presented below are valid for the proposed license expiration date.

**TABLE 6.3-7**  
**RT<sub>PTS</sub> Calculations for Seabrook Unit 1 Beltline Region Materials, 40 EFPY**

| Material   | Fluence<br>( $\times 10^{16}$ n/cm <sup>2</sup> ,<br>E>1.0 MeV) | FF   | CF<br>(°F) | $\Delta RT_{PTS}^{(c)}$<br>(°F) | Margin<br>(°F)      | RT <sub>NDT(U)</sub> <sup>(a)</sup><br>(°F) | RT <sub>PTS</sub> <sup>(b)</sup><br>(°F) |
|--|---|------|------------|---------------------------------|---------------------|---|--|
| Intermediate Shell Plate R-1806-1  | 2.20  | 1.21 | 28.5       | 34.5                            | 34                  | 40  | 109                                      |
| Intermediate Shell Plate R-1806-2  | 2.20  | 1.21 | 37         | 44.8                            | 34                  | 0   | 79                                       |
| Intermediate Shell Plate R-1806-3  | 2.20  | 1.21 | 47.5       | 57.5                            | 34                  | 10  | 102                                      |
| Lower Shell Plate R-1808-1   | 2.20  | 1.21 | 37         | 44.8                            | 34                  | 40  | 119                                      |
| Lower Shell Plate R-1808-2   | 2.20  | 1.21 | 37         | 44.8                            | 34                  | 10  | 89                                       |
| Lower Shell Plate R-1808-3   | 2.20  | 1.21 | 44         | 53.2                            | 34                  | 40  | 127                                      |
| Using S/C Data <sup>(d)</sup>  | 2.20  | 1.21 | 39.5       | 47.8                            | 17 <sup>(d)</sup>   | 40  | 105                                      |
| Intermediate & Lower Shell<br>Longitudinal Weld Seams (Heat #<br>4P6052) | 2.20  | 1.21 | 30.7       | 37.1                            | 37.1                | -60   | 14                                       |
| Using S/C Data <sup>(d)</sup>  | 2.20  | 1.21 | 12.4       | 15.0                            | 15.0 <sup>(d)</sup> | -60   | -30                                      |
| Intermediate to Lower Shell Girth<br>Weld Seam (Heat # 4P6052)           | 2.20  | 1.21 | 30.7       | 37.1                            | 37.1                | -60   | 14                                       |
| Using S/C Data <sup>(d)</sup>  | 2.20  | 1.21 | 12.4       | 15.0                            | 15.0 <sup>(d)</sup> | -60   | -30                                      |

**Notes:**

- (a) Initial RT<sub>NDT</sub> values are measured values
- (b)  $RT_{PTS} = RT_{NDT(U)} + \Delta RT_{PTS} + \text{Margin (°F)}$
- (c)  $\Delta RT_{PTS} = CF \cdot FF$
- (d) Using Credible Surveillance Capsule Data.

**RAI 2.**

Please provide a description of effect the proposed change would have on the reactor vessel surveillance program capsule withdrawal schedule, as required by 10 CFR Part 50, Appendix H. Specifically, identify whether the withdrawal schedule would need to be changed to remain in compliance with the edition of American Society for Testing and Materials (ASTM) E-185 "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," that is applicable to SS.

**FPLE Response: RAI No. 2**

The Seabrook Station reactor vessel surveillance program capsule withdrawal schedule was reevaluated in support of the Power Uprate Project. The Power Uprate License Amendment was submitted on March 17, 2004 and was approved by the NRC as License Amendment No. 101 on February 28, 2005. The surveillance capsule withdrawal schedule was determined per the guidelines specified in ASTM E185-82 and is documented in Calculation C-S-1-28048 (Westinghouse Calculation CN-RCDA-03-68). The nil ductility transition temperature shift  $\Delta RT_{NDT}$  values were calculated using uprated fluence values conservatively assuming 40 EFPY at the end-of-license (EOL) for all reactor vessel beltline materials. The projected maximum

EOL transition temperature increase of the beltline region materials is less than 100°F as tabulated in Table 6.3-3 of Calculation C-S-1-28048. As the transition temperature shift  $\Delta RT_{NDT}$  is less than 100°F at EOL assuming 40 EFPY, the number of surveillance capsules required to be tested per ASTM E-185-82 is unchanged at three capsules. The Seabrook surveillance capsule program has pulled and tested three capsules to date. A fourth capsule is scheduled to be removed at a time when the capsule fluence corresponds to not less than once or greater than twice the peak ID fluence at EOL. The scheduled removal time is 21 EFPY with a fluence of approximately  $4.24 \times 10^{19}$  n/cm<sup>2</sup>. With a new EOL fluence of  $2.20 \times 10^{19}$  n/cm<sup>2</sup> the last capsule will meet the ASTM E185 criteria removal time criteria and the current reactor vessel surveillance capsule withdrawal schedule is unaffected. Therefore, the proposed license expiration date does not require revision of the existing Seabrook Station surveillance capsule withdrawal schedule.

**TABLE 6.3-3**  
**EOL (40 EFPY)  $\Delta RT_{NDT}$  Values for all Seabrook Unit 1 Beltline Materials**

| Material  | CF <sup>(a)</sup> | f @ 40 EFPY <sup>(b)</sup> | FF <sup>(c)</sup> | $\Delta RT_{NDT}$ <sup>(d)</sup> |
|---|-------------------|----------------------------|-------------------|----------------------------------|
| Intermediate Shell Plate R-1806-1                                     | 28.5°F            | 2.20                       | 1.21              | 35°F                             |
| Intermediate Shell Plate R-1806-2                                     | 37°F              | 2.20                       | 1.21              | 45°F                             |
| Intermediate Shell Plate R-1806-3                                     | 47.5°F            | 2.20                       | 1.21              | 58°F                             |
| Lower Shell Plate R-1808-1  | 37°F              | 2.20                       | 1.21              | 45°F                             |
| Lower Shell Plate R-1808-2  | 37°F              | 2.20                       | 1.21              | 45°F                             |
| Lower Shell Plate R-1808-3  | 44°F              | 2.20                       | 1.21              | 53°F                             |
|   | 39.5°F            | 2.20                       | 1.21              | 48°F                             |
| Intermediate & Lower Shell Longitudinal<br>Weld Seams (Heat # 4P6052) | 30.7°F            | 2.20                       | 1.21              | 37°F                             |
|   | 12.4°F            | 2.20                       | 1.21              | 15°F                             |
| Intermediate to Lower Shell Girth Weld Seam<br>(Heat # 4P6052)        | 30.7°F            | 2.20                       | 1.21              | 37°F                             |
|   | 12.4°F            | 2.20                       | 1.21              | 15°F                             |

**Notes:**

(a) The chemistry factors are from Table 6.3-2.

(b) f @ 40 EFPY is the 40 EFPY fluence at the clad/base metal interface ( $\times 10^{19}$  n/cm<sup>2</sup>, E > 1.0 MeV).

(c)  $FF = f^{0.28 - 0.1 \log f}$ , where f is the clad/base metal interface fluence.

(d)  $\Delta RT_{NDT} = CF \cdot FF$