FPL Energy
Seabrook Station

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

April 20, 2006

Docket No. 50-443
SBK-L-06081

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
Completion of License Condition 2.K

References:

1. FPL Energy Seabrook, LLC letter (SBK-L-05226) to USNRC Document Control Desk, "Completion of License Condition 2.K," dated November 7, 2005.
2. FPL Energy Seabrook, LLC letter (SBK-L-06006) to USNRC Document Control Desk, "Completion of License Condition 2.K, Supplemental Information," dated January 11, 2006.
3. Memo to D. J. Roberts NRC, from G. E. Miller NRC, "Seabrook Station Unit No. 1 Facsimile Transmission, Draft Request for Additional Information (RAI) to be Discussed in an Upcoming Conference Call (TAC NO. MC8873), dated March 3, 2006.

By letter dated November 7, 2005 and supplemented by letter dated January 11, 2006 (References 1 and 2, respectively), FPL Energy Seabrook, LLC (FPL Energy Seabrook) provided a revised safety analysis for the inadvertent actuation of the Emergency Core Cooling System at power event. The letters provided the information required by facility operating license NFP-86, license condition 2.K.

A001

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 correspondence including the enclosure 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
20th day of April, 2006

Shirley Sweeney
Notary Public

Gene St. Pierre
Site Vice President

Enclosure to Letter SBK-L-06081

Response to Request for Additional Information Concerning Facility Operation License NPF-86 Completion of License Condition 2.K

RAI #1:

The Seabrook final safety analysis report (FSAR) Section 10.2.3.4 [sic: 10.3.2.4] lists the atmospheric relief valves (ARVs) stroke time to be less than, or equal to, 70 seconds, which appears to be different than the stroke time modeled in the analysis provided in the November 7, 2005, letter. Please clarify this discrepancy or provide an inadvertent emergency core cooling system actuation analysis that takes into account the value listed in the Seabrook FSAR for ARV stroke time.

FPL Energy Seabrook Response to RAI #1:

The 70 second stroke time specified in the Seabrook Station Updated Final Safety Analysis Report (UFSAR) Section 10.3.2.4 is the specified design limit for atmospheric steam dump valve closure. The atmospheric steam dump valve opening stroke time design range is 15 to 50 seconds and the closing stroke time design range is 30 to 70 seconds. Review of the actual open and close stroke times of all four atmospheric steam dump valves recorded in the test data over the last five years indicate opening and closing stroke times are well within the specified design ranges.

For the conservative analysis provided in FPL Energy Seabrook, LLC letter (SBK-L-05226) dated November 7, 2005, it was not necessary to explicitly model the atmospheric steam dump valve stroke time due to the relative insensitivity of the results to atmospheric steam dump valve stroke time. The cooling capability of the atmospheric steam dump valves is such that the Reactor Coolant System inventory rapidly cools to provide a significant volume reduction. When the atmospheric steam dump valves are opened anytime prior to a time when the pressurizer is near full capacity, several minutes into the event, the Reactor Coolant System inventory volume reduction is sufficient to prevent pressurizer overfill as described in the analysis. In addition to crediting only three of the available four atmospheric steam dump valves the analysis also conservatively assumes only 70% of the atmospheric steam dump valve flow capacity is available. An additional analysis has been performed at this time to confirm the relative insensitivity of the analysis results to atmospheric steam dump valve actuation or stroke time. This confirmatory analysis was performed crediting full atmospheric steam dump valve capacity as provided in Section 10.3.2.4 of the Seabrook Station UFSAR and delaying the opening of the atmospheric steam dump valves. The results of this confirmatory analysis, summarized below, demonstrates that even if the three of the four atmospheric steam dump valves are not opened until 8 minutes into the event, stopping the charging pumps at 9 and 13 minutes still prevents the pressurizer from going water-solid and confirms the overall conservative bounding nature of the analysis previously provided.

The confirmatory analysis was modeled consistent with the analysis provided in FPL Energy Seabrook letter SBK-L-05226 with the following assumptions:

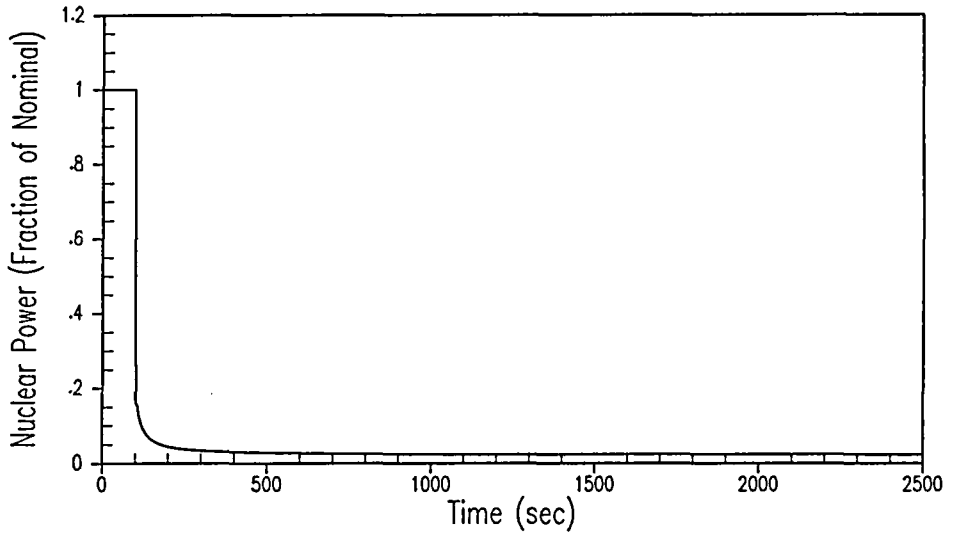
1. Operator action is taken to ensure three of four atmospheric steam dump valves are full open at or before 8 minutes (corresponding with the computer run time of 580 seconds) after event initiation while maintaining 557°F indicated T_{avg} for the remainder of the event.

2. The atmospheric steam dump valve flow area is defined in the Seabrook Station UFSAR Section 10.3.2.4.

Figures 1 through 4 below provide the results of the confirmatory analysis.

Additionally, operator time studies are based on manual positioning of the atmospheric steam dump valves to maintain Reactor Coolant System temperature at 557°F, as prescribed by the emergency operating procedures. Manual positioning of the atmospheric steam dump valves is performed by step 6 of E-0, "Reactor Trip or Safety Injection." Note that this step is also performed prior to stopping the first charging pump.

Thus, the successful termination of the inadvertent actuation of the Emergency Core Cooling System at power event does not require credit for automatic action and a specific stroke time of the atmospheric relief valves.



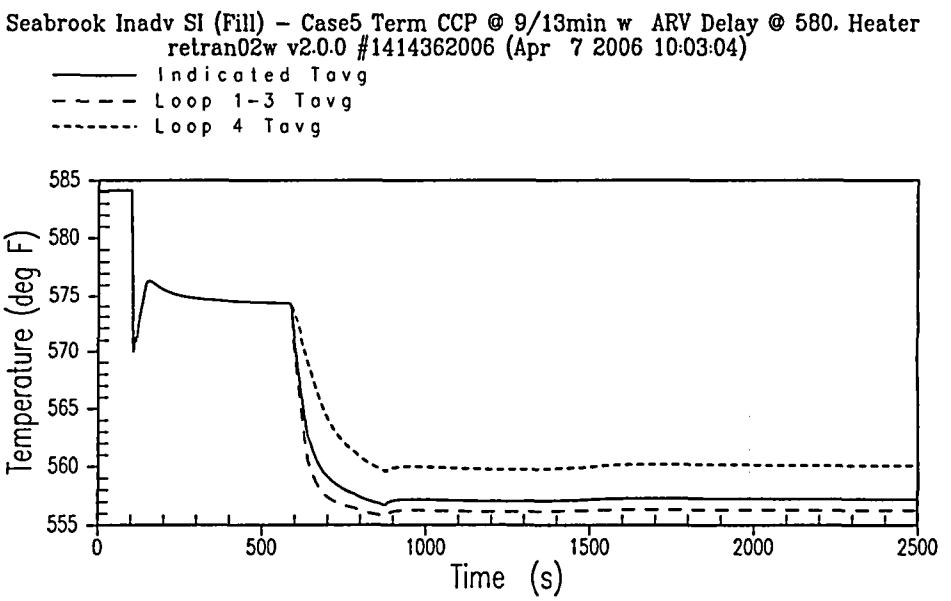
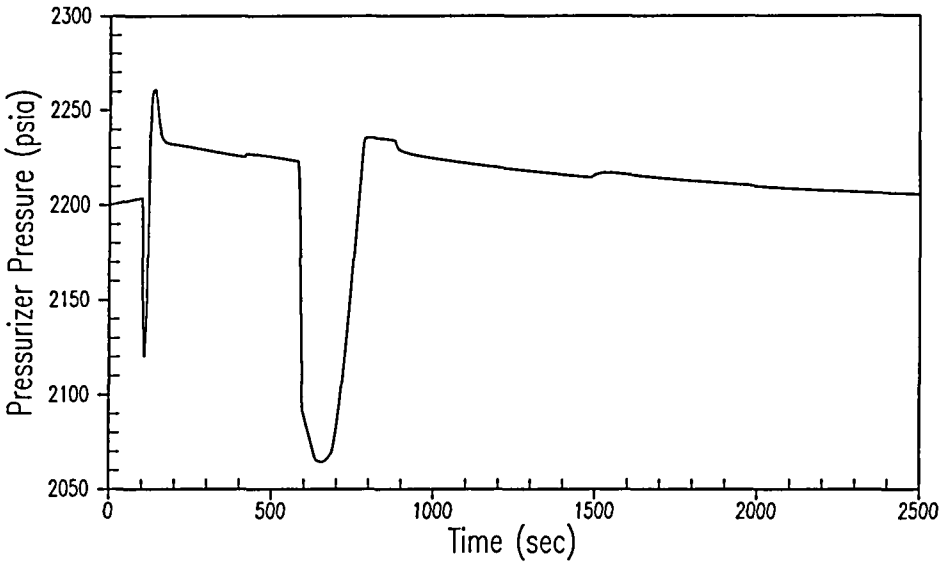


Figure 1
Nuclear Power and Indicated/Loop T_{avg} versus Time



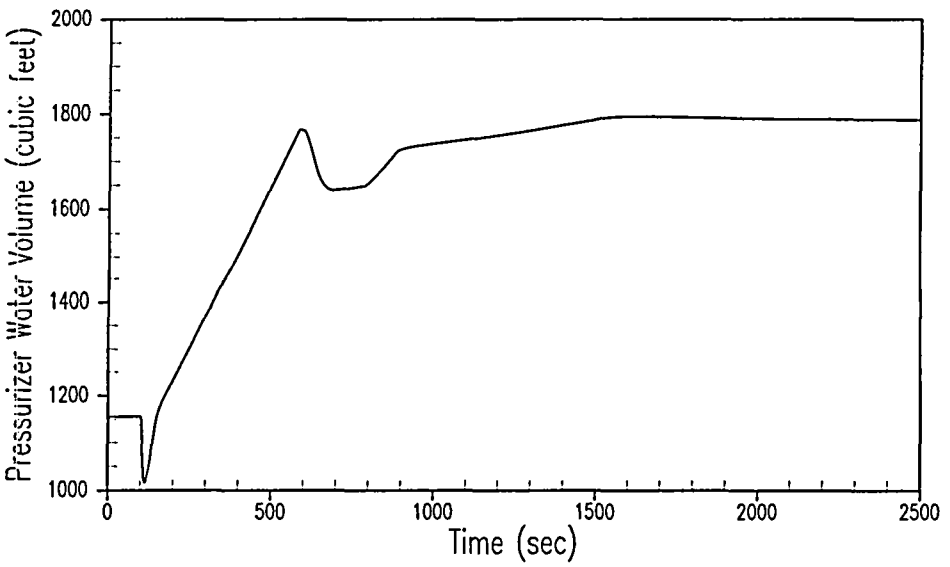


Figure 2
Pressurizer Pressure and Water Volume versus Time

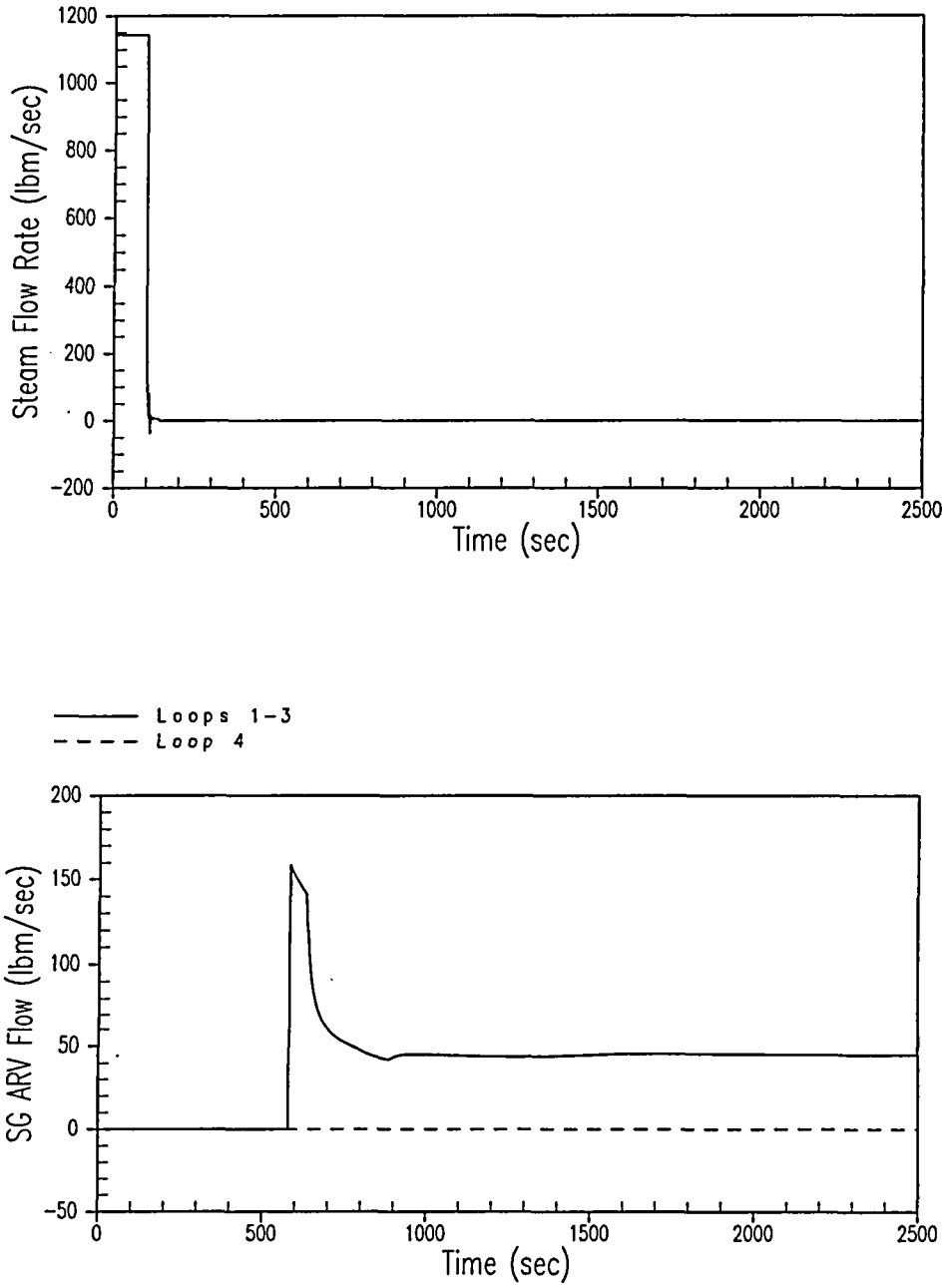


Figure 3
Steam Flow and
Steam Generator Atmospheric Steam Dump Valve Flow
versus Time

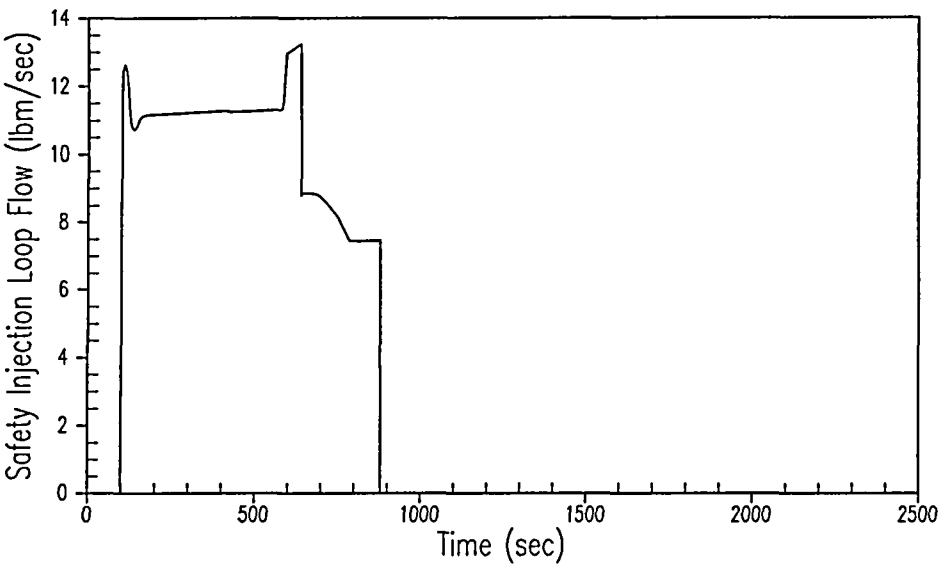


Figure 4
Safety Injection Flow versus Time

Notes:

1. Safety Injection flow is a function of Reactor Coolant System pressure.
2. Safety Injection flow from one centrifugal charging pump terminated at 540 seconds (9 minute operator action)
3. All Safety Injection flow terminated at 880 seconds (13 minute operator action)

RAI #2:

Technical Specification (TS) 3.7.1.6 governs the operability of the ARVs, and its associated Surveillance Requirement 4.7.1.6 requires verification of the operability at certain intervals based on nitrogen accumulator tank pressure and the ability to open and close fully. Provide a justification for why the following assumptions found in the analysis submitted and the FSAR do not meet any of the criterion of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.36(c)(2)(ii) or 10 CFR 50.36(c)(3) for inclusion in the Seabrook TSs:

a. The assumption that the valve stroke time is less than, or equal to, 70 seconds.

b. The ARVs are assumed to be in automatic mode during power operation (FSAR Section 10.2.3.4 [sic: 10.3.2.4] identifies that operation of the ADVs is possible in both automatic and manual modes).

c. The ARVs are assumed to regulate steam generator outlet header pressure to the analyzed value (approximately 1135 psia).

FPL Energy Seabrook Response to RAI #2:

10 CFR 50.36(c)(2)(ii) *Limiting conditions for operation.* A technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one of the following criteria:

(A) *Criterion* 1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

(B) *Criterion* 2. A process variable, design feature, or operating restriction that is the initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of the fission product barrier.

(C) *Criterion* 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(D) *Criterion* 4. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

10 CFR 50.36(c)(3) *Surveillance Requirements.* Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that the facility operation will be within safety limits, and that the limiting conditions for operation will be met.

a. As stated in the response to RAI #1, no specific credit for stroke time of the atmospheric dump valves is required to achieve acceptable results for mitigating this event. The analysis demonstrates that even if three of the four atmospheric steam dump valves are not opened until 8 minutes into the event, the pressurizer will not become water-solid. Therefore, the stroke time limit of 70 seconds is not required to mitigate the event and

does not meet any of the 10 CFR 50.36(c)(2)(ii) criteria A through D requiring the establishment of a limiting condition for operation or the 10 CFR 50.36(c)(3) criterion requiring a surveillance requirement.

b. As stated in the response to RAI #1, no specific credit for automatic operation is required to achieve acceptable results. This has been demonstrated through analysis and operator time studies on the Seabrook Station control room simulator. Therefore, the specific mode of automatic operation of the atmospheric steam dump valves is not required to mitigate the event and does not meet any of the 10 CFR 50.36(c)(2)(ii) criteria A through D requiring the establishment of a limiting condition for operation or the 10 CFR 50.36(c)(3) criterion requiring a surveillance requirement.

c. As stated in the response to RAI #1, the atmospheric dump valves are manually positioned to maintain Reactor Coolant System temperature at 557°F, as prescribed by the emergency operating procedures. There is no requirement to maintain steam generator outlet header pressure at a specific pressure. Therefore, steam generator outlet pressure does not meet any of the 10 CFR 50.36(c)(2)(ii) criteria A through D requiring the establishment of a limiting condition for operation or the 10 CFR 50.36(c)(3) criterion requiring a surveillance requirement.