FPL Energy
Seabrook Station

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SEP 9 2003

Docket No. 50-443

NYN-03077

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Seabrook Station
Response to Request for Information
Regarding License Amendment Requests 02-06 and 02-07

References:

1. NYN-02089, "Changes to TS 3.9.4 Containment Building Penetrations," dated October 11, 2002
2. NYN-02103, "Revision to Technical Specifications Associated With Reduction of Decay Time for Core Offload," dated October 11, 2002
3. NYN-03043, "Revision to License Amendment Request 02-07, Changes TS 3.9.4 Containment Building Penetrations," dated May 30, 2003
4. NYN-03049, "Response to Request for Information Regarding License Amendment Requests 02-06 and 02-07," dated July 16, 2003
5. NYN-03054, "Response to Request for Information Regarding License Amendment Request 02-06," dated July 17, 2003
6. NYN-03066, "Supplemental Information Regarding License Amendment Requests 02-06 and 02-07," August 18, 2003

Enclosed is the FPL Energy Seabrook, LLC response to the Nuclear Regulatory Commission (NRC) request for additional information issued on August 27, 2003. The information requested pertains to two license amendment requests (References 1 and 2) submitted to the NRC on October 11, 2002 and supplemented by letters date July 16, 2003, July 17, 2003, and August 18, 2003 (References 4, 5, and 6).

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

Very truly yours,
FPL Energy Seabrook, LLC

Mark E. Warner
Site Vice President

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

Mr. Gary Cheney, Director
New Hampshire Office of Emergency Management
State Office Park South
107 Pleasant Street
Concord, NH 03301

Oath and Affirmation

I, Mark E. Warner, Site Vice President of FPL Energy Seabrook, LLC, hereby affirm that the information and statements contained within this document 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

9th day of September, 2003

James W. Connolly
Notary Public

JAMES W. CONNOLLY
MY COMMISSION EXPIRES SEPT. 4, 2007
NOTARY PUBLIC
NEW HAMPSHIRE

Mark E. Warner
Site Vice President

ENCLOSURE TO NYN-03077

Requested Information

In your submittals dated October11, as supplemented by letters dated July 16, 2003, July 17, 2003 and August 18, 2003 you take credit for two separate control room air intakes. It appears that [the] west intake is not shielded from missiles. Please provide adequate information to conclude that the west air intake meets the requirements set forth in General Design Criteria 2 and 4.

Response:

General Design Criterion 2

General Design Criterion (GDC) 2 specifies that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. In the original Seabrook Station design, the Control Building Air (CBA) system west air intake was located on the west side of the Unit 2 Turbine Building. In 1991, a design change was implemented to relocate the west air intake to the east wall of the Cooling Tower. A piping analysis of the air intake piping was completed to evaluate both the underground and above ground sections of the pipe including the effects of the design basis earthquake. (Reference 1). The most significant concerns regarding the buried pipe are the effects of the design basis earthquake. The effects of the earthquake on the buried pipe have been addressed using the guidance provided by the American Society of Civil Engineers (ASCE) in "Seismic Response of Buried Pipes and Structural Components" (Reference 2). The calculation addresses three potential effects that must be considered in the evaluation of buried piping. These are (a) abrupt displacement in a zone of earthquake fault breakage; (b) ground failure due to seismic shaking (liquefication, landsliding, lateral spreading and gross settlement); and (c) ground deformation during seismic shaking. Based on the description of the site characteristics presented in the UFSAR Chapter 2 (Reference 3) a bedrock site with compacted fill (i.e., Seabrook Station) is not susceptible to these failure mechanisms. This analysis is consistent with the methodologies of UFSAR 3.7(B).3.12 "Buried Seismic Category I Piping Systems and Tunnels" which was reviewed and accepted by the NRC (Section 3.7.3 of Reference 4).

An ADLPIPE pipe model was developed to analyze the seismic effects on the above ground section of the piping. The calculated stresses are within the ASME Section III Code allowable stresses as calculated by methodologies described in the UFSAR 3.7(B).3.8 and UFSAR 3.9(B).1.2 which were reviewed and accepted by the NRC (Section 3.7.3 and Section 3.9.1 of Reference 4).

The west air intake is protected against flooding. The intake opening is located at approximate elevation 27 feet which is above the maximum flood water level of 20.6 feet MSL as identified in UFSAR section 3.4.1.1. Additionally, the design wind, hurricane or tornado wind loads on the

small exposed profile of the above ground piping are negligible with respect to the pipe mechanical integrity.

GDC 2 References:

1. Seabrook Station Calculation C-S-1-45106, Revision 0, "Stress Evaluation of Control Building Ventilation Make Up Air Line 1-CBA-9614-02," dated March 29, 1990.
2. ASCE Report, "Seismic Response of Buried Pipes and Structural Components," dated 1983.
3. Seabrook Station, Updated Final Safety Analysis Report.
4. NUREG-0896, Safety Evaluation Report Related to the Operation of Seabrook Station, dated March 1983.

General Design Criterion 4

GDC 4 states that structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. A probabilistic analysis of tornado missile impacts on the intake pipe was completed by the Environmental Sciences Group of Yankee Atomic Electric Company (References 1 & 2) in support of the relocation. The analysis is based on information from the Seabrook Station site specific tornado missile study (Reference 3), which was reviewed and accepted by the NRC (Section 3.5.2 of Reference 4). The tornado missile acceptance criterion is: "The probability of significant damage to structure, systems, and components required to prevent a release of radioactivity in excess of 10 CFR Part 100 following a missile strike, assuming loss of offsite power, shall be less than or equal to a median value of 10^{-7} or a mean value of 10^{-6} per year" (Reference 4).

Based on the analysis a conservative mean estimate of the annual probability of a tornado missile impacting the relocated west air intake pipe is in the range of 2×10^{-9} to 3×10^{-7}, less than 10^{-6} per year. These probabilities are for missile impact. The probability that the pipe would be hit and sufficiently damaged to preclude performance of its intake function is lower than impact alone.

The CBA west air intake tornado missile probabilities were estimated by adjusting the probabilities from specific targets modeled in the site specific tornado missile study (Reference 3) by the ratios of the target areas. The west air intake tornado missile target area was defined as the surface of the above grade pipe plus 2.5 feet of the vertical buried pipe. The length of the buried pipe was included to account for ground penetration of any tornado missiles. The maximum vertical tornado missile ground penetration is 1.6 feet or less and all horizontal portions of the underground intake pipe are at sufficient depth to preclude a tornado missile failure. The impact probabilities that were adjusted were conservatively chosen to account for the

direction the target faces, target location, and the number of potential tornado missiles in the surrounding area. This analysis was similar to the tornado missile evaluation for the diesel generator exhaust stacks (Reference 5) where the NRC concurred that hardened protection of the stacks was not necessary due to the acceptably low probability of tornado missile impact (Reference 6).

The probability of a tornado missile impacting the relocated CBA west air intake is less than the NRC acceptance criterion. Hardened tornado missile protection for the relocated west air intake is not necessary due to the acceptably low tornado missile impact probabilities. Pipe whipping and fluid discharge are not applicable to the west air intake, which is located in the Seabrook Station yard.

GDC 4 References:

1. YAEC Memo ESG 19/90 – "Tornado Missile Evaluation for Control Room West Air Intake Relocation," dated March 12, 1990.
2. YAEC Calculation SBC-367, Revision 1, "Control Room West Intake Relocation – Tornado Missiles," dated April 1990.
3. "Seabrook Nuclear Power Plant Tornado Missile Analysis," Applied Research Associates, Inc., Final Report C569, Revision 1, March 1984, Addendum 1 and 2, December 1984
4. NUREG-0896, "Safety Evaluation Report Related to the Operation of Seabrook Station," Supplement No. 3, July 1985.
5. YAEC Memo ESG 46/86 – "Diesel Generator Exhaust Stacks – Tornado Missiles," dated April 24, 1986
6. NUREG-0896, "Safety Evaluation Report Related to the Operation of Seabrook Station," Supplement No. 5, July 1986.