



Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

10 CFR 50.90
10 CFR 50.59

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BECo Ltr. #2.97-004

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

Request for NRC Review

Docket No. 50-293
License No. DPR-35

Boston Edison Company is aware the NRC is currently reviewing Pilgrim Nuclear Power Station (PNPS) Safety Evaluation #2971. This evaluation superseded an older evaluation that replaced containment drywell insulation with fibrous, NUKON insulation in 1984. This plant modification resulted in the need to credit containment pressure for sufficient net positive suction head (NPSH) for emergency core cooling system (ECCS) pumps following a loss of coolant accident (LOCA). There is a question, from a licensing standpoint, whether credit for containment pressure as part of the NPSH calculation can be taken under the 10CFR50.59 process or whether NRC review is needed. We are uncertain of when the NRC review will be completed and what the results of the review will be; consequently, since Pilgrim will be entering a refueling outage on February 15, 1997, we are requesting NRC review and approval of this issue prior to March 15, 1997. This request does not alter Boston Edison's position that credit for containment pressure is implied in the current Pilgrim licensing basis.

BACKGROUND

In 1984, Pilgrim replaced recirculation system piping and, along with the modification, also replaced the drywell reflective metal insulation with NUKON insulation. Safety Evaluation #1638 was prepared to evaluate this modification under the 10CFR50.59 process. In 1995, while performing additional analysis for another purpose, an error was discovered in Safety Evaluation #1638. Safety Evaluation #2971 was prepared to supersede #1638, and the docket was corrected by Boston Edison Letter #2.96.064 to the NRC dated June 28, 1996.

We are aware the NRC is reviewing Safety Evaluation #2971 in general, and one of the issues under review is the acceptability of crediting containment pressure for NPSH of the ECCS pumps under 10CFR50.59 versus requesting and receiving NRC approval. The enclosed documents show post-LOCA debris, generated and transported in accordance with the methodology of NRC Regulatory Guide 1.82, Revision 1, results in the need to credit a portion of the available containment pressure for post-LOCA net positive suction head for the ECCS pumps. Boston Edison's interpretation of the Pilgrim licensing basis indicated credit for the use of containment

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pressure was implied as part of the licensing basis. This position is consistent with NRC Safety Evaluation Report for plants of similar design and vintage to Pilgrim.

INFORMATION TO BE REVIEWED

NRC review and approval of the wording currently in FSAR rev. 19 section 14.5.3.1.3 (beginning on page 14.5-11) is requested. To aid in that review, the following documents are enclosed:

1. Safety Evaluation 2971
2. Safety Evaluation 2983
3. Calculation M662
4. GE Report GE-NE-B13-01805-11

Information from these sources and BECo letter #2 96.064 is summarized as follows:

Pump operation requires sufficient net positive suction head to avoid cavitation. The low pressure core spray (CS) pump requires 29 feet of NPSH and the residual heat removal (RHR) pumps require 23 feet at the run out flow rates assumed in core and containment cooling analysis.

Blankets filled with fiberglass fiber are used to insulate piping inside the Pilgrim Station drywell. The potential exists for insulation destruction and transport of fiberglass fiber to the suppression pool after a LOCA. Fiberglass fiber deposited on the pump suction strainer will result in an additional suction path head loss. The evaluation of the effects of fiberglass insulation debris on NPSH available and low pressure ECCS performance was done in accordance with draft Regulatory Guide 1.82, Rev. 1. The additional head loss from insulation debris has been estimated to be a maximum head loss of 14.5 feet of water for the RHR pump(s) and 8.6 feet for the CS pump(s).

The available NPSH is a function of torus airspace pressure, suppression pool temperature, suppression pool water level, and pump suction line losses. NPSH available for both the RHR and CS pump(s) was evaluated based on each of the above parameters. The limiting event for NPSH analysis was determined to be the design basis accident (e.g., failure of the recirculation pump suction line) because this event causes the greatest debris generation, the most rapid heating of the suppression pool, and the highest peak suppression pool temperature from all design basis events. The curves for this were provided in FSAR amendment #24 and take credit for containment overpressure. The torus airspace pressure was calculated consistent with previous licensing submittals that credit the increased airspace pressure provided by noncondensable gas (nitrogen) trapped inside the containment and heated to the temperature of the suppression pool water. The effect of leakage of the noncondensable gas from the containment was also considered when evaluating NPSH available consistent with the FSAR (5% per day) and Technical Specification (1% per day) limits for containment leakage.

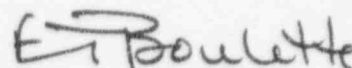
Containment response analysis performed by General Electric for the design basis LOCA using a constant ultimate heat sink temperature at the site maximum of 75°F predicts a peak suppression pool temperature of 178°F. Results from the NPSH analysis indicate that NPSH margin is present throughout the entire accident response. With the maximum debris loading, a torus airspace pressure of approximately 4.1 psig is required at the peak suppression pool temperature of 178°F to provide the required NPSH for both the RHR and CS pumps. Calculations of the available torus airspace pressure predict greater than 7 psig at the peak suppression pool temperature of 178°F.

In conclusion the minimum requirements for NPSH for Pilgrim's RHR and CS pumps are met at all times following postulated design basis events. The NPSH margin available post-LOCA is shown graphically on FSAR Figures 14.5-18 and 14.5-19.

REQUESTED ACTION

Pilgrim will be commencing a refueling outage on February 15, 1997. Since we are uncertain when the NRC review of Safety Evaluation #2971 will be complete and what the results of the review will be, we are requesting NRC review and approval for including containment pressure as a component of NPSH margin in the PNPS licensing basis, as stated above, by March 15, 1997. Until NRC review is complete, the enclosed documentation also provides the basis for continued operation.

Should you require any further information, please contact Mr. Jeffrey Keene at (508) 830-7876.


E. T. Boulette, PhD

JWK/dmc/npshusq

Enclosures:

1. Safety Evaluation 2971
2. Calculation M662
3. GE Report GE-NE-B13-01805-11
4. Safety Evaluation 2983

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