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

SUBJECT: Pilgrim 10 CFR 50.46(a)(3)(ii) Report for 2001

REFERENCES:

1. General Electric Nuclear Energy Report to BECo, NEDC-31852P, "Pilgrim Nuclear Power Station SAFER/GESTR-LOCA Analysis", Rev. 1, April 1992
2. General Electric Nuclear Energy Report to Entergy, GE-NE-J1103808-08-02P, "Pilgrim Nuclear Power Station ECCS-LOCA Evaluation for GE14", March 2001
3. Letter from Entergy to the NRC, "Pilgrim 10 CFR 50.46(a)(3)(ii) Report for 2000", ENGC Ltr. 2.01.042, March 30, 2001
4. GE 10 CFR 50.46 Notification Letter 2001-01
5. GE 10 CFR 50.46 Notification Letter 2001-02

LETTER NUMBER: 2.02.018

Dear Sir or Madam,

This letter is submitted by Pilgrim Nuclear Power Station in accordance with 10 CFR 50.46(a)(3)(ii), which requires the reporting of changes or errors in emergency core cooling system (ECCS) analyses.

Two error notifications were received by Pilgrim since the last report to the NRC made by Reference 2. The ECCS-LOCA analyses are performed for Pilgrim utilizing the NRC approved SAFER/GESTR-LOCA application methodology. The results of the analyses are summarized in references 1 and 2. Both of the errors are associated with the SAFER computer code.

Currently two types of nuclear fuel are in use at Pilgrim for Cycle 14: GE11, which is a 9x9 fuel design, and GE14, which is a 10x10 fuel design. All previously reported errors and changes including the two errors described in this report are already accounted for in the analysis of GE14 fuel and the licensing basis peak clad temperature (PCT) for GE14 fuel remains 1930 degrees F as previously reported in Reference 3. One of the additional errors as described below, impacts the licensing PCT for GE11 fuel as previously reported in Reference 3.

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The first error was a coding error that resulted in an overestimation of the amount of condensation in the reactor vessel lower plenum caused by low pressure coolant injection (LPCI) [Ref. 4]. This error led to a lower calculated PCT when LPCI is credited in the analyses. Pilgrim's limiting ECCS analysis and highest PCT occurs during a postulated DBA-LOCA and single failure of LPCI. Because no credit is taken for LPCI in the limiting ECCS analysis, overestimation of the amount of condensation in the reactor vessel lower plenum caused by LPCI has no affect on Pilgrim's licensing basis PCT. The second highest analyzed PCT follows a postulated DBA-LOCA and battery failure scenario. The ECCS equipment credited in this scenario includes two LPCI pumps. Thus, the PCT for the DBA-LOCA with battery failure was underestimated. The condensation error does not cause the postulated DBA-LOCA with battery failure scenario to become more limiting than the postulated DBA-LOCA with LPCI failure because the pre-existing difference between the predicted PCTs for these two failure scenarios exceeds this error.

The second error involved an over prediction of core inventory and an under prediction of the second peak PCT [Ref. 5]. In SAFER, steam condensation on the subcooled ECCS injection flow is calculated as long as sufficient steam mass is available in the vessel. The pressure rate equation maintains sufficient steam mass to fill the vessel by adjusting the flashing rates as the vessel depressurizes. Only when the vessel pressure is predicted to fall below the drywell pressure will the pressure rate be forced to zero, which allows steam mass to be reduced by condensation and not be replenished by flashing due to a decrease in pressure. When there is a change in the two-phase level position in the core, an inconsistent core exit steam flow was used in the SAFER pressure equation. This caused an error in the calculated pressure, which, in some cases, resulted in reduced flashing and the premature termination of ECCS condensation due to insufficient steam mass. Any change in core inventory will impact the calculated second PCT that occurs after ECCS initiation. This error resulted in a +10 degree F estimated error and increases the licensing basis PCT for GE11 fuel as described below.

The GE11 fuel licensing basis PCT exclusive of errors and changes is 1985 degrees F based on a postulated DBA-LOCA while operating at low core flow and rated power conditions combined with a single failure that renders low pressure coolant injection (LPCI) unavailable. As of this report, the net effect of all errors and changes is estimated to be less than 35 degrees F which includes the +10 degree F estimated error described above. The GE11 licensing basis PCT inclusive of all errors and changes is 2020 degrees F, a ten degree increase above the 2010 degree F PCT reported in Reference 3.

The cumulative sum of the absolutes of all errors and changes for GE11 fuel is estimated to be 120 degrees F. While the cumulative sum of the absolutes of the effects on PCT for GE11 fuel exceeds 50 degrees F, the expected PCT increase is less than 35 degrees F from the licensing basis PCT of 1985 degrees F.

In summary, inclusive of all currently known errors, the current licensing basis PCT for GE11 fuel is 2020 degrees F, and the current licensing basis PCT for GE14 fuel is 1930 degrees F. Therefore, both fuel designs used in the Pilgrim reactor during Cycle 14 satisfy the 2200 degree F peak clad temperature limit specified in 10 CFR 50.46.

This letter makes no commitment to perform reanalysis. Should you require further information on this report, please contact Mr. Bryan Ford at (508) 830-8403.

Sincerely,

W.J. Riggs

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cc:

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