



PECO NUCLEAR

A Unit of PECO Energy

10 CFR 50.46 (a)(3)(i) and (ii)

PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

November 4, 1998

Docket Nos. 50-352
50-353

License Nos. NPF-39
NPF-85

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

Subject: Limerick Generating Station, Units 1 and 2
10 CFR 50.46 Reporting Requirements

Dear Sir/Madam:

In accordance with 10 CFR 50.46 (a)(3)(i) and (ii), the following is a revision to the licensing basis Loss-of-Coolant Accident (LOCA) peak clad temperatures (PCTs) for Limerick Generating Station, Units 1 and 2. Additionally, PECO Energy Company (PECO Energy) is revising its method of reporting changes in the licensing basis PCT. Rather than identifying changes in licensing basis PCT by a single value based on the most limiting fuel type, changes will be reported by each fuel type. This change in reporting will ensure greater accuracy in reporting changes in the peak cladding temperatures. Table 1 (attached) provides the revised PCT values and the applicable changes. Based on the accumulated changes which result in a temperature difference of greater than 50° F from the calculated baseline temperature, this report is being submitted within 30 days.

On October 5, 1998, General Electric Nuclear Energy (GENE) informed PECO Energy that the accumulated PCT change of 45° F previously reported was overly conservative. The revision to our Limerick SAFER/GESTR analysis in 1995 had in fact corrected one error responsible for 5° F of the 45° F total. Therefore, this 5° F change is being eliminated from our reporting basis.

The remaining 40° F applies only to the GE9, GE11, and GE13 fuel types. The PCT error accumulation for P8x8R and GE8 fuels is 10° F. PECO Energy had conservatively applied the prior 45° F total to the limiting P8x8R fuel type in previous reports. As noted above, it is now our intention to track and report the changes by fuel type to improve clarity.

9811100261 981104
PDR ADOCK 05000352
P PDR



June 28, 1996

RJR-96-071
MFN-088-96

Document Control Desk
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: R. C. Jones, Jr., Chief
Reactor Systems Branch

Subject: **Reporting of Changes and Errors in ECCS Evaluation Models**

Reference: Letter, J. F. Klapproth to the Document Control Desk (R. C. Jones, Jr.), *Reporting of Changes and Errors in ECCS Evaluation Models*, dated June 24, 1995 (MFN-087-95), and revised by Letter, R. J. Reda to the Document Control Desk (R. C. Jones, Jr.), *Reporting of Changes and Errors in ECCS Evaluation Models*, February 20, 1996 (MFN-020-96).

The purpose of this letter is to report, in accordance with 10 CFR 50.46 (a) (3) (ii), the impact of changes and errors in the methodology used by GE to demonstrate compliance with the Emergency Core Cooling System (ECCS) requirements of 10 CFR 50.46. This report covers the period from the last report (Reference) to the present. It is noted that Peak Cladding Temperature (PCT) variations resulting from plant specific system or fuel changes are not addressed in this letter. These should be treated, as appropriate, on a plant specific basis in accordance with other sections of 10 CFR 50.

There have been no changes or errors identified for the SAFE/REFLOOD model described in NEDE 20566-P-A, *Analytical Model for Loss-of-Coolant Analysis in Accordance with 10 CFR 50 Appendix K*.

There have been no changes or errors identified for the SAFER/GESTR model described in NEDE 23785-1-P-A, *The GESTR-LOCA and SAFER Models for Evaluation of Loss-of-Coolant Accidents*, and NEDE 30996-P-A, *SAFER Model for Evaluation of Loss-of-Coolant Accidents for Jet Pump and Non-Jet Pump Plants*.

During the reporting period an error was discovered in some applications of the GE LOCA evaluation model SAFER/GESTR. It was determined that in some analyses cases an algorithm used to compute the number of fuel rods in a BWR lattice was incorrectly specified. As a result, SAFER input prepared in accordance with the automation process may have had incorrect data. The only impact was on the SAFER analyses for fuel designs containing large water rods where the input generation was automated. This finding does not impact plant safety.

In March 1995, a domestic utility requested that GENE review a concern regarding the RPV bottom head drain (BHD) impact on the LOCA analysis. The concern was that because the bottom head drain line is directly connected to the reactor recirculation loops, that a recirculation line break LOCA would also break the BHD, and the vessel would depressurize to the drywell faster than assumed in current models. Also, upon such an event occurring, some water required to keep the core covered to the 2/3 core height would exit the core due to either gravity or core pressure via the interconnected recirculation and bottom head RWCU suction lines.

A GENE evaluation concluded that while no analysis had been performed to precisely evaluate the PCT impact of the recirculation line break LOCA including the BHD, it is believed that the impact is less than 10°F based on engineering judgment and extrapolation of previous LOCA analyses. Since an event is considered by the NRC to be significant if the PCT is increased more than 50°F (10CFR50.46 (a)(3)(i)), this amount of increase can be considered insignificant and well within the margins of the safety analysis.

The impact of the BHD exiting flow on maintaining RPV level inside the shroud is similarly insignificant. It was determined that a slightly higher minimum makeup flow will be required, however, the increased makeup is well within the margins of available ECCS systems. The minimum makeup flow corresponds to that necessary to makeup for decay heat and the drain rate from the BHD.

By copy of this letter, Licensees utilizing the GE ECCS methodology in their plant licensing are informed of the status of changes in the evaluation methodology. Since no re-analysis or technical specification modifications are required, this submittal is believed to satisfy 10 CFR 50.46 (a) (3) (ii) for evaluation model changes without further reporting on the part of individual utilities.

If you have any questions, please call me or J. L. Embley at (910) 675-5774.

Sincerely,

Original signed by R. J. Reda, 12/15/95

R. J. Reda, Manager
Fuels and Facilities Licensing
(910) 675-5889, MC J26

cc: W. J. Sependa
J. L. Embley



GE Nuclear Energy

General Electric Company
P. O. Box 780, Wilmington, NC 28402

December 15, 1995

RJR-95-118
MFN-278-95

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

Attention: R. C. Jones, Jr.

Subject: **Reporting of Changes and Errors in ECCS Evaluation Models**

- Reference:
1. Letter, J. F. Klapproth to the Document Control Desk (R. C. Jones, Jr., *Reporting of Changes and Errors in ECCS Evaluation Models*, dated June 24, 1995 (MFN-087-95).
 2. Letter, R. C. Mitchell to the Office of Nuclear Reactor Regulation, *Reporting of Changes and Errors in ECCS Evaluation Models*, dated July 1, 1994 (MFN No. 088-94).

GE is submitting this letter which revises the Reference 1 letter. Revisions are marked by change bars in the margin.

The purpose of this letter is to report, in accordance with 10 CFR 50.46 (a) (3) (ii), the impact of changes and errors in the Emergency Core Cooling Systems (ECCS) evaluation methodology used by GE. This report covers the period from the last report (Reference 2) to the present. It is noted that Peak Cladding Temperature (PCT) variations resulting from plant specific system or fuel changes are not addressed in this letter. These should be treated, as appropriate, on a plant specific basis in accordance with other sections of 10 CFR 50.

There have been no changes or errors identified for the SAFER/REFLOOD model described in NEDE 20566-P-A, *Analytical Model for Loss-of-Coolant Analysis in Accordance with 10 CFR 50 Appendix K*.

There have been no changes or errors identified for the SAFER/GESTR model described in NEDE 23785-1-P-A, *The GESTR-LOCA and SAFER Models for Evaluation of Loss-of-Coolant Accidents*, and NEDE 30996-P-A, *SAFER Model for Evaluation of Loss-of-Coolant Accidents for Jet Pump and Non-Jet Pump Plants*.

9512180305 2 p 8

TABLE 1

**LIMERICK GENERATING STATION, UNITS 1 AND 2
CURRENT BASELINE PCT VALUES AND APPLICABLE CHANGES**

	P8x8R	GE8	GE9	GE 11/13
BASELINE PCT °F	1625	1515	1515	1605
CHANGES				
1. MFN 278-95* Bottom head drain	10	10	10	10
2. MFN 088-96* Incorrect number of fuel rods	0	0	30	30
TOTAL	10	10	40	40
ESTIMATED LICENSING BASIS PCT	1635	1525	1555	1645

* See attachment for the associated GENE letter which reported this change. The GENE letter is identified with a "MFN" designation.

ATTACHMENT
GENE LETTERS
MFN 278-95
MFN 088-96

This incorrect value for the number of active fuel rods resulted from a specification error in an automated SAFER/GESTR basedeck generation procedure. As a result of this specification error, the SAFER/GESTR basedecks for those fuel types containing large water rods (GE9/10/11/12/13) contained both an incorrect number of fuel rods and inappropriate values for the bundle flow areas and hydraulic diameters. Calculations performed to assess the significance of this error indicate that the impact on the calculated cladding temperature is less than 30°F.

Until recently, the limiting fuel types had not been associated with the large water rod designs and the base decks generated with the automated procedure were correct. The inconsistency was discovered as part of a normal GE quality assurance review of the SAFER/GESTR analysis for a specific plant with a large water rod limiting bundle. Actions have been taken to correct the problem and to ensure that the correct variable is used in all future applications. It should be noted that the PCT impact was small compared to the available margin to specified limits demonstrated by the SAFER/GESTR results and no impact on technical specification limits was found.

All utilities using these evaluation models have been notified of this error.

If you have any questions, please call me or J. L. Embley at (910) 675-5774.

Sincerely,

R. J. Reda, Manager
Fuels and Facility Licensing
(910) 675-5608

cc: W. J. Sependa
J. L. Embley