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U.S. Nuclear Regulatory Commission
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SUBJECT: James A FitzPatrick Nuclear Power Plant
Docket No. 50-333
10 CFR 50.46 Annual Report – Errors in Emergency Core Cooling System (ECCS) Evaluation Models

REFERENCES:
1. Entergy Nuclear Operations, Inc. letter T.A. Sullivan to USNRC (JAFP-02-0210) dated November 12, 2002 regarding same subject.
2. Entergy Nuclear Operations, Inc. letter M. Kansler to USNRC (JPN-02-023) dated August 14, 2002 regarding same subject.

Dear Sir:

The attached report summarizes changes and errors in emergency core cooling system (ECCS) evaluation models in accordance with 10 CFR 50.46(a)(3)(ii) for the period July 1, 2002 to June 30, 2003 for Entergy's James A. FitzPatrick Nuclear Power Plant.

A total of one change and two errors to the FitzPatrick model have been identified since the last report (Reference 2). Reference 1 document was submitted by FitzPatrick to the NRC in November 2002, following the completion of the plant's Refueling Outage 15 to inform the Commission that operations (commencing with Cycle 16) would be utilizing both General Electric 14 type fuel (GE 14) and General Electric 12 type fuel (GE 12). This change and the calculated peak clad temperature (PCT) for GE 14 are reflected on the attached summary sheets. For the remaining two errors, thirty day reports were not submitted because they did not qualify as a significant change (a peak clad temperature change of greater than 50° F) according to 10 CFR 50.46(a)(3)(i).

Corrected for these errors, estimated peak clad temperatures (PCTs) are unchanged from the previous reports and remain below the 2200° F requirement of 10 CFR 50.46(b)(1).

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This letter contains no new commitments. If you have any questions, please contact Mr. Andrew Halliday at (315) 349-6055

Very truly yours,

for T. Sullivan

T. A. SULLIVAN

cc: Regional Administrator, Region 1
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Attachment: Annual 10 CFR 50.46(a)(3)(ii) Report on Changes and Errors in Emergency Core Cooling System (ECCS) Evaluation Models for the period from July 1, 2002 to June 30, 2003.

INTRODUCTION

This report summarizes changes and errors in emergency core cooling system (ECCS) evaluation models in accordance with 10 CFR 50.46(a)(3)(ii) for the period July 1, 2002 to June 30, 2003 for Entergy's James A. FitzPatrick Nuclear Power Plant.

A total of one (1) change and two (2) errors to the FitzPatrick model have been identified since the last annual report (Reference 18). The change was reported to the Commission (Reference 19) following completion of the plant's fall 2002 Refuel Outage 15. Thirty-day reports were not submitted for the two errors because they do not qualify as a significant changes (a peak clad temperature [PCT] change of greater than 50° F) according to 10 CFR 50.46(a)(3)(i).

Table 1 summarizes the changes and errors to the current FitzPatrick ECCS evaluation models. The last three entries represent ECCS evaluation changes or errors identified during the period July 1, 2002 to June 30, 2003.

Additional information on the change and errors identified during the reporting period is provided below.

DISCUSSION OF CHANGES OR ERRORS IDENTIFIED DURING REPORTING PERIOD

USE OF GENERAL ELECTRIC 14 TYPE FUEL

The plant completed Refueling Outage 15 (October 2002), and began Cycle 16 operations utilizing both General Electric 14 type fuel (GE14) and General Electric 12 type fuel (GE12). GE12 has been use during the previous three operating cycles. The Licensing Basis peak clad temperature (PCT) calculated for GE14 is 1700° Fahrenheit (F), increasing the previous calculated PCT value by 160°F. PCT calculations for GE12/GE14 are based on the same NRC approved GE methods. The PCT increase is a result of: (1) higher Linear Heat Generation Rate (LHGR) for GE14; (2) lower assumed Core Spray System flow rate; and (3) a wider band of operating conditions including Maximum Extended Loadline Limit Analysis and Final Feedwater Temperature reduction.

SAFER Level/Volume Table Error

In 10 CFR 50.46 Notification Letter 2003-01, dated May 6, 2003 (Ref. 19), General Electric reported an error in the process for constructing the initial level/volume table in the SAFER. It was assumed that the value of initial water level was the same as the volume break point in the original RPV level/volume calculation. However, the level/volume tables were generated with revised initial water levels, which did not consider this assumption. This error resulted in an incorrect volume split in the nodes above and below the water surface, and incorrect initial liquid mass. The total volume in the mass was correct.

This error did not result in a change in PCT. Therefore, this error did not qualify as a significant change according to 10 CFR 50.46(a)(3)(i), and no 30-day report was submitted.

SAFER Initial Separator Pressure Drop Error

In 10 CFR 50.46 Notification Letter 2003-03, dated May 6, 2003 (Ref. 20), General Electric reported calculation errors in determining the initial steam separator pressure drop value. These errors resulted in a higher initial steam separator pressure drop and overly restricted the flow through the separator during the LOCA event.

These errors did not result in any changes to PCT. Therefore, these errors did not qualify as a significant change according to 10 CFR 50.46(a)(3)(i) and no 30-day report was submitted.

TABLE 1 - ACCOUNTING OF LICENSING BASIS PEAK CLAD TEMPERATURES FOR FITZPATRICK

(NOTE: GE11 FUEL REMOVED FROM CORE DURING JAF's REFUEL 15 OUTAGE)

Report Period	ECCS Evaluation	Estimated PCT Change			Updated PCT		
		GE11 Fuel (Removed at conclusion of Cycle 15, 10/2002)	GE12 Fuel	GE14 Fuel (Installed during RF15, 10/2002)	GE11 Fuel	GE12 Fuel	GE14 Fuel
Baseline Evals.	1993 FitzPatrick LOCA Analysis (Ref. 7)	Baseline	N/A	N/A	1570°F	N/A	N/A
	FitzPatrick Reload 12 Supplemental Report (Ref. 8)	N/A	Base-line	N/A	N/A	1370°F	N/A
	FitzPatrick Reload 13 Supplemental Report (Ref. 9)	Baseline		N/A	1570°F	1370°F	N/A
Prior to July 1, 2000	10 CFR 50.46 Notification Regarding Sensitivity To Smal Input Parameter Changes (Ref. 10)	+50°F		N/A	1620°F	1420°F	N/A
	10 CFR 50.46 Notification Regarding Minor Code Corrections (Ref. 10)	+5°F		N/A	1625°F	1425°F	N/A
	10 CFR 50.46 Notification Regarding Bottom Head Drain (Ref. 11)	+10°F		N/A	1635°F	1435°F	N/A
July 1, 2000 – June 30, 2001	10 CFR 50.46 Notification Regarding Time Step Size (Ref. 3)	-5F		N/A	1630°F	1430°F	N/A
	Estimated Effect Of Condensation Error On PCT (Ref. 12)	+90°F		N/A	1720°F	1520°F	N/A
	Estimated Effect Of Pressure Rate Inconsistency Error On PCT (Ref. 13	+10°F		N/A	1730°F	1530F	N/A
	Estimated Effect Of Accounting Error On PCT (Ref. 14)	N/A	-5°F	N/A	1730°F	1525°F	N/A

TABLE 1 – ACCOUNTING OF LICENSING BASIS PEAK CLAD TEMPERATURES FOR FITZPATRICK (Continued)

Report Period	ECCS Evaluation	Estimated PCT Change			Updated PCT		
		GE11 Fuel (Removed at conclusion of Cycle 15, 10/2002)	GE12 Fuel	GE14 Fuel (Installed during RF15, 10/2002)	GE11 Fuel	GE12 Fuel	GE14 Fuel
July 1, 2001 – June 30, 2002	SAFER Core Spray Injection Elevation Error (Ref. 16)	+5°F		N/A	1735°F	1530°F	N/A
	Impact of SAFER Bulk Water Level Error on the Peak Clad Temperature (Ref. 17)	+10°F		N/A	1745°F	1540°F	N/A
July 1, 2003 – June 30, 2003	Cycle 16 Core Load Using GE 14 Type Fuel (Ref. 19)	N/A (Fuel type no longer in use)	N/A	1700°F	N/A	N/A	1700°F
	Impact of SAFER Level/Volume Table Error on the Peak Clad Temperature (PCT) (Ref. 20)	N/A	0°F	0°F	N/A	1540°F	1700°F
	Impact of SAFER Initial Separator Pressure Drop Error on the Peak Clad Temperature (PCT) (Ref. 21)	N/A	0°F	N/A (ECCS-LOCA analyses not affected by error)	N/A	1540°F	1700°F

REFERENCES

1. NYPA letter, M. J. Colomb to USNRC (JAFP-00-0164), dated July 21, 2000, regarding reporting of changes and errors in ECCS evaluation models.

2. Entergy Nuclear Operations, Inc. letter, M. Kansler to USNRC, (JPN-01-010) dated June 4, 2001, regarding 10 CFR 50.46(a)(3)(ii) 30-day report, two errors in ECCS evaluation models.

3. Global Nuclear Fuel letter, A. Alzaben (GNF) to C. Franklin (NYPA), (AFA-00-N061 dated November 20, 2000) regarding 10 CFR 50.46 error report - impact of SAFER time step size on the peak clad temperature (PCT) for jet pump plant analyses. Includes General Electric/Global Nuclear Fuel 10 CFR 50.46 Notification Letter 2000-04 dated November 8, 2000 regarding "Impact of SAFER Time Step Size on the Peak Clad Temperature (PCT) for Jet Pump Plant Analyses." (Proprietary)

4. NEDC-23785-1-PA Rev. 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-Of-Coolant Accident Volume II, SAFER - Long Term Inventory Model for BWR Loss-Of-Coolant Analysis," October 1984.

5. NEDC-23785-1-PA Rev. 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-Of-Coolant Accident Volume III, SAFER/GESTR Application Methodology," October 1984.

6. General Electric Nuclear Energy Report, J11-03757SRL, August 2000, "Supplemental Reload Licensing Report for James A. FitzPatrick, Reload 14, Cycle 15."

7. General Electric Nuclear Energy, "James A. FitzPatrick Nuclear Power Plant SAFER/GESTER-LOCA, Loss-of-Coolant Analysis," Licensing Topical Report NEDC-31317P, Class III (proprietary), Revision 2, April 1993.

8. General Electric Nuclear Energy Report, J11-02914SRL, Revision 0, August 1996, "Supplemental Reload Licensing Report for James A. FitzPatrick, Reload 12, Cycle 13."

9. General Electric Nuclear Energy Report, J11-03359SRL, Revision 1, Class I, October 1998, "Supplemental Reload Licensing Report for James A. FitzPatrick, Reload 13, Cycle 14."

10. General Electric Nuclear Energy, MFN-090-93, June 30, 1993, "Reporting of Changes and Errors in ECCS Evaluation Models."

11. General Electric Nuclear Energy, MFN-020-96, February 20, 1996, "Reporting of Changes and Errors in ECCS Evaluation Models."

12. General Electric/Global Nuclear Fuel 10 CFR 50.46 Notification Letter 2001-01 dated May 8, 2001 (via E-mail) regarding "Impact of SAFER Condensation Error on the Peak Clad Temperature (PCT)." (Proprietary)

REFERENCES (CONT.)

13. General Electric/Global Nuclear Fuel 10 CFR 50.46 Notification Letter 2001-02 dated May 10, 2001 (via E-mail) regarding "Impact of SAFER Pressure Rate I inconsistency Error on the Peak Clad Temperature (PCT)." (Proprietary)

14. Global Nuclear Fuel letter, A. Alzaben (GNF) to J. Head (Entergy Nuclear Operations, Inc.), (AFA-01-E004, June 29, 2001) regarding GE12 Upper Bound PCT for FitzPatrick, (Proprietary).

15. Entergy letter, M. Kansler to USNRC, dated August 15, 2001 (JPN-01-0014) regarding "10 CFR 50.46 Annual Report – Errors in Emergency Core Cooling System (ECCS) Evaluation Models."

16. General Electric/Global Nuclear Fuel 10 CFR 50.46 Notification Letter 2002-01 regarding "SAFER Core Spray Injection Elevation Error." (Proprietary)

17. General Electric/Global Nuclear Fuel 10 CFR 50.46 Notification Letter 2002-02 regarding "Impact of SAFER Bulk Water Level Error on the Peak Clad Temperature (PCT)." (Proprietary)

18. Entergy letter, M. Kansler to USNRC, dated August 14, 2002 (JPN-02-023) regarding "10 CFR 50.46 Annual Report – Errors in Emergency Core Cooling System (ECCS) Evaluation Models."

19. Entergy letter, T.A. Sullivan to USNRC, dated November 12, 2002 (JAFP-02-0210) regarding "10 CFR 50.46 Reporting of Changes In Emergency Core Cooling System (ECCS) Evaluation Model."

20. General Electric 10 CFR 50.46 Notification Letter 2003-01, dated May 6, 2003 regarding "Impact of SAFER Level/Volume Table Error on the Peak Cladding Temperature (PCT)." (Proprietary)

21. General Electric 10 CFR 50.46 Notification Letter 2003-03, dated May 6, 2003 regarding "Impact of SAFER Initial Separator Pressure Drop Error on the Peak Cladding Temperature (PCT)." (Proprietary)