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April 28, 2015 TS 5.6.6
NRC-15-0043 10 CFR 50.46

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

Reference: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Submittal of 2014 Safety Relief Valve Challenge Report, Main Steam Bypass Line Report, and ECCS Cooling Performance Evaluation Model Changes or Errors Report

The Fermi 2 Technical Specifications (TS) contains a requirement for submitting an annual report for safety relief valve challenges (TS 5.6.6). Enclosure 1 provides the Safety Relief Valve Challenge Report for 2014.

Enclosure 2 provides the annual Service Life of the Main Steam Bypass Lines Report for 2014. This satisfies the commitment stated in Detroit Edison's letter to the NRC dated November 7, 1986 (VP-86-0154).

Enclosure 3 provides the annual Emergency Core Cooling System (ECCS) Cooling Performance Evaluation Model Changes or Errors Report for 2014. This report is provided in accordance with 10 CFR 50.46(a)(3)(ii).

Should you have any questions, please contact me at (734) 586-5076.

Sincerely,

for Christopher R. Robinson
Manager, Nuclear Licensing

Enclosures:

1. Safety Relief Valve Challenge Report
2. Service Life of Main Steam Bypass Lines Report
3. ECCS Cooling Performance Evaluation Model Changes or Errors Report

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 5, Region III
Regional Administrator, Region III
Michigan Public Service Commission,
Regulated Energy Division (kindschl@michigan.gov)

Enclosure 1 to
NRC-15-0043

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

Safety Relief Valve Challenge Report

January 1 to December 31, 2014

Safety Relief Valve Challenges

There were no instances in 2014 where reactor pressure was high enough to require Safety Relief Valve (SRV) actuation. There were also no instances in 2014 where an SRV actuation was demanded by an automatic logic system.

Enclosure 2 to
NRC-15-0043

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

Service Life of Main Steam Bypass Lines Report

January 1 to December 31, 2014

Service Life of Main Steam Bypass Lines

In accordance with Detroit Edison's letter to the NRC dated November 7, 1986 (VP-86-0154), the cumulative time the main steam bypass lines are operated with the bypass valves between 30 and 45 percent open will be reported annually. A cumulative value of 100 days is not to be exceeded without prior NRC notification.

As discussed in Detroit Edison's letter number VP-86-0154, the bypass lines are acceptable for safe operation when operated within the 100 day constraint.

As of December 31, 2014, the main steam bypass lines cumulative usage was 45.89 days.

Enclosure 3 to
NRC-15-0043

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

ECCS Cooling Performance Evaluation Model Changes or Errors Report

January 1 to December 31, 2014

ECCS Cooling Performance Evaluation Model - Analysis of Record

On June 23, 2008, DTE Energy submitted a re-analysis of the SAFER/GESTR Loss of Coolant Accident (LOCA) (Reference 1). This re-analysis established a new licensing basis Peak Clad Temperature (PCT) of 1990°F which was associated with the Upper Bound analysis of the limiting small break LOCA.

Emergency Core Cooling System (ECCS) Cooling Performance Evaluation Model Changes or Errors

Since the time of the submittal of the analysis of record identified above, General Electric - Hitachi (GEH) and Global Nuclear Fuel (GNF) have issued notifications which indicated that changes had been made in the ECCS- LOCA analyses inputs that affect Fermi 2. The notification letters below affect the Licensing Basis PCT for GNF 10x10 fuel type used at Fermi 2.

2008-01	November 25, 2008	Reference 2
2011-02	July 20, 2011	Reference 3
2011-03	July 20, 2011	Reference 4
2012-01	November 29, 2012	Reference 8
2013-01	January 15, 2013	Reference 9
2014-01	May 21, 2014	Reference 12
2014-02	May 21, 2014	Reference 13
2014-03	May 21, 2014	Reference 14
2014-04	May 21, 2014	Reference 15

Additionally, DTE Energy determined that the Low Pressure Coolant Injection (LPCI) pump performance curve used in Reference 1 to predict LPCI injection flow as a function of Reactor Pressure Vessel pressure was potentially non-conservative in that it did not allow for normal component degradation near pump shutoff consistent with that allowed under the design at rated flow conditions. Therefore, a design provision for degradation near shutoff was made and the impact on the limiting analyses was performed and documented in Reference 5. The net estimated impact on the analysis of record associated with this condition and the 2008 and 2011 notifications was reported in accordance with l0CFR50.46 on August 19, 2011 (Reference 6) and again in the annual reports issued on April 26, 2012 (Reference 7). GNF notifications, 2012-01(Reference 8) and 2013-01 (Reference 9), which occurred subsequent to these communications were reported in accordance with 10CFR50.46 in the annual reports issued on April 26, 2013 (Reference 10).

A tabulated summary of the impacts of all errors is provided below.

Current LOCA Model Assessment for GE14 Fuel

Description	GE14 PCT
10CFR 50.46 Baseline Licensing Basis PCT (Reference 5)	PCT = 1990°F
10 CFR 50.46 Notification Letter 2008-01 dated November 25, 2008, Impact of Steam Flow Induced Error on Level 3 Setpoint for Small Break LOCA Analysis.	ΔPCT = 5°F
10 CFR 50.46 Notification Letter 2011-02 dated July 20, 2011, Impact of Database Error for Heat Deposition on the Peak Cladding Temperature (PCT) for 10x10 fuel bundles.	ΔPCT = 40°F
10 CFR 50.46 Notification Letter 2011-03 dated July 20, 2011, Impact of Updated Formulation for Gamma Heat Deposition to Channel Wall for 9x9 and 10x10 Fuel Bundles.	ΔPCT = -15°F
Self-identified non-conservative assumption regarding LPCI pump degradation at shutoff pressure. (Reference 5)	ΔPCT = 57°F
10 CFR 50.46 Notification Letter 2012-01 dated November 29, 2012, PRIME Fuel Properties Implementation for Fuel Rod T/M Performance, replacing GESTR Fuel Properties	ΔPCT = 0°F
10 CFR 50.46 Notification Letter 2013-01 dated 01/15/2013, LPCS injection to the vessel based on a quadratic pump curve	ΔPCT = 30°F
10 CFR 50.46 Notification Letter 2014-01 dated 05/21/2014, SAFER04A E4-Maintenance Update Changes	ΔPCT = 0°F
10 CFR 50.46 Notification Letter 2014-02 dated 05/21/2014, SAFER04A E4-Mass Non-Conservatism	ΔPCT = 10°F
10 CFR 50.46 Notification Letter 2014-03 dated 05/21/2014, SAFER04A E4-Minimum Core DP Model	ΔPCT = -10°F
10 CFR 50.46 Notification Letter 2014-04 dated 05/21/2014, SAFER04A E4-Bundle/Lower Plenum CCFL Head	ΔPCT = 5°F
Net PCT	PCT = 2112°F

While the net PCT of 2112°F provides a 88°F margin to the 2200°F PCT limit in 10 CFR 50.46, this result is based on a core power assumed to correspond to extended power uprate values of 3952 MWth (Nominal)/4031 MWth (Appendix K). This is greater than the Fermi 2 current licensed thermal power of 3486 MWth (Reference 11). As such, there is additional margin that is not represented in the results above.

DTE Energy is pursuing a revision to the current analysis of record that includes incorporation of the above listed corrections and changes. The revised analysis assumes a core thermal power that more closely corresponds to the current licensed thermal power. The revised analysis will be provided in a future correspondence.

References:

1. Detroit Edison's Letter to USNRC, "Submittal of Plant Specific Emergency Core Cooling System (ECCS) Evaluation Model Reanalysis," NRC-08-0046, dated June 23, 2008. (ML081830408).

2. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2008-01, Revision 1" dated November 25, 2008.

3. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2011-02," dated July 20, 2011.

4. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2011-03," dated July 20, 2011.

5. Evaluation Report - GEH Report No. 0000-0121-0144-R1, "DTE Energy Enrico Fermi 2 - Reduced LPCI Flow GE11 and GE14 ECCS-LOCA Evaluation," dated July 2010 (GEH Proprietary).

6. Detroit Edison's Letter to USNRC, "30-Day 10 CFR 50.46 Report - Plant Specific ECCS Evaluation Change," NRC-11-0042, dated August 19, 2011. (ML112340598)

7. Enclosure 3 of Detroit Edison's Letter to USNRC, "Submittal of 2011 Safety Relief Valve Challenge Report, Main Steam Bypass Line Report, and ECCS Cooling Performance Evaluation Model Changes or Errors Report, NRC-12-0025, dated April 26, 2012. (ML12118A147)

8. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2012-01," dated November 29, 2012.

9. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2013-01," dated January 15, 2013.

10. Enclosure 3 of DTE's Letter to USNRC, "Submittal of 2012 Safety Relief Valve Challenge Report, Main Steam Bypass Line Report, and ECCS Cooling Performance Evaluation Model Changes or Errors Report," NRC-13-0017, dated April 26, 2013. (ML13119A106)

11. Fermi 2- Issuance of Amendment Re: Measurement Uncertainty Recapture Power Uprate (TAC NO. MF0650). (ML13364A131)

12. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2014-01," dated May 21, 2014.

13. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2014-02," dated May 21, 2014.

14. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2014-03," dated May 21, 2014.

15. General Electric- Hitachi "10 CFR 50.46 Notification Letter 2014-04," dated May 21, 2014.