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March 30, 2017
NRC-17-0036

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

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) DTE Electric Letter to NRC, "License Amendment Request to Revise Technical Specifications for Emergency Core Cooling System Instrumentation and Reactor Core Isolation Cooling System Instrumentation," NRC-17-0010, dated February 23, 2017 (ML17055A365)

Subject: Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications for Emergency Core Cooling System Instrumentation and Reactor Core Isolation Cooling System Instrumentation

In Reference 2, DTE Electric Company (DTE) submitted a license amendment request (LAR) to revise the Technical Specifications (TS) for Emergency Core Cooling System (ECCS) Instrumentation (TS 3.3.5.1) and Reactor Core Isolation Cooling (RCIC) System Instrumentation (TS 3.3.5.2). In an email from Ms. Sujata Goetz to Mr. Jason Haas dated March 28, 2017, the NRC sent DTE a request for additional information (RAI) regarding this LAR. The response to the RAI is enclosed.

No new commitments are being made in this submittal.

Should you have any questions or require additional information, please contact Mr. Scott A. Maglio, Manager – Nuclear Licensing, at (734) 586-5076.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 30, 2017

Keith J. Polson
Site Vice President

Enclosure: Response to Request for Additional Information

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 to
NRC-17-0036

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

Response to Request for Additional Information

Response to Request for Additional Information

RAI-1

The LAR defines the low pressure range as being between 150 psig and 600 psig. The calculations provided in the proprietary enclosure included with the LAR support a limit of 552 psig. Provide calculations, test result and references to support the 600 psig.

RESPONSE

DTE Electric Company (DTE) submitted a License Amendment Request (LAR) to revise the Fermi 2 Technical Specifications (TS) on February 23, 2017 (DTE letter NRC-17-0010). The LAR requested modification of the TS for Emergency Core Cooling System (ECCS) Instrumentation (TS 3.3.5.1) and Reactor Core Isolation Cooling (RCIC) System Instrumentation (TS 3.3.5.2). Specifically, the proposed changes were to add footnotes indicating that the injection functions of "Drywell Pressure – High" for High Pressure Coolant Injection (HPCI) and "Manual Initiation" for HPCI and RCIC are not required to be operable under low reactor pressure conditions. The phrase "low reactor pressure conditions" in the LAR refers to the pressure range of 150 psig to 600 psig, as described in Section 2.0 of the LAR. This RAI response provides the requested information regarding the selection of the value of 600 psig.

A Fermi 2 plant-specific analysis (Reference 1) included a calculation of the approximate pressure at which the off-calibration condition discussed in the LAR would result in the occurrence of a high reactor vessel water level (Level 8) trip signal when the actual reactor vessel water level was normal. This calculation is dependent on the plant-specific values for normal water level (+197.2 inches of water level measured from the top of the active fuel as indicated in Reference 2) and the Level 8 setpoint (+214.0 inches of water level measured from the top of the active fuel as indicated in UFSAR Figure 7.3-12 Sheet 3). The calculation determined that the Level 8 trip signal is present at a pressure of approximately 552 psig when the actual reactor vessel water level is normal. This means that during an evolution where reactor pressure is being decreased (e.g. a plant shutdown), the Level 8 trip signal would be expected to occur at approximately 552 psig when the actual reactor vessel water level is normal. Similarly, this means that during an evolution where reactor pressure is being increased (e.g. a plant startup), the Level 8 trip signal would be expected to clear at approximately 552 psig when the actual reactor vessel water level is normal. The magnitude of the off-calibration condition decreases as reactor vessel pressure increases such that it is insignificant by the time the reactor reaches normal operating pressures.

The calculation resulting in 552 psig is based on the actual reactor vessel water level being normal. However, fluctuations in level due to normal plant processes can result in levels slightly below or above this value. UFSAR Figure 7.3-12 Sheet 3 indicates the high and low level alarm setpoints (i.e. Levels 7 and 4, respectively) used to help maintain this normal level. Therefore, if the actual reactor vessel water level is near either of these alarm setpoints, then the reactor pressure corresponding to the Level 8 trip signal would be different than the 552 psig calculated for the normal water level. For example, if actual reactor vessel water level was near the low alarm setpoint, the methodology used in Reference 1 would calculate a reactor pressure for the Level 8 trip signal of less than 552 psig.

Reference 1 indicates that using an actual reactor vessel water level close to the low level alarm setpoint results in a pressure of approximately 418 psig for the Level 8 trip signal. Similarly, if actual reactor vessel water level was near the high level alarm setpoint, the methodology used in Reference 1 would determine a reactor pressure for the Level 8 trip signal of greater than 552 psig. Although it is not expected that water level would be controlled near either the low or high level alarm setpoints, it is possible. Therefore, in order to bound level fluctuations about the normal water level (i.e. +197.2 inches of water level measured from the top of the active fuel) used in the calculation in Reference 1, it was reasonable to propose a value in the TS of greater than the calculational value of 552 psig. From a human factors perspective, the value to be included in the TS should be a round number that is simple and clear for determining TS applicability. For these reasons, the bounding value selected for the LAR was 600 psig.

DTE reviewed plant-specific operating data to determine the pressure at which the Level 8 trip signal is present when operating under low reactor pressure conditions. Data from plant startups provides the pressure at which the Level 8 trip signal clears as pressure increases. Data from plant shutdowns provides the pressure at which the Level 8 trip signal occurs as pressure decreases. The Fermi 2 startup and shutdown data from the past 10 years indicates that the highest pressure at which a Level 8 trip signal was present during a normal startup/shutdown was approximately 530 psig. This operating data indicates that a pressure of approximately 550 psig would be bounding for use in the TS based on previous history. However, it was reasonable to select a value of 600 psig for use in the LAR to ensure that the proposed TS would include additional margin to bound all future plant startups and shutdowns.

In this RAI response, DTE has provided a basis for the selection of 600 psig in the LAR. DTE acknowledges that the calculation in the plant-specific analysis gives a value of approximately 552 psig and that plant-specific operating data shows that a value of approximately 530 psig has not been exceeded in the past 10 years. Based on the calculation and data, and in consideration of human factors, it would also be justifiable to select a value of 550 psig for the proposed TS changes. Therefore, after further review, DTE proposes to revise the pressure value for the TS footnote to be 550 psig rather than 600 psig. This will ensure that the proposed TS is more clearly consistent with the supporting calculation and operating data. Revised TS markup pages showing the value of 550 psig are provided on the following pages. This change does not expand the scope of the original LAR. In addition, the technical evaluation provided in Section 4.0 of the original LAR remains bounding of the new proposed value of 550 psig.

References

1. 004N0874, Revision 0, "HPCI/RCIC Unavailability – Wide Range Level Off-Calibration – Level 8 Trip at Low Pressure – for the Enrico Fermi 2 Nuclear Power Plant," dated February 2017.*1
2. Letter from DTE to U. S. Nuclear Regulatory Commission, NRC-17-0016, "Submittal of Plant Specific Emergency Core Cooling System (ECCS) Evaluation Model Reanalysis," dated February 13, 2017 (ML17045A668 / ML17045A669).*2

*1: Note that the RAI indicates that a proprietary enclosure was included with the LAR. However, the Fermi 2 plant-specific analysis in Reference 1 was performed by GE Hitachi and contains proprietary information. For this reason, the analysis was not submitted as part of the LAR. The analysis is controlled on the Fermi 2 site in accordance with UFSAR Section 13.6 and was therefore available to NRC staff.

*2: Reference 2 documented the reanalysis based on calculation 000N1319-R0. That calculation provides the normal water level of 563.5 inches in units of AVZ (above vessel zero). As indicated in that calculation, the top of the active fuel is 366.3 inches AVZ. Hence the normal water level of 197.2 inches above the top of the active fuel can be verified (i.e. 563.5 – 366.3).

Table 3.3.5.1-1 (page 3 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level – Low Low, Level 2	1, 2(d), 3(d)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 103.8 inches
b. Drywell Pressure – High	1, 2~~(d)~~, 3~~(d)~~	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 1.88 psig
c. Reactor Vessel Water Level – High, Level 8	1, 2(d), 3(d)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 219 inches
d. Condensate Storage Tank Level – Low	1, 2(d), 3(d)	2	D	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 0 inches
e. Suppression Pool Water Level – High	1, 2(d), 3(d)	2	D	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 5.0 inches
f. Manual Initiation	1, 2~~(d)~~, 3~~(d)~~	1(c)	C	SR 3.3.5.1.6	NA

(e)

(e)

(continued)

(c) Individual component controls.

(d) With reactor steam dome pressure > 150 psig.

(e) The injection functions of Drywell Pressure - High and Manual Initiation are not required to be OPERABLE with reactor steam dome pressure less than 550 psig.

Table 3.3.5.2-1 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low, Level 2	4	B	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4 SR 3.3.5.2.5	≥ 103.8 inches
2. Reactor Vessel Water Level – High, Level 8	2	C	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4 SR 3.3.5.2.5	≤ 219 inches
3. Condensate Storage Tank Level – Low	2	D	SR 3.3.5.2.1 SR 3.3.5.2.2 SR 3.3.5.2.3 SR 3.3.5.2.4 SR 3.3.5.2.5	≥ 0 inches
4. Manual Initiation (a)	1 per valve	C	SR 3.3.5.2.6	NA

(a) The injection function of Manual Initiation is not required to be OPERABLE with reactor steam dome pressure less than 550 psig.