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DTE Energy

10CFR50.90

February 27, 2003
NRC-03-0019

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) Detroit Edison Letter to NRC, "Proposed License Amendment for a One-Time Deferral of the Primary Containment Integrated Leak Rate Test," NRC-02-0040, dated May 23, 2002

3) Detroit Edison Letter to NRC, "Response to NRC Request For Additional Information Regarding the Proposed License Amendment for a One-Time Deferral of the Primary Containment Integrated Leak Rate Test," NRC-02-0084, dated December 20, 2002

Subject: Additional Information Regarding the Proposed License Amendment for a One-Time Deferral of the Primary Containment Integrated Leak Rate Test

In Reference 2, Detroit Edison requested NRC approval of a proposed license amendment to modify the Technical Specifications (TS) to allow a one-time deferral of the Type A primary containment integrated leak rate test (ILRT). Specifically, the request proposed revising TS 5.5.12, "Primary Containment Leakage Rate Testing Program," to extend the current interval for performing the ILRT from 10 years to 15 years.

In Reference 3, Detroit Edison provided a response to additional information requested by the NRC staff to help complete the NRC review and approval.

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In a conference call held between Detroit Edison and the NRC on January 27, 2003, the NRC requested additional information regarding the likelihood and risk implications of degradation-induced primary containment leakage occurring and going undetected through visual examination during the requested test interval extension. The requested information is provided in the Enclosure to this letter.

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

Sincerely,

William J. O'Connell

Enclosure

cc: M. A. Ring
J. F. Stang, Jr.
NRC Resident Office
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

I, WILLIAM T. O'CONNOR, JR., do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

William D. O'Connor

WILLIAM T. O'CONNOR, JR.
Vice President - Nuclear Generation

On this 27th day of February, 2003 before me personally appeared William T. O'Connor, Jr., being first duly sworn and says that he executed the foregoing as his free act and deed.

Karen M. Reed

Notary Public

KAREN M. REED
Notary Public, Monroe County, MI
My Commission Expires 09/02/2005

ENCLOSURE TO
NRC-03-0019

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

ADDITIONAL INFORMATION REGARDING THE PROPOSED LICENSE AMENDMENT FOR A ONE-TIME DEFERRAL OF THE PRIMARY CONTAINMENT INTEGRATED LEAK RATE TEST

SUMMARY: Concealed Flaw Corrosion Analysis

The analysis utilizes a similar approach to that outlined in the Calvert Cliffs assessment to estimate the likelihood and risk-implication of degradation-induced leakage occurring and going undetected in containment visual examinations during the extended test interval. It should be noted that the Calvert Cliffs analysis was performed for a concrete cylinder and dome containment with a steel liner whereas the Fermi containment is a BWR Mark I containment with a steel shell in the drywell region including the portion below the concrete drywell floor. As such, not all aspects of the Calvert Cliffs analysis are directly applicable to Fermi. Each of the analysis steps is described below with their relationship to the Calvert analysis noted where applicable.

The following approach is used to determine the change in likelihood, due to extending the ILRT, of detecting corrosion of the containment steel shell. This likelihood is then used to determine the resulting change in risk. Consistent with the Calvert Cliffs analysis, the following issues are addressed:

- Differences between the containment floor and other regions of containment;
- The historical steel shell flaw likelihood due to concealed corrosion;
- The impact of aging;
- The corrosion leakage dependency on containment pressure; and
- The likelihood that visual inspections will be effective at detecting a flaw.

Detailed Analysis

Table 1
Fermi Concealed Flaw Corrosion Analysis Steps

Step	Description	Containment Walls		Containment Floor	
1	**Historical Steel Liner Flaw Likelihood** Failure Data: Containment location specific (applicable wall events and derived failure value is consistent with Calvert Cliffs analysis; one floor event assumed applicable for Fermi whereas Calvert assumed 0.5 failures).	Events: 2 (4 industry events, North Anna and Brunswick events assumed applicable to Fermi) 2/(70 * 5.5) = **5.2E-3** (Based on 70 units with liners over 5.5 years)		Events: 1 (1 industry event at Oyster Creek assumed applicable to Fermi) 1/(70 * 5.5) = **2.6E-3** (Based on 70 units with liners over 5.5 years)	
2	**Age Adjusted Steel Liner Flaw Likelihood** During 15-year interval, assume flaw likelihood doubles every five years (14.9% increase per year). The average for 5th to 10th year is set to the historical failure rate (consistent with Calvert Cliffs analysis).	Year	Flaw Likelihood	Year	Flaw Likelihood
		1	2.1E-3	1	1.0E-3
		avg 5-10	5.2E-3	avg 5-10	2.6E-3
		15	1.4E-2	15	7.0E-3
		15 year average = 6.27E-3		**15 year average = 3.14E-3**	

Table 1
Fermi Concealed Flaw Corrosion Analysis Steps

Step	Description	Containment Walls	Containment Floor
3	**Flaw Likelihood at 3, 10, and 15 years** Cumulative age adjusted liner flaw likelihood (Step 2), assuming failure rate doubles every five years (consistent with Calvert Cliffs analysis), for the 3 year, 10 year, and 15 year points in time.	**7.10E-3 (at 3 years)** **4.06E-2 (at 10 years)** **9.40E-2 (at 15 years)** (Note that the Calvert Cliffs analysis presents the delta between 3 and 15 years of 8.7% to utilize in the estimation of the delta-LERF value. For this analysis, however, the values are calculated based on the 3, 10, and 15 year intervals consistent with the original evaluation shown in Table 1, and then the delta-LERF values are determined from there.)	**3.55E-3 (at 3 years)** **2.03E-2 (at 10 years)** **4.70E-2 (at 15 years)** (Note that the Calvert Cliffs analysis assumed 0.5 failures and this analysis assumes 1 failure such that the values above represent twice the delta between 3 and 15 years to utilize in the estimation of the delta-LERF value.)
4	**Likelihood of Breach in Containment Given Shell Flaw** Assume that a flaw in the wall leads to containment failure during the severe accident progression (compared to 1.1% in the Calvert Cliffs analysis). The floor failure probability is assumed to be 10% (compared to 0.11% in the Calvert analysis).	**100%** (Conservatively assume that all breaches will result in EPRI Release Class 3b given an applicable core damage event.)	**10%** (Conservatively assume that all breaches will result in EPRI Release Class 3b given an applicable core damage event.)
5	**Visual Inspection Detection Failure Likelihood** Utilize assumptions consistent with Calvert Cliffs analysis.	**10%** 5% failure to identify visible flaws plus 5% likelihood that the flaw is not visible (not through-wall but could be detected by ILRT) All industry events have been detected through visual inspection, 5% visible failure detection is a conservative assumption.	**100%** Cannot be visually inspected.

Table 1
Fermi Concealed Flaw Corrosion Analysis Steps

Step	Description	Containment Walls	Containment Floor
6	**Likelihood of Non-Detected Corrosion-Induced Containment Leakage** (Steps 3 * 4* 5)	**7.10E-4 (at 3 years)** 7.10E-3 * 100% * 10% **4.06E-3 (at 10 years)** 4.06E-2 * 100% * 10% **9.40E-3 (at 15 years)** 9.40E-2 * 100% * 10%	**3.55E-4 (at 3 years)** 3.55E-3 * 10% * 100% **2.03E-3 (at 10 years)** 2.03E-2 * 10% * 100% **4.70E-3 (at 15 years)** 4.70E-2 * 10% * 100%

The total likelihood of the corrosion-induced, non-detected containment leakage is the sum of Step 6 for the containment walls and the containment floor as summarized below.

Cumulative Likelihood of Non-Detected Containment Leakage due to Corrosion

At 3 years: 7.10E-4 + 3.55E-4 = 1.07E-3
At 10 years: 4.06E-3 + 2.03E-3 = 6.09E-3
At 15 years: 9.40E-3 + 4.70E-3 = 1.41E-2

Table 2 then shows the results of the updated ILRT assessment including the potential impact from non-detected containment leakage scenarios assuming that all of the candidate sequences result in EPRI Class 3b (i.e., result in LERF). Note that the impact of including the potential for corrosion-induced leakages compared to the original analysis results are noted in parenthesis.

Table 2
Final Results Including Concealed Flaw Corrosion Analysis
Fermi ILRT Cases: Base, 3 to 10, and 3 to 15 Yr Extensions

	Base Case 3 Years			Extend to 10 Years			Extend to 15 Years		
EPRI Class	CDF/Yr	Per-Rem	Per-Rem/Yr	CDF/Yr	Per-Rem	Per-Rem/Yr	CDF/Yr	Per-Rem	Per-Rem/Yr
1	*8.97E-07*	*2.05E+02*	*1.84E-04*	*7.78E-07*	*2.05E+02*	*1.59E-04*	*6.86E-07*	*2.05E+02*	*1.41E-04*
2	2.46E-10	4.09E+06	1.01E-03	2.46E-10	4.09E+06	1.01E-03	2.46E-10	4.09E+06	1.01E-03
3a	*4.32E-08*	*2.05E+03*	*8.85E-05*	*1.44E-07*	*2.05E+03*	*2.95E-04*	*2.16E-07*	*2.05E+03*	*4.43E-04*
3b	*6.02E-09*	*7.18E+03*	*4.32E-05*	*2.41E-08*	*7.18E+03*	*1.73E-04*	*4.41E-08*	*7.18E+03*	*3.17E-04*
4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7a	8.40E-08	1.88E+04	1.58E-03	8.40E-08	1.88E+04	1.58E-03	8.40E-08	1.88E+04	1.58E-03
7b	1.10E-06	1.25E+06	1.37E+00	1.10E-06	1.25E+06	1.37E+00	1.10E-06	1.25E+06	1.37E+00
7c	3.45E-07	4.31E+06	1.49E+00	3.45E-07	4.31E+06	1.49E+00	3.45E-07	4.31E+06	1.49E+00
7d	2.15E-07	1.21E+07	2.60E+00	2.15E-07	1.21E+07	2.60E+00	2.15E-07	1.21E+07	2.60E+00
7e	5.59E-07	7.41E+06	4.14E+00	5.59E-07	7.41E+06	4.14E+00	5.59E-07	7.41E+06	4.14E+00
8	3 41E-08	1.75E+07	5.97E-01	3.41E-08	1.75E+07	5.97E-01	3.41E-08	1.75E+07	5.97E-01
Total	3.28E-06		10.1976	3.28E-06		10.1980	3.28E-06		10.1982
ILRT Dose Rate from 3a and 3b			1.32E-04 (+1.2E-05)			4.68E-04 (+7.0E-05)			7.59E-04 (+1.62E-04)
% of Total			0.001% (+0.0001%)			0.005% (+0.0007%)			0.007% (+0.0016%)
Total Delta Dose Rate (3 to 15 yr)									**5.84E-04 (+1.45E-04)**
LERF from 3b			6.02E-09 (+1.7E-09)			2.41E-08 (+9.7E-09)			4.41E-08 (+2.25E-08)
Delta LERF (3 to 15 yr)									**3.81E-08 (+2.08E-08)**
CCFP %			71.37% (+0.05%)			71.92% (+0.30%)			72.53% (+0.69%)
Delta CCFP % (3 to 15 yr)									**1.16% (+0.63%)**

Based on the results in Table 2, it can be seen that including corrosion effects in the ILRT assessment would not alter the conclusions from the original analysis. That is, the change in LERF from extending the interval to 15 years from the original requirement is estimated to be about 3.8E-8 /yr. This is still well below the Regulatory Guide 1.174 acceptance criteria threshold for "very small" changes in risk of 1.0E-7. Additionally, the dose increase from 3a and 3b is estimated to be about 7.6E-4 person-rem/yr resulting in a net dose increase of 5.8E-4 person-rem/yr, and the conditional

containment failure probability increase is estimated to be about 1.2%. Both of these increases are also considered to be "very small". As such, the ILRT interval extension is judged to have a minimal impact on plant risk (including age-adjusted non-detectable corrosion impacts), and is therefore acceptable.