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August 4, 2017  
NRC-17-0051

10 CFR 50.55a

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 Company Letter to NRC, "Submittal of the Inservice Testing Program Relief Requests for Pumps and Valves – Third Ten-year Interval," NRC-09-0064, dated November 3, 2009 (ML093140302)
  - 3) DTE Electric Company Letter to NRC, "Response to Request for Additional Information Regarding Relief Request VRR-012 for the Inservice Testing Program Third Ten-Year Interval," NRC-10-0037, dated May 19, 2010 (ML101400550)
  - 4) NRC Letter to DTE Electric Company, "Fermi 2 – Evaluation of In-Service Testing Program Relief Requests VRR-011, VRR-012, and VRR-013 (TAC No. ME2558, ME2557, and ME2556)," dated September 28, 2010 (ML102360570)
  - 5) NRC Letter to DTE Electric Company, "Fermi 2 Nuclear Power Plant - Issuance of Amendment to Extend Containment Leakage Test Frequency (CAC No. MF7534)," dated March 9, 2017 (ML16351A460)
  - 6) Nuclear Energy Institute (NEI) Topical Report, 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012 (ML12221A202)

Subject: Submittal of Revised Relief Requests Nos. VRR-012 and VRR-013 for the Inservice Testing Program Third 10-Year Interval

Pursuant to 10 CFR 50.55a, “Codes and Standards,” paragraph (z)(1), DTE Electric Company (DTE) hereby requests NRC approval of the enclosed revision to relief requests, VRR-012 and VRR-013, for the Fermi 2 Power Plant. The third interval of the Fermi 2 IST Program began on February 17, 2010, and complies with the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code), 2004 Edition, no addenda.

In Reference 2, DTE submitted relief requests for the third Inservice Testing (IST) Program 10-year interval at Fermi 2 for NRC review and approval. Specifically, VRR-012 requested relief for subject valves from the requirement of ASME OM Code ISTC-3700, which requires the Position Indication Verification Test (PIT) be performed once every 2 years, and VRR-013 requested relief from the requirement of ASME OM Code ISTC-3630(a), which requires that leakage rate testing (water) for Pressure Isolation Valves (PIVs) be performed once every 2 years. DTE provided additional information for Relief Request VRR-012 in Reference 3. The NRC’s approval of Relief Requests VRR-012 and VRR-013 in Reference 4 stated that the proposed alternatives in the requests provide reasonable assurance that the 32 PIT valves and the 15 PIVs will remain operationally ready. The approved alternatives aligned the PIT frequency and the PIV test frequency with the Fermi 2 performance-based leakage-test program outlined in 10 CFR 50 Appendix J, Option B, which allowed testing to be performed once every 60 months for components with established good performance.

In Reference 5, the NRC issued Fermi 2 a license amendment to revise TS Section 5.5.12, “Primary Containment Leakage Rate Testing Program,” to reference the guidance in NEI 94-01, Revision 3-A, and conditions and limitations specified in NEI 94-01, Revision 2-A. The license amendment also allowed the extension of the containment isolation valve leakage test (i.e., Type C tests) from 60 months to 75 months in accordance with NEI 94-01, Revision 3-A for components with established good performance in the 10 CFR 50 Appendix J, Option B performance-based leakage-testing program. However, the NRC’s approval of Relief Requests VRR-012 and VRR-013 (Reference 4) to align the PIT frequency and the PIV test frequency with the Fermi 2 performance-based leakage-test program outlined in 10 CFR 50 Appendix J, Option B specified that the program interval shall not exceed 60 months. Therefore, DTE is hereby submitting a revision to Relief Requests VRR-012 (see Enclosure 1) and VRR-013 (see Enclosure 2) to realign the testing frequency with the 10 CFR 50 Appendix J, Option B program, which now specifies an interval limit of 75 months. NRC approval of the proposed alternative is requested for the remaining duration of the Fermi 2 Third Inservice Testing (IST) 10-Year Interval, which started on February 17, 2010.

DTE requests NRC approval of these relief requests within one calendar year of the date of this letter.

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, of my staff at (734) 586-5076.

Sincerely,



Keith J. Polson  
Site Vice President

Enclosures:

1. Revised Relief Request VRR-012 for the Inservice Testing Third 10-Year Interval
2. Revised Relief Request VRR-013 for the Inservice Testing Third 10-Year Interval

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-17-0051**

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

**Revised Relief Request VRR-012 for the  
Inservice Testing Third 10-Year Interval**

**10 CFR 50.55a Relief Request VRR-012, Revision 1**  
**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

**Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)**  
**Alternative Provides Acceptable Level of Quality and Safety**

**1. ASME Code Component(s) Affected**

<b>Valve Number</b>	<b>Class</b>	<b>Cat.</b>	<b>Function</b>
C5100F002A	2	A	TIP Channel A Ball Valve
C5100F002B	2	A	TIP Channel B Ball Valve
C5100F002C	2	A	TIP Channel C Ball Valve
C5100F002D	2	A	TIP Channel D Ball Valve
C5100F002E	2	A	TIP Channel E Ball Valve
E11F412	2	A	RHR Div II Pri. Containment Monitoring Isolation Valve
E11F413	2	A	RHR Div II Pri. Containment Monitoring Isolation Valve
E11F414	2	A	RHR Div I Pri. Containment Monitoring Isolation Valve
E11F415	2	A	RHR Div I Pri. Containment Monitoring Isolation Valve
E41F400	2	A	Pri. Containment Monitoring (PCM) - Suppression Pool
E41F401	2	A	Pri. Containment Monitoring (PCM) - Suppression Pool
E41F402	2	A	Pri. Containment Monitoring (PCM) - Suppression Pool
E41F403	2	A	Pri. Containment Monitoring (PCM) - Suppression Pool
P34F401A	1	A	Post Accident Sampling (PAS) V13-7360
P34F401B	1	A	Post Accident Sampling (PAS) V13-7361
P34F403A	2	A	Post Accident Sampling (PAS) V13-7364
P34F403B	2	A	Post Accident Sampling (PAS) V13-7365
P34F404A	2	A	Post Accident Sampling (PAS) V13-7374
P34F404B	2	A	Post Accident Sampling (PAS) V13-7375
P34F405A	2	A	Post Accident Sampling (PAS) V13-7366
P34F405B	2	A	Post Accident Sampling (PAS) V13-7367
P34F406A	2	A	Post Accident Sampling (PAS) V13-7376
P34F406B	2	A	Post Accident Sampling (PAS) V13-7377
P34F407	2	A	Post Accident Sampling (PAS) V13-7368
P34F408	2	A	Post Accident Sampling (PAS) V13-7369
P34F409	2	A	Post Accident Sampling (PAS) V13-7378
P34F410	2	A	Post Accident Sampling (PAS) V13-7379
T50F412A	2	A	Pri. Containment Torus Level Monitoring Division 1
T50F412B	2	A	Pri. Containment Torus Level Monitoring Division 2
T50F450	2	A	Pri. Containment Radiation Monitoring System Inlet Isolation Valve
T50F451	2	A	Pri. Containment Radiation Monitoring System Outlet Isolation Valve
T50F458	2	A	Pri. Cont Atmospheric Monitoring (PCAM) Division 2 Penetration X-27F Remote Manual Solenoid Valve

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**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

**2. Applicable Code Edition and Addenda**

ASME OM Code 2004 Edition, no Addenda

**3. Applicable Code Requirement**

ISTC-3700 "Position Verification Testing," states that "Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated."

**4. Reason for Request**

Pursuant to 10 CFR 50.55a, "Codes and Standards", paragraph (z)(1), relief is requested from the requirement of ASME OM Code ISTC-3700 for the subject valves. The proposed alternative will provide an acceptable level of quality and safety. Reducing the number of tests involving set-up of Leak Rate Monitors, tubing, etc. every two years will reduce overall dose.

Relief is requested from performing the position indication verification test (PIT) on a two year frequency. Recent historical data was used to identify that PIT alone each refuel outage (each 18 months) incurs a total dose of approximately 700 mRem. The NRC's approval of the proposed alternative in VRR-012, Revision 0, resulted in the PIT frequency being aligned with the Fermi 2 performance-based leakage-test program outlined in 10 CFR 50 Appendix J, Option B with a test interval limit of 60 months. VRR-012, Revision 1, proposes that position indication verification will be performed at a frequency commensurate with the 10 CFR 50 Appendix J, Option B performance-based leakage testing program at Fermi 2, which incorporates NEI 94-01, Revision 3-A (ADAMS Accession No. ML12221A202), and the conditions and limitations specified in NEI 94-01, Revision 2-A.

The Fermi 2 program which implements 10 CFR 50 Appendix J, Option B requires individual containment isolation valves to be good performers before they can be placed on extended seat leakage testing frequency. Assuming all of the PIT valves are classified as good performers, the extended test intervals would provide for a savings of approximately 2100 mRem (700 mRem above the 1400 mRem savings realized through the previously approved test interval limit of 60 months in VRR-012, Revision 0) over a 75-month period.

**10 CFR 50.55a Relief Request VRR-012, Revision 1**  
**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

**5. Proposed Alternative and Basis for Use**

In accordance with ISTC-3700, where local observation is not possible, other indications shall be used to verify valve position. The method used at Fermi 2 is a pressure test using the local leakage rate testing equipment. This method involves pressurizing the containment penetration volume to approximately 56.5 psig [pounds per square inch gauge], and verifying the penetration remains pressurized while the valve is indicating closed on the main control room board. The valve is then opened using the control switch in the main control room. A decrease in pressure is then verified along with valve position indicating open in the main control room. This method satisfies the requirement for position indication verification and ensures that the indicating system accurately reflects the valve position.

The subject valves are all in category A and are all containment isolation valves per the plant safety analysis. All of the subject valves have a safety function to close in order to isolate containment during a Loss of Coolant Accident (LOCA) when required.

Since these valves are containment isolation valves, they are each individually seat leakage tested in accordance with 10 CFR 50 Appendix J, Option B.

The subject valves are designed such that the position of the valve is not locally observable. The design of these valves is such that the coil position is internal to the valve body and not observable in either the energized or de-energized state. See Attachment 1 – Typical Solenoid Valve Arrangement, which is typical for the subject valves.

For the subject valves, Fermi 2 will perform the position indication verification in conjunction with the seat leakage test at a frequency in accordance with 10 CFR 50 Appendix J, Option B. This interval may be adjusted to a frequency of testing commensurate with the Option B of 10 CFR 50 Appendix J Type C leakage testing, which is based on valve seat leakage performance.

Each of these valves are seat leakage tested using local leakage rate testing equipment (i.e., Local Leakage Rate Monitors (LRMs)), and the current leakage rate tests have been modified to also perform the position indication verification test at the same time. The individual valve being tested must have its system properly drained, vented, and aligned correctly prior to performing the seat leakage test or the position indication verification, per code requirements. The radiation exposure and the Operations/Test personnel time/labor involved will be significantly reduced by performing the position indication verification test at the same interval (frequency) as the 10 CFR 50 Appendix J, Option B

## **10 CFR 50.55a Relief Request VRR-012, Revision 1**

### **Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

seat leakage test. A sample of PIT historical data has been provided in Attachment 2 and a sample of Local Leakage Rate Test historical data has been provided in Attachment 3.

In addition, each of these subject valves are exercised on a quarterly or refueling frequency and their stroke times are measured and compared to the ASME OM Code ISTC-5152 "Stroke Test Acceptance Criteria," which states "Test results shall be compared to referenced values established in accordance with ISTC-3300, ISTC-3310, or ISTC-3320." By continuing this valve exercising, the performance of the position indication verification, and the seat leakage test in accordance with 10 CFR 50 Appendix J, Option B, an adequate assessment of valve health may be determined. A sample of the stroke time history for each valve has been provided in Attachment 4.

These PIT valves are also subject to Preventive Maintenance program coverage, in which preventive maintenance activities are performed periodically to satisfy Environmental Qualifications (EQ) Program criteria. Any maintenance that is performed on these valves which might affect position indication will be followed by applicable Post Maintenance Testing (PMT) including PIT. EQ Program maintenance information has been provided in Attachment 5.

In 1996, Fermi 2 received a Safety Evaluation (Technical Specification Amendment No. 108) with approval to implement Option B of the 10 CFR 50 Appendix J Program. This program permits the extension of the Appendix J seat leakage testing to a frequency corresponding to the specific valve performance. Valves whose leakage test results indicate good performance may have their interval of testing increased based on these test results.

On March 9, 2017, Fermi 2 received a Safety Evaluation (Technical Specification Amendment No. 205) with approval to implement NEI 94-01, Revision 3-A (ADAMS accession No. ML12221A202) and the conditions and limitations specified in NEI 94-01, Revision 2-A, to implement the performance-based leakage-testing program in accordance with 10 CFR 50 Appendix J, Option B. This Amendment increased the containment isolation valves leakage test intervals (i.e., Type C tests) from 60 months to 75 months. The Fermi 2 program which implements 10 CFR 50 Appendix J, Option B requires individual containment isolation valves to be good performers before they can be placed on extended seat leakage testing frequency. Based on the data contained in Attachment 3, all the listed valves have passed their last three PIT Local Leakage Rate Tests.

In conclusion, the ability to detect degradation and ensure the operational readiness of the subject valves to perform their intended function is not jeopardized by performing the position indication verification test at the same frequency as specified by 10 CFR 50



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Appendix J, Option B. This frequency of testing provides reasonable assurance of the operational readiness of the subject valves and provides an acceptable level of quality and safety.

**6. Duration of Proposed Alternative**

This proposed alternative is for the remaining duration of the Femi 2 Third Inservice Testing (IST) 10-Year Interval, which started February 17, 2010.

**7. Precedents**

- NRC Safety Evaluation Report: Kewaunee Nuclear Power Plant – Fourth 10-Year Inservice Testing Interval Program Requests for Relief (TAC Nos. MC4182, MC4183, MC4184, and MC4185), dated March 4, 2005 (ML050380305)
- NRC Safety Evaluation Report: Fermi 2 – Evaluation of In-Service Testing Program Relief Requests VRR-011, VRR-012, and VRR-013 (TAC No. ME2558, ME2557, and ME2556), dated September 28, 2010 (ML102360570)

**8. Attachments**

Attachment 1 – Typical Solenoid Valve Arrangement

Attachment 2 – Position Indication Test History Sample (Last Three Tests)

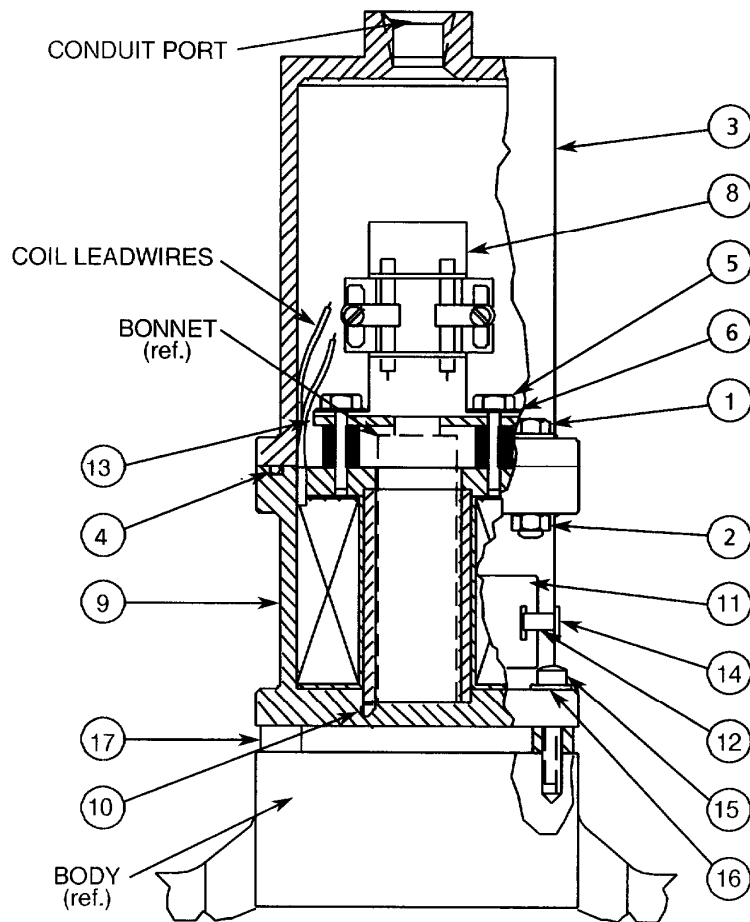
Attachment 3 – Position Indication Test Valve Local Leakage Rate Test History Sample  
(Last Three Tests)

Attachment 4 – Stroke Time History Sample

Attachment 5 – Position Indication Test EQ Program Maintenance

**10 CFR 50.55a Relief Request VRR-012, Revision 1**  
**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 1 - Typical Solenoid Valve Arrangement



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Cover Bolts	10	Seal
2	Locknut	11	Nameplate
3	Cover	12	Strap
4	O-Ring	14	Buckle
5	Bolt	15	Bolt
6	Lockwasher	16	Lockwasher
8	Switch Block Assy.	17	Spacer
9	Coil Shell Assy.		

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Attachment 2 – Position Indication Test History Sample (Last Three Tests)

Valve Number	PIT Date	Status	Procedure Number
C5100F002A	4/10/2017	PASS	43.401.338
	4/15/2012	PASS	
	4/15/2009	PASS	
C5100F002B	4/10/2017	PASS	43.401.337
	4/15/2012	PASS	
	4/15/2009	PASS	
C5100F002C	4/10/2017	PASS	43.401.339
	4/15/2012	PASS	
	4/15/2009	PASS	
C5100F002D	4/10/2017	PASS	43.401.341
	4/15/2012	PASS	
	4/15/2009	PASS	
C5100F002E	4/10/2017	PASS	43.401.340
	4/15/2012	PASS	
	4/15/2009	PASS	
E11F412	4/2/2017	PASS	43.401.331
	4/20/2012	PASS	
	4/12/2009	PASS	
E11F413	4/2/2017	PASS	43.401.332
	4/23/2012	PASS	
	4/12/2009	PASS	
E11F414	3/21/2017	PASS	43.401.350
	4/7/2012	PASS	
	4/5/2009	PASS	
E11F415	3/21/2017	PASS	43.401.351
	4/7/2012	PASS	
	4/5/2009	PASS	
E41F400	3/25/2017	PASS	43.401.379
	4/8/2012	PASS	
	4/6/2009	PASS	

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Attachment 2 – Position Indication Test History Sample (Last Three Tests)

Valve Number	PIT Date	Status	Procedure Number
E41F402	4/11/2017	PASS	43.401.378
	4/21/2012	PASS	
	4/9/2009	PASS	
P34F401A	11/3/2015	PASS	43.401.329
	11/3/2010	PASS	
	4/10/2009	PASS	
P34F401B	11/15/2015	PASS	43.401.346
	11/4/2010	PASS	
	4/10/2009	PASS	
P34F403A	3/5/2014	PASS	43.401.324
	4/11/2012	PASS	
	6/30/2009	PASS	
P34F403B	3/5/2014	PASS	43.401.359
	4/11/2012	PASS	
	7/16/2009	PASS	
P34F404A	3/12/2014	PASS	43.401.324
	3/5/2014	PASS	
	4/11/2012	PASS	
P34F404B	3/5/2014	PASS	43.401.359
	4/11/2012	PASS	
	7/16/2009	PASS	
P34F405A	3/4/2014	PASS	43.401.387
	4/11/2012	PASS	
	3/4/2009	PASS	
P34F405B	3/17/2014	PASS	43.401.386
	4/11/2012	PASS	
	3/4/2009	PASS	
P34F406A	9/28/2015	PASS	43.401.387
	3/4/2014	PASS	
	4/11/2012	PASS	

**10 CFR 50.55a Relief Request VRR-012, Revision 1**  
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Attachment 2 – Position Indication Test History Sample (Last Three Tests)

Valve Number	PIT Date	Status	Procedure Number
P34F406B	3/17/2014	PASS	43.401.386
	4/11/2012	PASS	
	3/4/2009	PASS	
P34F408	3/2/2014	PASS	43.401.383
	2/24/2010	PASS	
	4/30/2008	PASS	
P34F410	3/2/2014	PASS	43.401.383
	9/18/2013	PASS	
	2/24/2010	PASS	
T50F450	1/21/2015	PASS	43.401.354
	1/14/2015	PASS	
	1/19/2011	PASS	
T50F451	4/14/2015	PASS	43.401.383
	1/19/2011	PASS	
	1/22/2009	PASS	
T50F458	3/5/2013	PASS	43.401.389
	3/12/2010	PASS	
	3/11/2008	PASS	
E41F403	4/11/2017	PASS	43.401.400
	4/16/2012	PASS	
	4/10/2009	PASS	
E41F401	3/25/2017	PASS	43.401.401
	4/8/2012	PASS	
	4/5/2009	PASS	
P34F407	3/5/2014	PASS	43.401.405
	1/6/2010	PASS	
	1/9/2008	PASS	
P34F409	3/5/2014	PASS	43.401.405
	1/6/2010	PASS	
	1/9/2008	PASS	

**10 CFR 50.55a Relief Request VRR-012, Revision 1**  
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Attachment 2 – Position Indication Test History Sample (Last Three Tests)

<b>Valve Number</b>	<b>PIT Date</b>	<b>Status</b>	<b>Procedure Number</b>
T50F412A	3/24/2017	PASS	43.401.402
	4/27/2012	PASS	
	4/13/2012	PASS	
T50F412B	3/5/2014	PASS	43.401.403
	4/11/2012	PASS	
	4/13/2009	PASS	

**10 CFR 50.55a Relief Request VRR-012, Revision 1**

**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 3 – Position Indication Test Valve Local Leakage Rate Test (LLRT) History Sample  
 (Last Three Tests)

Valve Number	PIT Valve LLRT (air) Date	Acceptance Criteria (scfh)	Measured Value (scfh)	Status	Procedure Number
C5100F002A	4/10/2017	2.00	0.05	SAT	43.401.338
	4/15/2012		0.05	SAT	
	10/19/2007		0.05	SAT	
C5100F002B	4/10/2017	2.00	0.05	SAT	43.401.337
	4/15/2012		0.05	SAT	
	10/19/2007		0.05	SAT	
C5100F002C	4/10/2017	2.00	0.05	SAT	43.401.339
	4/15/2012		0.05	SAT	
	10/19/2007		0.05	SAT	
C5100F002D	4/10/2017	2.00	0.05	SAT	43.401.341
	4/15/2012		0.05	SAT	
	10/19/2007		0.05	SAT	
C5100F002E	4/10/2017	2.00	0.05	SAT	43.401.340
	4/15/2012		0.05	SAT	
	10/19/2007		0.05	SAT	
E11F412	4/2/2017	2.00	0.13	SAT	43.401.331
	4/20/2012		0.05	SAT	
	10/3/2007		0.05	SAT	
E11F413	4/2/2017	2.00	0.14	SAT	43.401.332
	4/23/2012		0.09	SAT	
	10/3/2007		0.05	SAT	
E11F414	3/21/2017	2.00	0.11	SAT	43.401.350
	4/7/2012		0.08	SAT	
	10/20/2007		0.05	SAT	
E11F415	3/21/2017	2.00	0.10	SAT	43.401.351
	4/7/2012		0.07	SAT	
	10/20/2007		0.11	SAT	

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**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 3 – Position Indication Test Valve Local Leakage Rate Test (LLRT) History Sample  
 (Last Three Tests)

Valve Number	PIT Valve LLRT (air) Date	Acceptance Criteria (scfh)	Measured Value (scfh)	Status	Procedure Number
E41F400	3/25/2017	2.00	0.05	SAT	43.401.379
	4/8/2012		0.05	SAT	
	10/20/2007		0.15	SAT	
E41F402	4/11/2017	2.00	0.11	SAT	43.401.378
	4/21/2012		0.17	SAT	
	10/11/2007		0.20	SAT	
P34F401A	11/3/2015	1.00	0.05	SAT	43.401.329
	11/3/2010		0.05	SAT	
	4/3/2006		0.05	SAT	
P34F401B	11/15/2015	1.00	0.05	SAT	43.401.346
	11/4/2010		0.05	SAT	
	4/10/2009		0.05	SAT	
P34F403A	3/5/2014	1.00	0.16	SAT	43.401.324
	4/11/2012		0.05	SAT	
	4/2/2007		0.08	SAT	
P34F403B	3/5/2014	1.00	0.07	SAT	43.401.359
	4/11/2012		0.05	SAT	
	4/17/2007		0.08	SAT	
P34F404A	3/5/2014	1.00	0.05	SAT	43.401.324
	4/11/2012		0.05	SAT	
	4/4/2007		0.08	SAT	
P34F404B	3/5/2014	1.00	0.14	SAT	43.401.359
	4/11/2012		0.17	SAT	
	4/17/2007		0.13	SAT	
P34F405A	3/4/2014	1.50	0.68	SAT	43.401.387
	4/11/2012		0.18	SAT	
	5/16/2007		0.20	SAT	



**10 CFR 50.55a Relief Request VRR-012, Revision 1**

**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 3 – Position Indication Test Valve Local Leakage Rate Test (LLRT) History Sample  
 (Last Three Tests)

Valve Number	PIT Valve LLRT (air) Date	Acceptance Criteria (scfh)	Measured Value (scfh)	Status	Procedure Number
P34F405B	3/17/2014	1.00	0.14	SAT	43.401.386
	4/11/2012		0.12	SAT	
	5/16/2007		0.18	SAT	
P34F406A	9/28/2015	1.00	0.49	SAT	43.401.387
	3/4/2014		0.61	SAT	
	4/11/2012		0.05	SAT	
P34F406B	3/17/2014	1.00	0.15	SAT	43.401.386
	4/11/2012		0.10	SAT	
	5/16/2007		0.17	SAT	
P34F408	3/2/2014	1.00	0.22	SAT	43.401.383
	4/30/2008		0.18	SAT	
	1/31/2006		0.20	SAT	
P34F410	3/2/2014	1.00	0.09	SAT	43.401.383
	9/18/2013		0.11	SAT	
	10/14/2007		0.05	SAT	
T50F450	1/14/2015	2.00	0.05	SAT	43.401.354
	1/19/2011		0.05	SAT	
	1/23/2007		0.05	SAT	
T50F451	4/14/2015	2.00	0.05	SAT	43.401.383
	1/19/2011		0.21	SAT	
	1/23/2007		0.05	SAT	
T50F458	3/5/2013	2.00	0.05	SAT	43.401.389
	3/11/2008		0.05	SAT	
	3/16/2004		0.05	SAT	

**10 CFR 50.55a Relief Request VRR-012, Revision 1**

**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 3 – Position Indication Test Valve Local Leakage Rate Test (LLRT) History Sample  
 (Last Three Tests)

Valve Number	PIT Valve LLRT (water) Date	Acceptance Criteria (mL/min)	Measured Value (mL/min)	Status	Procedure Number
E41F403	4/11/2017	3785.00	0.00	SAT	43.401.400
	4/16/2012		0.00	SAT	
	10/11/2007		0.00	SAT	
E41F401	3/25/2017	3785.00	0.00	SAT	43.401.401
	4/8/2012		0.00	SAT	
	10/20/2007		0.00	SAT	
P34F407	3/5/2014	500.00	0.00	SAT	43.401.405
	1/9/2008		0.00	SAT	
	1/14/2004		41.80	SAT	
P34F409	3/5/2014	500.00	0.00	SAT	43.401.405
	1/9/2008		0.00	SAT	
	1/14/2004		34.80	SAT	
T50F412A	3/24/2017	3785.00	19.30	SAT	43.401.402
	4/13/2012		16.24	SAT	
	10/20/2007		0.00	SAT	
T50F412B	3/5/2014	3785.00	0.00	SAT	43.401.403
	4/11/2012		2.32	SAT	
	10/12/2007		0.00	SAT	
Legend: SAT is Satisfactory SCFH is Standard Cubic Feet per Hour mL/min is milliliters per minute					

**10 CFR 50.55a Relief Request VRR-012, Revision 1**  
**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 4 – Stroke Time History Sample

Valve Number	Stroke Direction	Acceptance Criteria	Exam Date	Stroke Time	Exam Date	Stroke Time	Exam Date	Stroke Time
C5100F002A	Closed	≤ 2 Sec.	4/29/2017	0.5	1/22/2017	0.5	10/22/2016	0.2
C5100F002B	Closed	≤ 2 Sec.	4/29/2017	0.3	1/22/2017	0.4	10/22/2016	0.3
C5100F002C	Closed	≤ 2 Sec.	4/29/2017	0.4	1/22/2017	0.4	10/22/2016	0.3
C5100F002D	Closed	≤ 2 Sec.	4/29/2017	0.4	1/22/2017	0.5	10/22/2016	0.3
C5100F002E	Closed	≤ 2 Sec.	4/29/2017	0.4	1/22/2017	0.4	10/22/2016	0.2
E11F412	Closed	≤ 2 Sec.	4/8/2017	0.7	11/8/2016	0.6	10/12/2015	0.9
E11F413	Closed	≤ 2 Sec.	4/8/2017	0.7	11/8/2016	0.6	10/12/2015	0.5
E11F414	Closed	≤ 2 Sec.	3/24/2017	0.4	11/8/2016	0.5	10/31/2015	0.5
E11F415	Closed	≤ 2 Sec.	3/24/2017	0.2	11/8/2016	0.4	10/31/2015	0.3
E41F400	Open	≤ 2 Sec.	6/18/2017	0.2	5/18/2017	0.5	4/21/2017	0.2
E41F400	Closed	≤ 2 Sec.	6/18/2017	0.3	5/18/2017	0.4	4/21/2017	0.2
E41F401	Open	≤ 2 Sec.	6/18/2017	0.3	5/18/2017	0.3	4/21/2017	0.2
E41F401	Closed	≤ 2 Sec.	6/18/2017	0.4	5/18/2017	0.4	4/21/2017	0.2
E41F402	Open	≤ 2 Sec.	5/28/2017	0.3	3/16/2017	0.3	11/29/2016	0.3
E41F402	Closed	≤ 2 Sec.	5/28/2017	0.4	3/16/2017	0.3	11/29/2016	0.5
E41F403	Open	≤ 2 Sec.	5/28/2017	0.4	3/29/2017	0.2	11/29/2016	0.5
E41F403	Closed	≤ 2 Sec.	5/28/2017	0.4	3/29/2017	0.2	11/29/2016	0.4
P34F401A	Closed	≤ 2 Sec.	5/8/2017	0.8	2/6/2017	0.4	11/18/2016	0.9
P34F401B	Closed	≤ 2 Sec.	7/10/2017	0.4	6/5/2017	0.5	5/8/2017	0.4
P34F403A	Closed	≤ 2 Sec.	5/8/2017	0.5	2/6/2017	0.4	11/8/2016	0.3
P34F403B	Closed	≤ 2 Sec.	5/8/2017	0.4	2/6/2017	0.3	11/8/2016	0.3
P34F404A	Closed	≤ 2 Sec.	5/8/2017	0.4	2/6/2017	0.3	11/8/2016	0.3
P34F404B	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.2
P34F405A	Closed	≤ 2 Sec.	5/8/2017	0.4	2/6/2017	0.2	11/8/2016	0.2
P34F405B	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.3
P34F406A	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.2

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**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 4 – Stroke Time History Sample

Valve Number	Stroke Direction	Acceptance Criteria	Exam Date	Stroke Time	Exam Date	Stroke Time	Exam Date	Stroke Time
P34F406B	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.3
P34F407	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.4
P34F408	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.3
P34F409	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.3
P34F410	Closed	≤ 2 Sec.	5/8/2017	0.3	2/6/2017	0.3	11/8/2016	0.3
T50F412A	Open	≤ 2 Sec.	6/18/2017	0.4	5/18/2017	0.6	4/21/2017	0.4
T50F412A	Closed	≤ 2 Sec.	6/18/2017	0.8	5/18/2017	0.6	4/21/2017	0.7
T50F412B	Open	≤ 2 Sec.	6/26/2017	0.5	5/28/2017	0.4	5/1/2017	0.5
T50F412B	Closed	≤ 2 Sec.	6/27/2017	0.4	5/28/2017	0.7	5/1/2017	0.6
T50F450	Closed	≤ 2 Sec.	4/21/2017	0.5	1/19/2017	0.3	10/19/2016	0.5
T50F451	Closed	≤ 2 Sec.	4/21/2017	0.4	1/19/2017	0.3	10/19/2016	0.5
T50F458	Open	≤ 2 Sec.	5/28/2017	0.4	3/16/2017	0.3	11/29/2016	0.3
T50F458	Closed	≤ 2 Sec.	5/28/2017	0.4	3/16/2017	0.3	11/29/2016	0.5

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**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 5 – Position Indication Test EQ Program Maintenance

<b>Valve Number</b>	<b>PM</b>	<b>Description</b>	<b>EQ</b>	<b>Frequency (Years)</b>	<b>Previous Completion Date</b>
E11F412	E156	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/19/2012
	Q011	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/16/2003
E11F413	E157	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/26/2012
	E011	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/22/2003
E11F414	E158	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/5/2012
	E088	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/5/2003
E11F415	E159	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/5/2012
	E090	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/5/2003
E41F400	E436	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/6/2012
	E093	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/11/2003
E41F402	E437	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/20/2012
	E099	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/8/2003
P34F401A	H185	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	10/25/2015
	E160	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	10/25/2015
P34F401B	P237	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	11/1/2015
	E161	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	11/1/2015
P34F403A	H189	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/6/2014
	H176	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	2/11/2005

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**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 5 – Position Indication Test EQ Program Maintenance

Valve Number	PM	Description	EQ	Frequency (Years)	Previous Completion Date
P34F403B	H190	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	2/20/2014
	H184	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	11/16/2004
P34F404A	H191	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/2/2014
	E191	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	2/11/2005
P34F404B	H200	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	2/20/2014
	E192	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	1/31/2005
P34F405A	H201	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/6/2014
	E194	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/8/2005
P34F405B	H202	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	2/25/2014
	E195	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	5/27/2005
P34F406A	H203	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/2/2014
	H193	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/8/2005
P34F406B	H204	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	2/20/2014
	H196	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	5/27/2005
P34F408	P284	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	2/16/2014
	H198	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	5/5/2005
P34F410	H208	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	2/16/2014
	E202	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	5/5/2005

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**Relief to Perform Position Indication Testing at Appendix J Option B Frequency**

Attachment 5 – Position Indication Test EQ Program Maintenance

Valve Number	PM	Description	EQ	Frequency (Years)	Previous Completion Date
T50F450	U367	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	1/13/2015
	U360	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/28/2005
T50F451	U368	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/14/2015
	U362	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/28/2005
P34F407	H205	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/6/2014
	H197	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/15/2005
P34F409	H207	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/6/2014
	E199	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/15/2005
T50F412A	T608	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	4/12/2012
	E208	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	4/9/2003
T50F412B	T610	Replace 10 Year Components Required by NE-6.6-EQMS.070	Y	10	3/5/2014
	E217	Replace 20 Year Components Required by NE-6.6-EQMS.070	Y	20	11/20/2004
Note: Valves C5100F002A through E, E41F401, E41F403, and T50F458 are EQ Cat 2C, therefore no periodic EQ part replacements are specified.					

**Enclosure 2 to  
NRC-17-0051**

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

**Revised Relief Request VRR-013 for the  
Inservice Testing Third 10-Year Interval**



**10 CFR 50.55a Relief Request VRR-013, Revision 1  
Performance-Based Scheduling of PIV Leakage Tests**

**Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)  
Alternative Provides Acceptable Level of Quality and Safety**

**1. ASME Code Component(s) Affected**

Valve No.	Description	Appendix J, Option B Air Tested	Code Class
E1100F050A	RHR Div. 1 Inbd Isolation Testable Check Valve	N	1
E1100F050B	RHR Div. 2 Inbd Isolation Testable Check Valve	N	1
E1150F008	RHR Div. 1 & 2 Shutdown Cooling Outboard Cont. Isol. Valve	Y	1
E1150F009	RHR Div. 1 & 2 Shutdown Cooling Inbd Cont. Isol. Valve	Y	1
E1150F015A	RHR Div. 1 Low Pressure Coolant Injection (LPCI) Inbd Isolation Valve	N	1
E1150F015B	RHR Div. 2 Low Pressure Coolant Injection (LPCI) Inbd Isolation Valve	N	1
E1150F608	RHR Shutdown Cooling Inbd Inlet Isolation Bypass Valve	Y	1
E2100F006A	Core Spray (CS) Div. 1 Inbd Primary Containment (PC) Check Valve	Y	1
E2100F006B	Core Spray (CS) Div. 2 Inbd Primary Containment (PC) Check Valve	Y	1
E2150F005A	Core Spray (CS) Div.1 Inbd Isolation Valve	Y	1
E2150F005B	Core Spray (CS) Div.2 Inbd Isolation Valve	Y	1
E4150F006	HPCI Main Pump Outlet to Feedwater Isolation Valve	Y	1
E4150F007	HPCI Main Pump Discharge Isolation Valve	N	2
E5150F012	Reactor Core Isolation Cooling (RCIC) Pump Discharge Isolation Valve	N	2
E5150F013	Reactor Core Isolation Cooling (RCIC) Pump Supply To Feedwater Header Isolation Valve	Y	1

**2. Applicable Code Edition and Addenda**

ASME OM Code 2004 Edition, no Addenda

**10 CFR 50.55a Relief Request VRR-013, Revision 1**  
**Performance-Based Scheduling of PIV Leakage Tests**

**3. Applicable Code Requirement**

ISTC-3630, "Leakage Rate for other than Containment Isolation Valves," states that "Category A valves with a leakage requirement not based on an Owner's 10 CFR 50, Appendix J program, shall be tested to verify their seat leakages within acceptable limits. Valve closure before seat leakage testing shall be by using the valve operator with no additional closing force applied."

ISTC-3630(a), "Frequency," states that "tests shall be conducted at least once every 2 years."

**4. Reason for Request**

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirement of ASME OM Code ISTC-3630(a). The basis of this relief request is that the proposed alternative would provide an acceptable level of quality and safety.

ISTC-3630(a) requires that leakage rate testing (water) for pressure isolation valves (PIV) be performed at least once every two years. The radiation exposure and the personnel time involved will be significantly reduced by performing the PIV test at the same interval (frequency) as the 10 CFR 50 Appendix J "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," Option B "Performance-Based Requirements," seat leakage test. Recent historical data was used to identify that PIV testing alone each refuel outage (each 18 months) incurs a total dose of approximately 900 mRem. The reason for this relief request is to reduce outage dose and to align the PIV test frequency to the Appendix J, Option B test frequency.

The NRC's approval of the proposed alternative in VRR-013, Revision 0, resulted in the PIV test frequency being aligned with the Fermi 2 performance-based leakage-test program outlined in 10 CFR 50 Appendix J, Option B but with a test interval limit of 60 months. VRR-013, Revision 1, proposes that PIV testing will be performed at a frequency commensurate with the 10 CFR 50 Appendix J, Option B performance-based leakage testing program at Fermi 2, which incorporates NEI 94-01, Revision 3-A (ADAMS Accession No. ML12221A202), and the conditions and limitations specified in NEI 94-01, Revision 2-A.

The Fermi 2 program which implements 10 CFR 50 Appendix J, Option B requires individual containment isolation valves to be good performers before they can be placed on extended seat leakage testing frequency. Assuming all of the PIVs are classified as good performers, the extended test intervals would provide for a savings of

**10 CFR 50.55a Relief Request VRR-013, Revision 1**  
**Performance-Based Scheduling of PIV Leakage Tests**

approximately 2700 mRem (900 mRem above the 1800 mRem savings realized through the previously approved test interval limit of 60 months in VRR-013, Revision 0) over a 75-month period.

**5. Proposed Alternative and Basis for Use**

Pressure Isolation Valves (PIVs) are not included in the scope for performance-based testing as provided for in 10 CFR 50 Appendix J, Option B. The concept behind the Option B alternative for containment isolation valves is that licensees should be allowed to adopt cost effective methods for complying with regulatory requirements. NEI 94-01 describes the risk-informed basis for the extended test intervals under Option B. That justification shows that for valves which have demonstrated good performance by passing their leak rate tests for three consecutive cycles, further failures appear to be governed by the random failure rate of the component. NEI 94-01 also presents the results of a comprehensive risk analysis, including the statement that "the risk impact associated with increasing [leakrate] test intervals is negligible (less than 0.1% of total risk)." The valves identified in this relief request are all in water applications. The PIV testing is performed with water pressurized to normal plant operating pressures. This relief request is intended to provide for a performance-based scheduling of PIV tests at Fermi 2.

NUREG-0933, "Resolution of Generic Safety Issues," Issue 105, "Interfacing Systems LOCA at LWRs," discussed the need for PIV leak rate testing based primarily on three pre-1980 historical failures of applicable valves industry-wide. These failures all involved human errors in either operations or maintenance. None of these failures involved inservice equipment degradation. The performance of PIV leak rate testing provides assurance of acceptable seat leakage with the valve in a closed position. Typical PIV testing does not identify functional problems which may inhibit the valves ability to re-position from open to closed. For check valves, such functional testing is accomplished per ASME OM Code Section ISTC-3522 "Category C check Valves" and Section ISTC-3520 "Exercising Requirements." Power-operated valves are routinely full stroke tested in accordance with ASME OM Code Section ISTC-5100, "Power Operated Valves," to ensure their functional capabilities. At Fermi 2, these functional tests for PIVs are performed only at a Cold Shutdown or refuel outage frequency. Such testing is not performed online in order to prevent any possibility of an inadvertent Interfacing System Loss of Coolant Accident (ISLOCA) condition. The 18-month functional stroke testing of the PIVs is adequate to identify any abnormal condition that might affect closure capability. Performance of the separate 18-month PIV leak rate testing does not contribute any additional assurance of functional capability as it only verifies the seat tightness of the closed valves.

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**Performance-Based Scheduling of PIV Leakage Tests**

Fermi 2 proposes to perform PIV testing at intervals (frequencies) ranging from every 30 months up to every 75 months. The specific interval for each valve would be a function of its seat leakage performance and would be established in a manner consistent with the Containment Isolation valves (CIVs) process under 10 CFR 50 Appendix J Option B. Thirteen of the fifteen valves listed are classified as CIVs and nine of those valves are leak rate tested with air at intervals determined by 10 CFR 50 Appendix J, Option B (hereto referred to as Option B). IST Leak Rate Program guidance will be established such that if any of those nine valves fail either their CIV test or their PIV test, the test interval for both tests will be reduced to every 30 months until they can be re-classified as good performers per the 10 CFR 50 Appendix J, Option B requirements.

The test intervals for the valves with a PIV-only function will be determined in the same manner as is done for CIV testing under Option B. That is, the test interval may be extended up to every four refueling outages (not to exceed 75 months) upon completion of three consecutive periodic PIV tests with results within prescribed acceptance criteria. Any PIV test failure will require a return to the initial (every 30 months) interval until good performance can be re-established.

The primary basis for this relief request is the historically good performance of the PIVs. There have been no PIV failures due to seating surface condition of the valves. Several of the valves covered by this relief request have passed the as found PIV water test but experienced failures of as found CIV air leakage tests due to seat imperfections. There is industry-wide consensus that CIV air-testing is a more challenging and accurate measurement of seat condition, and more likely to identify any seat condition degradation. A sample of PIV leak rate test performance has been provided in Attachment 1.

NUREG/CR-5928, "Final Report of the NRC-sponsored ISLOCA Research Program", evaluated the likelihood and potential severity of ISLOCA events in BWRs and PWRs. The BWR design used as a reference for this analysis was a BWR-4 with a Mark 1 containment. Fermi 2 was listed in Section 4.1 of the document as one of the applicable plants. The applicable BWR systems were individually analyzed and in each case this report concluded that the system was not at risk with respect to ISLOCA risk. Section 4.3 concluded the BWR portion of the analysis by saying "ISLOCA is not a risk concern for the BWR plant examined here."

On March 9, 2017, Fermi 2 received a Safety Evaluation (Technical Specification Amendment No. 205) with approval to implement NEI 94-01, Revision 3-A (ADAMS accession No. ML12221A202) and the conditions and limitations specified in NEI 94-01, Revision 2-A, to implement the performance-based leakage-testing program in

**10 CFR 50.55a Relief Request VRR-013, Revision 1**  
**Performance-Based Scheduling of PIV Leakage Tests**

accordance with 10 CFR 50 Appendix J, Option B. This Amendment increased the containment isolation valves leakage test intervals (i.e., Type C tests) from 60 months to 75 months. Valves whose leakage test results indicate good performance may have their interval of testing increased based on these test results. The Fermi 2 program which implements 10 CFR 50 Appendix J, Option B requires individual containment isolation valves be good performers before they can be placed on extended seat leakage testing frequency. Based on the data contained in Attachment 1, the majority of the listed valves have passed their last three PIV Leak Rate Tests.

Summary of bases and rationale for this relief request:

- Performance-based PIV testing would yield a dose reduction of approximately 2700 mRem over a 75-month period.
- Performance of functional stroke testing of PIVs every 18 months per ASME Code.
- Excellent historical performance results from PIV testing for all the applicable valves.
- Very low likelihood of valve mispositioning during power operations (procedures, interlocks).
- Air testing versus water testing - degrading seat conditions are identified much sooner with air testing.
- Relief valves in the low pressure piping - these relief valves may not provide ISLOCA mitigation for inadvertent PIV mispositioning (gross leakage) but their relief capacity can easily accommodate conservative PIV seat leakage rates.
- Alarms that identify high pressure to low pressure leakage - Operators are highly trained to recognize symptoms of a present or incipient ISLOCA and to take appropriate actions.

The intent of this relief request is to allow a performance-based approach to the scheduling of PIV leakage testing. Fermi 2 PIVs have an excellent performance history in terms of seat leakage testing. The risks associated with extending the leakage test interval to a maximum of 75 months are extremely low. This relief will provide significant reductions in radiation dose.

**6. Duration of Proposed Alternative**

This proposed alternative is for the remaining duration of the Femi 2 Third Inservice Testing (IST) 10-Year Interval, which started February 17, 2010.

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**Performance-Based Scheduling of PIV Leakage Tests**

**7. Precedents**

- NRC Safety Evaluation Report: Limerick Generating Station, Units 1 and 2 – Proposed Relief Request GVRR-8 Regarding Inservice Testing Program Third 10-Year Interval (CAC Nos. MF8787 and MF8788), dated February 7, 2017 (ML17004A063)
- NRC Safety Evaluation Report: Fermi 2 – Evaluation of In-Service Testing Program Relief Requests VRR-011, VRR-012, and VRR-013 (TAC No. ME2558, ME2557, and ME2556), dated September 28, 2010 (ML102360570)

**8. Attachments**

Attachment 1 – Historical Pressure Isolation Valves Leakage Test Performance  
(Last Three Tests)

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**Performance-Based Scheduling of PIV Leakage Tests**

Attachment 1 – Historical Pressure Isolation Valves Leakage Test Performance (Last Three Tests)

Valve Number	Date of Test	Acceptance Criteria (gpm)	Measured Value (gpm)
E1100F050A	2/15/2014	10.00	0.00
	3/29/2009		0.211
	10/17/2007		0.22
E1100F050B	4/4/2017	10.00	Unsat**
	10/6/2015		0.077
	2/27/2014		Unsat***
E1150F008	3/12/2014	5.00	0.14
	4/17/2009		0.06
	10/20/2007		0.003
E1150F009 and E1150F608*	3/12/2014	5.00	0.12
	4/17/2009		0.002
	10/20/2007		0.012
E1150F015A	2/14/2014	0.40	0.002
	3/29/2009		0.021
	10/17/2007		0.001
E1150F015B	2/27/2014	0.40	0.00
	4/8/2009		0.003
	10/2/2007		0.00
E2100F006A	3/21/2017	5.00	0.00
	4/18/2012		0.00
	11/5/2010		0.00
E2100F006B	4/3/2017	5.00	0.00
	4/6/2012		0.00
	11/13/2010		0.001
E2150F005A	2/13/2014	5.00	0.00
	3/30/2009		0.00
	10/9/2007		0.014

**10 CFR 50.55a Relief Request VRR-013, Revision 1  
Performance-Based Scheduling of PIV Leakage Tests**

Attachment 1 – Historical Pressure Isolation Valves Leakage Test Performance (Last Three Tests)

Valve Number	Date of Test	Acceptance Criteria (gpm)	Measured Value (gpm)
E2150F005B	2/24/2014	5.00	0.008
	4/6/2009		0.00
	10/1/2007		0.003
E4150F006	2/19/2014	5.00	0.00
	4/1/2009		0.00
	10/5/2007		0.06
E4150F007	2/19/2014	5.00	0.001
	4/1/2009		0.00
	10/5/2007		0.00
E5150F012	2/15/2014	3.00	0.00
	4/1/2009		0.00
	10/5/2007		0.018
E5150F013	2/15/2014	3.00	0.00
	4/1/2009		0.00
	10/5/2007		0.007

Legend:  
gpm is gallons per minute  
\* Group tested together  
\*\* Unable to pressurize E1100F050B (04/04/2017). This was due to actuator shaft, indicator shaft and bushing found to be mechanically bound together. In addition, the brass indicator shaft bushing found mechanically bound to the valve body. Corrective Actions: actuator shaft, indicator shaft and bushing, and actuator stuffing box were replaced, and proper clearance was obtained.  
\*\*\* Unable to pressurize E1100F050B (02/27/14). This was due to mechanical binding and sticking of the actuator or linkage (hinge/bearing). Corrective Actions: Performed check valve internal inspection, cleaned and machined swing arm and created Preventive Maintenance (PM) events for internal inspection and/or maintenance of the E1100F050A and E1100F050B.