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May 29, 2019 10 CFR 50.55a
NRC-19-0025

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

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

Subject: Submittal of Valve Relief Requests for the Inservice Testing Program Fourth 10-Year Interval

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z), DTE Electric Company (DTE) hereby requests NRC approval of the following relief requests for the Fermi 2 Inservice Testing (IST) Program fourth 10-year interval, which begins on February 17, 2020 and ends on February 16, 2030.

- VRR-001, Relief for Test Frequency of Excess Flow Check Valves
- VRR-002, Relief to Perform Position Indication Testing at Appendix J Option B Frequency
- VRR-003, Alternative for Performance-Based Scheduling of PIV Leakage Tests
- VRR-005, Alternative Frequency Requirements for Pressure Relief Valves
- VRR-008, Relief to Perform Drywell-to-Torus Vacuum Breaker Leakage Testing at Appendix J Option B Frequency

The enclosures to this letter provide details of each of the individual relief requests. Relief requests VRR-001, VRR-002, and VRR-003 are based on relief requests currently approved by the NRC for use at Fermi 2 during the IST Program third 10-year interval, which ends on February 16, 2020. Relief requests VRR-005 and VRR-008 are new relief requests for Fermi 2.

DTE requests NRC approval of relief requests VRR-001, VRR-002, VRR-003, VRR-005 and VRR-008 by March 16, 2020 to support planned testing during the next refuel outage scheduled in the spring of 2020.

No new commitments are being made in this submittal.

Should you have any questions or require additional information, please contact Mr. Jason R. Haas, Manager – Nuclear Licensing, at (734) 586-1769.

Sincerely,

Paul Fessler
Senior Vice President and CNO

Enclosures:

1. Relief Request VRR-001 for the IST Fourth 10-Year Interval
2. Relief Request VRR-002 for the IST Fourth 10-Year Interval
3. Relief Request VRR-003 for the IST Fourth 10-Year Interval
4. Relief Request VRR-005 for the IST Fourth 10-Year Interval
5. Relief Request VRR-008 for the IST Fourth 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-19-0025

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

Relief Request VRR-001 for the IST Fourth 10-Year Interval

10 CFR 50.55a Relief Request VRR-001

Relief for Test Frequency of Excess Flow Check Valves

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 Identification (PIS) No.	ASME Code Class	OM Valve Category	Plant Drawing
B21F501A*	1	A/C	M-5701-1
B21F501B*	1	A/C	M-5701-1
B21F501C*	1	A/C	M-5701-1
B21F501D*	1	A/C	M-5701-1
B21F502A*	1	A/C	M-5701-1
B21F502B*	1	A/C	M-5701-1
B21F502C*	1	A/C	M-5701-1
B21F502D*	1	A/C	M-5701-1
B21F503A*	1	A/C	M-5701-1
B21F503B*	1	A/C	M-5701-1
B21F503C*	1	A/C	M-5701-1
B21F503D*	1	A/C	M-5701-1
B21F504A*	1	A/C	M-5701-1
B21F504B*	1	A/C	M-5701-1
B21F504C*	1	A/C	M-5701-1
B21F504D*	1	A/C	M-5701-1
B21F506*	1	A/C	M-5701-2
B21F507*	1	A/C	M-5701-2
B21F508*	1	A/C	M-5701-2
B21F509*	1	A/C	M-5701-2
B21F510*	1	A/C	M-5701-2
B21F511*	1	A/C	M-5701-2
B21F512	1	A/C	M-5701-2
B21F513A*	1	A/C	M-5701-2
B21F513B*	1	A/C	M-5701-2
B21F513C	1	A/C	M-5701-2
B21F513D	1	A/C	M-5701-2
B21F514A*	1	A/C	M-5701-2

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Relief for Test Frequency of Excess Flow Check Valves

Valve Identification (PIS) No.	ASME Code Class	OM Valve Category	Plant Drawing
B21F514B*	1	A/C	M-5701-2
B21F514C	1	A/C	M-5701-2
B21F514D	1	A/C	M-5701-2
B21F515A	1	A/C	M-5701-2
B21F515B	1	A/C	M-5701-2
B21F515C	1	A/C	M-5701-2
B21F515D	1	A/C	M-5701-2
B21F515E	1	A/C	M-5701-2
B21F515F	1	A/C	M-5701-2
B21F515G	1	A/C	M-5701-2
B21F515H	1	A/C	M-5701-2
B21F515L	1	A/C	M-5701-2
B21F515M	1	A/C	M-5701-2
B21F515N	1	A/C	M-5701-2
B21F515P	1	A/C	M-5701-2
B21F515R	1	A/C	M-5701-2
B21F515S	1	A/C	M-5701-2
B21F515T	1	A/C	M-5701-2
B21F515U	1	A/C	M-5701-2
B21F516A	1	A/C	M-5701-2
B21F516B	1	A/C	M-5701-2
B21F516C	1	A/C	M-5701-2
B21F517A	1	A/C	M-5701-2
B21F517B	1	A/C	M-5701-2
B21F517C	1	A/C	M-5701-2
B21F517D	1	A/C	M-5701-2
B31F501A*	1	A/C	M-5702-1
B31F501B*	1	A/C	M-5702-1
B31F501C*	1	A/C	M-5702-1
B31F501D*	1	A/C	M-5702-1
B31F502A*	1	A/C	M-5702-1
B31F502B*	1	A/C	M-5702-1
B31F502C*	1	A/C	M-5702-1

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Relief for Test Frequency of Excess Flow Check Valves

Valve Identification (PIS) No.	ASME Code Class	OM Valve Category	Plant Drawing
B31F502D*	1	A/C	M-5702-1
B31F503A*	1	A/C	M-5702-1
B31F503B*	1	A/C	M-5702-1
B31F504A*	1	A/C	M-5702-1
B31F504B*	1	A/C	M-5702-1
B31F505A*	1	A/C	M-5702-1
B31F505B*	1	A/C	M-5702-1
B31F506A*	1	A/C	M-5702-1
B31F506B*	1	A/C	M-5702-1
B31F510A*	1	A/C	M-5702-1
B31F510B*	1	A/C	M-5702-1
B31F511A*	1	A/C	M-5702-1
B31F511B*	1	A/C	M-5702-1
B31F512A	1	A/C	M-5702-1
B31F512B	1	A/C	M-5702-1
B31F515A	1	A/C	M-5702-1
B31F515B	1	A/C	M-5702-1
B31F516A	1	A/C	M-5702-1
B31F516B	1	A/C	M-5702-1
E21F500A	1	A/C	M-5707
E21F500B	1	A/C	M-5707
E41F500*	1	A/C	M-5708-1
E41F501*	1	A/C	M-5708-1
E41F502*	1	A/C	M-5708-1
E41F503*	1	A/C	M-5708-1
E51F503*	1	A/C	M-5709-1
E51F504*	1	A/C	M-5709-1
E51F505*	1	A/C	M-5709-1
E51F506*	1	A/C	M-5709-1
G33F583	1	A/C	M-5711-1
N21F539A	1	A/C	M-5715-1
N21F539B	1	A/C	M-5715-1

* Excess Flow Check Valves with an asterisk in the Valves Identification (PIS) No. column have an Open and Closed safety function, all others have only a Closed safety function.

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Relief for Test Frequency of Excess Flow Check Valves

2. Applicable Code Edition and Addenda

ASME OM Code 2012 Edition, No Addenda

10 CFR 50.55a(b)(3)(xi), OM condition: Valve Position Indication.

3. Applicable Code Requirement

ISTC-3522, Category C Check Valves, part (c):
"If exercising is not practicable during operation at power and cold shutdown, it shall be performed during refueling outages."

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

10 CFR 50.55a(b)(3)(xi), OM condition: Valve Position Indication. When implementing ASME OM Code, 2012 Edition, Subsection ISTC-3700, "Position Verification Testing," licensees shall verify that valve operation is accurately indicated by supplementing valve position indicating lights with other indications, such as flow meters or other suitable instrumentation, to provide assurance of proper obturator position. For the purpose of the excess flow check valves (EFCVs) which are the subject of this relief request, obturator verification is equivalent to the position of the poppet assembly which is detected by switches to change the status of indicating lights.

4. Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirements of ASME OM Code ISTC-3522(c), ISTC-3700, and 10 CFR 50.55a(b)(3)(xi) for the subject valves. The basis of the relief request is that the proposed alternative will provide an acceptable level of quality and safety.

Relief is requested from performing ISTC-3522(c) on a refueling frequency.

Relief is requested from performing the position indication verification test (PIT) on a 2 year frequency as required by ISTC-3700. Position indication and obturator verification will be performed at a frequency commensurate with testing prescribed in Technical Specification (TS) Surveillance Requirement (SR) 3.6.1.3.9. The SR 3.6.1.3.9 states "Verify a representative sample of reactor instrumentation line EFCVs actuates on a simulated instrument line break to restrict flow."

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Relief for Test Frequency of Excess Flow Check Valves

Relief is requested from performing obturator verification on a 2 year (PIT) frequency as required by 10 CFR 50.55a(b)(3)(xi). Obturator verification will be performed at a frequency commensurate with testing prescribed in TS SR 3.6.1.3.9.

Per Regulatory Guide (RG) 1.97, check valve remote position indication is excluded as a required parameter for evaluating containment isolation. The remote position indication is verified accurate at the same frequency as the exercise test prescribed in TS SR 3.6.1.3.9.

The testing described above requires removal of the associated instrument or instruments from service. Since these instruments are in use during plant operation, removal of any of these instruments from service may cause a spurious signal, which could result in a plant trip or an unnecessary challenge to safety systems. Additionally, process liquid will be contaminated to some degree, requiring special measures to collect flow from the vented instrument side and also will contribute to an increase in personnel radiation exposure.

Testing on a cold shutdown frequency is impractical considering the large number of valves to be tested and the condition that reactor pressure greater than 500 psig is needed for testing. In this instance, considering the number of valves to be tested and the conditions required for testing, it is also a hardship to test all these valves during refueling outages.

The appropriate time for performing excess flow check valve test is during refueling outages in conjunction with vessel hydrostatic pressure testing. As a result of shortened outages, decay heat levels during hydrostatic pressure tests are higher than in the past. If the hydrostatic pressure test were extended to test all EFCVs, the vessel could require depressurization several times to avoid exceeding the maximum bulk coolant temperature limit. This is an evolution that challenges the reactor operators and thermally cycles the reactor vessel and should be avoided if possible. Also, based on past experience, excess flow check valve testing during hydrostatic pressure testing becomes an outage critical path activity and could possibly extend the outage if all EFCVs were to be tested during this timeframe.

5. Proposed Alternative and Basis for Use

Functional testing with verification that flow is checked will be performed per TS SR 3.6.1.3.9 during refueling outages. SR 3.6.1.3.9 allows a “representative sample” of EFCVs to be tested every 18 months, such that each EFCV will be tested at least once every ten years (nominal). The six sample groups contain approximately 15 EFCVs each and are selected from different plant locations and operating conditions. The basis for this alternative is that testing a sample of EFCVs each refueling outage provides a level of safety and quality equivalent to that of the Code-required testing.

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Relief for Test Frequency of Excess Flow Check Valves

The EFCVs have position indication in the control room. Check valve remote position indication is excluded from RG 1.97 as a required parameter for evaluating containment isolation. The remote position indication will be verified accurate at the same frequency as the exercise test prescribed in TS SR 3.6.1.3.9. Although inadvertent actuation of an EFCV during operation is highly unlikely due to the spring poppet design, Fermi 2 checks the EFCV indications on a daily basis as part of the Operations Routines Checklist #26. Corrective Action Program documents are initiated for any EFCVs with abnormal position indication displays and repairs are scheduled for the next refueling outage.

EFCVs are provided in each instrument process line that is part of the reactor coolant pressure boundary. The excess flow check valve is designed so that it will not close accidentally during normal operation, will close if a rupture of the instrument line occurs downstream of the valve, and can be reopened, when appropriate, after closure from a local panel. These valves have both local position indication and position indication in the control room.

The design and installation of the EFCVs at Fermi 2 follows the guidance of RG 1.11. As detailed in the Fermi 2 Updated Final Safety Analysis Report (UFSAR), DTE has incorporated into the design of each EFCV source line the equivalent of a 0.25-inch restricting orifice. This was done by either the installation of a 0.25-inch orifice, the tap size of the source line being 0.25-inch, or in the case of the feedwater pressure-sensing lines, taking credit for an inboard containment isolation valve. Additionally, the design of each EFCV contains an internal 0.25-inch main body orifice. The restrictions in the source lines of the EFCVs limit leakage, in case of a failure to close, to a level where the integrity and functional performance of secondary containment and associated safety systems are maintained. The coolant loss is well within the capabilities of the reactor coolant makeup system, and the potential offsite exposure is substantially below the guidelines of 10 CFR 100.

EFCVs are required to be tested in accordance with ISTC-3522, which requires exercising check valves nominally every three months to the positions required to perform their safety functions. ISTC-3522(c) permits deferral of this requirement to every reactor refueling outage. EFCVs are also required to be tested in accordance with ISTC-3700 and 10 CFR 50.55a(b)(3)(xi), which requires remote position indication, including obturator verification at least once every 2 years.

The EFCVs are classified as ASME Code Category A/C and are also containment isolation valves. However, these valves are excluded from 10 CFR 50 Appendix J Type C leak rate testing, due to the size of the instrument lines and upstream orifices.

The excess flow check valve is a simple and reliable device. The major components are a poppet and spring. The spring holds the poppet open under static conditions. The valve will

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Relief for Test Frequency of Excess Flow Check Valves

close upon sufficient differential pressure across the poppet. Functional testing of the valve is accomplished by venting the instrument side of the valve. The resultant increase in flow imposes a differential pressure across the poppet, which compresses the spring and decreases flow through the valve. System design does not include test taps upstream of the EFCV. For this reason, the EFCVs cannot be isolated and tested using a pressure source other than reactor pressure.

Industry experience as documented in the NRC-approved GE Nuclear Energy topical report NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation," (Accession No. ML003729011) indicates the EFCVs have a very low failure rate. The report indicates similarly that many reported test failures at other plants were related to test methodologies and not actual EFCV failures. The technology for testing these valves is simple and has been demonstrated effectively during the operating history of Fermi 2. Test history at Fermi 2 shows a very low failure rate and no evidence of common mode failure, which is consistent with the findings of NEDO-32977-A. The EFCVs at Fermi 2, consistent with the industry, have exhibited a high degree of reliability, availability, and provide an acceptable level of quality and safety.

In conclusion, the Fermi 2 TS detail what frequency is required to maintain a high degree of reliability and availability, and provide an acceptable level of quality and safety. Therefore, DTE requests relief pursuant to 10 CFR 50.55a (z)(1) to test excess flow check valves on a representative sample basis and at the frequency specified in Fermi 2 TS SR 3.6.1.3.9.

In accordance with 10 CFR 50.55a(b)(3)(xi) associated with obturator verification, the valves listed in this relief request would require the obturator verification to be performed at the stated frequency within ISTC-3700 (2 years). However, these valves are all tested in accordance with Fermi 2 TS SR 3.6.1.13.9. The relief from this requirement has been added to the current relief request for the third 10-year interval (see Section 7 below) which was approved for use of SR 3.6.1.3.9 to satisfy ISTC-3522(c) and ISTC-3700. The current methodology used for functional testing of the EFCVs will be credited to meet the obturator verification requirements. During the functional test, the closed obturator position is confirmed visually with no leakage through an open drain valve and compared to indication. The check valve is then reset to the open position and compared to indication. The obturator open position is further confirmed by Operations during plant operation by observing indication and functionality of the related TS instrumentation.

6. Duration of Proposed Alternative

This proposed alternative will be utilized for the entire fourth 10-year interval. The fourth interval begins on February 17, 2020 and ends on February 16, 2030.

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Relief for Test Frequency of Excess Flow Check Valves

7. Precedent

Fermi 2 currently has an approved relief request for excess flow check valves for the third 10-year interval. The current relief request is identified as VRR-011 in the approval document listed below:

- "Fermi 2 – Evaluation of In-Service Testing Program Relief Request VRR-011, VRR-012, and VRR-013," dated September 28, 2010, Accession No. ML102360570.

No precedent was identified for the 10 CFR 50.55a(b)(3)(xi), Obturator Verification.

Enclosure 2 to
NRC-19-0025

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

Relief Request VRR-002 for the IST Fourth 10-Year Interval

10 CFR 50.55a Relief Request VRR-002

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

Valve Identification (PIS) No.	Noun Description	ASME Code Class	OM Valve Category
C5100F002A	Traversing In-Core Probe (TIP) Channel A Ball Valve	2	A
C5100F002B	TIP Channel B Ball Valve	2	A
C5100F002C	TIP Channel C Ball Valve	2	A
C5100F002D	TIP Channel D Ball Valve	2	A
C5100F002E	TIP Channel E Ball Valve	2	A
E11F412	Residual Heat Removal (RHR) Division II Primary Containment Monitoring Isolation Valve	2	A
E11F413	RHR Division II Primary Containment Monitoring Isolation Valve	2	A
E11F414	RHR Division I Primary Containment Monitoring Isolation Valve	2	A
E11F415	RHR Division I Primary Containment Monitoring Isolation Valve	2	A
E41F400	Primary Containment Monitoring (PCM) - Suppression Pool Valve	2	A
E41F401	PCM - Suppression Pool Valve	2	A
E41F402	PCM - Suppression Pool Valve	2	A
E41F403	PCM - Suppression Pool Valve	2	A
P34F401A	Post Accident Sampling (PAS) V13-7360	1	A
P34F401B	PAS V13-7361	1	A
P34F403A	PAS V13-7364	2	A
P34F403B	PAS V13-7365	2	A
P34F404A	PAS V13-7374	2	A
P34F404B	PAS V13-7375	2	A
P34F405A	PAS V13-7366	2	A
P34F405B	PAS V13-7367	2	A
P34F406A	PAS V13-7376	2	A
P34F406B	PAS V13-7377	2	A

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

Valve Identification (PIS) No.	Noun Description	ASME Code Class	OM Valve Category
P34F407	PAS V13-7368	2	A
P34F408	PAS V13-7369	2	A
P34F409	PAS V13-7378	2	A
P34F410	PAS V13-7379	2	A
T50F412A	Primary Containment Torus Level Monitoring Division 1	2	A
T50F412B	Primary Containment Torus Level Monitoring Division 2	2	A
T50F450	Primary Containment Radiation Monitoring System Inlet Isolation Valve	2	A
T50F451	Primary Containment Radiation Monitoring System Outlet Isolation Valve	2	A
T50F458	Primary Containment Atmospheric Monitoring (PCAM) Division 2 Penetration X-27F Remote Manual Solenoid Valve	2	A

2. Applicable Code Edition and Addenda

ASME OM Code 2012 Edition, No Addenda

10 CFR 50.55a(b)(3)(xi), OM condition: Valve Position Indication

3. Applicable Code Requirement

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

10 CFR 50.55a(b)(3)(xi), OM condition: Valve Position Indication. When implementing ASME OM Code, 2012 Edition, Subsection ISTC–3700, "Position Verification Testing," licensees shall verify that valve operation is accurately indicated by supplementing valve position indicating lights with other indications, such as flow meters or other suitable instrumentation, to provide assurance of proper obturator position. The NRC added 50.55a(b)(3)(xi) to emphasize the provisions in OM Code, 2012 Edition, Subsection ISTC-3700, "Position Verification Testing," to verify that valve obturator position is accurately indicated.

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

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 and 10 CFR 50.55a(b)(3)(xi), for the subject valves. The basis of the relief request is that the proposed alternative will provide an acceptable level of quality and safety.

The ASME OM Code (Section ISTC-3700) and 10 CFR 50.55a(b)(3)(xi) require that a Position Indication Test (PIT) and obturator verification be performed every two years. The PIT would also require positive verification of the obturator position. This would result in operators and test personnel entering the radiological areas to perform observations and install monitoring equipment. In addition to the PIT, operators and test personnel are required to enter these radiological areas to install test equipment and to perform leakage testing at the Appendix J frequency. Combining the PIT and leakage testing and performing them together at the Appendix J frequency will reduce labor and overall dose.

Relief is requested from performing the PIT and obturator verification on a 2 year frequency. PIT and obturator 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.

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, and verifying the penetration remains pressurized while the valve is indicating closed on the main control room (MCR) board. The valve is then opened using the control switch in the MCR. A decrease in pressure is then verified along with valve position indicating open in the MCR. This method satisfies the requirement for position indication verification, obturator verification, and the required leakage rate testing at the same time.

The subject valves are all OM valve 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.

Each of the subject valves is a solenoid operated valve designed such that the position of the valve is not locally observable. The design of these valves is such that the coil position is

10 CFR 50.55a Relief Request VRR-002

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

internal to the valve body and not observable in either the energized or de-energized state. See Attachment 1 to this Enclosure, which is typical for the subject valves.

For the subject valves, Fermi 2 will perform the position indication and obturator 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 Option B of 10 CFR 50 Appendix J Type C leakage testing based on valve seat leakage performance. 10 CFR 50.55a(b)(3)(xi) for Valve Position Indication states "When implementing ASME OM Code, 2012 Edition, Subsection ISTC-3700, "Position Verification Testing," licensees shall verify that valve operation is accurately indicated by supplementing valve position indicating lights with other indications, such as flow meters or other suitable instrumentation, to provide assurance of proper obturator position."

Since each of these valves is seat leakage tested using local leakage rate testing equipment, 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. Allowance of an extended frequency for ISTC-3700 and 10 CFR 50.55a(b)(3)(xi) will allow for all tests to be performed as part of the same activity. Radiation exposure and the time and labor for Operations and test personnel will be significantly reduced by performing the position indication verification test (as well as obturator verification) at the same interval as the Appendix J seat leakage test.

Additionally, each of these subject valves is exercised on a quarterly or cold shutdown frequency and their stroke times measured and compared to the ASME OM Code acceptance criteria which will identify potential issues with position indication and overall valve health in the interim period between Appendix J tests.

These solenoid operated valves are also subject to Preventive Maintenance (PM) Program coverage. Non-metallic parts of these solenoid operated valves are periodically replaced as part of the PM Program. Any maintenance that is performed on these valves which might affect position indication will be followed by applicable post-maintenance testing including PIT and obturator verification.

In 1996, Fermi 2 received approval of License Amendment 108 (ADAMS Accession No. ML020730597) 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 approval of License Amendment No. 205 (ADAMS Accession No. ML16351A460) to implement NEI 94-01, Revision 3-A (ADAMS Accession

10 CFR 50.55a Relief Request VRR-002

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

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 License 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 Appendix J, Option B requires individual containment isolation valves to pass three successful seat leakage tests before they can be placed on extended seat leakage testing frequency. The majority of the listed valves are in good performer status, requiring a seat leakage test every 4 refueling outages (18 month refueling cycle) or 3 refueling outages (2 year refueling cycle).

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 and obturator verification test at the same frequency as specified by 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. The testing also ensures that the indicating system accurately reflects the valve disc position.

6. Duration of Proposed Alternative

This proposed alternative will be utilized for the entire fourth 10-year interval. The fourth interval begins on February 17, 2020 and ends on February 16, 2030.

7. Precedent

Fermi 2 currently has an approved relief request for containment isolation valves for the third 10-year interval. The current relief request is identified as VRR-012 in the approval documents listed below:

- "Fermi 2 – Evaluation of In-Service Testing Program Relief Request VRR-011, VRR-012, and VRR-013," dated September 28, 2010, Accession No. ML102360570.
- "Fermi, Unit 2 – Relief from the Requirements of the ASME OM Code," dated March 7, 2018, Accession No. ML17354B002.

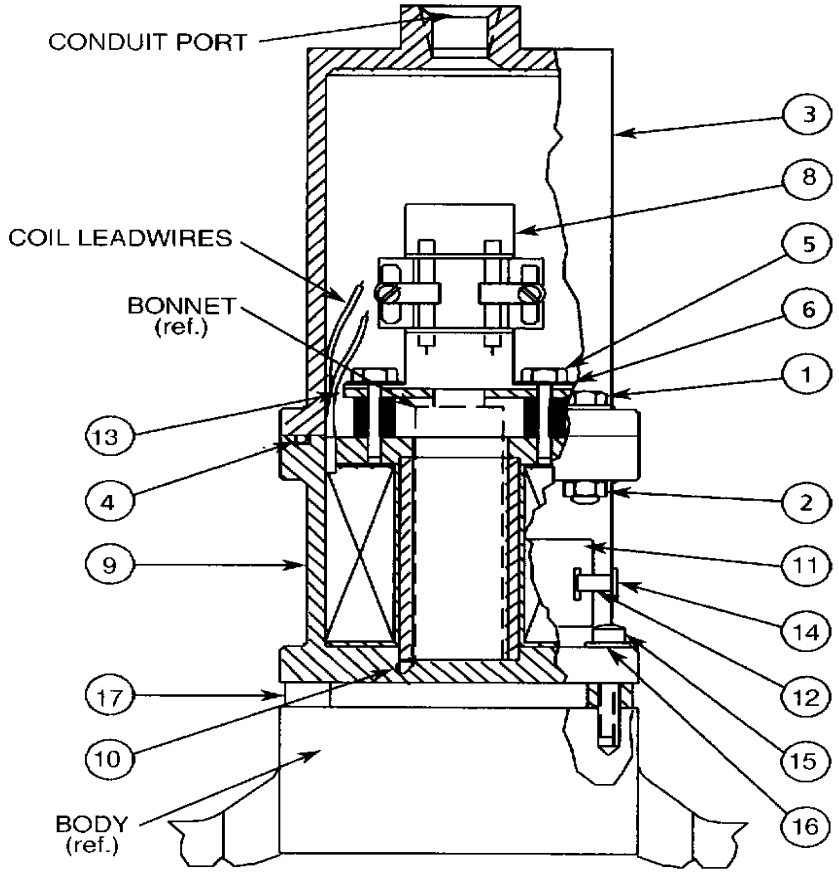
No precedent was identified for the 10 CFR 50.55a(b)(3)(xi), Obturator Verification.

8. Attachments

(1) Typical Solenoid Valve Arrangement [1 page]

ATTACHMENT 1 TO ENCLOSURE 2 OF NRC-19-0025 (VRR-002)

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.		

Enclosure 3 to
NRC-19-0025

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

Relief Request VRR-003 for the IST Fourth 10-Year Interval

10 CFR 50.55a Relief Request VRR-003

Alternative for 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 Identification (PIS) No.	Noun Description	ASME Code Class	OM Valve Category	Appendix J, Option B Air Tested
E1100F050A	Residual Heat Removal (RHR) Div. 1 Inboard Isolation Testable Check Valve	1	A/C	N
E1100F050B	RHR Div. 2 Inboard Isolation Testable Check Valve	1	A/C	N
E1150F008	RHR Div. 1 & 2 Shutdown Cooling Outboard Containment Isolation Valve	1	A	Y
E1150F009	RHR Div. 1 & 2 Shutdown Cooling Inboard Containment Isolation Valve	1	A	Y
E1150F015A	RHR Div. 1 Low Pressure Coolant Injection (LPCI) Inboard Isolation Valve	1	A	N
E1150F015B	RHR Div. 2 LPCI Inboard Isolation Valve	1	A	N
E1150F608	RHR Shutdown Cooling Inboard Inlet Isolation Bypass Valve	1	A	Y
E2100F006A	Core Spray (CS) Div. 1 Inboard Primary Containment Check Valve	1	A/C	Y
E2100F006B	CS Div. 2 Inboard Primary Containment Check Valve	1	A/C	Y
E2150F005A	CS Div.1 Inboard Isolation Valve	1	A	Y
E2150F005B	CS Div.2 Inboard Isolation Valve	1	A	Y
E4150F006	High Pressure Coolant Injection (HPCI) Main Pump Outlet to Feedwater Isolation Valve	1	A	Y
E4150F007	HPCI Main Pump Discharge Isolation Valve	2	A	N
E5150F012	Reactor Core Isolation Cooling (RCIC) Pump Discharge Isolation Valve	2	A	N
E5150F013	RCIC Pump Supply to Feedwater Header Isolation Valve	1	A	Y

10 CFR 50.55a Relief Request VRR-003

Alternative for Performance-Based Scheduling of PIV Leakage Tests

2. Applicable Code Edition and Addenda

ASME OM Code 2012 Edition, No Addenda

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 yr."

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 the relief request is that the proposed alternative will 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 and position indication test (PIT) 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. Historical data collected during the third 10-year interval identified that PIV testing alone each refueling 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.

For the third 10-year interval, the NRC's approval of the relief request 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, was subsequently approved to perform PIV testing with a test interval limit of 75 months (see Section 7, Precedent). This frequency is 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

10 CFR 50.55a Relief Request VRR-003

Alternative for Performance-Based Scheduling of PIV Leakage Tests

extended seat leakage testing frequency. As documented in the third 10-year interval relief request VRR-013, Revision 1, the total dose saving was estimated to be 2700 mRem for the extended test intervals.

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 [leak rate] 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 Sections ISTC-3522 "Category C Check Valves," ISTC-5221 "Valve Obturator Movement," and ISTC-5222 "Condition-Monitoring Program." Motor operated valves are routinely full stroke tested in accordance with ASME OM Code Section ISTC-5120, "Motor Operated Valves," to ensure their functional capabilities. At Fermi 2, these functional tests for PIVs have historically been performed at a Quarterly, Cold Shutdown, or Refuel outage frequency. In the fourth interval, the motor operated valves will follow the frequencies and testing required by Mandatory Appendix III, "Preservice and In-service Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants." The functional 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.

10 CFR 50.55a Relief Request VRR-003

Alternative for 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. Eleven 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 recent PIV leak rate test performance is provided in Attachment 1 to this Enclosure.

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 approval of License Amendment No. 205 (ADAMS Accession No. ML16351A460) 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 License Amendment increased the containment isolation valves leakage test intervals (i.e., Type C tests) from 60 months to 75 months.

10 CFR 50.55a Relief Request VRR-003

Alternative for Performance-Based Scheduling of PIV Leakage Tests

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 to this Enclosure, almost all of the listed valves have passed their last three PIV Leak Rate Tests and would currently qualify for extended frequency.

Summary of the 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 based on historical data.
- Performance of functional stroke testing of PIVs is per the ASME Code.
- PIV testing for the applicable valves has excellent historical performance results.
- There is a very low likelihood of valve mispositioning during power operations (procedures, interlocks).
- Some valves are also air tested and degrading seat conditions are identified much sooner with air testing.
- The low pressure piping typically has relief valves. 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 are typically provided to 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 will be utilized for the entire fourth 10-year interval. The fourth interval begins on February 17, 2020 and ends on February 16, 2030.

7. Precedent

Fermi 2 currently has an approved relief request for containment isolation valves for the third 10-year interval. The current relief request is identified as VRR-013 in the approval documents listed below:

10 CFR 50.55a Relief Request VRR-003

Alternative for Performance-Based Scheduling of PIV Leakage Tests

- "Fermi 2 – Evaluation of In-Service Testing Program Relief Request VRR-011, VRR-012, and VRR-013," dated September 28, 2010, Accession No. ML102360570.
- "Fermi, Unit 2 – Relief from the Requirements of the ASME OM Code," dated March 7, 2018, Accession No. ML17354B002.

8. Attachments

(1) Historical Pressure Isolation Valves Leakage Test Performance (Last Three Tests) [2 pages]

ATTACHMENT 1 TO ENCLOSURE 3 OF NRC-19-0025 (VRR-003)

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	10/23/2018	10.00	0.230
	4/4/2017		Unsat**
	10/6/2015		0.077
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
E2150F005B	10/6/2018	5.00	0.0015
	2/24/2014		0.008
	4/6/2009		0.00
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

ATTACHMENT 1 TO ENCLOSURE 3 OF NRC-19-0025 (VRR-003)

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

Valve Number	Date of Test	Acceptance Criteria (gpm)	Measured Value (gpm)
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.

Enclosure 4 to
NRC-19-0025

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

Relief Request VRR-005 for the IST Fourth 10-Year Interval

10 CFR 50.55a Relief Request VRR-005

Alternative Frequency Requirements for Pressure Relief Valves

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 Identification (PIS) No.	Noun Description	ASME Code Class	OM Valve Category	Plant Drawing
E1100F029	Residual Heat Removal (RHR) Shutdown Cooling Relief Valve	2	C	M-5706-1
E4100F020	High Pressure Coolant Injection (HPCI) Booster Pump Inlet Pressure Relief Valve	2	C	M-5708-1
E4100F050	HPCI Lube Oil Cooler Inlet Pressure Relief Valve	2	C	M-5708-1

2. Applicable Code Edition and Addenda

ASME OM Code 2012 Edition, No Addenda

3. Applicable Code Requirement

I-3150, Test Frequency, Classes 2 and 3 Pressure Relief Valves:

"(a) 10-Yr test interval. Classes 2 and 3 pressure relief valves, with the exception of PWR main steam safety valves, shall be tested every 10 yr, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested during any single plant operating cycle; however, a minimum of 20% of the valves from each valve group shall be tested within any 48-mo interval. This 20% shall consist of valves that have not been tested during the current 10-yr test interval, if they exist.

The test interval for any installed valve shall not exceed 10 yr. The 10-yr test interval shall begin from the date of the as-left set pressure test for each valve. PWR main steam safety valves shall be tested in accordance with para. I-1320."

4. Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirements of ASME OM Code I-3150. The basis of the relief request is that the proposed alternative will provide an acceptable level of quality and safety.

10 CFR 50.55a Relief Request VRR-005

Alternative Frequency Requirements for Pressure Relief Valves

E1100F029, E4100F020, and E4100F050 are currently tested individually and are not grouped (i.e. there is only one relief valve in the group). As such, I-1350(a) requires testing of each of these valves every 48 months. Recently developed ASME OM Code Case OMN-24 allows ASME Class 2 and 3 Relief Valves where there is only one valve in a group to have the test frequency extended out from 48 months by 24 months with good performance. This extension may be repeated with continued good performance until the valve is tested every 120 months. The ASME OM Code Case OMN-24 is attached to this relief request as Attachment 1 to this Enclosure. OMN-24 Code Case applicability is for ASME OM Code 2001 Edition through the 2017 Edition.

5. Proposed Alternative and Basis for Use

Fermi 2 relief valves E1100F029, E4100F020, and E4100F050 are each in a group of only one valve. Fermi 2 would implement the alternative methods of ASME OM Code Case OMN-24 for the relief valve test frequencies for E1100F029, E4100F020 and E4100F050. Each of the items (a) through (f) of the Code Case are addressed as follows:

The relief valves will be tracked by plant identification number as provided by its manufacturer or as applied by Fermi 2.

Upon adoption of this Code Case, the initial test interval shall not exceed 48 months since the last set-pressure test. A 12 month period is allowed to complete testing once any of these relief valves are removed from the system.

Each of these relief valve that satisfies the as-found set-pressure test criterion may have its test interval extended by up to 24 months; not to exceed 120 months. The test interval shall begin from the date of the as-left set-pressure test for the installed valve.

Any of these relief valves that fails the as-found set-pressure test shall have its test interval reduced by 24 months. The minimum required test frequency for this circumstance is a 24 month interval.

The test interval for any individual relief valve shall not exceed 120 months except that a six month grace period is allowed to coincide with refueling outages to accommodate extended operation or shutdown periods.

Fermi 2 may satisfy testing requirements by installing a pretested valve to replace the valve that had been in service provided that the valve removed from service shall be tested within 12 months of removal from the system.

In conclusion, using the provisions of this relief request as an alternative to the specific requirements of I-3150 will provide adequate indication of valve performance and continue

10 CFR 50.55a Relief Request VRR-005

Alternative Frequency Requirements for Pressure Relief Valves

to provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(z)(1), Fermi 2 requests relief from the specific requirements identified in this request.

6. Duration of Proposed Alternative

This proposed alternative will be utilized for the entire fourth 10-year interval. The fourth interval begins on February 17, 2020 and ends on February 16, 2030.

7. Precedent

This ASME OM Code Case (OMN-24) will be published as part of the 2020 Edition of the ASME OM Code. No precedents or submittals have been identified for this OM Code Case.

8. Attachments

(1) Case OMN-24, "Alternative Requirements for Testing ASME Class 2 and 3 Pressure Relief Valves (For Relief Valves in a Group of One)" [1 page]

Case OMN-24

Alternative Requirements for Testing ASME Class 2 and 3 Pressure Relief Valves (For Relief Valves in a Group of One)

Applicability: ASME OM Code 2001 Edition through the 2017 edition.

Inquiry: What alternative requirements to the ASME OM Code Appendix I sample plan approach described by the ASME OM Code 2001 through 2017 edition Section I1350(a) may be used to test ASME Class 2 and 3 Relief Valves when there is only one (1) valve in a group?

Reply: It is the opinion of the Committee that when addressing a valve group of one (1), in lieu of the sample plan approach described by ASME OM Code Section I-1350(a), ASME Class 2 and 3 Relief Valves, except for PWR Main Steam Safety Valves, may be tested using the alternative methods described below:

a) The relief valve shall be tracked by its plant identification number as provided by its manufacturer or as applied by the Owner.

b) Upon adoption of this Code Case, the initial test interval shall not exceed 48 months since its last set-pressure test. A 12 month period is allowed to complete testing once the relief valve is removed from the system.

c) A relief valve that satisfies the as-found set-pressure test criterion may have its test interval extended by up to 24 months. The test interval shall begin from the date of the as-left set-pressure test for the installed valve.

d) A relief valve that fails the as-found set-pressure test shall have its test interval reduced by 24 months. The minimum required test frequency for this circumstance is a 24 month interval.

e) The test interval for any individual relief valve shall not exceed 120 months except that a six (6) month grace period is allowed to coincide with refueling outages to accommodate extended operation or shutdown periods.

f) The Owner may satisfy testing requirements by installing a pretested valve to replace the valve that had been in service provided that the valve removed from service shall be tested within 12 months of removal from the system.
Applicability: ASME OM Code 2001 Edition through the 2017 edition.

Enclosure 5 to
NRC-19-0025

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

Relief Request VRR-008 for the IST Fourth 10-Year Interval

10 CFR 50.55a Relief Request VRR-008

Relief to Perform Drywell-to-Torus Vacuum Breaker Leakage 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

Valve Identification (PIS) No.	Noun Description	ASME Code Class	OM Valve Category	Plant Drawing
T23F400A	Drywell-to-Torus Vacuum Breaker T2300F400A Solenoid Valve	2	A	M-5739-1
T23F400B	Drywell-to-Torus Vacuum Breaker T2300F400B Solenoid Valve	2	A	M-5739-1
T23F400C	Drywell-to-Torus Vacuum Breaker T2300F400C Solenoid Valve	2	A	M-5739-1
T23F400D	Drywell-to-Torus Vacuum Breaker T2300F400D Solenoid Valve	2	A	M-5739-1
T23F400E	Drywell-to-Torus Vacuum Breaker T2300F400E Solenoid Valve	2	A	M-5739-1
T23F400F	Drywell-to-Torus Vacuum Breaker T2300F400F Solenoid Valve	2	A	M-5739-1
T23F400G	Drywell-to-Torus Vacuum Breaker T2300F400G Solenoid Valve	2	A	M-5739-1
T23F400H	Drywell-to-Torus Vacuum Breaker T2300F400H Solenoid Valve	2	A	M-5739-1
T23F400J	Drywell-to-Torus Vacuum Breaker T2300F400J Solenoid Valve	2	A	M-5739-1
T23F400K	Drywell-to-Torus Vacuum Breaker T2300F400K Solenoid Valve	2	A	M-5739-1
T23F400L	Drywell-to-Torus Vacuum Breaker T2300F400L Solenoid Valve	2	A	M-5739-1
T23F400M	Drywell-to-Torus Vacuum Breaker T2300F400M Solenoid Valve	2	A	M-5739-1

2. Applicable Code Edition and Addenda

ASME OM Code 2012 Edition, No Addenda

10 CFR 50.55a Relief Request VRR-008

Relief to Perform Drywell-to-Torus Vacuum Breaker Leakage Testing at Appendix J Option B Frequency

3. Applicable Code Requirement

ISTC-3630, "Leakage Rate for Other Than Containment Isolation Valves," requires a two-year leakage test for Category A valves.

4. Reason for Request

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

The normally closed solenoid valves, which control the testing actuators for the drywell-to-torus vacuum breakers, have a passive safety function in the closed direction because they form part of the primary containment inboard closed boundary associated with penetrations X-204A through X-204M. This results in an OM Code requirement (ISTC-3630) to demonstrate the leak tight integrity of the solenoids every 2-years to ensure the penetration piping meets the requirements of a closed system.

Testing for these valves involves entry into the torus which is a confined space, high risk foreign material (FME) exclusion zone, and high radiation dose area.

5. Proposed Alternative and Basis for Use

It is proposed to test the solenoid valves at the Appendix J frequency (performance based frequency up to 75 months) with the related outboard containment isolation valves (T4800F416 through T4800F427). The seat leakage test for the related outboard containment isolation valves use the solenoid valves as part of the test boundary. This requires entry into the torus to test the outboard containment isolation valves. It is beneficial to perform the leakage testing for the outboard primary containment valves and the solenoid valves at the same time for the following reasons:

1. Alignment of the testing will reduce dose to testing operators.
2. There will be less entries into an area that is classified as both a confined space and a high risk FME exclusion zone.
3. There will be less manipulation of the solenoids. Testing of the solenoids and the related outboard containment isolation valves both require removal of the exhaust nozzle, plugging the exhaust port, and disconnecting the nitrogen tubing of the solenoid valve.

In 1996, Fermi 2 received approval of License Amendment 108 (ADAMS Accession No. ML020730597) to implement Option B of the 10 CFR 50 Appendix J Program. This

10 CFR 50.55a Relief Request VRR-008

Relief to Perform Drywell-to-Torus Vacuum Breaker Leakage Testing at Appendix J Option B Frequency

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 approval of License Amendment No. 205 (ADAMS Accession No. ML16351A460) 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 License Amendment increased the containment isolation valves leakage test intervals from 60 months to 75 months.

The risk for extending the frequency of the solenoid leakage test to the Appendix J frequency is considered to be low because the performance based testing frequency and methodology used for the Appendix J valves has been proven to be effective. In addition, satisfactory testing history exists for the solenoid valves which were not previously included in the IST Program scope. The results of the last three leakage tests (see Attachment 1) have all been satisfactory.

6. Duration of Proposed Alternative

This proposed alternative will be utilized for the entire fourth 10-year interval. The fourth interval begins on February 17, 2020 and ends on February 16, 2030.

7. Precedent

No precedent was identified for this relief request.

8. Attachments

(1) Drywell-to-Torus Vacuum Breaker Solenoid Leakage Testing Results [1 page]

ATTACHMENT 1 TO ENCLOSURE 5 OF NRC-19-0025 (VRR-008)

Drywell-to-Torus Vacuum Breaker Solenoid Leakage Testing Results

Valve	Procedure	Date	Fermi 2 Work Order	Result (SCFH)	Acceptance Criteria (SCFH)
T23F400A	43.401.362	3/30/06	333060414	0.047	1.00
		10/27/10	3336101020	0.047	2.00
		4/8/12	29595243	0.047	2.00
T23F400B	43.401.363	3/30/06	3337060414	0.047	1.00
		10/27/10	3337101020	0.047	2.00
		4/8/12	29595245	0.047	2.00
T23F400C	43.401.364	10/13/07	0438101020	0.05	1.00
		4/5/09	26030933	0.047	2.00
		4/8/12	26030922	0.047	2.00
T23F400D	43.401.365	3/30/06	3339060414	0.51	1.00
		10/27/10	3339101020	0.047	2.00
		4/8/12	29595247	0.047	2.00
T23F400E	43.401.366	3/30/06	3340060414	0.047	1.00
		4/27/10	3340101020	0.047	2.00
		4/8/12	29595249	0.047	2.00
T23F400F	43.401.367	3/30/06	3341060414	0.53	1.00
		10/27/10	3341101020	0.047	2.00
		4/8/12	29595265	0.047	2.00
T23F400G	43.401.368	3/30/06	3342060414	0.06	1.00
		10/27/10	3342101020	0.047	2.00
		4/8/12	29595268	0.047	2.00
T23F400H	43.401.369	3/30/06	3343060414	0.06	1.00
		10/27/10	3343101020	0.047	2.00
		4/8/12	29595270	0.047	2.00
T23F400J	43.401.370	3/30/06	3344041022	0.047	1.00
		10/27/10	3344101002	0.047	2.00
		4/8/12	29595272	0.047	2.00
T23F400K	43.401.371	3/30/06	3345060414	0.06	1.00
		10/22/10	29595274	0.047	2.00
		4/8/12	32732276	0.047	2.00
T23F400L	43.401.372	3/30/06	3346041022	0.047	1.00
		10/22/10	3346101002	0.047	2.00
		4/8/12	29595276	0.047	2.00
T23F400M	43.401.373	3/30/06	3347060414	0.047	1.00
		10/27/10	29595278	0.047	2.00
		4/8/12	32732308	0.047	2.00