

DTE Energy - Fermi 2

Inservice Testing Program Fourth Ten-Year Interval

Fermi 2 Nuclear Operations Center
6400 N. Dixie Highway
Newport, Michigan 48166

Date of Commercial Operation - 01-23-1988
Fourth Interval Start - February 17, 2020

Revised per LCR 20-045-ISI.

APPROVALS:

QUAL

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INFORMATION AND PROCEDURES

DSN: <u>IST Program Description</u>	Rev: <u>4</u>	Date: <u>1/25/21</u>
DTC: <u>TM PLAN</u>	File: <u>1715.04</u>	Recipient: _____
Date Approved: _____	Release authorized by: _____	

IST Program Plan Description

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CMJ-03	RHR Min Flow Checks
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- 12.1 Plant Equipment Identification with IST scoping basis

IST Program Plan Description

1.1 Purpose

To provide requirements for the performance and administration of assessing the operational readiness of those pumps and valves whose specific functions are required to either:

- Shutdown the reactor to the safe shutdown condition, and/or
- Maintain the safe shutdown condition, and/or
- To mitigate the consequences of an accident.

Fermi 2 was designed and licensed to operate with the Hot Shutdown condition (Mode 3) **defined as the "safe" shutdown condition**. Since Safe Shutdown is defined in the Fermi 2 licensing basis as the hot shutdown condition, inservice testing of components which are required to achieve cold shutdown is unwarranted. However, decay heat removal is an important safety function that must be accomplished or core damage could result. Although the RHR shutdown cooling subsystem does not meet a specific criterion of 10 CFR 50.36(c)(2)(ii), it is identified as a significant contributor to risk reduction. For the purposes of IST scoping the term "Safe Shutdown" will be conservatively defined as a Cold Shutdown condition (Mode 4). All components necessary to achieve and maintain a Cold Shutdown condition will be included within the IST scope. OM ISTB-3420 and ISTC-3570 require IST Program testing to remain current unless a System is in a mode where it is not required to be operable. Systems must be tested within 3 months of returning to operable status. For Systems with requirements to remain operable during Modes 4 and 5, IST Program testing must commence prior to Mode 4. Reference TS 3.5.2.7 (CARD 20-27489) as an example.

The Fermi 2 Inservice Testing Program (IST) is required by 10CFR50.55a including applicable OM Code Conditions. Fermi 2 used the following guidance documents in developing the IST Program:

- System Design Basis Documents
- ISI Program Boundary Drawings
- Technical Specifications
- Technical Requirements Manual
- UFSAR
- NUREG-1482 Revision 2, Guidelines for Inservice Testing at Nuclear Power Plants"

The Fermi 2 Fourth 120-month interval Pump and Valve Inservice Testing Plan will be in effect as follows:

Begin: 02/17/2020 **End:** 02/16/2030

The key features of this Plan are: the Pump and Valve table listings, Relief Requests, Refueling Outage Justifications, Cold Shutdown Justifications, Check Valve Condition Monitoring Plans, Technical Positions, and the Program Scoping Basis document. The component level basis information and testing data is maintained within the Iddeal software. The 2012 Edition of the ASME OM Code defines all scoping and classification requirements.

Grace for IST testing is 25% for periods specified as fewer than 2 years and 6 months for periods equal to or greater than 2 years per Code Case OMN-20.

The IST Program Interval history is as follows:

First Interval (Start 1/23/1988)
 Second Interval (Start 2/17/2000)
 Third Interval (Start 2/17/2010)
 Fourth Interval (Start 2/17/2020)

The second interval started approximately twelve years after the start of the first interval. The extension was due to a 389 day extended outage for a main turbine blade failure and an elective 1 year extension. This extension follows the OM Code sections ISTA-3120 (d) and (e). No additional interval extensions can be applied in the future without NRC approval.

1.2 Scope

The IST program plan has been prepared to meet the requirements of the American Society of Mechanical Engineers (ASME) OM Code 2012 Edition. Mandatory Appendix I, II, III, and V. As noted above, modification of the OM Code requirements is made as applicable by following the conditions listed in 10CFR 50.55a.

The IST Program Plan provides a complete listing of those pumps and valves included in the program per the requirements of the following:

- ASME OM Code 2012, Subsection ISTA, *“General Requirements”*
 - ISTA contains the requirements directly applicable to inservice testing including **the Owner’s Responsibility and Records Requirements.**
- ASME OM Code 2012, Subsection ISTB, *“Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants”*

ISTB establishes the requirements for inservice testing of pumps in light-water reactor nuclear power plants. The pumps covered are those provided with an emergency power source, which are required in the shutting down the reactor to the safe shutdown condition, in maintaining the safe shutdown condition, and/or in mitigation of the consequences of an accident.

- ASME OM Code 2012, Subsection ISTC, “*Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants*”

ISTC establishes the requirements for inservice testing of valves in light-water reactor nuclear power plants. The valves covered include those which provide overpressure protection and those which are required to perform a specific function, either actively through the changing of valve obturator position or passively by maintaining required obturator position in shutting down a reactor to the safe shutdown condition, in maintaining the safe shutdown condition, or in mitigating the consequences of an accident.

- ASME OM Code 2012, Subsection ISTD, “*Preservice and Inservice Examination and Testing of Dynamic Restraints (Snubbers) in Light-Water Reactor Nuclear Power Plants*”

ISTD establishes the requirements for inservice testing of snubbers in light-water reactor nuclear power plants including the **Owner’s Responsibility and Records Requirements**. The Snubber Program is managed outside of the IST Program as an independent program.

- ASME OM Code 2012, Mandatory Appendix I, “*Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants*”

Provides the requirements for performance testing and monitoring of nuclear plant pressure relief devices. Methods, intervals, and record requirements for monitoring and testing are established, as well as guidelines for the evaluation of results. The Appendix applies to safety valves, safety relief valves, pilot-operated pressure relief valves, power-actuated pressure relief valves, nonreclosing pressure relief devices and vacuum relief devices, including all accessories and appurtenances.

- ASME OM Code 2012, Mandatory Appendix II, “**Check Valve Condition Monitoring Program**”

Provides an alternative to the testing or examination requirements of ISTC-3510 through ISTC-5221. The purpose of this program is both to improve valve performance and to optimize testing, examination, and preventive maintenance activities to maintain the continued acceptable performance of a select group of check valves.

- ASME OM Code 2012, Mandatory Appendix III, “**Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants**”

The purpose of this program is to establish the requirements for preservice and inservice testing of motor operated valves.

- ASME OM Code 2012, Mandatory Appendix V, “**Pump Periodic Verification Test Program**”

The purpose of this program is to establish the requirements for implementing a pump periodic verification test for certain pumps with specific design basis accident flow rates in Technical Specifications, Technical Requirements, or updated safety analysis report. The test verifies that a pump can meet the required pressure as applicable, at the highest design basis accident flow rate.

1.3 Requirements

- 1.3.1 The IST Plan is implemented through the performance of implementing procedures to satisfy testing requirements identified for each component in the program.
- 1.3.2 The acceptability of component performance is determined by comparison to the identified acceptance criteria contained in the implementing procedure. That acceptance criteria are derived from Technical Specifications and ASME Code requirements.
- 1.3.3 Periodic review of selected performance data associated with pumps and valves is performed for trending purposes.
- 1.3.4 Maintenance activities are reviewed to determine the impact on the performance of the IST Program pumps and valves.
- 1.3.5 The content of the IST Plan is revised as necessary during the interval due to Code edition upgrade, design changes or program enhancements.
- 1.3.6 Applicable changes to implementing test procedures are reviewed to ensure IST Plan compliance.
- 1.3.7 Component performance anomalies are analyzed, and input provided for program resolution.

1.4 Plant Systems

Plant systems are identified by a single alphabetic character followed by two numeric characters. The list below identifies the three character system identifiers and system names included in the In-service Testing Program for Pumps and Valves. Plant drawing 6M721-5808 identifies the individual ISI boundary drawings for each system.

Plant Identification System (PIS) Codes for Plant Systems

- B21 - PIS Number for the Nuclear Boiler System
- B31 - PIS Number for the Reactor Recirculation System
- C11 - PIS Number for the Control Rod Drive System
- C41 - PIS Number for the Standby Liquid Control System
- C51 - PIS Number for the Neutron Monitoring System
- E11 - PIS Number for the Residual Heat Removal System
- E21 - PIS Number for the Core Spray System

- E41 - PIS Number for the High Pressure Coolant Injection System
- E51 - PIS Number for the Reactor Core Isolation Cooling System
- G11 - PIS Number for the Radwaste System
- G33 - PIS Number for the Reactor Water Cleanup System
- G41 - PIS Number for the Fuel Pool Cooling and Cleanup System
- G51 - PIS Number for the Torus Water Management System
- N11 - PIS Number for the Main Steam Supply System
- N21 - PIS Number for the Feedwater System
- P11 - PIS Number for the Condensate Storage and Transfer System
- P34 - PIS Number for the Post Accident Sampling System
- P42 - PIS Number for the Reactor Building Closed Cooling Water System
- P44 - PIS Number for the Emergency Equipment Cooling Water System
- P45 - PIS Number for the Emergency Equipment Service Water System
- P50 - PIS Number for the Station and Control Air System
- R30 - PIS Number for the Diesel Generator System
- T23 - PIS Number for the Primary Containment System
- T41 - PIS Number for the RBHVAC & CCHVAC Systems
- T46 - PIS Number for the Standby Gas Treatment System
- T48 - PIS Number for the Containment Atmosphere Control System
- T49 - PIS Number for the Primary Containment Pneumatic System
- T50 - PIS Number for the Primary Containment Atmosphere Monitoring System

1.5 Test Intervals

The following table lists the codes that may be used in the valve tables to describe the intervals at which various tests are performed

IST Exam Interval table

Frequency Code	Frequency in Days (app.)	Frequency Description
Q	92	Quarterly
RO	550	Reactor Refuel
CS	N/A	Cold Shutdown
App J	N/A	Per Appendix J Option B
2Y	732	2 Years
App 3	N/A	Per Appendix III MOV PM frequencies
6M	183	183 Days
5Y	1825	5 Years
6Y	2190	6 Years
10Y	3652	10 Years
CM	Varies	Check Valve Condition Monitoring Frequency
3Y	1100	3 Years
3C	2190	6 Years based on two-year cycle

Jeffrey D Auler

From: Craig E Shepherd
Sent: Friday, January 8, 2021 12:39 PM
To: Jeffrey D Auler
Subject: Approvals, IST Program Description

To: Jeff Auler, IST Program Manager

I have reviewed and approved the following

DTC	DSN	Revision	Approval
TMPLAN	IST Program Description	4	Reviewer: Craig Shepherd

I also authorize any page renumbering required by inclusion of this email within the overall document as required per NSIP-20-0005.

Regards, Craig Shepherd

Jeffrey D Auler

From: Jeffrey D Auler
Sent: Friday, January 8, 2021 1:15 PM
To: Jeffrey D Auler
Subject: IST Program Description

I have prepared and approve the following

DTC	DSN	Revision	Approval
TMPLAN	IST Program Description	4	Preparer: Jeffrey D. Auler /s/

I also authorize any page renumbering required by inclusion of this email within the overall document as required per NSIP-20-0005.

Regards, Jeffrey D. Auler

Jeffrey D Auler

From: James D Wines
Sent: Monday, January 11, 2021 3:48 PM
To: Jeffrey D Auler
Cc: Randy D Breymaier
Subject: FW: Program Description
Attachments: IST Program Plan Part 1 Program Description.pdf

I have reviewed and approve the following as the Supervisor – Programs Engineering

DTC	DSN	Revision	Approval
TMPLAN	IST Program Description	4	Reviewed by or Approved by:

I also authorize any page renumbering required by inclusion of this email within the overall document as required per NSIP-20-0005.

James Wines | Supervisor – Nuclear Engineering (Programs)

Phone: 734.586.1701 | [Text](#): 734.625.3154 | [Pager](#): 734.227.0076 | eMail: James.Wines@dteenergy.com

Jeffrey D Auler

From: Mark D Wilson
Sent: Tuesday, January 19, 2021 7:43 AM
To: Jeffrey D Auler
Subject: RE: ANII signature for IST Program Parts

Jeff,

I have reviewed and concur as the ANII with the following Revision to the IST Program:

DTC	DSN	Revision	Approval
TMPLAN	IST Program Description	4	Concurred by: Mark D. Wilson – ANII /s/

Mark D. Wilson, ANII
 The Hartford Steam Boiler Inspection and Insurance Company

From: Jeffrey D Auler <jeffrey.auler@dteenergy.com>
Sent: Wednesday, January 13, 2021 9:45 AM
To: Mark D Wilson <mark.wilson@dteenergy.com>
Subject: ANII signature for IST Program Parts

Mark, I placed a copy of IST Program Parts 1, 3, 5, 7, 11, and 12 into the Y: temp folder under your name.

Part 1 is the only cover page that requires a signature however I put all the documents in the drop box for you for reference.

These documents have been reviewed by Craig Shepherd, the Licensing Engineer, Jim, and Randy. I would have attached the signature emails but Randy filled his out incorrectly.

Please send back the following:

I have reviewed and concur as the ANII – Programs Engineering

DTC	DSN	Revision	Approval
TMPLAN	IST Program Description	4	Concurred by: Mark D. Wilson – ANII /s/

I also authorize any page renumbering required by inclusion of this email within the overall document as required per **NSIP-20-0005**.

Regards, Mark D. Wilson

Jeffrey D Auler

From: Randy D Breymaier
Sent: Friday, January 15, 2021 1:54 PM
To: Jeffrey D Auler
Subject: Approval of program description (part 1)

I have reviewed and approve the following as Manager, Engineering Programs

DTC	DSN	Revision	Approval
TMPLAN	IST Program Description	4	Manager Approval Randy Breymaier /s/

I also authorize any page renumbering required by inclusion of this email within the overall document as required per NSIP-20-0005.

Randy Breymaier
 Manager Performance Engineering
 734 586-1811