UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

July 29, 2019

Mr. Paul Fessler, Senior VP
and Chief Nuclear Officer
DTE Energy Company
Fermi 2 – 260 TAC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI POWER PLANT, UNIT 2—DESIGN BASIS ASSURANCE INSPECTION (TEAMS); INSPECTION REPORT 05000341/2019012

Dear Mr. Fessler:

On July 10, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Fermi Power Plant, Unit 2, and discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

Two findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. The inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at Fermi.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC Resident Inspector at Fermi.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal* Regulations, Part 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Karla K. Stoedter, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50–341
License No. NPF–43

Enclosure:
As stated

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Letter to Paul Fessler from Karla K. Stoedter dated July 29, 2019.

SUBJECT: FERMI POWER PLANT, UNIT 2—DESIGN BASIS ASSURANCE INSPECTION (TEAMS); INSPECTION REPORT 05000341/2019012

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000341
License Number:	NPF-43
Report Number:	05000341/2019012
Enterprise Identifier:	I-2019-012-0005
Licensee:	DTE Electric Company
Facility:	Fermi Power Plant, Unit 2
Location:	Newport, MI
Inspection Dates:	May 06, 2019 to July 10, 2019
Inspectors:	A. Dahbur, Senior Reactor Inspector N. Feliz-Adorno, Senior Reactor Inspector W. Hopf, Contractor M. Jones, Reactor Inspector L. Rodriguez, Reactor Inspector R. Waters, Contractor
Approved By:	Karla K. Stoedter, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a design basis assurance inspection (teams) inspection at Fermi Power Plant, Unit 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. Licensee-identified non-cited violations are documented in report sections: 71111.21M.

List of Findings and Violations

Failure to Incorporate Acceptance Limits Contained in High Pressure Coolant Injection Design Documents Into Test Procedure			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000341/2019012-01 Open/Closed	[H.8] - Procedure Adherence	71111.21M
The inspectors identified a finding of very low safety significance (Green) and an associated Non-Cited Violation (NCV) of Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to incorporate the minimum total developed head acceptance limits contained in Design Document DC-0501, "HPCI Hydraulic Analysis," Revision F, into Test Procedure 24.202.01, "HPCI Pump and Valve Operability Test at 1025 psi," Revision 118.			

Non-Conservative Motor-Operated Valve Output Torque Capacity Methodology			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000341/2019012-02 Open/Closed	None (NPP)	71111.21M
The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify the adequacy of the output torque capacity of safety-related motor-operated valves (MOVs). Specifically, the licensee evaluated MOV output torque capability, in part, by using the ComEd WP-125 method and the full motor nominal voltage (rather than using the calculated terminal voltage) when the calculated voltage was greater than 90 percent of the nominal voltage. However, the use of full motor nominal voltage when calculating the output torque capacity using the ComEd WP-125 method was non-conservative and resulted in output torque values which were not reflective of the actual motor capacity limit needed to ensure safety-related MOVs would perform their safety function.			

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.21M - Design Bases Assurance Inspection (Teams)

The inspectors evaluated the components and associated attributes, permanent modifications, and operating experience listed below. During this review, the inspectors noted degradation of containment coatings and became concerned that the coatings could peel off and interfere with the operation of safety systems in the unlikely event of an accident. The NRC determined this concern warranted additional inspection by a Special Inspection Team. The results of the Special Inspection will be documented in Inspection Report 05000341/2019050.

Design Review - Large Early Release Frequency (LERFs) (IP Section 02.02) (1 Sample)

(1) Drywell Exhaust and Air Purge Isolation Valves (T4803-F602 & T4600-F411/F402)

- Licensing basis requirements
- Material condition and configuration
- Operating procedures
- System health, corrective maintenance, and corrective action history
- Maintenance effectiveness
- Consistency between station documentation (e.g., procedures) and vendor specifications
- Environmental qualification
- Valve capability calculations
- Air supply availability and capability
- Stroke timing
- Testing procedures, acceptance criteria, and recent results
- Thermal overload testing and sizing
- Response to degraded voltage
- Minimum voltage calculation
- Torque requirement calculation

Design Review - Risk-Significant/Low Design Margin Components (IP Section 02.02) (5 Samples)

(1) High Pressure Coolant Injection (HPCI) Pump (E4101C001A)

- Licensing basis requirements
- Material condition and configuration
- Operating procedures
- Modifications
- System health, corrective maintenance, and corrective action history
- Maintenance effectiveness
- Consistency between station documentation (e.g., procedures) and vendor specifications
- Turbine and pump performance and capability calculations
- Runout and minimum flow
- Submergence (i.e., net positive suction head (NPSH) and vortexing)
- Protection against flooding and seismic events
- Water supply availability
- Steam supply availability
- Suction strainer blockage
- Gas intrusion and hydraulic transients
- Room heat up and ventilation
- Component lubrication
- Surveillance and test procedures, acceptance criteria, and results
- Control logic for turbine trips and pump start
- Component control instrumentation
- Instrumentation set point calculations
- Direct current (DC) voltage to DC MOVs for torque considerations

(2) Reactor Core Isolation Cooling (RCIC) Pump (E5101C001)

- Licensing basis requirements
- Material condition and configuration
- Operating procedures
- Protection against flooding, seismic events, and high energy line breaks
- Maintenance effectiveness
- Component health, corrective maintenance, and corrective action history
- Consistency between station documentation (e.g., procedures) and vendor specifications
- Turbine and pump performance and capability calculations
- Runout and minimum flow
- Submergence (e.g., NPSH and vortexing)
- Water supply availability
- Gas intrusion and hydraulic transients
- Room heat up and ventilation calculations
- Surveillance and test procedures, acceptance criteria, and results

(3) 260/130 Volt DC Main Distribution Panels 2PA-2 and 2PB-2 (R3200S026/7)

- Licensing basis requirements
- Operating procedures
- Component health, corrective maintenance, and corrective action history
- Maintenance effectiveness
- Flood and seismic protection
- Room heat up and ventilation
- Surveillance and test procedures, acceptance criteria, and results
- Load, short circuit, and coordination calculations
- Temperature effects and environmental qualification
- Inverter capacity and capability to supply adequate voltage
- Cable ampacity
- Protective breakers and trip set points

(4) 130/260 Volt DC Battery 2PA and 2PB (R3200S003/4)

- Licensing basis requirements
- System health, corrective maintenance, and corrective action history
- Maintenance effectiveness
- Performance testing
- Technical Specification required surveillance testing
- Discharge testing
- Battery charger sizing
- Terminal corrosion resistance
- Battery sizing and loading
- Short circuit calculation
- Voltage drop calculation
- Protection against flooding and seismic events
- Room heat up and ventilation calculations

(5) Safety Relief Valve (B2104F013A)

- Licensing basis requirements
- Operating procedures
- System health, corrective maintenance, and corrective action history
- Maintenance effectiveness
- Consistency between station documentation (e.g., procedures) and vendor specifications
- Environmental qualification
- Relief capacity
- Accumulator sizing calculations
- Pneumatic supply capability
- Lift settings
- Low-low set setpoint
- Surveillance and test procedures, acceptance criteria, and results
- Control logic

Modification Review - Permanent Mods (IP Section 02.03) (4 Samples)

(1) 37272.001, RCIC Pump Discharge High Point Vent Relocation
(2) Calculation Change DC-0501 VOL I, HPCI Hydraulic Analysis
(3) Calculation Change DC-6478 VOL I, 120 Volts Alternating Current Protective Device Coordination Calculation for Divisions 1 and 2
(4) Calculation Change DC-5512 VOL I, Evaluation of 1E/Non-1E Separation Criteria

Review of Operating Experience Issues (IP Section 02.06) (2 Samples)

(1) NRC Information Notice 2005-30, Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events and Inadequate Design
(2) NRC Information Notice 2017-06, Battery and Battery Charger Short-Circuit Contribution to a Fault on DC System

INSPECTION RESULTS

Licensee-Identified Non-Cited Violation	71111.21M
This violation of very low safety significance was identified by the licensee and has been entered into the licensee Corrective Action Program and is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure conditions adverse to quality (CAQ), such as non-conformances, are promptly identified and corrected. Contrary to the above, between June 28, 2007, and April 26, 2019, the licensee failed to establish measures to assure a CAQ was promptly corrected. Specifically, on June 28, 2007, the licensee identified the HPCI, RCIC, and core spray (CS) pumps, which are safety-related, were not protected from air-entraining vortices when their suctions were aligned to the condensate storage tank. This CAQ was captured in the Corrective Action Program as CARD 07-23630. However, on April 26, 2019, the licensee identified they had not corrected this CAQ because the implementation of the proposed corrective action (i.e., installation of a vortex suppressor) had been deferred multiple times without an appropriate justification. Significance: Green. The finding was evaluated using the Significance Determination Process in accordance with Inspection Manual Chapter 0609 Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions." The finding screened as having very low safety significance (Green) because it did not result in the loss of operability or functionality of the HPCI, RCIC, or CS pumps. Specifically, the licensee reasonably determined the HPCI and RCIC pump suctions would likely transfer to the torus before vortexing became a concern during a design basis event by crediting the torus high water level automatic suction transfer. In addition, the licensee reviewed historical condensate storage tank water levels and reasonably determined the condensate storage tank actual level was sufficient to enable CS to accomplish its function before vortexing became a concern. Corrective Action References: CARD 07-23630, CARD 19-23227, CARD 19-23632, CARD 19-23797, and CARD 19-23966	

Observation: Effectiveness Review of Corrective Actions Taken by the Licensee to Issues Identified during Previous Component Design Basis Inspection and Design Bases Assurance Inspections	71111.21M

In accordance with IP 71111.21M, Section 02.05c, the inspectors reviewed the effectiveness of corrective actions taken by the licensee to address issues identified during previous Component Design Basis Inspections and Design Bases Assurance Inspections. No findings or violations were identified. The items reviewed were:

1. NCV 05000341/2007003-03, "HPCI Pump In-Service Testing Acceptance Criterion Was Not Conservative with Respect to the System Performance Requirements."
2. NCV 05000341/2016007-07, "Failure to Ensure that Protective Devices for the Loads Required at the Beginning of a Loss of Coolant Accident Would Not Trip Under Degraded Voltage Conditions."

Failure to Incorporate Acceptance Limits Contained in High Pressure Coolant Injection Design Documents into Test Procedure

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000341/2019012-01 Open/Closed	[H.8] - Procedure Adherence	71111.21M

The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to incorporate the minimum total developed head acceptance limits contained in Design Document DC-0501, "HPCI Hydraulic Analysis," Revision F, into Test Procedure 24.202.01, "HPCI Pump and Valve Operability Test at 1025 psi," Revision 118.

Description: The HPCI pump is safety-related and is part of the emergency core cooling systems designed to provide core cooling during design basis events. To verify the pump develops the flow rate required by the applicable safety analyses, Technical Specifications Surveillance Requirement (SR) 3.5.1.9 requires periodic in-service testing in accordance with the ASME OM Code. This SR is implemented by Procedure 24.202.01, "HPCI Pump and Valve Operability Test at 1025 psi," Revision 118, which is intended to evaluate test results against the acceptance criteria established by Calculation DC-0501, "HPCI Hydraulic Analysis," Revision F.

However, the inspectors noted the HPCI pump minimum total developed head acceptance limits contained in Procedure 24.202.01 were less restrictive than the acceptance limits established in Calculation DC-0501. Therefore, the test procedure acceptance limits did not ensure the HPCI pump was capable of developing the flow rates required by the applicable safety analyses.

Further review determined the calculation was revised in January 2018, and the licensee failed to update the procedure with the revised acceptance limits. Through discussions with the licensee, the inspectors learned the test procedure was not updated because a procedure revision notice had not been issued. The licensee relies on procedure revision notices to identify and update procedures affected by calculation changes.

Corrective Actions: As an immediate corrective action, the licensee reviewed historical test data obtained since the issuance of Revision F of DC-0501 and reasonably determined the HPCI pump performance was acceptable. The licensee's proposed corrective action is to revise Procedure 24.202.01 before the next scheduled test to incorporate the revised acceptance limits.

Corrective Action References: CARD 19-23989

Performance Assessment:

Performance Deficiency: The inspectors determined the licensee's failure to incorporate the acceptance limits contained in Design Document DC-0501, Revision F, into Test Procedure 24.202.01, Revision 118, was contrary to 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," and was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the failure to incorporate the acceptance limits contained in the revised hydraulic analysis into the test procedure would have the potential to lead to the acceptance of a condition where the HPCI pump is incapable of performing its accident mitigating function.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The finding affected the Mitigating Systems cornerstone and screened as having very low safety significance (Green) because it did not result in the loss of operability or functionality of the HPCI pump. Specifically, the licensee reviewed historical test data since the issuance of Revision F of DC-0501 and reasonably determined the HPCI pump performance was acceptable.

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. Specifically, the licensee did not identify and update procedures affected by the revision of Calculation DC-0501 in 2018, which was not in accordance with Procedure MES20, "Implementation of Modifications," Revision 35B.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. The licensee established Procedure 24.202.01, "HPCI Pump and Valve Operability Test at 1025 psi," Revision 118, as the implementing procedure for the HPCI in-service testing required by SR 3.5.1.9. Also, the licensee established Calculation DC-0501, "HPCI Hydraulic Analysis," Revision F, as the design document for the applicable test acceptance limits.

Contrary to the above, since January 2018, the licensee failed to establish a test program to assure that testing required to demonstrate the safety related HPCI pump will perform satisfactorily in service was identified and performed in accordance with written test procedures which incorporated the requirements and acceptance limits contained in applicable design documents. Specifically, the licensee failed to incorporate the HPCI minimum total developed head acceptance limits contained in Revision F of DC-0501 into Revision 118 of Test Procedure 24.202.01.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

Non-Conservative Motor-Operated Valve Output Torque Capacity Methodology			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000341/2019012-02 Open/Closed	None (NPP)	71111.21M

The inspectors identified a finding of very-low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the licensee's failure to verify the adequacy of the output torque capacity of safety-related MOVs. Specifically, the licensee evaluated MOV output torque capability, in part, by using the ComEd WP-125 method and the full motor nominal voltage (rather than using the calculated terminal voltage) when the calculated voltage was greater than 90 percent of the nominal voltage. However, the use of full motor nominal voltage when calculating the output torque capacity using the ComEd WP-125 method was non-conservative and resulted in output torque values which were not reflective of the actual motor capacity limit needed to ensure safety-related MOVs would perform their safety function.

Description: The licensee verified MOV output torque capacity in Calculation DC-5719, “Minimum Required Target Thrust (MRTT) for Generic Letter 89-10 Gate, Globe and Quarter-Turn Valves,” Revision V. This calculation determined output torque values using the following two methods: (1) the Limitorque Torque Capability method and (2) the ComEd WP-125 method. Regardless of the calculational method used, the licensee utilized full nominal voltage values as an input even when expecting degraded voltage values. The licensee selected the higher of the resulting two output torque values as the motor capability limit during MOV diagnostic testing, which was intended to demonstrate the MOVs can perform their accident mitigating functions.

The inspectors noted the use of full nominal voltage in place of the degraded terminal voltage was only allowed by the Limitorque Torque Capability method. Specifically, Limitorque Technical Update 98-01 allowed for the use of full nominal voltage in place of the calculated terminal voltage when the calculated value was greater than 90 percent of the nominal value. However, the application of this voltage allowance when calculating output torque values using the ComEd WP-125 method was not allowed because it resulted in non-conservative output torque values and could result in multiple safety-related valves being unable to perform their mitigating functions.

Corrective Actions: As an immediate corrective action, the licensee preliminarily revised their calculation with the correct version of the ComEd WP-125 method using the calculated terminal voltage and determined eight MOVs had negative analytical torque margin. As a result, the licensee performed further analysis for these MOVs using different analytical strategies and reasonably determined they remained operable. These MOVs were the reactor recirculation pump A discharge isolation valve (B3105F031A), residual heat removal (RHR) Division 1, pump C, suppression pool suction isolation valve (E1150F004C), RHR Division 2 drywell spray inboard isolation valve (E1150F021B), RHR Division 1 suppression pool containment spray test isolation valve (E1150F028A), RHR Division 2 suppression pool containment spray test isolation valve (E1150F028B), CS Division 2 torus suction isolation

valve (E2150F036B), reactor building close cooling water Division 1 supply isolation valve (P4400F603A), and emergency equipment cooling water Division 1 drywell return outboard isolation valve (P4400F607A).

Corrective Action References: CARD 19-23915, CARD 19-23640, CARD 19-23636, CARD 19-23865, and CARD 19-23863.

Performance Assessment:

Performance Deficiency: The inspectors determined the licensee's failure to verify the adequacy of the output torque capacity for safety-related MOVs was contrary to the requirements of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and was a performance deficiency. Specifically, the licensee evaluated MOV output torque capability, in part, by using the ComEd WP-125 method and the full motor nominal voltage in place of the calculated terminal voltage when the calculated value was greater than 90 percent of nominal. However, the use of full nominal voltage in place of the calculated terminal voltage for calculating the output torque capacity using the ComEd WP-125 method was non-conservative.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone. The performance deficiency adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of mitigating systems to respond to initiating events to prevent undesirable consequences. Specifically, the failure to verify the adequacy of safety-related MOV output torque capacity did not ensure the MOVs were capable of performing their accident mitigating functions.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality of mitigating systems. Specifically, the licensee performed an operability evaluation and reasonably determined that all impacted MOVs remained operable.

Cross-Cutting Aspect: Not Present Performance. No cross cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Contrary to the above, as of May 21, 2019, the licensee failed to verify or check the adequacy of design of safety-related MOVs by the performance of design reviews, the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, the licensee evaluated MOV output torque capability, in part, by using the ComEd WP-125 calculational method and the full motor nominal voltage when the calculated terminal voltage was greater than 90 percent of the nominal voltage. However, the use of full nominal voltage in place of the calculated terminal voltage for calculating the output torque capacity

using the ComEd WP-125 method was non-conservative and resulted in output torque capabilities which were not reflective of the those needed during accident conditions.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

- On July 10, 2019, the inspectors presented the Design Basis Assurance Inspection (Teams) inspection results to Paul Fessler and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21M	Calculations	102-00058	Summary Report for the GE Component Seismic Evaluation	0
		6M721-2044	RCIC System	BE
		DBD-E51-00	Reactor Core Isolation Cooling	F
		DC-0369 Volume I	RCIC System Design Computations	F
		DC-0469 Volume I	Essential Accumulators for Class I Valves (MSIVs, ADS-SRVs, LLS-SRVs)	04/17/1997
		DC-0501	HPCI Hydraulic Analysis	F
		DC-0502 Volume I	RCIC Hydraulic Analysis	G
		DC-0885	ECCS Suction Line Air Ingestion	E
		DC-0885 Volume I	ECCS Suction Line Air Ingestion	E
		DC-3078	Reactor Water Level Transmitters: Zero Elevation and Span	C
		DC-4255 Volume II	Sizing of the Primary Containment Pneumatic Supply Back-Up Nitrogen Bottles	08/25/2008
		DC-4523	Reactor Wide Range Water Level Surveillance Procedure Validation	J
		DC-4523 Volume I	Reactor Wide Range Water Level Surveillance Procedure Validation	J
		DC-4528	Reactor Narrow Range Water Level Surveillance Procedure Validation	G
		DC-5147 Volume I	DBTF Concerns With Battery Room/Charger Area HVAC	0
		DC-5426 Volume I	PBOC - High and Moderate Energy Line Break Evaluation	D
		DC-5487	Maximum Expected Differential Pressure (MEDP) for Valves T4803F601, F602, T4804F601A/B, F602A/B, F603A/B, F604A/B, F605A/B, F606A/B, F001A/B, F002A/B, F003A/B	C
		DC-5589 Volume I	Reactor Building Environmental Response for HELB and LOCA Conditions	C

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		DC-5719 VOL I	Minimum Required Target Thrust (MRTT) for Generic letter 89-10 Gate, Globe and Quarter-Turn Valves (Torque)	V
		DC-5954 Volume I	Anchorage Qualification of Div. II 260/130V Battery Racks	0
		DC-5979	Estimation of Debris Sources for ECCS Suction Strainers	0
		DC-6212 Volume I	Environmental Response Profiles for Areas Containing Safety Related Equipment	A
		DC-6372 Volume I	Assessment of Channel Instrument Error (CIE) for RCIC Flow and Speed Loops	0
		DC-6397 Volume I	Calculation of Safety Related GL 89-10/96-05 and non GL 89-10/96-05 AC MOV Motor Terminal Voltages	C
		DC-6478 Volume I	120 VAC Protective Device Coordination Calculation for Division 1 and 2	C
		DC-6480 Volume I	130/260 DC System Analysis	C
		DC-6480 Volume I	130/260 V DC System Analysis	C
		DC-6482	260/130V and 48/24V DC Protective Devices Coordination	C
		DC-6482 Volume I	260/130V and 48/24V Protective Device Coordination Calculation	C
		EDP-37272	RCIC Pump Discharge High Point Vent Relocation	0
		M4A	SBFW Pump NPSHA	12/10/2008
		QR-284030-01	Environmental and Seismic Qualification Report	0
		TSR-35639	Revision of Design Calculation DC-2680	A
		TSR-36510	Issue New/Revised AOV Torque Calculations (2206C, 2399C, 2402C, 2414C, DC-5989 Vol. I), update CECO, and Relevant BCDDs for Re-Analysis Using Lower Air Pressure	0
		TSR-37565	Revise CECO & Post Changes Against BCDDs Such as DC-5719 and DC-6083 (Both Vol. I)	0
	Corrective Action Documents	05-25383	SEN Internal Flood Design Deficiencies	05/20/2009
		07-23630	CDBI: UFSAR Anti-Vortex Methodology Non-Conservative	06/28/2007
		07-23851	NRC CDBI Inspection Item 073: HPCI IST Test Acceptance Criteria Inadequate	07/11/2007
		09-20540	WGI(URS) Review of the Design Calculation DC-0215	01/27/2009

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		10-298000	Degraded Torus Earthquake Tie Attached to Bay 9	10/30/2010
		12-24503	Potential Non-Conservative Application of TS SR 3.5.1.4	05/16/2012
		13-20872	HPCI Booster Pump Outboard Bearing Level Indication	02/05/2013
		14-21750	Stroke Time Limits for T4600F402 do not Match in 24.404.03 Between Sections 5.1 and 5.2	02/27/2014
		14-23884	Conflicting Design Basis MEDP Capability for T4803F601 and T4803F602	05/05/2014
		15-20116	Revise 23.205 for LPCI Inoperability in SDC	01/06/2015
		15-28410	Degraded Coatings Identified Inside the Torus	10/29/2015
		16-26533	2016 CDBI Issue - Non-Conformance to License Bases for Evaluation of Degraded Voltage	08/17/2016
		16-26800	CDBI: Inappropriate Disposition of Penetration Min-K Debris Generation	08/26/2016
		17-22973	Extensive Coating Defects Identified during Torus Underwater Inspection	04/02/2017
		17-23743	RCIC Turbine Oil Filter Inlet Pressure Indication Reading Low OOS	04/19/2017
		17-25515	Drains Backed up Causing Overflow on to Floor	06/22/2017
		18-24343	Procedure and Required M&TE Inconsistency	05/31/2018
		18-24957	Floor Drains Overflowed From Pumping Down Sump DO-74	06/26/2018
		18-26749	RCIC Lube Oil Pump Discharge Pressure Trend	09/07/2018
		18-27527	Foreign Material Found in SRV T-Quencher in Bay 16	09/29/2018
		19-23227	Recommend Review of Site Response to Open CARD 07-23630	04/26/2019
		19-23383	Oil Drops on HPCI Turbine Stop Valve Actuator	05/02/2019
		91-0840	Seismic Adequacy of CST Water Source	10/31/1991
		OE 2017-0529	IN-17-06, Battery and Battery Charger Short-Circuit Current Contributions to a Fault on the Direct Current Distribution	11/03/2017
	Corrective Action Documents Resulting from Inspection	19-23216	PSA Main Control Room Abandonment Modeling Discrepancy	04/26/2019
		19-23490	2019 DBAI: DC-4523 Vol 1, Rev. J, Missing and Not Updated References for NTSPs Moved From Tech Specs to TRM (Legacy Issue)	05/06/2019

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		19-23493	2019 DBAI: Discrepancy Between UFSAR and Tech Spec Bases	05/06/2019
		19-23495	2019 DBAI: Drawing I-2225-05 has the Incorrect PIS for HPCI Turbine Speed Indicator	05/06/2019
		19-23534	2019 DBAI: I-2201-15 Reference Drawing Listed for Testability Trip Unit Relay B31K202A is Incorrect (Legacy Issue)	05/07/2019
		19-23571	2019 DBAI: DC-6480 Vol. I, Rev. C Issued Without Updating Impacted MOV Outputs	05/08/2019
		19-23574	2019 DBAI: Ambient Temperature Rating for DC Distribution Cabinets R3200S026 and R3200S027	05/15/2019
		19-23579	CARD 18-21882, Inadequate Evaluation of IN-1706	05/09/2019
		19-23582	2019 DBAI: Use of Non-Conservative Values During 42.309.05	05/09/2019
		19-23592	2019 DBAI: Two SRV Accumulator Check Valve Test Procedures Exist	05/09/2019
		19-23615	Unnecessary Evaluation of a Fault in DC Control Circuit for 480 Switchgear Breaker Feeding Non-1E Load from 1E 480V 1E Bus in Calculation DC-5512	05/09/2019
		19-23616	2019 DBAI, SRV Set-Point out of Tolerance not Evaluated for LLS/ADS SRVs	05/09/2019
		19-23631	2019 DBAI: CST Valve Pit not Included on Confined Space List	05/10/2019
		19-23632	2019 DBAI: Update to 23.107.01 Section 3.5 to Correct Inconsistency With Last Update	05/10/2019
		19-23636	2019 DBAI: E4150F003 CECO Design Basis Open Stroke Time Does not Match TRM 3.6-5 Open Stroke Time Note	05/10/2019
		19-23637	2019 DBAI: HPCI/RCIC Procedures 24.202.03 and 24.206.03	05/10/2019
		19-23640	DC-6447 Issued without Updating Impacted MOV Outputs	05/10/2019
		19-23651	Information Notice IN-1706 - Battery Charger (Ametek) May Contribute up to 10 Times their Rating for a Short Period	05/10/2019
		19-23689	Calculation DC-6397 not Updated for Change to Thermal Overload Resistance for Valve T4803F602	05/13/2019

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		19-23754	2019 DBAI: Ambient Temperature Rating for DC Distribution Cabinets R3200S026 and R3200S027	05/15/2019
		19-23764	2019 DBAI: Typographical Errors Found in DC-3078 Vol. I	05/15/2019
		19-23780	2019 DBAI: SRV Coatings/Corrosion When Shifting to a 24-Month Cycle	05/16/2019
		19-23797	2019 DBAI - Revisions to Procedures Related to CST Level for Modes 4 and 5	05/16/2019
		19-23850	2019 DBAI: Potential Trend in Missed Impacted Calculations	05/20/2019
		19-23863	2019 DBAI: Margin Issues With AC Motor Operated Valves	05/20/2019
		19-23865	2019 DBAI: Margin Issues With 250VDC Motor Operated Valves Investigation	05/20/2019
		19-23867	2019 DBAI: Past Operability Review not Documented for CARD 17-23452	05/20/2019
		19-23915	Methodology Error Found in MOV Torque Calculation	05/21/2019
		19-23933	Revise HPCI/RCIC Surveillances to Clarify Tech Spec Acceptance Criteria	05/22/2019
		19-23939	2019 DBAI: MRFF Action Needed for Previously Closed CARD 17-23452	05/22/2019
		19-23961	2019 DBAI Related (Untimely Corrective Action for Coating Restoration on 180 Torus Earthquake Tie)	05/23/2019
		19-23966	2019 DBAI: Additional Procedure Guidance Needed for Use of Core Spray Aligned to Condensate Storage Tank in Modes 4 and 5	05/23/2019
		19-23975	2019 DBAI Related - Consider Revision of 43.000.004 (Reference DBAI Item 19-398)	05/23/2019
		19-23989	2019 DBAI - DC-0501 Vol. I, was Updated in January 2018 to Revision F Without Required PPRN Reviews	05/23/2019
		19-24218	2019 DBAI: NRC Concern Blistered Torus Coating	06/03/2019
		CARD 19-24605	2019 DBAI: Recommended Clarifications to Procedure 43.000.019 Primary Containment Inspection	06/18/2019
	Drawings	61721-2095-30	Schematic Diagram Nuclear BLR PRCS INSTR A & B Circuits Testability Modification	L
		61721-2155-01	Schematic Diagram Reactor Protection System Power Distribution Notes & References	T

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		61721-2225-03	Schematic Diagram HPCI Logic Circuit PT 1	AA
		61721-2522-01	Tank Mounted Cabinet for Miscellaneous Instruments	O
		61721-2654-14	Schematic Diagram - Nitrogen Inerating Inboard Isolation Valve	Q
		6M721-2089	System Diagram Nuclear Boiler System	BN
		6M721-2900	System Diagram Nuclear Boiler System	AN
		6SD721-2530-10	One Line Diagram; 260/130V ESS Dual Battery 2PA Distribution- Division 1	AM
		6SD721-2530-11	One Line Diagram 260/130V ESS Dual Battery 2PB Distribution - Division II	AQ
	Engineering Evaluations	16-0246	High Pressure Coolant Injection (HPCI) Hydraulic Analysis	0
		DECO-12-2191	Evaluation of Containment Coatings	June 1985
		EQ1-EF2-155	EEQ Qualification Evaluation Report - Target Rock Valves	02/25/2009
		ERE 32092	MOV Lubrication Change	C
		NUC2016135.00	Evaluation of Fermi 2 Blister Torus Wetted (Immersion) Region Substrate Coatings	03/10/2017
	Miscellaneous		System Health Report Associated With RCIC	2018 Q3 & Q4
		22A2918AB	Nuclear Boiler Design Specification Data Sheet	13
		EF2-57987	Letter Subject: Errors in BWR Water Level Indication	07/15/1982
		EF2-60002	Letter Subject: Errors in BWR Water Level Indication	10/11/1982
		EFA-R32-19-005	Engineering Functional Analysis - Information Notice IN - 1706 - Battery Chargers Contribution Fault Conditions	0
		EQ0-EF2-018	Summary of Environmental Parameters Used for Fermi 2 EQ Program	N
		EQ1-EF2-044	Qualification Evaluation Report	G
		NEDC 31336P	Instrument Setpoint Methodology	A
		NUC2017123	Reactor Torus Desludge, ASME XI IWE VT Exams, Coatings, Inspection & Coating Repair - Immersion Area	05/30/2017
		NUC2018130	Reactor Torus Desludge, ASME XI IWE VT Exams, Coatings Inspection & Coating Repair - Immersion Area	11/12/2018
		TSR-36108	Increases in ECCS Suction Strainer Debris Loads	0
		VMR1-45.2	Vertical Induction Triclad Motors	F

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		VMR4-14.1	RCIC Turbine	G
		VMR4-4.0	RCIC Pump	B
		VMR4-4.1	RCIC Pump	A
	NDE Reports	VT-S12-021	Torus Earthquake Ties (4 Locations)	04/14/2012
	Operability Evaluations	TE-B21-19-021	Past Operability Review for CARDs 19-23867 and 17-23452	05/30/2019
		TE-E11-18-081	Past Operability Evaluation of Foreign Material Impact to ECCS Suction Strainers	0
	Procedures	20.000.18	Control of the Plant from the Dedicated Shutdown Panel	54
		20.000.18	Control of the Plant from the Dedicated Shutdown Panel	53
		20.000.19	Shutdown from Outside the Control Room	43
		20.300.Offsite	Loss of Offsite Power	12A
		23.104	Condensate Storage and Transfer System	87
		23.107.01	Standby Feedwater System	41
		23.201	Safety Relief Valves and Automatic Depressurization System	26
		23.206	Reactor Core Isolation Cooling Syste	103
		23.309	260/130 DC Electrical System (ESF and BOP)	69
		23.601	Instrument Trip Sheets	40
		24.107.03	SBFW Pump and Valve Operability and Lineup Verification Test	45
		24.137.02	MSIV/ADS and LLS SERV Accumulator Check Valve Test	37
		24.201.01	SRV Vacuum Breaker Valve Operability Test	27
		24.202.01	HPCI Pump and Valve Operability Test at 1025 PSI	118
		24.202.03	HPCI System Piping Filled and Valve Position Verification	35
		24.206.01	RCIC System Pump and Valve Operability Test	79
		24.206.03	RCIC Discharge Piping Venting and Valve Verification Test	41
		24.206.04	RCIC System Automatic Actuation and Flow Test	53
		24.404.03	Standby Gas Treatment System Valve Operability Test	51
		24.406.02	Nitrogen Inerting System Valve Position Indication Test	38
		27.000.09	Time Critical Actions Validations and Verification	4
		29.100.01 Sheet 1	RPV Control	17

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		29.ESP-06	Primary Containment Venting and Purge for Hydrogen and Oxygen Control	8
		29.ESP.07	Primary Containment Venting	12
		3017-128-EZ-04	Electrical Design Instruction for Control and Power Cable Ampacities	C
		43.137.001	Main Steam Safety/Relief Valve Setpoint Testing	32
		43.137.002	SRV Accumulator Check Valve Test	26A
		44.210.059	D1 MS SRV Solenoid Functional Test	4
		ARP 1D24	RCIC System Actuated	11
		ARP 1D69	SBFW Sys Suction Pressure Low	12
		ARP 1D79	RCIC Turbine Shutdown RPV H2) Level L8	9
		ARP 1D81	RCIC Pump Discharge Flow Low	11
		ARP 2D48	HPCI/RCIC Suction Trans CST Level Low	9
		ARP 8D40	Cable Tray Cooling Fan Tripped	7
		QCP-10-1	Underwater Coating Inspection	3
		QCP-10-2	Underwater Coating Repair	3
		TE-ANL-12-069	Risk Significant PSA Credited Operator Actions	C
	Self-Assessments	TMPE-18-0180	Quick Hit Self-Assessment: Preparation for the 2019 NRC Design Basis Assessment Inspection Self-Assessment	09/22/2018
	Work Orders	1162000318	Perform 43.137.002 Division 1 SRV Accumulator Check Valve Test	05/10/2000
		116201093	Perform 43.137.002 Division 1 SRV Accumulator Check Valve Test	11/13/2001
		1162201117	SRV Accumulator Check Valve Test	11/17/2001
		25975596	Desludge, Inspect, Repair - Torus Coatings Below Water Level	05/21/2009
		25975596	Desludge, Inspect, Repair - Torus Coatings Below Water Level	04/01/2009
		25980121	Perform HPCI Turbine Internal Inspection	06/08/2009
		26766225	Perform 43.000.019 Inside Torus / Inside DW / Outside DW (Offline) (VT-3) Inspection	04/15/2017
		303100100	Perform Internal Inspection of RCIC Turbine per NUE NE-PJ-90-0373	04/20/2017

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		34379073	Perform 43.000.019 Inside Torus / Inside Drywell / Outside DW (Offline) Inspection	03/14/2014
		34567763	Perform 43.137.001 Main Steam Safety Relief Valves Setpoint Test	03/27/2014
		37491496	Inspection of Div. 2 Torus Suction Strainer (RHR, CS, HPCI)	12/09/2015
		37545467	Perform 24.137.02	11/09/2015
		37545495	Perform 24.137.02	11/12/2015
		37734090	Perform 43.137.001 Main Steam Safety Relief Valves Setpoint Test	12/04/2015
		38115948	Perform 44.210.059 ECCS/ADS/MDS D1 SRV Solenoid Functional Test	11/06/2015
		38442118	Desludge, Inspect, Repair - Torus Coatings Below Water Level	04/28/2017
		38574156	Perform 24.206.01 RCIC System Pump Operability and Valve Test @ 1000 PSIG	02/09/2016
		42281891	Perform 43.401.510 LLRT Purge and Vent Test 1: T4803F602, T4600F402, T4600F411	01/14/2016
		42282032	Perform 24.404.03 Sec-5.1 SGTS Valve Operability Test	04/13/2016
		43040731	Lube, Clean Cooling Coils, Replace Belts	09/22/2016
		43168864	Perform 44.030.400 ECCS HPCI/RCIC CST Level, E41N061B, Calibration/Functional	10/28/2016
		43579247	EDP-37272 R18 Installation RCIC High Point Vent	04/20/2017
		43648553	Perform 24.404.03 SEC-5.2 SGTS Valve Operability & Position Indication Verif.	01/08/2017
		44066355	Perform 24.201.01 SRV Vacuum Breaker Operability	03/21/2017
		44151810	Perform 24.137.02	04/13/2017
		44153720	Perform 44.210.059 ECCS/ADS/MDS D1 SRV Solenoid Functional Test	04/10/2017
		44268548	Perform 24.406.01 Sec-5.2 N2 Inerting Cold S/D Valve Operability/Timing Test	04/02/2017
		44417440	Perform 43.137.001 Main Steam Safety Relief Valves Setpoint Test	06/22/2017
		44883915	Check P1100 Cabinet Space Heaters & Thermostats for Proper Operation	08/09/2017

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		45151430	Inspection of Div. 2 Torus Suction Strainers (RHR, CS, HPCI)	06/23/2017
		45275955	Perform 24.404.03 Sec-5.1 SGTS Valve Operability Test	10/09/2017
		46582800	Perform 44.030.401 ECCS HPCI/RCIC CST Level, E41N061D, Calibration/Functional	06/21/2018
		46748956	Perform 24.202.01 HPCI Pump/Flow Test & Valve Stroke at 1025 PSIG	06/03/2018
		47203637	Check Listed Cabinet Space Heaters & Thermostats for Proper Operation	08/07/2018
		47345713	Perform 24.201.01 SRV Vacuum Breaker Operability	09/26/2018
		47435850	Penetration X-25 Exceeds it Leakage Limit - Failed LLRT	06/08/2017
		47460525	Perform 44.210.059 ECCS/ADS/MDS D1 SRV Solenoid Functional Test	10/15/2018
		47490205	Perform 24.406.01 Sec-5.2 N2 Inerting Cold S/D Valve Operability/Timing Test	10/05/2018
		47490879	Perform 24.137.02 for T4901-F040 Only	04/16/2017
		47500501	Perform 24.137.02	10/19/2018
		47510304	Perform 24.202.04 HPCI Offline Auto Initiation and Time Response Test	10/22/2018
		47525996	Perform 24.202.02 HPCI Flow Rate Test at 165 PSIG	10/21/2018
		47526001	Perform 24.206.04 Sec. 5.2 RCIC System Automatic Actuation Test	10/26/2018
		47642989	Perform Mini Periodic MOV Inspection (T4803-F602)	10/03/2018
		47654752	Perform 24.404.03 Sec-5.1 SGTS Valve Operability Test	09/18/2018
		48399139	Perform 43.401.510 LLRT Purge and Vent Test 1: T4803F602, T4600F402, T4600F411	09/20/2018
		48555968	Perform 24.202.08 Sec-5.2 (DW Press) HPCI LSFT & Pump Operability at 1025 PSIG	08/23/2018
		48693770	Extensive Coating Defects Identified During Torus Underwater Inspection	01/04/2019
		48693770	Extensive Coating Defects Identified During Torus Underwater Inspection	09/22/2018
		48693800	Inspect and Repair Torus Coating, Above Water	01/24/2019

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		49309090	Perform 44.060.002 RCIC System Logic Functional Test - Online	05/06/2019
		50350374	Perform 24.206.01 RCIC System Pump Operability and Valve Test @ 1000 PSIG	10/26/2018
		D167030100	Perform MOV Thermal O/L Test - T4803F602 @ MCC 72B-3A POS-5C-R	05/01/2009
		E016150100	Disassemble Motor, Inspect and Clean in Accordance With NE-6/6-EQMS.036	06/14/2006
		T577090200	Replace Valve Seat per EQ Requirement Contained in LTR NE-6.6-EQMS.118	01/07/2016