

# FERMI 2 INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

FERMI 2 Fourth 10 YEAR INTERVAL - START DATE 02/17/2020

## **PART 8: IST PROGRAM COLD SHUTDOWN JUSTIFICATIONS**

**REVISION 4**

Revision Summary:

1. Revised per 4<sup>th</sup> Interval IST Program Update

|                                                                      |                        |                                                          |
|----------------------------------------------------------------------|------------------------|----------------------------------------------------------|
| Prepared: <u>Jeffrey D. Auler / George Auler</u>                     | Date: <u>10-23-20</u>  | <u>QUAL</u><br>PE-03 <input checked="" type="checkbox"/> |
| IST Program Manager                                                  |                        |                                                          |
| Reviewed: <u>VLADIMIR TAMANKYAEV</u>                                 | Date: <u>1/22/2021</u> | PE-03 <input checked="" type="checkbox"/>                |
| ISI/PEP Engineer                                                     |                        |                                                          |
| Reviewed: <u>James D. Wines /s/, e54431, see attached email.</u>     | Date: <u>2/2/21</u>    | N/A                                                      |
| Supervisor, Performance Engineering                                  |                        |                                                          |
| Approved: <u>Randy D. Breymaier /s/, e50801, see attached email.</u> | Date: <u>2/2/21</u>    | N/A                                                      |
| Manager, Performance Engineering                                     |                        |                                                          |

---

### INFORMATION AND PROCEDURES

|                             |                              |                     |
|-----------------------------|------------------------------|---------------------|
| DSN: <u>IST Program CSJ</u> | Rev: <u>4</u>                | Date: <u>2/3/21</u> |
| DTC: <u>TM PLAN</u>         | File: <u>1715.04</u>         | Recipient: _____    |
| Date Approved: _____        | Release authorized by: _____ |                     |

# IST PROGRAM PLAN PART 8

## COLD SHUTDOWN JUSTIFICATIONS (CSJ)

### INDEX

| Cold Shutdown Justification No. | Description                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------|
| CSJ-001                         | Not used                                                                                             |
| CSJ-002                         | Feedwater Check Valves Open Direction Testing                                                        |
| CSJ-003                         | Not used                                                                                             |
| CSJ-004                         | Exercising for E4150F006                                                                             |
| CSJ-005                         | Not used                                                                                             |
| CSJ-006                         | Exercising / stroke time / fail safe testing for MSIVs                                               |
| CSJ-007                         | Exercising / stroke time / fail safe testing for Reactor Recirculation Pump Seal Water Supply Valves |
| CSJ-008                         | Not used                                                                                             |
| CSJ-009                         | Exercising / stroke time testing for RPS Instrument Isolation Valves                                 |
| CSJ-010                         | Exercising / stroke time testing for E4150F002                                                       |
| CSJ-011 to 018                  | Not used                                                                                             |
| CSJ-019                         | HPCI Keep Fill E4100F220 and E4100F221 closed exercise testing                                       |
| CSJ-020                         | HPCI and RCIC vacuum breaker check valve exercising                                                  |
| CSJ-021                         | Exercising / stroke time / fail safe testing for Primary Containment Pneumatic Supply Valves         |
| CSJ-022                         | Not used                                                                                             |
| CSJ-023                         | Exercising and stroke time testing for E5150F007                                                     |
| CSJ-024                         | Primary containment to torus vacuum breaker testing.                                                 |

**COLD SHUTDOWN JUSTIFICATION - CSJ-002****SYSTEM: FEEDWATER****VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| B2100F010A           | 1                 | A/C             | 5715-1         |
| B2100F010B           | 1                 | A/C             | 5715-1         |
| B2100F076A           | 1                 | A/C             | 5715-1         |
| B2100F076B           | 1                 | A/C             | 5715-1         |

**FUNCTIONS:**

These check valves open to permit Feedwater flow to the vessel during plant operations and

Valve B2100F010A opens to permit HPCI injection to the reactor vessel via the "A" Feedwater Line.

Valve B2100F010B opens to permit RCIC injection to the reactor vessel via the "B" Feedwater Line.

**QUARTERLY TEST REQUIREMENTS:** Open (BDO)/(CVO) Exercising (ISTC-3510)

**JUSTIFICATION:**

Isolating a feedwater line to full stroke (BDO)/(CVO) open a feedwater check valve from the closed position would necessitate feedwater flow being reduced by 50% from 100% feedwater flow during plant operations. The feedwater lines cannot be isolated during reactor operation to facilitate testing. If a feedwater isolation valve was closed during operation, the feedwater nozzle and spargers would undergo a severe thermal shock when feedwater was restored. This thermal shock could cause cracking and possible failure of the spargers and nozzles. The open stroke of the Feedwater check valves is verified during plant startup after cold shutdown by verification of flow to the reactor vessel.

**COLD SHUTDOWN TESTING:**

These valves will be exercised open (BDO)/(CVO) during startup from cold shutdowns when system configuration permits in accordance with ISTC-3521(c).

**COLD SHUTDOWN JUSTIFICATION - CSJ-004****SYSTEM: HIGH PRESSURE COOLANT INJECTION****VALVES:**

| Valve PIS No. | Code Class | Category | Drawing |
|---------------|------------|----------|---------|
| E4150F006     | 1          | A        | 5708-1  |

**FUNCTIONS:**

This motor operated valve has a safety function in the OPEN position. This valve is normally closed and opens on a High Pressure Coolant Injection (HPCI) initiation signal to allow water from the HPCI pump to be injected into the Feedwater (FW) line and provide make-up to the Reactor Pressure Vessel (RPV) following a Loss of Coolant Accident (LOCA). This motor operated valve has a safety function in the CLOSED position. This valve is normally closed to isolate containment penetration X-9A to maintain containment integrity, and to isolate the normally standby, low pressure portion of the High Pressure Coolant Injection (HPCI) system from the high pressure feedwater system during normal plant operation. This valve is considered a Pressure Isolation Valve (PIV). This valve provides the class boundary break between the class 1 and class 2 piping of the HPCI system and provides the Reactor Coolant Pressure Boundary (RCPB) between the HPCI system and the Reactor Coolant System (RCS). This valve is subject to Type C leak rate testing.

**QUARTERLY TEST REQUIREMENTS:** ETO and ETC Exercising (III-3610, III-3721)**JUSTIFICATION:**

Inadvertent opening of this valve is prevented by various system controls and interlocks. In accordance with guidance presented in NRC Information Notice 84-74 and previous NRC concerns regarding intersystem LOCAs, cycling this valve every quarter during power operation increases the probability of exposing the downstream low pressure piping to reactor coolant pressure (since only one valve would have to be ruptured or stuck open to expose the low pressure system to reactor coolant pressure).

Interfacing system LOCAs produce consequences that are very difficult to mitigate. The best defense is to minimize the probability of occurrence. An important contribution to such minimization is to test pressure boundary valves only at conditions of low reactor vessel pressure. Also, maintenance history on this valve has shown that excessive cycling at pressure will reduce the leak tightness of the valves.

**COLD SHUTDOWN TESTING:**

Exercising (ETO and ETC) of this valve will be performed during cold shutdowns.

**COLD SHUTDOWN JUSTIFICATION - CSJ-006****SYSTEM: NUCLEAR BOILER****VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| B2103F022A           | 1                 | A               | 5701-1         |
| B2103F022B           | 1                 | A               | 5701-1         |
| B2103F022C           | 1                 | A               | 5701-1         |
| B2103F022D           | 1                 | A               | 5701-1         |
| B2103F028A           | 1                 | A               | 5701-1         |
| B2103F028B           | 1                 | A               | 5701-1         |
| B2103F028C           | 1                 | A               | 5701-1         |
| B2103F028D           | 1                 | A               | 5701-1         |

**FUNCTIONS:**

These valves are the inboard and outboard Main Steam Line Isolation Valves (MSIV's) and serve as primary containment isolation valves for the main steam line penetrations.

**QUARTERLY TEST REQUIREMENTS:** ETC/STC/FSC Exercising (ISTC-3510)

**JUSTIFICATION:**

Full stroke closed (ETC) testing of these valves during normal reactor operation requires isolating one of the four main steam lines. Isolation of these lines results in primary system pressure spikes, reactor power fluctuation, and increased flow in the un-isolated steam lines. These unstable conditions can lead to reactor scrams. In addition, pressure transients resulting from stroke testing MSIVs increase the chances of inadvertent actuation of primary system safety relief valves (SRVs). These valves are partial stroke tested every three months as required per System Engineering evaluation.

This deferral also contributes to a reduction of the Main Steam Safety Relief Valves challenge rate as recommended in NUREG-0626.

**COLD SHUTDOWN TESTING:**

These valves will be full stroke exercised (ETC), stroke timed closed (STC), and fail safe tested (FSC) during cold shutdowns.

**COLD SHUTDOWN JUSTIFICATION - CSJ-007**

**SYSTEM: REACTOR RECIRCULATION, REACTOR RECIRCULATION PUMP SEAL WATER SUPPLY VALVES**

**VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| B3100F014A           | 2                 | A               | 5702-1         |
| B3100F014B           | 2                 | A               | 5702-1         |
| B3100F016A           | 2                 | A               | 5702-1         |
| B3100F016B           | 2                 | A               | 5702-1         |

**FUNCTIONS:**

These valves are primary containment isolation valves on the CRD supply to the Reactor Recirculation pumps seals. Their safety function is to close for primary containment isolation.

**QUARTERLY TEST REQUIREMENTS:** ETC/STC/FSC Exercising (ISTC-3510)

**JUSTIFICATION:**

It is not practical to verify the closure function of these valves on a quarterly basis. Exercising these valves during normal operation would result in the isolation of seal water flow to the Reactor Recirculation pump seals. The isolation of the seal water flow to the recirculation pumps could potentially damage the seals and result in a plant shutdown and extensive maintenance.

**COLD SHUTDOWN TESTING:**

These valves will be full stroke exercised (ETC), stroke timed closed (STC), and fail safe tested (FSC) during cold shutdowns when the reactor recirculation pumps are secured.

**COLD SHUTDOWN JUSTIFICATION - CSJ-009****SYSTEM: RESIDUAL HEAT REMOVAL****VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| E11F412              | 2                 | A               | 5706-1         |
| E11F413              | 2                 | A               | 5706-1         |
| E11F414              | 2                 | A               | 5706-2         |
| E11F415              | 2                 | A               | 5706-2         |

**FUNCTIONS:**

These valves act as primary containment isolation valves to isolate the Reactor Protection System instrumentation from the Primary Containment atmosphere.

**QUARTERLY TEST REQUIREMENTS:** ETC/STC Exercising (ISTC-3510)

**JUSTIFICATION:**

These normally open valves cannot be stroked during plant operation since these valves isolate the Reactor Protection System instrumentation. The closing of the isolation valves can cause a pressure spike that would result in an ESF actuation and a reactor scram.

**COLD SHUTDOWN TESTING:**

These valves will be full stroke exercised and stroke timed closed (ETC/STC) during cold shutdowns.

**COLD SHUTDOWN JUSTIFICATION - CSJ-010****SYSTEM: HIGH PRESSURE COOLANT INJECTION (E41)****VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| E4150F002            | 1                 | A               | 5708-1         |

**FUNCTIONS:**

E4150F002 is an inboard containment isolation valve and isolates the primary containment when required.

**QUARTERLY TEST REQUIREMENTS:** ETO and ETC Exercising (III-3610, III-3620, III-3721), stroke time closed (STC) per 10CFR50.55a (b)(3)(ii)(D)

**JUSTIFICATION:**

This valve is located inside the primary containment. E4150F002 is the inboard containment isolation valve on the steam supply to the HPCI turbine. Closing this valve isolates the steam supply and renders the HPCI system inoperable. This valve is normally open. Frequent operation can be a contributor to actuator and/or valve degradation. The failure of this valve, if stroked time tested at power, would result in a portion or the entire system becoming inoperable. Since this valve is inaccessible during operations a plant shutdown to correct the problem would be required.

**COLD SHUTDOWN TESTING:**

This valve will be full stroke exercised (ETO/ETC) and stroke timed closed (STC) during cold shutdowns. The ASME OM code requires open/close exercising and stroke time closed per a 10CFR50.55a Condition.



**COLD SHUTDOWN JUSTIFICATION - CSJ-019****SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM****VALVES:**

| Valve PIS No. | Code Class | Category | Drawing |
|---------------|------------|----------|---------|
| E4100F220     | 2          | C        | 5708-1  |
| E4100F221     | 2          | C        | 5708-1  |

**FUNCTIONS:**

A High Pressure Coolant Injection (HPCI) keep fill system using condensate system water as an additional pressurization source was installed per EDP-29446. This modification was necessary because CST pressure (10-12 psig) alone was insufficient to prevent voiding upstream of the HPCI Injection Valve, E4150F006. Check valves E4100F220 and E4100F221 protect the lower pressure condensate system from HPCI discharge pressure when HPCI is operating.

These check valves are the class boundary isolation valves between the Class 2 HPCI injection piping and the Class D keep fill (condensate) piping. These check valves open to supply keep fill water/pressure to the HPCI system and have a safety function to close on the initiation of the HPCI system so as to direct all HPCI flow into the vessel and to protect the keep-fill piping from over pressurization.

**QUARTERLY TEST REQUIREMENTS:** CVC Exercising (ISTC-3510)**JUSTIFICATION:**

These check valves tie into the HPCI system pump discharge piping downstream of the E4150F007 and are therefore potentially subject to pressures of greater than 1100 psig. The check valve testing methodology requires the installation of bypass hoses within the Class 2 boundaries and bypassing the inboard check valve. In this configuration the test lineup could subject the low pressure condensate piping to pressures in excess of their design pressure.

The installation of the bypass hoses within the Class boundary results in HPCI being declared inoperable. Not only would the testing result in additional inoperable time for HPCI, but also would require additional fills and vents after the check valve testing. Additionally, testing during reactor operation has the potential to expose test personnel to HPCI pump discharge pressure, if the system were to auto-initiate, which is a personnel safety concern.

Under Cold Shutdown conditions, the HPCI auto start is inhibited and thus the personnel safety concern is eliminated. Also, no additional out of service time for HPCI will be incurred.

Plant operators observe the Keep Fill supply relief valve during HPCI system runs and regularly scheduled surveillance tests. No discharge from the relief valve indicates that the two check valves (as a pair) are closed and holding against HPCI pump discharge pressure.

**COLD SHUTDOWN TESTING:**

Check valve closed exercise testing (CVC) will be conducted during cold shutdown conditions.

**COLD SHUTDOWN JUSTIFICATION - CSJ-020****SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM****VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| E4100F076            | 2                 | C               | 5708-1         |
| E4100F077            | 2                 | C               | 5708-1         |
| E5100F063            | 2                 | C               | 5709-1         |
| E5100F064            | 2                 | C               | 5709-1         |

**FUNCTIONS:**

These two in-series check valves function to:

- Open to break vacuum in the HPCI (RCIC) Turbine Steam Exhaust Line resulting from condensing steam
- Close to prevent HPCI (RCIC) Turbine exhaust steam from entering the Torus air space.

**QUARTERLY TEST REQUIREMENTS:** CVO and CVC Exercising (ISTC-3510)

**JUSTIFICATION:**

The open (CVO) and closed (CVC) exercise tests present a personnel safety concern when performed on a quarterly basis. The valves are above the torus, which is a difficult and hazardous place to work. The testing is time-consuming and involves connecting and disconnecting hoses from multiple piping connections. The dose considerations and handling / draining of radioactive fluid make this test impractical to perform every 92 days.

The HPCI and RCIC vacuum breaker check valve tests were completed at various frequencies (quarterly, cold shutdown, and 18 months) in the past and there has been no evidence of any degradation of these valves. Consideration of bypassing containment isolation valves, out of service time, and the personnel safety and radiological concerns outweigh any safety benefit provided by more frequent IST examinations. An extended test frequency of Cold Shutdown will continue to provide reasonable assurance of continued acceptability of these check valves.

**COLD SHUTDOWN TESTING:**

The open (CVO) and closed (CVC) exercise tests for these check valves will be performed during cold shutdowns.

**COLD SHUTDOWN JUSTIFICATION - CSJ-021****SYSTEM: PRIMARY CONTAINMENT PNEUMATIC SUPPLY SYSTEM****VALVES:**

| Valve PIS No. | Code Class | Category | Drawing |
|---------------|------------|----------|---------|
| T4901F465     | 2          | A        | 5740    |
| T4901F468     | 2          | A        | 5740    |
| T4901F469     | 3          | B        | 5740    |

**FUNCTIONS:**

Division 1 consists of the outboard Nitrogen supply AOV (T4901F465). This valve is normally open to allow a supply of Nitrogen for the: Inboard MSIVs (B2103F022A, B, C, D), E1100F050A, E2100F006A, B3100F019, B3100F014A, B3100F014B, T4800F455, C5102J011, and SRVs (R, E, J, H, P, A, B).

Division 2 consists of the outboard Nitrogen supply AOV (T4901F468). This valve is normally open to allow a supply of Nitrogen for the: SRVs (F, K, D, M, N, L, C, G), E1100F050B, and E2100F006B.

During an accident, these valves close to isolate primary containment and the normal air supply to these components.

T4901F465 and T4901F468 also have a safety function in the open direction to supply control nitrogen. These valves may need to be re-opened after closure to re-establish control air inside the drywell if needed to respond to a design basis event.

T4901F469 is normally open to supply N2 from the NIS to the PCPS system Div 2 header. This header supplies control N2 to the NON-ADS MSRVS and one Low Low Set MSRVS and its accumulator. This provides control air for the valves to be remotely controlled from the control room and for the LLS MSRVS to respond automatically to a LOCA. The valve fails closed on loss of power or air and can be remotely closed from the control room to isolate the supply line from the NIS when the emergency back-up N2 bottles are used to supply N2 to the components supplied by the PCPS system Div 2 control air header.

**QUARTERLY TEST REQUIREMENTS:** STC/ETC (All), STO/ETO (T4901F465, T4901F468), and FSC (T4901F465, T4901F468, and T4901F469)

**JUSTIFICATION:**

The STC/ETC and FSC tests create an operational concern when-performed on a quarterly basis.

Division 1:

If the outboard isolation valve (T4901F465) fails in the closed position, an Operator cannot be stationed at the normally closed by-pass valve T4901F007. It is not reasonable to assume an operator could respond to the 60 second TRM closure requirement to isolate this penetration during a LOCA signal.

Division 2:

If the outboard isolation valve (T4901F468) fails in the closed position, an Operator cannot be stationed at the normally closed by-pass valve T4901F016. It is not reasonable to assume an operator could respond to the 60 second TRM closure requirement to isolate this penetration

during a LOCA signal. If T4901F469 were to fail closed, administrative action would be needed to supply nitrogen from Division 2 Nitrogen bottles.

These tests were completed quarterly in the past and there has been no evidence of any problems or degradation of these valves. An extended test frequency of Cold Shutdown will continue to provide reasonable assurance of continued acceptability of these valves.

**COLD SHUTDOWN TESTING:**

The exercise test (ETO/ETC), closed stroke time test (STC), open stroke time test (STO), and fail safe tests (FSC) for these valves will be performed during cold shutdowns.

**COLD SHUTDOWN JUSTIFICATION - CSJ-023****SYSTEM:** Reactor Core Isolation Cooling (RCIC)**VALVES:**

| Valve PIS No. | Code Class | Category | Drawing |
|---------------|------------|----------|---------|
| E5150F007     | 1          | A        | 5709-1  |

**FUNCTIONS:**

E5150F007 (motor operated valve) has a safety function in the OPEN position. This valve is the inboard CIV for penetration X-10 and is normally open to supply steam to the RCIC turbine to allow rapid startup of the turbine following a loss of feedwater event to supply makeup water to the RPV. This motor operated valve has a safety function in the CLOSED position. This valve closes to isolate containment penetration X-10 to maintain containment integrity, isolate the main steam header from the RCIC system and maintain the RCPB. This valve is also closed to prevent bypass of secondary containment.

**QUARTERLY TEST REQUIREMENTS:** ETO and ETC Exercising (III-3610, III-3620, III-3721), stroke time closed (STC) per 10CFR50.55a (b)(3)(ii)(D)

**JUSTIFICATION:**

E5150F007 is inaccessible, is normally open to supply steam to the RCIC turbine. If this valve were to fail as-is in the closed direction, the RCIC function would not be available. NUREG 1482 states that a challenge to a safety system is an adequate basis for a testing deferral to a cold shutdown frequency. RCIC is not an ECCS System but is needed to achieve a safe shutdown due to a loss of feedwater.

**COLD SHUTDOWN TESTING:**

The exercise and closed stroke time will be performed during cold shutdowns.

**COLD SHUTDOWN JUSTIFICATION CSJ-024****SYSTEM: PRIMARY CONTAINMENT, VACUUM BREAKERS****VALVES:**

| <b>Valve PIS No.</b> | <b>Code Class</b> | <b>Category</b> | <b>Drawing</b> |
|----------------------|-------------------|-----------------|----------------|
| T2300F400A           | 2                 | A/C             | M-5739-1       |
| T2300F400B           | 2                 | A/C             | M-5739-1       |
| T2300F400C           | 2                 | A/C             | M-5739-1       |
| T2300F400D           | 2                 | A/C             | M-5739-1       |
| T2300F400E           | 2                 | A/C             | M-5739-1       |
| T2300F400F           | 2                 | A/C             | M-5739-1       |
| T2300F400G           | 2                 | A/C             | M-5739-1       |
| T2300F400H           | 2                 | A/C             | M-5739-1       |
| T2300F400J           | 2                 | A/C             | M-5739-1       |
| T2300F400K           | 2                 | A/C             | M-5739-1       |
| T2300F400L           | 2                 | A/C             | M-5739-1       |
| T2300F400M           | 2                 | A/C             | M-5739-1       |

**FUNCTIONS:**

Vacuum breakers automatically open to prevent formation of excessive negative pressure in the suppression pool chamber. Torus-to-Drywell vacuum breakers which vent air from the Torus to the Drywell to equalize the pressure between the two vessels and to prevent excessive water level variation in the submerged portion of the vent discharge lines. The requirement that the vacuum breakers be closed ensures that there is no excessive bypass leakage should a LOCA occur.

**QUARTERLY TESTING:**

The ASME OM Code requires bi-directional exercising on a quarterly frequency for check valves (CVO/CVC).

**JUSTIFICATION:**

The vacuum breakers are cycled by opening locked closed air operated valves (T4800F416-F427) to supply nitrogen up to the normally de-energized solenoid valves (T23F400A-M). The air operated valves serve as containment isolation valves. The solenoid valves serve as an inboard boundary for the applicable penetrations. This testing could potentially add unnecessary risk to the station if the air operated or solenoid operated valves were to fail during plant operation. A CARD search was performed between the years 2000 and 2021; no CARD was found related to issues cycling the vacuum breakers which confirms the acceptability

of the historical cold shutdown testing frequency.

**COLD SHUTDOWN TESTING:**

The Drywell to Torus Vacuum Breakers will be full stroke tested, open and closed (CVO/CVC), during cold shutdowns in parallel with functions per SR 3.6.1.8.2, TRSR 3.6.5.1, and TRLCO 3.6.5 Action A.2.1.

**Jeffrey D Auler**

---

**From:** James D Wines  
**Sent:** Tuesday, February 2, 2021 3:27 PM  
**To:** Jeffrey D Auler  
**Cc:** James D Wines  
**Subject:** Electronic Signature

I have reviewed and approve the following as the Supervisor/s/, Programs Engineering.

| DTC    | DSN             | Revision | Approval                       |
|--------|-----------------|----------|--------------------------------|
| TMPLAN | IST Program CSJ | 4        | Reviewer:<br>James D Wines /s/ |
| TMPLAN | IST Program ROJ | 4        | Reviewer:<br>James D Wines /s/ |

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](mailto:James.Wines@dteenergy.com)



**Jeffrey D Auler**

---

**From:** Randy D Breymaier  
**Sent:** Tuesday, February 2, 2021 12:23 PM  
**To:** Jeffrey D Auler  
**Subject:** Approval of IST Program CSJ and ROJ Rev 4

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

| DTC    | DSN             | Revision | Approval                            |
|--------|-----------------|----------|-------------------------------------|
| TMPLAN | IST Program CSJ | 4        | Reviewer:<br>Randy D. Breymaier /s/ |
| TMPLAN | IST Program ROJ | 4        | Reviewer:<br>Randy D. 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