William T. O'Connor, Jr.
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DTE Energy

10CFR50.90

June 24, 2003
NRC-03-0012

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

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

Subject: Proposed License Amendment Request to Revise the Frequency of Technical Specification Surveillance Requirement (SR) 3.7.6.1 for Turbine Bypass Valve Cycling

Pursuant to 10CFR50.90, Detroit Edison hereby proposes to amend the Fermi 2 Plant Operating License, Appendix A, Technical Specifications (TS) to revise the frequency of Surveillance Requirement (SR) 3.7.6.1 for verification of one complete cycle of each turbine bypass valve.

The proposed change to SR 3.7.6.1 will extend the surveillance frequency from "Once per 92 days and once after each entry into MODE 4," to "Once per 92 days," with a Surveillance Note stating that the Surveillance is "Only required to be performed prior to exceeding 25% RTP [Rated Thermal Power] following entry into MODE 4." This change request is consistent with the SR 3.7.6.1 frequency requirements that are in effect at the Fitzpatrick plant, which requires cycling of the valves prior to entry into Mode 2 or Mode 3 from Mode 4 (i.e., during plant shutdown).

Enclosure 1 provides a description and an evaluation of the proposed change. Enclosure 2 provides an analysis of the issue of significant hazards consideration using the standards of 10CFR50.92. Enclosure 3 provides a marked up page of the existing TS to show the proposed change and a typed version of the affected TS page

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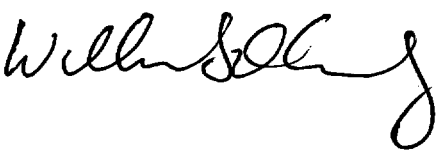
with the proposed change incorporated. Enclosure 4 provides a copy of the TS Bases page affected by this change, for your information.

Detroit Edison has reviewed the proposed change against the criteria of 10CFR51.22 for environmental considerations. The proposed change does not involve a significant hazards consideration, nor does it significantly change the types or significantly increase the amounts of effluents that may be released offsite. The proposed change does not significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, Detroit Edison concludes that the proposed change meets the criteria provided in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement or an Environmental Assessment.

Detroit Edison requests NRC approval of this license amendment by December 30, 2003, with an implementation period of within 30 days following NRC approval, in order to minimize the number of future performances of this surveillance while at power.

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

Sincerely,



Enclosures

cc: M. A. Ring
J. F. Stang, Jr.
NRC Resident Office
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

I, WILLIAM T. O'CONNOR, JR., do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

WILLIAM T. O'CONNOR, JR.
Vice President - Nuclear Generation

On this 24th day of June, 2003 before me personally appeared William T. O'Connor, Jr., being first duly sworn and says that he executed the foregoing as his free act and deed.

Karen M Reed
Notary Public

KAREN M. REED
Notary Public, Monroe County, MI
My Commission Expires 09/02/2005

NRC-03-0012
ENCLOSURE 1

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

REQUEST TO REVISE TECHNICAL SPECIFICATION
SURVEILLANCE REQUIREMENT 3.7.6.1 FREQUENCY

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

DESCRIPTION:

The proposed change to SR 3.7.6.1 will extend the surveillance frequency from "Once per 92 days and once after each entry into MODE 4," to "Once per 92 days," and will add a Surveillance Note stating that the Surveillance is "Only required to be performed prior to exceeding 25% RTP [Rated Thermal Power] following entry into MODE 4." Although the Note suggests performance at low power levels, consistent with the Applicability of "Thermal Power ≥ 25 % RTP" for Limiting Condition for Operation (LCO) 3.7.6, "Main Turbine Bypass System and Moisture Separator Reheater," it is our intent to cycle these valves only during Mode 4, Cold Shutdown. This change will help to eliminate the secondary plant transients that we currently experience when the valves are cycled for this test during power operation, and will minimize wear on the valves and the condenser internals resulting from the significant amount of steam bypassed directly to the condenser by these large bypass valves. The Bases will be revised to reflect this change as shown in Enclosure 4.

BACKGROUND:

The Main Turbine Bypass System (MTBS) and the moisture separator reheater (MSR) are designed to control steam pressure when reactor steam generation exceeds turbine requirements during unit startups, sudden load reductions, and cool down evolutions. They allow excess steam flow from the reactor to pass directly to the condenser without first going through the turbine. The bypass capacity of the MTBS and the MSR is approximately 33% of the Nuclear Steam Supply System (NSSS) rated steam flow. Sudden load reductions within the capacity of the MTBS and the MSR can be accommodated without reactor scram. The MTBS consists of two large turbine bypass valves (TBVs) connected to the 52-inch steam manifold, which is located between the main steam isolation valves and the turbine stop valves. Each of these valves is operated by a separate hydraulic unitized actuator and is capable of passing approximately 12.5% of the rated steam flow from the reactor. The TBVs are controlled by the Main Turbine Pressure Regulator Control System. They are normally closed, with the Main Turbine Pressure Regulator Control System directing all steam flow through the turbine control valves and on to the turbine. If steam flow restriction occurs, either through turbine speed control or load limiter, the Main Turbine Pressure Regulator Control System controls system pressure by opening the TBVs. With the TBVs open, steam flows from the 52-inch manifold through connecting piping directly to the condenser. The reheating steam flowpath to the MSR (52 inch manifold) provides an additional steam flow capacity of approximately 8% of rated steam flow to mitigate a rapid pressure increase (e.g., from a turbine generator trip event).

The MTBS and MSR are assumed to function during pressurization transients, as discussed in the UFSAR, Chapter 15. Reactor vessel pressure increase and MCPR decrease during such an event, are mitigated by TBV opening and MSR steamflow. An inoperable MTBS and/or MSR will result in the need to impose more restrictive MCPR operating limits.

The Technical Specifications (TS) ensure operability of the MTBS through Surveillance Requirements (SR) 3.7.6.1, a simple valve stroke to demonstrate mechanical freedom of movement; SR 3.7.6.2, a check of the system response to an actuation signal; and SR 3.7.6.3, a check of the system's response time. Limiting Condition for Operation (LCO) 3.7.6 allows continued plant operation in the event of an inoperable MTBS (either one or both TBVs inoperable) provided the more restrictive MCPR limit is applied. These SRs and LCOs are based on those in the NRC Standard TS (NUREG-1434, Revision 2).

The problem with the current 92 day frequency for performing SR 3.7.6.1, to "verify one complete cycle of each main turbine bypass valve," is that testing these valves at power usually results in a rather severe plant transient involving loss of the feedwater heater drains followed by a reactor recirculation pump run back, requiring significant operator involvement and time from which to recover. SR 3.7.6.1 has been performed 52 times since the Fermi 2 extended plant shutdown due to the main turbine failure in December 1993. Twenty-four (24) of these tests have been performed during Mode 1 at various power levels ranging from 39% to 92.8%, with the turbine generator on line. A plant transient has occurred in 18 of these 24 "at power" tests.

The purpose of the Heater Drains System is to control feedwater heater and MSR drain flow to maximize overall plant efficiency. The feedwater heaters are divided into two distinctly different sections, the High Pressure Extraction Steam and Heater Drains Section and the Low Pressure Extraction Steam and Heater Drains Section. The High Pressure Drain System (also known as the Pump Forward system) is the one that is affected by the transient associated with TBV testing. Heater 5North(South) receives cascading drains from heater 6N(S), the HP turbine exhaust, MSR shell side drains, heater 6N(S) extraction steam drains, leak-off from the HP control valves, HP turbine 5th stage extraction steam used for sparging, the reheater seal tank vent valves, and heater drain flash tank vent lines. The effluent from the 5 N(S) feedwater heaters is routed to the heater drain pump flash tanks. Located in the drain lines downstream of heaters 5N and 5S and upstream of the flash tank motor operated isolation valves, are instrumented check valves, F026A(B). These check valves have limit switches to detect either flashing in the flash tanks, or the lack of condensate flow from feedwater heaters 5N(S) to the flash tanks. These limit switches trigger a reactor recirculation pump runback upon sensing an impending loss of the heater drain pumps. The heater drain pumps provide approximately 30% of the required total feedwater flow at 100% reactor power.

The 5N(S) feedwater heaters do not have drain coolers. They are designed as de-aerating heaters and operate at close to saturation conditions. The opening of a TBV while testing at power lowers the pressure in the 5N(S) feedwater heaters causing the water in the heaters to flash to steam. This flashing initiates oscillations in the heaters, which ultimately leads to 5N(S) feedwater heater level control problems, and to 5N(S) heater isolation. Flashing (two phase flow) also occurs in the drain piping between the 5N(S) feedwater heaters and the heater drain pump flash tanks, resulting in closure of both of the instrumented F026A(B) check valves, and following a short time delay, the reactor recirculation pump speed runback discussed above.

EVALUATION:

While the valve cycling test ensures the TBVs are mechanically free to move, the 92 day testing frequency (requiring the test to be performed at power) imposes unnecessary transients on the plant. Our data shows that full cycling of the TBVs during MODE 1, usually results in a significant plant transient that lasts from less than an hour to several hours, and requires substantial effort by the operators in order to restore steady state plant operating conditions. Additionally, testing at power causes wear on both the TBVs and the condenser internals, and lowers plant capacity factor. Fermi 2 in-house experience has shown that the TBVs have reliable equipment performance in that they consistently pass the valve cycling test when cycled at the 92 day frequency. There has been no testing or maintenance experience that would indicate that the TBVs would not have fully opened and closed properly had they been called upon to do so; nor has there been any operational experience in which the TBVs have failed to fully open and close when required.

The failure modes of the Main Turbine Bypass System have been reviewed and it has been determined that, with the exception of mechanical binding of the TBVs, there are no failed conditions that could not be readily detected by control room alarms, control room indications, direct operator observation, periodic preventive maintenance, or routine system testing. The risk of mechanical binding of one or both of the TBVs is judged to be low, based upon a review of the Fermi 2 design, maintenance and surveillance history, and applicable industry operating experience. Additionally, required testing following maintenance performed during an outage, and surveillance testing conducted prior to exceeding 25% RTP following entry into MODE 4 will verify that the valves are mechanically operable prior to the time that they may be needed.

Therefore, reducing the cycling frequency for the TBVs is judged to not significantly degrade the performance of the Main Turbine Bypass System; but it will reduce the overall plant risk and challenges to the plant operators by removing the possibility of plant transients due to TBV cycling while at power, and will reduce wear on the balance of plant equipment. This change also is consistent with the practices for ASME Section XI Inservice Test Programs, which allow deferral of certain component testing when plant design limitations make testing impractical during power operation.

This proposed TS amendment does not change the TS operability requirements, or the functional characteristics of the MTBS. It affects only the surveillance frequency requirement in SR 3.7.6.1, which is performed to demonstrate that the TBVs are mechanically operable. The surveillance tests that ensure the MTBS meets the system's automatic actuation requirements (SR 3.7.7.2) and response time limits (SR 3.7.7.3) are not affected by this proposed TS amendment. Therefore, we have concluded that this proposed amendment to the Fermi 2 Technical Specifications is acceptable.

NRC-03-0012
ENCLOSURE 2

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

REQUEST TO REVISE TECHNICAL SPECIFICATION
SURVEILLANCE REQUIREMENT 3.7.6.1 FREQUENCY

10CFR50.92 SIGNIFICANT HAZARDS CONSIDERATION

10CFR50.92 SIGNIFICANT HAZARDS CONSIDERATION

In accordance with 10CFR50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards consideration. The proposed revision to the frequency of Technical Specification Surveillance Requirement (SR) 3.7.6.1, does not involve a significant hazards consideration for the following reasons:

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The current TS SR 3.7.6.1 requires that the turbine bypass valves (TBVs) be cycled once every 92 days to demonstrate that they are mechanically operable (free to move). Fermi in-house experience has shown that the TBVs have reliable equipment performance in that they consistently pass the valve cycling test when cycled at the 92 day frequency. There has been no testing or maintenance experience that would indicate that the TBVs would not have fully opened and closed properly had they been called upon to do so; nor has there been any operational experience in which the TBVs have failed to fully open and close when required. The failure modes of the Main Turbine Bypass System have been reviewed and it has been determined that, with the exception of mechanical binding of the TBVs, there are no failed conditions that could not be readily detected by control room alarms, control room indications, direct operator observation, periodic preventive maintenance, or routine system testing. The risk of mechanical binding of one or both of the TBVs is judged to be low, based upon a review of the Fermi 2 design, maintenance and surveillance history, and applicable industry operating experience. Additionally, required testing following maintenance performed during an outage, and surveillance testing conducted prior to exceeding 25% RTP following entry into MODE 4 will verify that the valves are mechanically operable prior to the time that they may be needed. A test frequency of essentially every 18 months, supplemented by testing following any plant shutdown occurring between plant refueling outages (if not within the 92 day frequency), is sufficient to ensure the reliability of the TBVs. Fermi 2 is analyzed for the increase in reactor pressure transient events with the assumption that the MTBS is out-of-service. Turbine generator trip represents the most limiting event in this analytical category, and provides the basis for the MCPR operating limit curves. Continued plant operation is allowed, in cases of inoperable MTBS, provided a more restrictive MCPR limit is applied (LCO 3.7.6). Margin to the MCPR Safety Limit is bounded by the analyzed failure of the MTBS. Should a TBV fail a valve cycling test, the alternate LCO requiring a MCPR penalty or the TS required actions would be taken accordingly. Therefore, this proposed amendment will not involve a significant increase in the probability or the consequences of an accident previously evaluated.

2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

There are no modifications being made to the MTBS or to system operation or maintenance by this proposed TS amendment. The only change is the TBV cycling frequency from 92 days to 18 months or more frequently if plant conditions warrant. The proposed TS amendment does not alter the operability requirements or performance characteristics of the MTBS. The reduced TBV cycling frequency reduces the number of reactivity changes and pressure perturbations on the reactor. Therefore this proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The change does not involve a significant reduction in the margin of safety.

The proposed TS amendment changes the frequency of the TBV cycling test from 92 days to 18 months or more frequently if plant conditions warrant. The operability requirements and functional characteristics of the MTBS remain unchanged. Fermi in-house experience has shown that the TBVs have reliable equipment performance in that they consistently pass the valve cycling test when cycled at the 92 day frequency. There has been no testing or maintenance experience that would indicate that the TBVs would not have fully opened and closed properly had they been called upon to do so; nor has there been any operational experience in which the TBVs have failed to fully open and close when required. The failure modes of the Main Turbine Bypass System have been reviewed and it has been determined that, with the exception of mechanical binding of the TBVs, there are no failed conditions that could not be readily detected by control room alarms, control room indications, direct operator observation, periodic preventive maintenance, or routine system testing. The risk of mechanical binding of one or both of the TBVs is judged to be low, based upon a review of the Fermi 2 design, maintenance and surveillance history, and applicable industry operating experience. Additionally, required testing following maintenance performed during an outage, and surveillance testing conducted prior to exceeding 25% RTP following entry into MODE 4 will verify that the valves are mechanically operable prior to the time that they may be needed. The TBV response times are used in determining the effect on the MCPR. The surveillance test that ensures the MTBS meets the system's response time limits (SR 3.7.7.3) is not affected by this proposed TS amendment and will continue to be performed at the current TS frequency. Therefore, this proposed amendment will not involve a significant reduction in a margin of safety.

Based on the above, Detroit Edison has determined that the proposed license amendment does not involve a significant hazards consideration.

NRC-03-0012
ENCLOSURE 3

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

REQUEST TO REVISE TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 3.7.6.1 FREQUENCY

Attached is a marked-up copy of the existing TS indicating the proposed change (Part 1), and a typed version showing the incorporated proposed change (Part 2)

NRC-03-0012
ENCLOSURE 3
PART 1

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

PROPOSED TS MARKED – UP PAGE

INCLUDED PAGE:

3.7-17

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify one complete cycle of each main turbine bypass valve.	92 days AND Once after each entry into MODE 4
SR 3.7.6.2	Perform a system functional test.	18 months
SR 3.7.6.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	18 months

NOTE

Only required to be performed prior to exceeding 25% RTP following entry into MODE 4.

NRC-03-0012
ENCLOSURE 3
PART 2

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

PROPOSED TS REVISED PAGE

INCLUDED PAGE:

3.7-17

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.6.1	----------NOTE---------- Only required to be performed prior to exceeding 25% RTP following entry into MODE 4. ---------- Verify one complete cycle of each main turbine bypass valve.	92 days
SR 3.7.6.2	Perform a system functional test.	18 months
SR 3.7.6.3	Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	18 months

NRC-03-0012
ENCLOSURE 3

FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43

REQUEST TO REVISE TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 3.7.6.1 FREQUENCY

Attached is a marked-up copy of the existing TS Bases indicating the proposed change

INCLUDED PAGE:

B 3.7.6-3

BASES

ACTIONS (continued)

specified in the COLR, are not applied, the assumptions of the design basis transient analysis may not be met. Under such circumstances, prompt action should be taken to restore the Main Turbine Bypass System and Moisture Separator Reheater to OPERABLE status or adjust the MCPR limits accordingly. The 2 hour Completion Time is reasonable, based on the time to complete the Required Action and the low probability of an event occurring during this period requiring the Main Turbine Bypass System and/or Moisture Separator Reheater.

B.1

If the Main Turbine Bypass System and Moisture Separator Reheater cannot be restored to OPERABLE status or the MCPR limits for an inoperable Main Turbine Bypass System and/or Moisture Separator Reheater are not applied, THERMAL POWER must be reduced to < 25% RTP. As discussed in the Applicability section, operation at < 25% RTP results in sufficient margin to the required limits, and the Main Turbine Bypass System and Moisture Separator Reheater are not required to protect fuel integrity during rapid pressurization transients. The 4 hour Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

Cycling each main turbine bypass valve through one complete cycle of full travel demonstrates that the valves are mechanically OPERABLE and will function when required. The 92 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Operating experience has shown that these components usually pass the SR when performed at the 92 day Frequency. Therefore, the Frequency is acceptable from a reliability standpoint. This SR is also performed after each entry into MODE 4, since this will not affect operating conditions, and will provide added assurance of valve OPERABILITY.

Insert 1 →

Insert 1

The surveillance is modified by a Note stating that valve cycling is only required to be performed when the plant is in a condition in which a loss of heater drains and the resultant recirculation pump runback cannot occur (the heater drains system utilizes a flash tank and operates at near saturated conditions, leading to an isolation of the heater drains when the turbine bypass valves are opened for this test while at any significant power level).

The 92 day Frequency and the Note in the Surveillance ensure that the valves are cycled at least once every refueling outage, and more frequently, if interim plant shutdowns occur. This provides adequate assurance that the valves will function on subsequent plant trips.