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DTE Energy

10 CFR 50.90

January 4, 2010
NRC-10-0003

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 to Revise the Core Spray Flow Requirement of Technical Specification Surveillance Tests SR 3.5.1.8 and SR 3.5.2.6

Pursuant to 10 CFR 50.90, Detroit Edison hereby proposes to amend the Fermi 2 Plant Operating License, Appendix A, Technical Specifications to revise the Core Spray flow requirement in Technical Specifications Surveillance Requirements 3.5.1.8 and 3.5.2.6 from 6350 to 5725 gallons per minute consistent with the flow assumed in the Emergency Core Cooling System (ECCS) safety analyses.

Enclosure 1 provides an evaluation of the proposed license amendment, including an analysis of the issue of significant hazards consideration using the standards of 10 CFR 50.92. Detroit Edison has concluded that the change proposed in this submittal does not result in a significant hazards consideration. Enclosure 2 provides marked up pages of the existing Technical Specifications to show the proposed change. Enclosure 3 provides a typed version of the affected Technical Specifications pages with the proposed change incorporated. Enclosure 4 provides a copy of the current Technical Specification Bases pages associated with this change for information only. No change is proposed to the current Technical Specification Bases as a result of this license amendment request.

Detroit Edison has reviewed the proposed change against the criteria of 10 CFR 51.22 and has concluded that it meets the criteria provided in 10 CFR 51.22(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, 2010 with an implementation date within 60 days of NRC approval.

No new commitments are being made in this submittal.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated Michigan State Official.

Should you have any questions or require additional information, please contact Mr. Rodney W. Johnson of my staff at (734) 586-5076.

Sincerely,

Joseph H. Plona

Enclosures

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 4, Region III
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

I, Joseph H. Plona, 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.

Joseph H. Plona

Joseph H. Plona
Site Vice President, Nuclear Generation

On this 4th day of January, 2010 before me personally appeared Joseph H. Plona, being first duly sworn and says that he executed the foregoing as his free act and deed.

Stacy Oakes

Notary Public

STACY OAKES
NOTARY PUBLIC, STATE OF MI
COUNTY OF MONROE
MY COMMISSION EXPIRES Jul 28, 2012
ACTING IN COUNTY OF MONROE

ENCLOSURE 1
TO NRC-10-0003

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

PROPOSED LICENSE AMENDMENT TO REVISE THE REQUIRED CORE SPRAY PUMP FLOW RATE IN TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS 3.5.1.8 AND 3.5.2.6

EVALUATION OF THE PROPOSED LICENSE AMENDMENT

Evaluation of the Proposed License Amendment

Subject: Revise the Core Spray Flow of Technical Specifications Surveillance Requirements 3.5.1.8 and 3.5.2.6.

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1.0 Description

Detroit Edison is requesting NRC approval of this proposed revision to the Fermi 2 Technical Specification (TS) Surveillance Requirements (SRs) 3.5.1.8 and 3.5.2.6 to define a Core Spray flow requirement consistent with the licensing basis accident analysis. This change is requested to provide an improved test margin to core spray surveillance test requirements.

2.0 Proposed Change

The current Fermi 2 TS Surveillance Requirements 3.5.1.8 and 3.5.2.6 require that the Core Spray (CS) pumps be tested to demonstrate a flow capability of 6350 gallons per minute (gpm) per division (i.e. for two pumps). It is requested that these surveillance requirements be revised to require CS pumps to demonstrate a flow capability of 5725 gpm per division consistent with the 10 CFR 50.46 and 10 CFR 50 Appendix K analyses, and with the Fermi 2 Technical Specification Bases and the Standard Technical Specifications Bases (NUREG 1433).

3.0 Background

The Technical Specifications require each divisional loop of Core Spray (2 pumps) to be capable of providing 6350 gpm with both pumps operating in parallel at a discharge pressure corresponding to a reactor pressure of 100 psig. This flow capability is consistent with the original Appendix K accident analysis for Fermi 2. Beginning with the accident analysis performed for the initial power uprate in June 1991 (References 1 and 2), the ECCS Appendix K safety analyses have assumed a corresponding CS flow of 5725 gpm; however, TS SRs 3.5.1.8 and 3.5.2.6 were not revised to be consistent with the newer safety analyses.

This License Amendment Request provides the technical basis for a change to TS SR 3.5.1.8 and SR 3.5.2.6 to re-align these surveillance requirements with the plant safety analysis.

Historically, the CS system has been capable of meeting the TS SR requirement minimum performance. However, minimum allowed CS pump performance has incrementally increased as a result of recent changes to implement industry and NRC guidance as well as the correction of calculation errors. Specifically, testing margin has been impacted by inclusion of test measuring instrument uncertainties, allowance for Emergency Diesel Generator (EDG) under-frequency, density correction of design accident discharge pressure to test fluid conditions, and additional design allowances for system hydraulic resistance for post-LOCA Emergency Core Cooling System (ECCS) strainer debris loading. Most recently, the Core Spray flow indication used to perform the TS surveillance was identified to contain a non-conservative bias for flows measured under test conditions. Even though actual pump performance over recent years is relatively unchanged and the pump is not considered to be physically degraded, the aggregate effect of these analytical corrections has been a reduction in test margin relative to the plant TS SR 3.5.1.8 and SR 3.5.2.6 minimum flow requirements such that it is possible that a future TS

SR result will not pass even though the requirements of the Appendix K safety analysis are satisfied. The requested change is necessary to allow these identified design considerations to be addressed without unnecessarily impacting the ability to demonstrate operability under the Technical Specifications.

4.0 Technical Analysis

10 CFR 50.46, Appendix K ECCS Analyses

The Fermi 2 TS Bases for SR 3.5.1.8 state that the performance requirements of the low pressure ECCS pumps are evaluated against the acceptance criteria defined in 10 CFR 50.46 and are determined through application of the 10 CFR 50, Appendix K methodology. Fermi 2 TS SR 3.5.1.8 is performed periodically (on a frequency that complies with the ASME Code, Section XI, requirements for the ECCS pumps) to verify that the ECCS pumps will develop the flow rates required by the respective Appendix K analyses. The TS SR verifies pump outlet pressure is adequate to overcome the elevation head pressure between the pump suction and the vessel discharge, the piping friction losses, and TS SR specified RPV pressure. Fermi 2 TS SR 3.5.1.8 currently requires quarterly demonstration that two divisional CS pumps operating in parallel are capable of providing a minimum flow of 6350 gpm at a discharge head corresponding to a reactor pressure of 100 psig. This test is performed for each of the two CS divisions.

The TS SR is satisfied by throttling CS flow in the test return line to an indicated value that meets or exceeds the TS SR specified flow and verifying that the pump discharge head is sufficient to provide this flow against the system hydraulic resistance corresponding to a reactor pressure of 100 psig as determined in the plant system hydraulic analysis. The analysis demonstrates that this level of performance - adjusted for other factors such as instrument uncertainty, allowance for Emergency Diesel Generator (EDG) under-frequency, and test conditions (e.g. water density) - remains greater than the minimum performance assumed in the Appendix K safety analyses.

At the time of the initial Fermi 2 power uprate from 3293 Megawatts thermal (MWt) to 3430 MWt granted under Fermi 2 License Amendment 87 (Reference 2), the Fermi 2 Appendix K safety analyses were revised to assume lower core delivered flow. The SAFER/GESTR analysis results (Reference 1), Table 4-1, submitted in support of this uprate and subsequent analyses assume CS flows per division (2 pumps) equal to 5625 gpm. This value is the flow rate to the core and does not include an assumed 100 gpm Core Spray leakage through slip joints and vent holes that is assumed by the methodology to bypass the core (References 3 and 4, Appendix A, Section N1). This revised minimum analyzed CS flow was reflected in the Updated Final Safety Analysis (UFSAR) Table 6.3-6, "ECCS Analysis Significant Input Variables and Initial Conditions" as part of the implementation of License Amendment 87, but was not reflected in TS SR 3.5.1.8 and SR 3.5.2.6 in conjunction with this license change.

The most recent General Electric-Hitachi SAFER/GESTR analysis proprietary results for GE-11 fuel (Reference 3) and for GE-14 fuel (Reference 4) were submitted to the NRC in support of a re-analysis of the LOCA pursuant to 10 CFR 50.46. These results were reviewed and approved in an NRC Safety Evaluation (Reference 5). These most recent analyses also assume the same divisional CS Flow of 5625 gpm, not including the 100 gpm assumed core bypass flow.

This submittal requests revision of Fermi 2 TS SRs 3.5.1.8 and 3.5.2.6 to change the specified test flow requirement from 6350 gpm to 5725 gpm. This change establishes consistency of the SRs with the current reviewed and approved Appendix K design basis and provides for a test margin between the TS surveillance requirements and measured pump performance. As stated in the current TS Bases, the corresponding system head pressure accounts for elevation head between the pump suction and the vessel discharge, piping friction losses, and the TS SR specified RPV pressure. This request will not affect the TS SR specified RPV pressure requirement, which remains unchanged. Since the proposed change in the TS SR requirement does not impact Core Spray System performance as demonstrated in the current reviewed and approved safety analyses, current compliance with 10CFR50.46 limits on post-LOCA fuel clad performance remains unaffected.

Fermi 2 TS SR 3.5.2.6 requires each loop of the CS system to be capable of meeting the same functional performance as TS SR 3.5.1.8. As stated in the current TS Bases, the Bases provided for SR 3.5.1.8 are also applicable to SR 3.5.2.6. This TS SR is therefore revised consistent with TS SR 3.5.1.8.

Due to a throttling limitation in the Fermi 2 Core Spray system test lines, CS pumps cannot be individually tested. Inservice Testing Relief Requests have been approved since the original licensing of the plant to perform parallel pump testing of core spray pumps. A modification plan is currently being finalized that will allow for individual pump testing as well as providing more precise throttling capability. It is planned that quarterly testing of both Core Spray Pumps in a Division in parallel will continue to be performed until the test line modifications have been completed and placed in service. The acceptance criteria necessary to satisfy the revised TS SRs would be established in the plant design basis in the form of the minimum required pump performance defined for a range of flows above the specified TS SR flow. Detroit Edison intends to continue TS SR and IST pump testing at the current IST pump baseline and establish compliance with the TS SR by comparing the measured performance against the design minimum pump curve.

Other Potentially Impacted Functions

Containment Analysis:

The ECCS flow rates are also inputs to the analysis of the post-LOCA primary containment temperature pressure response. The current containment analysis assumes a CS flow of 6350 gpm per division. Relative to this design basis, the proposed change has been evaluated and was determined to not impact the short-term containment response, which covers the initial reactor

vessel blowdown period, because the initial reactor thermal-hydraulic conditions that govern the blowdown flow rate to the containment do not change. With respect to the long-term containment response, the analysis is directed primarily at the suppression pool temperature response. This response is not impacted because it is governed by the thermal performance of the Residual Heat Removal (RHR) heat exchangers, which is unaffected by a reduction in CS flow. Therefore, a change to the containment analysis is not necessary to support the requested change to the Core Spray Surveillance Requirements.

EDG Connected Loads:

UFSAR Table 8.3-2 provides EDG loading data associated with different levels of ECCS pump delivered flow. The current EDG loading evaluation is based on higher flow rates than the flow assumed in the ECCS safety analysis; therefore, the impact of CS flow on the design bases associated with EDG electrical loading (for example, EDG capacity and fuel consumption) is conservatively bounded under the proposed CS surveillance requirement, and testing CS against the lower performance assumed in the Appendix K analyses does not adversely impact the UFSAR description of EDG design.

Technical Analysis Conclusion

This evaluation provides the technical basis to support a revision of Fermi 2 Technical Specification Surveillance Requirements 3.5.1.8 and 3.5.2.6 for Core Spray (two pump) minimum flow from 6350 gpm to 5725 gpm at a discharge head corresponding to a reactor pressure of 100 psig. This is consistent with the safety analyses performed for the current uprated power condition (Reference 1) and subsequent analyses. The 5725 gpm surveillance requirement is determined from the 5625 gpm core spray flow used in the safety analyses plus the 100 gpm of Core Spray flow assumed by the methodology to bypass the core.

The containment analysis is not impacted because short-term maximum containment pressure occurs before ECCS injection commences. With respect to the long-term containment response, the analysis is directed primarily at the suppression pool temperature response. This response is not impacted because it is governed by the thermal performance of the Residual Heat Removal (RHR) heat exchangers, which is unaffected by a reduction in CS flow. Analyses involving EDG loading do not credit reduced Core Spray flow used in the ECCS safety analysis and are therefore conservative.

5.0 Regulatory Safety Analysis

5.1 No Significant Hazards Consideration

In accordance with 10 CFR 50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards consideration. The proposed change to Core Spray Pump required flow in Technical Specification Surveillance Requirements 3.5.1.8 and 3.5.2.6

from 6350 to 5725 gallons per minute (gpm) 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 minimum performance requirements of the low pressure Emergency Core Cooling System (ECCS) pumps, including the Core Spray pumps, are determined through application of the 10 CFR 50, Appendix K methodology to ensure the criteria of 10 CFR 50.46 are satisfied. The surveillance testing of the Core Spray pumps is performed periodically in accordance with the ASME Code, Section XI verifies that two Core Spray pumps in parallel operation within a single division develop sufficient discharge pressure at the Technical Specification required flow to overcome the elevation head pressure between the pump suction and the vessel discharge, the piping friction losses, and TS SR specified Reactor Pressure Vessel pressure. The acceptance criteria necessary to satisfy the revised TS SRs would be established in the plant design basis in the form of the minimum required pump performance defined for a range of flow about the specified TS SR flow. Detroit Edison intends to continue TS SR and IST pump testing at the current IST pump baseline flow and establish compliance with the TS SR by comparing the measured performance against the design minimum pump curve. In this manner, the minimum actual delivered divisional Core Spray pump performance is assured to meet or exceed that required by the Appendix K safety analyses. These performance requirements are unchanged and are met by the proposed change.

   The bases for the core spray flow requirements in the Technical Specifications Surveillance Requirements are unchanged. The requirements are selected based on the flow values assumed and used in the current ECCS safety analyses. The value proposed for core spray divisional (2 pump) flow is consistent with the inputs used for ECCS safety analyses performed for the current licensed power level.

   Therefore, the proposed change does not involve a significant increase in the probability or 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.

   The proposed change revises the Technical Specification Surveillance Requirements for Core Spray flow to be consistent with the accident analysis. No physical changes are being made to the installed core spray system. The proposed surveillance requirements are consistent with those used in the accident analyses which analyze the effect of Core Spray system performance for the accident conditions for which the system is designed to respond. No new or different accident scenarios are created by this change.

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

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

The Core Spray system has historically been capable of meeting the Core Spray Technical Specification Surveillance Requirements. However, correction of non-conservative errors in the system hydraulic calculation and the identification of a non-conservative bias in the test flow instrument calibration have eroded the test margin such that it is possible that the Technical Specification Surveillance Requirements may not be satisfied for some surveillances and at the same time maintain a relatively large margin compared to the minimum performance assumed in the ECCS safety analyses. These non-conservative errors or biases have always existed, but have not always been specifically accounted for in the surveillance testing acceptance criteria. Since there is no change in the Technical Specification bases associated with the requested change, there is no real change in the margin provided in the system design or analyses. The proposed change makes the margin between the current Core Spray Technical Specification Surveillance Requirements and the performance assumed in the plant safety analyses available as a design and test margin. The minimum required performance necessary to satisfy the Core Spray Technical Specification Surveillance Requirements will be established in the plant design basis with the minimum required pump performance adjusted upward as necessary to account for instrument uncertainty and bias as well as differences between assumed accident and actual test operating conditions.

Therefore, the proposed change does 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.

5.2 Applicable Regulatory Requirements

10 CFR 50.46 requires nuclear plants to be provided with emergency core cooling systems that must be designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to a specified criteria. ECCS cooling performance must be calculated in accordance with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated. The evaluation model must include sufficient supporting justification to show that the analytical technique realistically describes the behavior of the reactor system during a loss-of-coolant accident. Comparisons to applicable experimental data must be made and uncertainties in the analysis method and inputs must be identified and assessed so that the uncertainty in the calculated results can be estimated. This uncertainty must be accounted for, so that, when the calculated ECCS cooling performance is compared to the criteria set forth in 10 CFR 50.46, there is a high level of probability that the criteria would not be exceeded. Appendix K, Part II "Required Documentation" sets forth the documentation requirements for each evaluation model. The SAFER/GESTR LOCA Analyses (References 1, 3 and 4) discussed in this submittal meet these requirements and are unchanged by the requested Core Spray Surveillance Requirement change.

The Fermi 2 Core Spray TS SR 3.5.1.8, and SR 3.5.2.6 are performed periodically (on a frequency that complies with the ASME Code, Section XI, requirements for the ECCS pumps) to verify that the ECCS pumps will develop the flow rates required by the respective Appendix K analyses. The pump flow rates are verified against a system head equivalent to the RPV pressure expected during a LOCA. The total system pump outlet pressure is adequate to overcome the elevation head pressure between the pump suction and the vessel discharge, the piping friction losses, and RPV pressure present during a LOCA. Surveillances are required to be performed on a quarterly basis to demonstrate that two divisional Core Spray pumps operating in parallel are capable of providing the TS SR minimum specified flow at a discharge head corresponding to a reactor pressure of 100 psig. The flow corresponds to the divisional core spray flow assumed in the safety analyses. This test is performed for each of the two Core Spray divisions. There are no changes in the testing bases.

6.0 Environmental Considerations

Detroit Edison has reviewed the proposed change against the criteria of 10 CFR 51.22 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 10 CFR 51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement or an Environmental Assessment.

7.0 References:

1) NEDC-31982P, "Fermi 2 SAFER/GESTR-LOCA Loss of Coolant Accident Analysis," dated July 1991, submitted to the NRC by Detroit Edison as Attachment 5 to Letter NRC-91-0102, "Proposed License Amendment - Uprated Power Operation," dated September 24, 1991.

2) Fermi 2 Amendment 87, dated September 9, 1992 (ML020720520)

3) GE-NE-0000-0047-1716-R1, "Fermi 2 SAFER/GESTR Loss-of-Coolant Accident Analysis for GE11 Fuel," dated June 2008, submitted under Detroit Edison letter NRC-08-0046, "Submittal of Plant Specific Emergency Core Cooling System (ECCS) Evaluation Model Reanalysis," dated June 23, 2008. (ML081830408).

4) GE-NE-0000-0030-6565-R1, "Fermi 2 SAFER/GESTR- Loss-of-Coolant Accident Analysis for GE14 Fuel," dated June 2008, submitted under Detroit Edison letter NRC-08-0046, "Submittal of Plant Specific Emergency Core Cooling System (ECCS) Evaluation Model Reanalysis," dated June 23, 2008. (ML081830408).

5) "Fermi 2 -Approval of Plant Specific Emergency Core Cooling System (ECCS) Evaluation Model Reanalysis," dated June 30, 2009. (TAC NO. MD9169) (ML091740255).

ENCLOSURE 2
TO NRC-10-0003

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

PROPOSED LICENSE AMENDMENT TO REVISE THE REQUIRED CORE SPRAY PUMP FLOW RATE IN TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS SR 3.5.1.8 AND SR 3.5.2.6

MARKED-UP TS PAGE

Affected Pages:

3.5-6 and 3.5-11

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.8	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF Core Spray: ≥ ~~6350~~ 5725 gpm, 2, ≥ 100 psig LPCI: ≥ 10,000 gpm, 1, ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.1.9	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 1045 and ≥ 945 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Inservice Testing Program
SR 3.5.1.10	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 215 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	----------NOTE---------- LPCI subsystem(s) may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. ---------- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.6	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF CS / ≥ ~~6350~~ 5725 gpm / 2 / ≥ 100 psig LPCI / ≥ 10,000 gpm / 1 / ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.2.7	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	18 months

ENCLOSURE 3
TO NRC-10-0003

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

PROPOSED LICENSE AMENDMENT TO REVISE THE REQUIRED CORE SPRAY PUMP FLOW RATE IN TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS SR 3.5.1.8 AND SR 3.5.2.6

CLEAN TS PAGES

New Pages:

3.5-6 and 3.5-11

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.8	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF Core Spray: ≥ 5725 gpm, 2, ≥ 100 psig LPCI: ≥ 10,000 gpm, 1, ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.1.9	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 1045 and ≥ 945 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	In accordance with the Inservice Testing Program
SR 3.5.1.10	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify, with reactor pressure ≤ 215 psig, the HPCI pump can develop a flow rate ≥ 5000 gpm against a system head corresponding to reactor pressure.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	----------NOTE---------- LPCI subsystem(s) may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. ---------- Verify each required ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.6	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM / FLOW RATE / NO. OF PUMPS / SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF CS / ≥ 5725 gpm / 2 / ≥ 100 psig LPCI / ≥ 10,000 gpm / 1 / ≥ 20 psig	In accordance with the Inservice Testing Program
SR 3.5.2.7	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	18 months

ENCLOSURE 4
TO NRC-10-0003

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

PROPOSED LICENSE AMENDMENT TO REVISE THE REQUIRED CORE SPRAY PUMP FLOW RATE IN TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS SR 3.5.1.8 AND SR 3.5.2.6

TS BASES PAGES
(Unchanged, For Information Only)

Related pages:

B 3.5.1-14, B 3.5.1-18, B 3.5.2-5

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.8, SR 3.5.1.9, and SR 3.5.1.10

The performance requirements of the low pressure ECCS pumps are determined through application of the 10 CFR 50, Appendix K criteria (Ref. 8). This periodic Surveillance is performed (in accordance with the ASME Code, Section XI, requirements for the ECCS pumps) to verify that the ECCS pumps will develop the flow rates required by the respective analyses. The low pressure ECCS pump flow rates ensure that adequate core cooling is provided to satisfy the acceptance criteria of Reference 10. The pump flow rates (for Core Spray, 2 pumps in parallel operation) are verified against a system head equivalent to the RPV pressure expected during a LOCA. The total system pump outlet pressure is adequate to overcome the elevation head pressure between the pump suction and the vessel discharge, the piping friction losses, and RPV pressure present during a LOCA. These values may be established during preoperational testing. Actual testing is performed via the test flow path against test line pressures established in Reference 17.

The flow tests for the HPCI System are performed at two different pressure ranges such that system capability to provide rated flow is tested at both the higher and lower operating ranges of the system. Additionally, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the HPCI System diverts steam flow. Reactor steam pressure must be ≥ 945 psig to perform SR 3.5.1.9 and ≥ 165 psig to perform SR 3.5.1.10. Adequate steam flow is represented by main turbine generator on line or turbine bypass valves open at least 15% in auto-pressure control. Therefore, sufficient time is allowed after adequate pressure and flow are achieved to perform these tests. Reactor startup is allowed prior to performing the low pressure Surveillance test because the reactor pressure is low and the time allowed to satisfactorily perform the Surveillance test is short. The reactor pressure is allowed to be increased to normal operating pressure since it is assumed that the low pressure test has been satisfactorily completed and there is no indication or reason to believe that HPCI is inoperable.

BASES

REFERENCES

1. UFSAR, Section 6.3.2.2.3.
2. UFSAR, Section 6.3.2.2.4.
3. UFSAR, Section 6.3.2.2.1.
4. UFSAR, Section 6.3.2.2.2.
5. UFSAR, Section 15.2.7.
6. UFSAR, Section 15.6.4.
7. UFSAR, Section 15.6.5.
8. 10 CFR 50, Appendix K.
9. UFSAR, Section 6.3.3.
10. 10 CFR 50.46.
11. UFSAR, Section 6.3.3.3.
12. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
13. UFSAR, Table 6.3-6.
14. UFSAR, Section 5.2.2.2.3.
15. Technical Requirements Manual.
16. NEDO-32291, "System Analyses for Elimination of Selected Response Time Testing Requirements," January 1994; and Fermi-2 SER for Amendment 111, dated April 18, 1997.
17. DC-5079 Vol I, RHR & CSS Technical Specification Surveillance Pump Discharge Pressures.

BASES

SURVEILLANCE REQUIREMENTS (continued)

provide adequate makeup if the RPV were completely drained. Therefore, only one CS subsystem is allowed to use the CST. This ensures the other required ECCS subsystem has adequate makeup volume.

The 12 hour Frequency of these SRs was developed considering operating experience related to suppression pool water level and CST water level variations and instrument drift during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool or CST water level condition.

SR 3.5.2.3

The LPCI System injection valves, recirculation pump discharge valves, and LPCI cross-tie valve are powered from the LPCI swing bus, which must remain energized to support OPERABILITY of any required LPCI subsystem. Therefore, verification of proper voltage and correct breaker alignment to the swing bus is made every 7 days. The correct breaker alignment ensures the appropriate electrical power sources are available, and the appropriate voltage is available to the swing bus, including verification that the swing bus is energized. The verification of proper voltage availability ensures that the required voltage is readily available for critical system loads connected to this bus. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC swing bus electrical power sources, and other indications available in the control room that alert the operator to subsystem malfunctions.

SR 3.5.2.4, SR 3.5.2.6, and SR 3.5.2.7

The Bases provided for SR 3.5.1.3, SR 3.5.1.8, and SR 3.5.1.11 are applicable to SR 3.5.2.4, SR 3.5.2.6, and SR 3.5.2.7, respectively.