

APPLICABILITY

SURVEILLANCE REQUIREMENTS

4.0.1 Surveillance Requirements shall be applicable during the OPERATIONAL MODES or other conditions specified for individual Limiting Conditions for Operation unless otherwise stated in an individual Surveillance Requirement.

4.0.2 Each Surveillance Requirement shall be performed within the specified time interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

4.0.3 Failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by Specification 4.0.2, shall constitute noncompliance with the OPERABILITY requirements for a Limiting Condition for Operation.

The time limits of the ACTION requirements are applicable at the time it is identified that a Surveillance Requirement has not been performed. -

The ACTION requirements may be delayed for up to 24 hours to permit the completion of the surveillance when the allowable (equipment inoperability) outage time limits of the ACTION requirements are less than 24 hours.

Surveillance requirements do not have to be performed on inoperable equipment.

4.0.4 Entry into an OPERATIONAL MODE or other specified applicability condition shall not be made unless the Surveillance Requirement(s) associated with the Limiting Condition for Operation have been performed within the stated surveillance interval or as otherwise specified.

4.0.5 Surveillance Requirements for inservice inspection and testing of ASME Code Class 1, 2 and 3 components shall be applicable as follows:

- a. Inservice inspection of ASME Code Class 1, 2 and 3 components and inservice testing of ASME Code Class 1, 2 and 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50, Section 50.55a.
- b. Surveillance intervals specified in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda for the inservice inspection and testing activities required by the ASME Boiler and Pressure Vessel Code and applicable Addenda shall be applicable as follows in these Technical Specifications:

APPLICABILITY

BASES

4.0.1 This specification provides that surveillance activities necessary to insure the Limiting Conditions for Operation are met and will be performed during the OPERATIONAL MODES or other conditions for which the Limiting Conditions for Operation are applicable. Provisions for additional surveillance activities to be performed without regard to the applicable OPERATIONAL MODES or other conditions are provided in the individual Surveillance Requirements.

4.0.2 The provisions of this specification provide allowable tolerances for performing surveillance activities beyond those specified in the nominal surveillance interval. These tolerances are necessary to provide operational flexibility because of scheduling and performance considerations. The phrase "at least" associated with a surveillance frequency does not negate this allowable tolerance value and permits the performance of more frequent surveillance activities.

The allowable tolerance for performing surveillance activities is sufficiently restrictive to ensure that the reliability associated with the surveillance activity is not significantly degraded beyond that obtained from the nominal specified interval. It is not intended that the allowable tolerance be used as a convenience to repeatedly schedule the performance of surveillances at the allowable tolerance limit.

The allowable tolerance for performing surveillance activities also provides flexibility to accommodate the length of a fuel cycle for surveillances that are specified to be performed at least once each REFUELING INTERVAL. It is the intent that REFUELING INTERVAL surveillances be performed in an OPERATIONAL MODE consistent with safe plant operation.

4.0.3 This specification establishes the failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by the provisions of Specification 4.0.2, as a condition that constitutes a failure to meet the OPERABILITY requirements for a Limiting Condition for Operation. Under the provisions of this specification, systems and components are assumed to be OPERABLE when Surveillance Requirements have been satisfactorily performed within the specified time interval. However, nothing in this provision is to be construed as implying that systems or components are OPERABLE when they are found or known to be inoperable although still meeting the Surveillance Requirements. This specification also clarifies that the ACTION requirements are applicable when Surveillance Requirements have not been completed within the allowed surveillance interval and that the time limits of the ACTION requirements apply from the point in time it is identified that a surveillance has not been performed and not at the time that the allowed surveillance inter-

3/4.2 POWER DISTRIBUTION LIMITS

AXIAL POWER IMBALANCE

LIMITING CONDITION FOR OPERATION

3.2.1 AXIAL POWER IMBALANCE shall be maintained within the acceptable AXIAL POWER IMBALANCE operating limits provided in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1 above 40% of RATED THERMAL POWER.*

ACTION:

With AXIAL POWER IMBALANCE exceeding the limits specified above, either:

- a. Restore the AXIAL POWER IMBALANCE to within the limits provided in the CORE OPERATING LIMITS REPORT within 15 minutes, or
- b. Within one hour reduce power until imbalance limits provided in the CORE OPERATING LIMITS REPORT are met or to 40% of RATED THERMAL POWER or less.

SURVEILLANCE REQUIREMENTS

4.2.1 The AXIAL POWER IMBALANCE shall be determined to be within the limits provided in the CORE OPERATING LIMITS REPORT at least once every 12 hours when above 40% of RATED THERMAL POWER except when the AXIAL POWER IMBALANCE alarm is inoperable, then calculate the AXIAL POWER IMBALANCE at least once per hour.

*See Special Test Exception 3.10.1.

POWER DISTRIBUTION LIMITS

QUADRANT POWER TILT

LIMITING CONDITION FOR OPERATION

3.2.4 THE QUADRANT POWER TILT shall not exceed the Steady State Limit for QUADRANT POWER TILT provided in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODE 1 above 15% of RATED THERMAL POWER.*

ACTION:

- a. With the QUADRANT POWER TILT determined to exceed the Steady State Limit but less than or equal to the Transient Limit provided in the CORE OPERATING LIMITS REPORT:
 1. Within 2 hours:
 - a) Either reduce the QUADRANT POWER TILT to within its Steady State Limit, or
 - b) Reduce THERMAL POWER so as not to exceed THERMAL POWER, including power level cutoff, allowable for the reactor coolant pump combination less at least 2% for each 1% of QUADRANT POWER TILT in excess of the Steady State Limit and within 4 hours, reduce the High Flux Trip Setpoint and the Flux- Δ Flux-Flow Trip Setpoint at least 2% for each 1% of QUADRANT POWER TILT in excess of the Steady State Limit.
 2. Verify that the QUADRANT POWER TILT is within its Steady State Limit within 24 hours after exceeding the Steady State Limit or reduce THERMAL POWER to less than 60% of THERMAL POWER allowable for the reactor coolant pump combination within the next 2 hours and reduce the High Flux Trip Setpoint to \leq 65.5% of THERMAL POWER allowable for the reactor coolant pump combination within the next 4 hours.
 3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 60% of THERMAL POWER allowable for the reactor coolant pump combination may proceed provided that the QUADRANT POWER TILT is verified within its Steady State Limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

*See Special Test Exception 3.10.1.

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

- b. With the QUADRANT POWER TILT determined to exceed the Transient Limit but less than the Maximum Limit provided in the CORE OPERATING LIMITS REPORT, due to misalignment of either a safety, regulating or axial power shaping rod:
 1. Reduce THERMAL POWER at least 2% for each 1% of indicated QUADRANT POWER TILT in excess of the Steady State Limit within 30 minutes.
 2. Verify that the QUADRANT POWER TILT is within its Transient Limit within 2 hours after exceeding the Transient Limit or reduce THERMAL POWER to less than 60% of THERMAL POWER allowable for the reactor coolant pump combination within the next 2 hours and reduce the High Flux Trip Setpoint to $\leq 65.5\%$ of THERMAL POWER allowable for the reactor coolant pump combination within the next 4 hours.
 3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 60% of THERMAL POWER allowable for the reactor coolant pump combination may proceed provided that the QUADRANT POWER TILT is verified within its Steady State Limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POW.
- c. With the QUADRANT POWER TILT determined to exceed the Transient Limit but less than the Maximum Limit provided in the CORE OPERATING LIMITS REPORT, due to causes other than the misalignment of either a safety, regulating or axial power shaping rod:
 1. Reduce THERMAL POWER to less than 60% of THERMAL POWER allowable for the reactor coolant pump combination within 2 hours and reduce the High Flux Trip Setpoint to $\leq 65.5\%$ of THERMAL POWER allowable for the reactor coolant pump combination within the next 4 hours.
 2. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 60% of THERMAL POWER allowable for the reactor coolant pump combination may proceed provided that the QUADRANT POWER TILT is verified within its Steady State Limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

- d. With the QUADRANT POWER TILT determined to exceed the Maximum Limit provided in the CORE OPERATING LIMITS REPORT, reduce THERMAL POWER to ≤ 15% of RATED THERMAL POWER within 2 hours.

SURVEILLANCE REQUIREMENTS

4.2.4 The QUADRANT POWER TILT shall be determined to be ≤ the Steady State Limits provided in the CORE OPERATING LIMITS REPORT at least once every 7 days during operation above 15% of RATED THERMAL POWER except when the QUADRANT POWER TILT alarm is inoperable, then the QUADRANT POWER TILT shall be calculated at least once per 12 hours.

INSTRUMENTATION

INCORE DETECTORS

LIMITING CONDITION FOR OPERATION

3.3.3.2 As a minimum, the incore detectors shall be OPERABLE as specified below.

- a. For AXIAL POWER IMBALANCE measurements:
 1. Nine detectors shall be arranged such that there are three detectors in each of three strings and there are three detectors lying in the same axial plane with one plane at the core mid-plane and one plane in each axial core half.
 2. The axial planes in each core half shall be symmetrical about the core mid-plane.
 3. The detector strings shall not have radial symmetry.
- b. For QUADRANT POWER TILT measurements with the Minimum Incore Detector System:
 1. Two sets of 4 detectors shall lie in each core half. Each set of detectors shall lie in the same axial plane. The two sets in the same core half may lie in the same axial plane.
 2. Detectors in the same plane shall have quarter core radial symmetry.
- c. For QUADRANT POWER TILT measurements, at least 75% of the Symmetric Incore Detectors in each core quadrant shall be OPERABLE.
- d. For $F_{\Delta H}^N$ and F_Q measurements with the Incore Detector System at least 75% of all incore detectors in each core quadrant shall be OPERABLE.

APPLICABILITY: When the incore detection system is used for measurement of:

- a. The AXIAL POWER IMBALANCE.
- b. The QUADRANT POWER TILT.
- c. $F_{\Delta H}^N$
- d. F_Q .

ACTION:

With less than the specified minimum incore detector arrangement OPERABLE, do not use incore detectors for the above applicable measurement. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

- 4.3.3.2 The incore detector system shall be demonstrated OPERABLE:
- a. By performance of a CHANNEL CHECK within 7 days prior to its use for measurement of the AXIAL POWER IMBALANCE or the QUADRANT POWER TILT.
 - b. At least once per 18 months by performance of a CHANNEL CALIBRATION which does not include the neutron detectors.

3/4.2 POWER DISTRIBUTION LIMITS

BASES

The specifications of this section provide assurance of fuel integrity during Condition I (normal operation) and II (incidents of moderate frequency) events by: (a) maintaining the minimum DNBR in the core \geq the minimum allowable DNB ratio during normal operation and during short term transients, (b) maintaining the peak linear power density \leq 18.4 kW/ft during normal operation, and (c) maintaining the peak power density less than the limits given in the bases to specification 2.1 during short term transients. In addition, the above criteria must be met in order to meet the assumptions used for the loss-of-coolant accidents.

The power imbalance envelope and the insertion limit curves defined in the CORE OPERATING LIMITS REPORT are based on LOCA analyses which have defined the maximum linear heat rate such that the maximum clad temperature will not exceed the Final Acceptance Criteria of 2200°F following a LOCA. Operation outside of the power imbalance envelope alone does not constitute a situation that would cause the Final Acceptance Criteria to be exceeded should a LOCA occur. The power imbalance envelope represents the boundary of operation limited by the Final Acceptance Criteria only if the control rods are at the insertion limits, as defined in the CORE OPERATING LIMITS REPORT and if the steady-state limit QUADRANT POWER TILT exists. Additional conservatism is introduced by application of:

- a. Nuclear uncertainty factors.
- b. Thermal calibration uncertainty.
- c. Fuel densification effects.
- d. Hot rod manufacturing tolerance factors.
- e. Potential fuel rod bow effects.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensures that the original criteria are met.

The definitions of the design limit nuclear power peaking factors as used in these specifications are as follows:

F_Q Nuclear heat flux hot channel factor, is defined as the maximum local fuel rod linear power density divided by the average fuel rod linear power density, assuming nominal fuel pellet and rod dimensions.

POWER DISTRIBUTION LIMITS

BASES

$F_{\Delta H}^N$ Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod on which minimum DNBR occurs to the average rod power.

It has been determined by extensive analysis of possible operating power shapes that the design limits on nuclear power peaking and on minimum DNBR at full power are met by compliance with the protective and operating limits in the CORE OPERATING LIMITS REPORT.

Power peaking is not a directly observable quantity and therefore limits have been established on the bases of the AXIAL POWER IMBALANCE produced by the power peaking. It has been determined that the above hot channel factor limits will be met provided the following conditions are maintained.

1. Control rods in a single group move together with no individual rod insertion differing by more than $\pm 6.5\%$ (indicated position) from the group average height.
2. Regulating rod groups are sequenced with overlapping groups as required in Specification 3.1.3.6.
3. The regulating rod insertion limits of Specification 3.1.3.6 are maintained.
4. AXIAL POWER IMBALANCE limits are maintained. The AXIAL POWER IMBALANCE is a measure of the difference in power between the top and bottom halves of the core. Calculations of core average axial peaking factors for many plants and measurements from operating plants under a variety of operating conditions have been correlated with AXIAL POWER IMBALANCE. The correlation shows that the design power shape is not exceeded if the AXIAL POWER IMBALANCE is maintained between the limits specified in Specification 3.2.1.

The design limit power peaking factors are the most restrictive calculated at full power for the range from all control rods fully withdrawn to minimum allowable control rod insertion and are the core DNBR design basis. Therefore, for operation at a fraction of RATED THERMAL POWER, the design limits are met. When using incore detectors to make power distribution maps to determine F_G and $F_{\Delta H}^N$:

- a. The measurement of total peaking factor F_G^{meas} , shall be increased by 1.4 percent to account for manufacturing tolerances and further increased by 7.5 percent to account for measurement error.

POWER DISTRIBUTION LIMITS

BASES

- b. The measurement of enthalpy rise hot channel factor, $F_{\Delta H}^N$, shall be increased by 5 percent to account for measurement error.

For Condition II events, the core is protected from exceeding the values given in the bases to specification 2.1 locally, and from going below the minimum allowable DNB ratio by automatic protection on power, AXIAL POWER IMBALANCE pressure and temperature. Only conditions 1 through 3, above, are mandatory since the AXIAL POWER IMBALANCE is an explicit input to the reactor protection system.

The QUADRANT POWER TILT limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during startup testing and periodically during power operation.

The QUADRANT POWER TILT limit at which corrective action is required provides DNB and linear heat generation rate protection with x-y plane power tilts. In the event the tilt is not corrected, the margin for uncertainty on F_0 is reinstated by reducing the power by 2 percent for each percent of tilt in excess of the limit.

3/4.2.5 DNB PARAMETERS

The limits on the DNB related parameters assure that each of the parameters are maintained within the normal steady state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the FSAR initial assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR greater than the minimum allowable DNB ratio throughout each analyzed transient.

The 12 hour periodic surveillance of these parameters through instrument read-out is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The 18 month periodic measurement of the RCS total flow rate using delta P instrumentation is adequate to detect flow degradation and ensure correlation of the flow indication channels with measured flow such that the indicated percent flow will provide sufficient verification of flow rate on a 12 hour basis.

3/4.3 INSTRUMENTATION

BASES

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

3/4.3.3.2 INCORE DETECTORS

The OPERABILITY of the incore detectors ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution of the reactor core. See Bases Figures 3-1 and 3-2 for examples of acceptable minimum incore detector arrangements.

3/4.3.3.3 SEISMIC INSTRUMENTATION

Deleted

3/4.3.3.4 METEOROLOGICAL INSTRUMENTATION

Deleted

3/4.3.3.5 REMOTE SHUTDOWN INSTRUMENTATION

The OPERABILITY of the remote shutdown instrumentation ensures that sufficient capability is available to permit shutdown and maintenance of

MAY 18 1988

MEMORANDUM FOR: Ted Quay, Senior Project Manager
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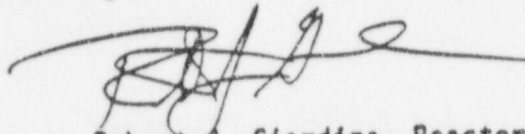
THRU: Richard L. Emch, Section Chief
Technical Specifications Branch
Division of Operational Events Assessment, NRR

FROM: Robert J. Giardina, Reactor Engineer
Review & Assessment Section
Technical Specifications Branch
Division of Operational Events Assessment, NRR

SUBJECT: FERMI-2 TECHNICAL SPECIFICATION INTERPRETATIONS

REFERENCE: Memorandum for G. Holahan, from C. Norelius dated
August 12, 1987

In response to your August 26, 1987 request for assistance to clarify several Technical Specification questions submitted by Region III, Enclosures 1, 2 and 3 provide OTSB's response to Issues 2 (Situational Surveillances), 3 (Startup Definition), and 6 (Technical Specification Parameter Accuracy) respectively.



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Enclosures: As staced

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PART 9900: TECHNICAL GUIDANCE

STANDARD TECHNICAL SPECIFICATIONS
STS, SECTION 4.0.2

A. PURPOSE

To provide guidance regarding the conditions under which the specified time interval for Surveillance Requirements may be extended.

B. BACKGROUND

During inspection activities performed in 1987 at the Fermi-2 site, the Resident Inspectors encountered a number of issues associated with Technical Specifications (TS) interpretations. One of the issues involved TS 4.0.2 which allows a 25% extension to the interval for performance of a Surveillance Requirement (SR). Certain surveillance activities in the Fermi-2 Technical Specifications and all other Standard Technical Specifications (STS) are based upon particular plant conditions or situations. Two examples of this type of "situational" surveillance are SR 4.4.1.4 which states "The temperature differentials and flow rate shall be determined to be within the limits within 15 minutes prior to startup..." and SR 4.8.1.1.1.c.2 which states "By verifying within 30 days of obtaining the sample". The Region requested that NRR provide assistance in determining whether TS 4.0.2 applies to situational surveillances.

C. DISCUSSION

TS 4.0.2 establishes the conditions under which the specified time interval for SRs may be extended. According to the BASES, the intent of STS 4.0.2 is to provide operational flexibility by permitting an extension of up to 25% of the normal surveillance interval to facilitate surveillance scheduling and consideration of plant operating conditions that may not be suitable for conducting the surveillance; e.g., transient conditions or other on-going surveillance or maintenance activity. The second part of TS 4.0.2 states that the total of three consecutive intervals may not exceed 3.25 times the specified interval. This part is intended to limit the use of the 25% extension to ensure that it is not used excessively.

Clearly TS 4.0.2 was intended for application to regular surveillance intervals, intervals characterized by the wording "At least once per" a specified time interval (i.e., 15 minutes, 1 week, 31 days, etc.). A situational surveillance requirement is characterized by the wording "within" a specified

time interval and is followed by a certain condition or situation (i.e., prior to startup, after control rod movement, after taking a sample, etc.). The wording of the situational surveillance requirement allows the specified surveillance to be performed at any time during the specified time interval. Therefore, the operational flexibility is already built into the situational surveillance which is not a regular surveillance interval, and TS 4.0.2 does not apply.

In some cases, a situational surveillance can become a regular interval surveillance temporarily because of circumstances. For example, during a period when the containment personnel airlock is being used everyday, the situational surveillance "within 72 hour after airlock use" becomes a regular surveillance interval of "once per 72 hours." Under such conditions the flexibility of TS 4.0.2 can be applied.

D. CONCLUSION

TS 4.0.2 is not applicable to situational surveillance requirements.

E. REFERENCE

1. Memorandum for G. Holahan from C. Morelius dated August 12, 1987 on Request for Technical Assistance - Technical Specification Interpretations.

END