

ATTACHMENT 2 TO AEP:NRG:1182

EXISTING TECHNICAL SPECIFICATION PAGES
MARKED TO REFLECT PROPOSED CHANGES

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REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

{ with all individual indicated rod positions
within the allowed rod misalignment }

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE and positioned within ~~± 12 steps~~ (indicated position) of their group step counter demand position as follows:

[insert attached text]

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than ~~± 12 steps~~ the ~~(indicated position)~~, be in HOT STANDBY within 6 hours.
allowed rod misalignment,
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than ~~± 12 steps~~ (indicated ~~position~~ ^{the allowed rod misalignment}), POWER OPERATION may continue provided that within one hour either:
 1. The affected rod is restored to OPERABLE status within the above alignment requirements, or
 2. The affected rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions, and
 - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and

*See Special Test Exceptions 3.10.2 and 3.10.4

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- o for THERMAL POWER less than or equal to 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 18 steps, and
- o for THERMAL POWER greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 12 steps or as determined from Figure 3.1-4. Figure 3.1-4 permits for an allowed rod misalignment from ± 13 steps (for APL equal to 101%) to ± 18 steps (for APL greater or equal to 106%) provided the value of R (defined in Figure 3.1-4) is greater than or equal to 1.04.

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

- c) A power distribution map is obtained from the movable incore detectors and $F_0(2)$ and $F_{\Delta H}^N$ are verified to be within their limits within 72 hours, and
- d) Either the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or
- e) The remainder of the rods in the group with the inoperable rod are aligned to within ~~12~~ ^{the allowed rod misalignment} steps of the inoperable rod within one hour while maintaining the rod sequence and insertion limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.5 during subsequent operation.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted shall be determined to be OPERABLE by movement of at least 8 steps in any one direction at least once per 31 days.

4.1.3.1.3 The allowed rod misalignment for THERMAL POWER greater than 85% of RATED THERMAL POWER shall be determined in conjunction with the measurement of APL as defined in Specification 4.2.6.2.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.2 All shutdown and control rod position indicator channels and the demand position indication system shall be OPERABLE and capable of determining the control rod positions within ~~± 12 steps~~ the allowed rod misalignment specified in Specification 3.1.3.1.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one rod position indicator channel per group inoperable either:
 1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or
 2. Reduce THERMAL POWER TO < 50% of RATED THERMAL POWER within 8 hours.
- b. With a maximum of one demand position indicator per bank inoperable either:
 1. Verify that all rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of ~~± 12 steps~~ of each other at least once per 8 hours, or the allowed rod misalignment
 2. Reduce THERMAL POWER to < 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each rod position indicator channel shall be determined to be OPERABLE by verifying the demand position indication system and the rod position indicator channels agree within ~~12 steps~~ ^{the allowed rod misalignment} at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indicator channels at least once per 4 hours.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, and nuclear enthalpy rise hot channel factors ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable, but will normally only be determined periodically, as specified in Specifications 4.2.2.1, 4.2.2.2, 4.2.3, 4.2.6.1 and 4.2.6.2. This periodic surveillance is sufficient to ensure that the hot channel factor limits are maintained provided:

- REPLACE WITH ATTACHED TEXT
- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 12 steps from the group demand position.
 - b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.5.
 - c. The control rod insertion limits of Specifications 3.1.3.4 and 3.1.3.5 are maintained.
 - d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

The relaxation in F_H^N as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits. F_H^N will be maintained within its limits as specified in the COLR, provided conditions (a) through (d) above are maintained.

When an F_0 measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance for a full core map taken with the incore detector flux mapping system, and 3% is the appropriate allowance for manufacturing tolerance.

When F_H^N is measured, experimental error must be allowed for, and 4% is the appropriate allowance for a full core map taken with the incore detection system. This 4% measurement uncertainty has been included in the design DNBR limit value. The specified limit for F_H^N also contains an additional 4% allowance for uncertainties. The total allowance is based on the following considerations:

- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 18 steps from the group demand position (allowed rod misalignment) for power levels less than or equal to 85% of RATED THERMAL POWER. For power levels greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is from ± 12 to ± 18 steps, which is dependent on the Allowable Power Level and the ratio of $F_{\Delta H}^N$ limit at 100% of RATED THERMAL POWER to maximum measured $F_{\Delta H}^N$ as indicated in Figure 3.1-4.

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

{with all individual indicated rod positions
within the allowed rod misalignment}

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE and positioned within ~~±12 steps (indicated position)~~ of their group step counter demand position~~x~~ as follows.

[insert attached text]

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than ~~±12 steps the (indicated position)~~ be in HOT STANDBY within 6 hours.
allowed rod misalignment
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than ~~±12 steps (indicated position)~~ *the allowed rod misalignment* POWER OPERATION may continue provided that within one hour either:
 1. The affected rod is restored to OPERABLE status within the above alignment requirements, or
 2. The affected rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions, and
 - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and

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*See Special Test Exceptions 3.10.2 and 3.10.3

- for THERMAL POWER less than or equal to 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 18 steps, and
- for THERMAL POWER greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 12 steps or as determined from Figure 3.1-4. Figure 3.1-4 permits for an allowed rod misalignment from ± 13 steps (for APL equal to 101%) to ± 18 steps (for APL greater or equal to 106%) provided the value of R (defined in Figure 3.1-4) is greater than or equal to 1.04.

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

- c) A power distribution map is obtained from the movable incore detectors and $F_0(Z)$ and $F_{\Delta H}^N$ are verified to be within their limits within 72 hours, and
- d) Either the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or
- e) The remainder of the rods in the group with the inoperable rod are aligned to within ~~the allowed~~ *the allowed rod misalignment* steps of the inoperable rod within one hour while maintaining the rod sequence and insertion limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 8 steps in any one direction at least once per 31 days.

4.1.3.1.3 The allowed rod misalignment for THERMAL POWER greater than 85% of RATED THERMAL POWER shall be determined in conjunction with the measurement of APL as defined in Specification 4.2.6.2.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS-OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2 All shutdown and control rod position indicator channels and the demand position indication system shall be OPERABLE and capable of determining the control rod positions within ~~+12 steps~~. *the allowed rod misalignment specified in Specification 3.1.3.1.*

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one rod position indicator channel per group inoperable either:
 1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or.
 2. Reduce THERMAL POWER TO < 50% of RATED THERMAL POWER within 8 hours.
- b. With a maximum of one demand position indicator per bank inoperable either:
 1. Verify that all rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of ~~12 steps~~ of each other at least once per 8 hours, or *the allowed rod misalignment*
 2. Reduce THERMAL POWER to < 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

the allowed rod misalignment

4.1.3.2 Each rod position indicator channel/shall be determined to be OPERABLE by verifying the demand position indication system and the rod position indicator channels agree within ~~12 steps~~ at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indicator channels at least once per 4 hours.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, and nuclear enthalpy rise hot channel factor ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit:

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2.1, 4.2.2.2, 4.2.3, 4.2.6.1 and 4.2.6.2. This periodic surveillance is sufficient to ensure that the limits are maintained provided:

- REPLACE WITH ATTACHED TEXT
- a. ~~Control rods in a single group move together with no individual rod insertion differing by more than plus or minus 12 steps from the group demand position.~~
 - b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6.
 - c. The control rod insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are maintained.
 - d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

F_{AH}^N will be maintained within its limits as specified in the COLR provided conditions a. through d. above are maintained. The relaxation of F_{AH}^N as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits. The form of this relaxation for DNBR limits is discussed in Section 2.1.1 of this basis.

When an F_0 measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance on F_0 for a full core map taken with the incore detector flux mapping system and 3% in the appropriate allowance for manufacturing tolerance.

- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 18 steps from the group demand position (allowed rod misalignment) for power levels less than or equal to 85% of RATED THERMAL POWER. For power levels greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is from ± 12 to ± 18 steps, which is dependent on the Allowable Power Level and the ratio of $F_{\Delta H}^N$ limit at 100% of RATED THERMAL POWER to maximum measured $F_{\Delta H}^N$ as indicated in Figure 3.1-4.

ATTACHMENT 3 TO AEP:NRC:1182

PROPOSED
TECHNICAL SPECIFICATION PAGES

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE with all individual indicated rod positions within the allowed rod misalignment of their group step counter demand position as follows:

- o for THERMAL POWER less than or equal to 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 18 steps, and
- o for THERMAL POWER greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 12 steps or as determined from Figure 3.1-4. Figure 3.1-4 permits for an allowed rod misalignment from ± 13 steps (for APL equal to 101%) to ± 18 steps (for APL greater or equal to 106%) provided the value of R (defined in Figure 3.1-4) is greater than or equal to 1.04.

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than the allowed rod misalignment, be in HOT STANDBY within 6 hours.
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than the allowed rod misalignment, POWER OPERATION may continue provided that within one hour either:
 1. The affected rod is restored to OPERABLE status within the above alignment requirements, or
 2. The affected rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions, and

*See Special Test Exceptions 3.10.2 and 3.10.4

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

- b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and
- c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and F_{AH}^N are verified to be within their limits within 72 hours, and
- d) Either the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or
- e) The remainder of the rods in the group with the inoperable rod are aligned to within the allowed rod misalignment of the inoperable rod within one hour while maintaining the rod sequence and insertion limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.5 during subsequent operation.

SURVEILLANCE REQUIREMENTS

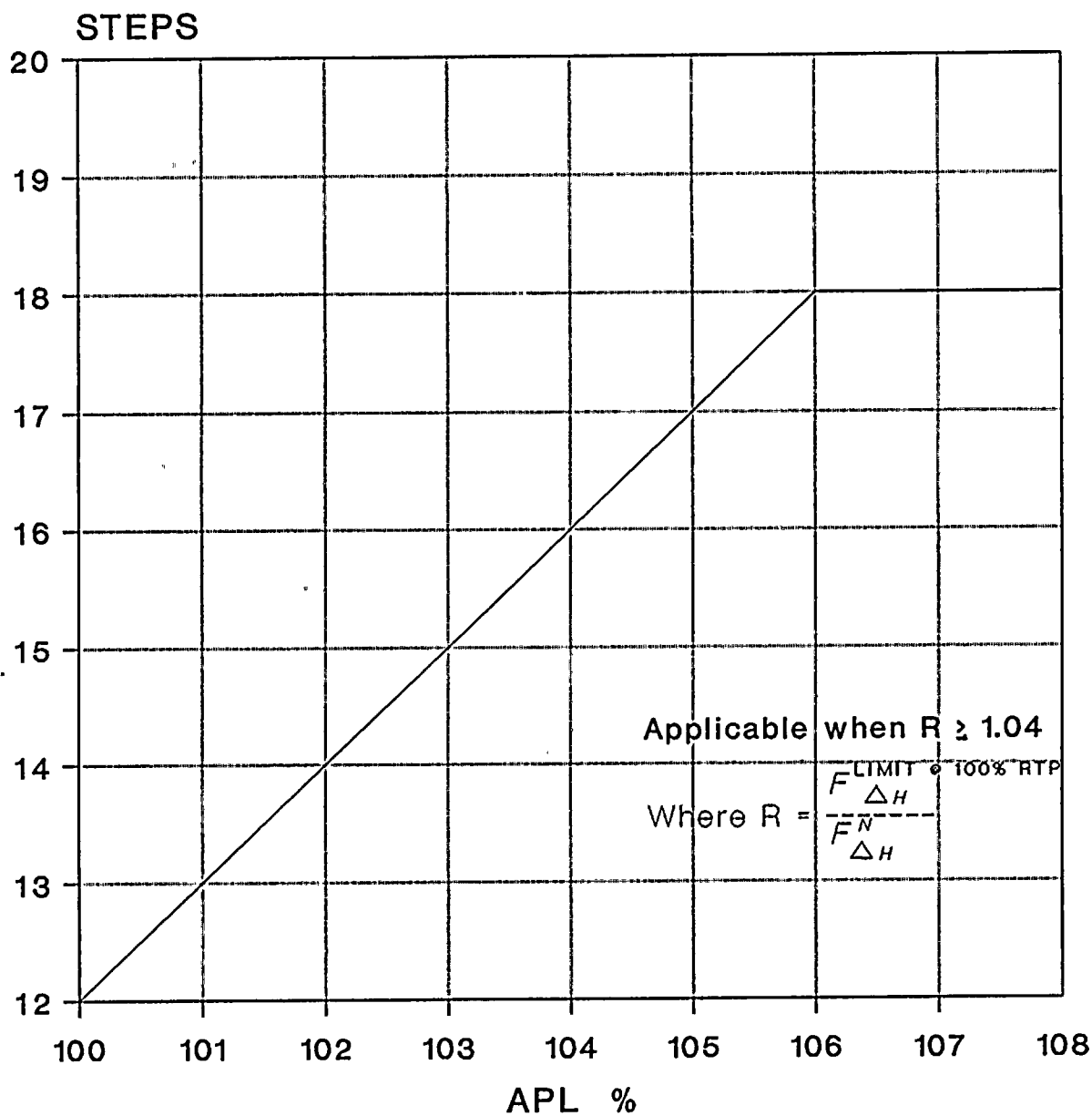
4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 8 steps in any one direction at least once per 31 days.

4.1.3.1.3 The allowed rod misalignment for THERMAL POWER greater than 85% of RATED THERMAL POWER shall be determined in conjunction with the measurement of APL as defined in Specification 4.2.6.2.

ALLOWED ROD MISALIGNMENT ABOVE 85% RTP

FIGURE 3.1-4



REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.2 All shutdown and control rod position indicator channels and the demand position indication system shall be OPERABLE and capable of determining the rod positions within the allowed rod misalignment specified in Specification 3.1.3.1.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one rod position indicator channel per group inoperable either:
 1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.
- b. With a maximum of one demand position indicator per bank inoperable either:
 1. Verify that all rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of the allowed rod misalignment of each other, at least once per 8 hours, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each rod position indicator channel shall be determined to be OPERABLE by verifying the demand position indication system and the rod position indicator channels agree within the allowed rod misalignment at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indicator channels at least once per 4 hours.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, and nuclear enthalpy rise hot channel factors ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable, but will normally only be determined periodically, as specified in Specifications 4.2.2.1, 4.2.2.2, 4.2.3, 4.2.6.1 and 4.2.6.2. This periodic surveillance is sufficient to ensure that the hot channel factor limits are maintained provided:

- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 18 steps from the group demand position (allowed rod misalignment) for power levels less than or equal to 85% of RATED THERMAL POWER. For power levels greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is from ± 12 to ± 18 steps, which is dependent on the Allowable Power Level and the ratio of $F_{\Delta H}^N$ limit at 100% of RATED THERMAL POWER to maximum measured $F_{\Delta H}^N$ as indicated in Figure 3.1-4.
- b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.5.
- c. The control rod insertion limits of Specifications 3.1.3.4 and 3.1.3.5 are maintained.
- d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

The relaxation in $F_{\Delta H}^N$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits. $F_{\Delta H}^N$ will be maintained within its limits as specified in the COLR, provided conditions (a) through (d) above are maintained.

When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance for a full core map taken with the incore detector flux mapping system, and 3% is the appropriate allowance for manufacturing tolerance.

When $F_{\Delta H}^N$ is measured, experimental error must be allowed for, and 4% is the appropriate allowance for a full core map taken with the incore detection system. This 4% measurement uncertainty has been included in the design DNBR limit value. The specified limit for $F_{\Delta H}^N$ also contains an additional 4% allowance for uncertainties. The total allowance is based on the following considerations:

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE with all individual indicated rod positions within the allowed rod misalignment of their group step counter demand position as follows:

- o for THERMAL POWER less than or equal to 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 18 steps, and
- o for THERMAL POWER greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is ± 12 steps or as determined from Figure 3.1-4. Figure 3.1-4 permits for an allowed rod misalignment from ± 13 steps (for APL equal to 101%) to ± 18 steps (for APL greater or equal to 106%) provided the value of R (defined in Figure 3.1-4) is greater than or equal to 1.04.

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than the allowed rod misalignment, be in HOT STANDBY within 6 hours.
- c. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than the allowed rod misalignment, POWER OPERATION may continue provided that within one hour either:
 1. The affected rod is restored to OPERABLE status within the above alignment requirements, or
 2. The affected rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions, and

*See Special Test Exceptions 3.10.2 and 3.10.3

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

- b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and
- c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and F_{AH}^N are verified to be within their limits within 72 hours, and
- d) Either the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the high neutron flux trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or
- e) The remainder of the rods in the group with the inoperable rod are aligned to within the allowed rod misalignment of the inoperable rod within one hour while maintaining the rod sequence and insertion limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.

SURVEILLANCE REQUIREMENTS

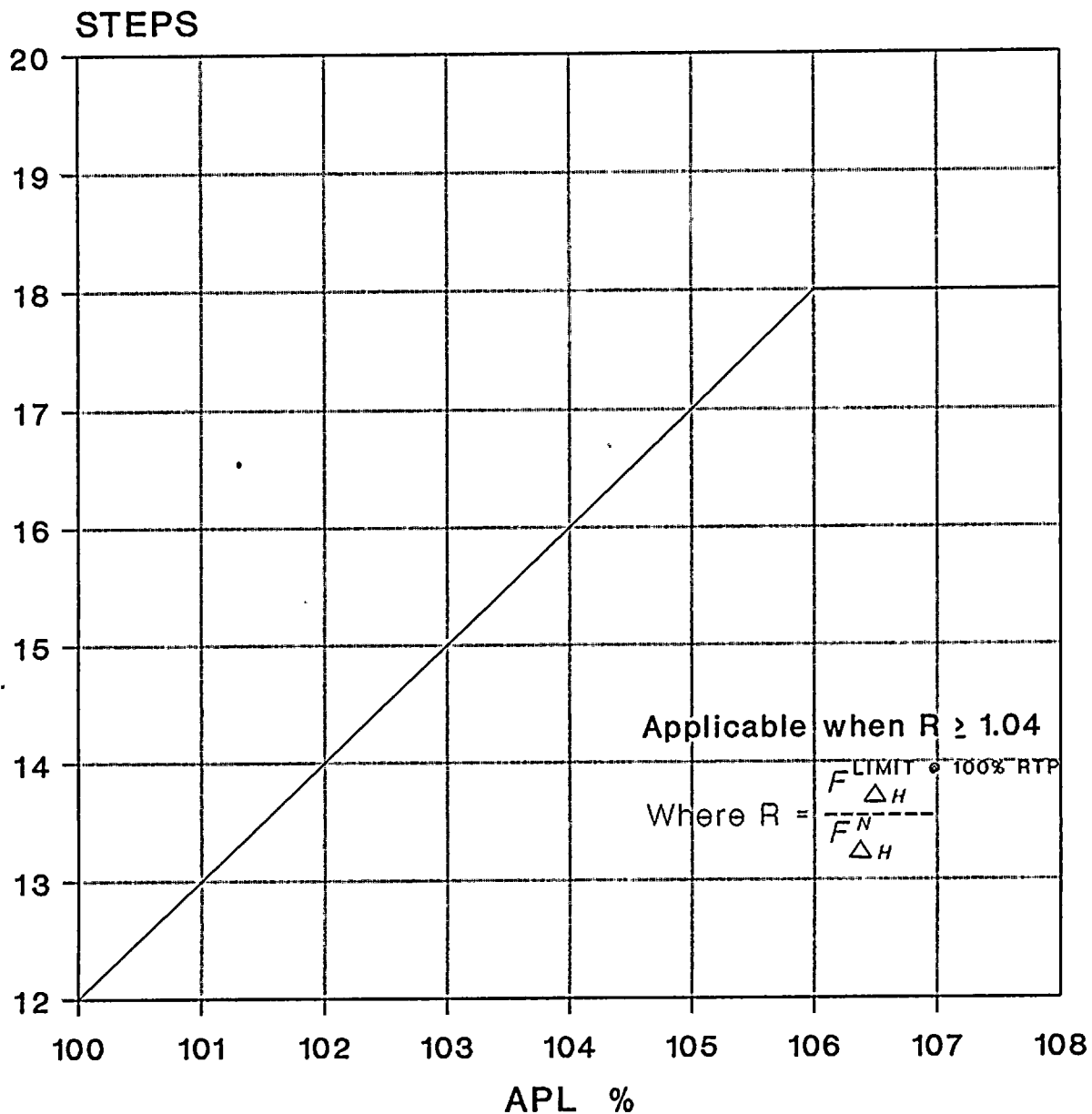
4.1.3.1.1 The position of each full length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 8 steps in any one direction at least once per 31 days.

4.1.3.1.3 The allowed rod misalignment for THERMAL POWER greater than 85% of RATED THERMAL POWER shall be determined in conjunction with the measurement of APL as defined in Specification 4.2.6.2.

ALLOWED ROD MISALIGNMENT ABOVE 85% RTP

FIGURE 3.1-4



REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

3.1.3.2 All shutdown and control rod position indicator channels and the demand position indication system shall be OPERABLE and capable of determining the rod positions within the allowed rod misalignment specified in Specification 3.1.3.1.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one rod position indicator channel per group inoperable either:
 1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.
- b. With a maximum of one demand position indicator per bank inoperable either:
 1. Verify that all rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of the allowed rod misalignment of each other, at least once per 8 hours, or
 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each rod position indicator channel shall be determined to be OPERABLE by verifying the demand position indication system and the rod position indicator channels agree within the allowed rod misalignment at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the demand position indication system and the rod position indicator channels at least once per 4 hours.

POWER DISTRIBUTION LIMITS

BASES

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, and nuclear enthalpy rise hot channel factor ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2.1, 4.2.2.2, 4.2.3, 4.2.6.1 and 4.2.6.2. This periodic surveillance is sufficient to ensure that the limits are maintained provided:

- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 18 steps from the group demand position (allowed rod misalignment) for power levels less than or equal to 85% of RATED THERMAL POWER. For power levels greater than 85% of RATED THERMAL POWER, the allowed rod misalignment is from ± 12 to ± 18 steps, which is dependent on the Allowable Power Level and the ratio of $F_{\Delta H}^N$ limit at 100% of RATED THERMAL POWER to maximum measured $F_{\Delta H}^N$ as indicated in Figure 3.1-4.
- b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6.
- c. The control rod insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are maintained.
- d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

$F_{\Delta H}^N$ will be maintained within its limits as specified in the COLR provided conditions a. through d. above are maintained. The relaxation of $F_{\Delta H}^N$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits. The form of this relaxation for DNBR limits is discussed in Section 2.1.1 of this basis.

When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. 5% is the appropriate allowance on F_Q for a full core map taken with the incore detector flux mapping system and 3% if the appropriate allowance for manufacturing tolerance.

