VOLUME 6

CNP UNITS 1 AND 2
IMPROVED TECHNICAL
SPECIFICATIONS CONVERSION

ITS SECTION 3.1
REACTIVITY CONTROL SYSTEMS

Revision 0

LIST OF ATTACHMENTS

ATTACHMENT 1

ITS 3.1.1, SDM

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.1

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN - ~~TAVG GREATER THAN 200°F~~ A.2

LIMITING CONDITION FOR OPERATION

LCO 3.1.1 — 3.1.1.1 The SHUTDOWN MARGIN shall be ~~greater than or equal to 1.3% Delta k/k~~. within the limits specified in the COLR LA.1

APPLICABILITY: MODES 1, 2*, 3, and 4. with k_{eff} < 1.0 A.3 A.4

ACTION:

ACTION A — With the SHUTDOWN MARGIN ~~less than 1.3% Delta k/k~~, not within limits ~~immediately~~ within 15 minutes initiate ~~and continue~~ boration ~~at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent~~ until the required SHUTDOWN MARGIN is restored. LA.1 L.1 L.2

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1 — 4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be ~~greater than or equal to 1.3% Delta k/k~~: within limits LA.1

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). See ITS 3.1.4 See ITS Chapter 1.0

b. When in MODE 1 or MODE 2 with Keff greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.5.

c. When in MODE 2 with Keff less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.5. See ITS 3.1.6

~~d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.5.~~ L.3

~~*See Special Test Exception 3.10.1.~~ A.4

ITS 3.1.1

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

MODE 2 with k_{eff} < 1.0 — M.1

SR 3.1.1.1 e. When in MODES 3 or 4, at least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration,
6. Samarium concentration, and
7. Boron penalty (MODE 4 only).

LA.2

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within plus or minus 1% Delta k/k at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.e, above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

See ITS 3.1.2

ITS 3.1.1

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN ~~- TAVG LESS THAN OR EQUAL TO 200°F~~ A.2

LIMITING CONDITION FOR OPERATION

LCO 3.1.1 — 3.1.1.2 The SHUTDOWN MARGIN shall be ~~greater than or equal to 1.0% Delta k/k~~ within the limits specified in the COLR. LA.1

APPLICABILITY: MODE 5. LA.1

ACTION:

ACTION A — With the SHUTDOWN MARGIN ~~less than 1.0% Delta k/k~~ not within limits, ~~immediately~~ within 15 minutes initiate ~~and continue~~ boration ~~at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent~~ until the required SHUTDOWN MARGIN is restored. L.1 L.2

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1 — 4.1.1.2 The SHUTDOWN MARGIN shall be determined to be ~~greater than or equal to 1.0% Delta k/k~~ within limits: LA.1

~~a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s).~~ See ITS 3.1.4 / See ITS Chapter 1.0

SR 3.1.1.1 — b. At least once per 24 hours ~~by consideration of the following factors:~~ LA.2

~~1. Reactor coolant system boron concentration,~~

~~2. Control rod position,~~

~~3. Reactor coolant system average temperature,~~

~~4. Fuel burnup based on gross thermal energy generation,~~

~~5. Xenon concentration~~

~~6. Samarium concentration, and~~

~~7. Boron penalty.~~

ITS 3.1.1

A.1

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ITS 3.1.1

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN - T_{AVG} GREATER THAN 200°F — A.2

LIMITING CONDITION FOR OPERATION

LCO 3.1.1

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k. [within the limits specified in the COLR] LA.1

APPLICABILITY: MODES 1, 2*, 3, and 4. [with k_{eff} < 1.0] A.3, A.4

ACTION:

ACTION A

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, [not within limits] immediately [within 15 minutes] initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored. LA.1, L.1, L.2

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k: [within limits] LA.1

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. [See ITS 3.1.4] If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). [See ITS Chapter 1.0]

b. When in MODE 1 or MODE 2 with K_{eff} greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2 with K_{eff} less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6. [See ITS 3.1.6]

d. ~~Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.6.~~ L.3

~~*See Special Test Exception 3.10.1.~~ A.4

ITS 3.1.1

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

MODE 2 with k_{eff} < 1.0

M.1

SR 3.1.1.1

e. When in MODES 3 or 4, at least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration,
6. Samarium concentration, and
7. Boron penalty (MODE 4 only).

LA.2

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within plus or minus 1% Delta k/k at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.e, above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

See ITS 3.1.2

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ITS 3.1.1

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN ~~- T_{avg} LESS THAN OR EQUAL TO 200°F~~ A.2

LIMITING CONDITION FOR OPERATION

LCO 3.1.1

3.1.1.2 The SHUTDOWN MARGIN shall be ~~greater than or equal to 1.0% Delta k/k~~ within the limits specified in the COLR. LA.1

APPLICABILITY: MODE 5. LA.1

ACTION:

ACTION A

With the SHUTDOWN MARGIN ~~less than 1.0% Delta k/k~~ not within limits, ~~immediately~~ within 15 minutes initiate ~~and continue~~ boration ~~at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent~~ until the required SHUTDOWN MARGIN is restored. L.1 L.2

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

4.1.1.2 The SHUTDOWN MARGIN shall be determined to be ~~greater than or equal to 1.0% Delta k/k~~ within limits: LA.1

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). See ITS 3.1.4 See ITS Chapter 1.0

SR 3.1.1.1

b. At least once per 24 hours ~~by consideration of the following factors:~~ LA.2

~~1. Reactor coolant system boron concentration,~~

~~2. Control rod position,~~

~~3. Reactor coolant system average temperature,~~

~~4. Fuel burnup based on gross thermal energy generation,~~

~~5. Xenon concentration,~~

~~6. Samarium concentration, and~~

~~7. Boron penalty.~~

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A.1

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ITS 3.1.1

A.1

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DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 CTS 3.1.1.1 provides SHUTDOWN MARGIN (SDM) requirements in MODES 1, 2, 3, and 4. CTS 3.1.1.2 provides SDM requirements in MODE 5. ITS 3.1.1 provides SDM requirements in MODE 2 with k_{eff} < 1.0 and MODES 3, 4, and 5. This changes the CTS by combining the SDM requirements for MODE 2 with k_{eff} < 1.0 and MODES 3, 4, and 5. The change in Applicability for MODE 1 and MODE 2 with $k_{eff} \geq 1.0$ are described in DOC A.3.

This change is acceptable because the requirements have not changed. Combining the Specifications is an editorial change. Any technical changes resulting from this combination are discussed in other DOCs. This change is designated as administrative because it does not result in a technical change to the CTS.

A.3 CTS 3.1.1.1 provides SDM requirements in MODES 1, 2, 3, and 4. CTS 4.1.1.1.1.b states that when in MODES 1 and 2 with $k_{eff} \geq 1.0$, verify that the control bank withdrawal is within the limits of Specification 3.1.3.5 (Unit 1) and Specification 3.1.3.6 (Unit 2), Control Rod Insertion Limits. ITS 3.1.1 is Applicable in MODE 2 with k_{eff} < 1.0 and MODES 3, 4, and 5. ITS 3.1.6 contains the control bank insertion requirements. This changes the CTS by dividing the SDM requirements and placing those applicable in MODE 2 with k_{eff} < 1.0 and MODES 3, 4, and 5 in ITS 3.1.1 and placing those applicable in MODE 1 and MODE 2 with $k_{eff} \geq 1.0$ in the control bank Specifications.

The purpose of CTS 3.1.1.1 is to ensure that the SDM assumed in the accident analyses is available. When the reactor is critical, SDM is verified by ensuring that the control rods are within the control rod insertion limits. The Applicability Bases to ITS 3.1.1 states that in MODES 1 and 2, SDM is ensured by complying with LCO 3.1.5, "Shutdown Bank Insertion Limits," and LCO 3.1.6, "Control Bank Insertion Limits." This change is acceptable because the SDM requirements have not changed. Even though CTS 3.1.1.1 is applicable in MODES 1 and 2, the CTS Surveillances only requires the verification that control rod bank withdrawal is within the control rod insertion limits (i.e., CTS 3.1.3.5 (Unit 1) and CTS 3.1.3.6 (Unit 2)). The ITS also verifies SDM in MODES 1 and 2 by the rod insertion limits. Any changes to the rod insertion limit requirements are discussed in DOCs for those Specifications. This change is designated as administrative because it does not result in a technical change to the CTS.

A.4 The Applicability of CTS 3.1.1.1 is MODES 1, 2, 3, and 4 with a footnote for MODE 2 stating "See Special Test Exception 3.10.1." ITS 3.1.1 Applicability does not contain the footnote or a reference to the Special Test Exception.

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

The purpose of the footnote reference is to alert the user that a Special Test Exception exists that may modify the Applicability of the Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative as it incorporates an ITS convention with no technical change to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 4.1.1.1.1.e requires SDM to be determined to be within its limit every 24 hours when in MODES 3 and 4. ITS SR 3.1.1.1 requires SDM to be determined to be within its limit not only in MODES 3 and 4, but also in MODE 2 with k_{eff} < 1.0. This changes the CTS by expanding the applicability of the Surveillance to include MODE 2 with k_{eff} < 1.0.

The purpose of the CTS 4.1.1.1.1.e is to verify that sufficient SDM is available. CTS 4.1.1.1.1.b states that when the reactor is in MODE 1 and MODE 2 with $k_{eff} \geq 1.0$, SDM is verified by determining that the control rods are above the rod insertion limits. In MODE 2 with k_{eff} < 1.0, CTS 4.1.1.1.1.c verifies SDM by determining that the predicted critical position is within the rod insertion limits within 4 hours prior to achieving criticality. However, no CTS Surveillance requires a periodic verification of SDM when in MODE 2 with k_{eff} < 1.0. This change is acceptable because the ITS requires specific verification that the SDM is within the limit when in MODE 2 with k_{eff} < 1.0 on a periodic basis. This change is designated as more restrictive because it expands the conditions under which a Surveillance must be performed.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 5 – Removal of Cycle-Specific Parameter Limits from the Technical Specifications to the Core Operating Limits Report)* CTS 3.1.1.1 and associated Action and CTS 4.1.1.1.1 require that the SDM be $\geq$ 1.3% Δk/k when in MODES 1, 2, 3, and 4. CTS 3.1.1.2 and associated Action and CTS 4.1.1.2 requires that the SDM be $\geq$ 1.0% Δk/k when in MODE 5. ITS 3.1.1 states that the SDM shall be within the limits of the COLR, ITS 3.1.1 ACTION A provides actions for when the SDM is not within the limits, and ITS SR 3.1.1.1 requires verification that the SDM is within limits. This changes the CTS by relocating the SDM limits, which must be confirmed on a cycle-specific basis, to the COLR.

The removal of these cycle-specific parameter limits from the Technical Specifications to the COLR is acceptable because the cycle-specific limits are developed or utilized under NRC-approved methodologies which will ensure that the Safety Limits are met. The NRC documented in Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits From Technical Specifications," that this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the SDM requirement. The methodologies used to develop the parameters in the COLR have obtained prior approval by the NRC in accordance with Generic Letter 88-16. Also, this change is acceptable because the removed information will be adequately controlled in the COLR under the requirements provided in ITS 5.6.5, "Core Operating Limits Report." ITS 5.6.5 ensures that the applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems limits, and nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analyses are met. This change is designated as a less restrictive removal of detail change because information relating to cycle-specific parameter limits is being removed from the Technical Specifications.

LA.2 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.1.1.1.1.e and 4.1.1.2.b require determination that the SDM is within limits, and specifically require the consideration of the following factors: reactor coolant system boron concentration, control rod position, reactor coolant system average temperature, fuel burnup based on gross thermal energy generation, xenon concentration, samarium concentration, and boron penalty (MODES 4 and 5 only). ITS SR 3.1.1.1 requires determination that SDM is within limits, but does not describe the factors that must be considered in the calculation. This information is relocated to the Bases. This changes the CTS by removing details on how the SDM calculation is performed from the Specifications and placing the information in the Bases.

The removal of these details for performing Surveillance Requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that the SDM be within limits. The details of how SDM is calculated does not need to appear in the Specification in order for the requirement to apply. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the CTS.

LESS RESTRICTIVE CHANGES

L.1 *(Category 3 – Relaxation of Completion Time)* CTS 3.1.1.1 and CTS 3.1.1.2 Actions state that when the SDM is less than the applicable limit, boration must be initiated immediately. ITS 3.1.1 ACTION A states that when SDM is not within limits, boration must be initiated within 15 minutes. This changes the CTS by relaxing the Completion Time from "immediately" to 15 minutes.

The purpose of CTS 3.1.1.1 and CTS 3.1.1.2 Actions is to restore the SDM to within its limit promptly. This change is acceptable because the Completion Time

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

is consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time. The ITS Completion Time of 15 minutes is adequate for an operator to correctly align and start the required systems and components. In addition, the ITS Bases for the ACTION state that boration must be initiated promptly. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L.2 *(Category 4 – Relaxation of Required Action)* CTS 3.1.1.1 and CTS 3.1.1.2 Actions state that when the SDM is not within the applicable limits, boration must be initiated and continued at $\geq$ 34 gpm of a solution containing $\geq$ 6,550 ppm boron or equivalent until the required SDM is restored. ITS 3.1.1 ACTION A states that with the SDM not within limits, initiate boration to restore SDM to within limits. This changes the CTS by eliminating the specific values of flow rate and boron concentration that must be used to restore compliance with the LCO.

The purpose of the CTS 3.1.1.1 and CTS 3.1.1.2 Actions is to restore the SDM to within its limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. Removing the specific values of flow rate and boron concentration from the CTS Action provides flexibility in the restoration of the SDM and eliminates conflicts between the SDM value and the specific boration values in the CTS Action. As stated in the ITS Bases for ACTION A, "In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. Since it is imperative to raise the boron concentration of the RCS as soon as possible, the boron concentration should be a highly concentrated solution, such as that normally found in the boric acid tank or the refueling water storage tank. The operator should borate with the best source available for the unit conditions." Specifying a minimum flow rate and concentration in the ACTION may not accomplish the objective of raising the RCS boron concentration as soon as possible. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.3 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.1.1.1.d requires verification that SDM is within its limit, "Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.5 (Unit 1) and Specification 3.1.3.6 (Unit 2)." The ITS does not contain a similar requirement.

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

The purpose of CTS 4.1.1.1.1.d is to verify the core design predictions by determining the SDM with the control rods at the insertion limits. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify the LCO is within limit. The core design predictions, such as rod worth, boron worth, and critical boron concentration, are verified during the startup physics test program. Thus, the SDM continues to be verified in a manner and at a Frequency necessary to give confidence that the parameter is within limit. The critical boron concentration is verified periodically by ITS 3.1.2. Therefore, the core design parameters upon which SDM relies are verified before exceeding 5% RATED THERMAL POWER after each refueling outage. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1.1, LCO 3.1.1.2

LCO 3.1.1 SDM shall be within the limits specified in the COLR.

APPLICABILITY: MODE 2 with $k_{eff} < 1.0$,
MODES 3, 4, and 5.

ACTIONS

3.1.1.1 Action, 3.1.1.2 Action

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limits.	A.1 Initiate boration to restore SDM to within limits.	15 minutes

SURVEILLANCE REQUIREMENTS

4.1.1.1.1, 4.1.1.1.e, 4.1.1.2, 4.1.1.2.b

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify SDM to be within limits.	24 hours

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

None.

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Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.1 SHUTDOWN MARGIN (SDM)

BASES

INSERT 1 | making and | two independent

BACKGROUND

INSERT 2
INSERT 3

According to GDC 26 (Ref. 1), the reactivity control systems must be redundant and capable of holding the reactor core subcritical when shut down under cold conditions. Maintenance of the SDM ensures that postulated reactivity events will not damage the fuel. ①

transients

SDM requirements provide sufficient reactivity margin to ensure that acceptable fuel design limits will not be exceeded for normal shutdown and anticipated operational occurrences (AOOs). As such, the SDM defines the degree of subcriticality that would be obtained immediately following the insertion or scram of all shutdown and control rods, assuming that the single rod cluster assembly of highest reactivity worth is fully withdrawn.

making and holding

The system design requires that two independent reactivity control systems be provided, and that one of these systems be capable of maintaining the core subcritical under cold conditions. These requirements are provided by the use of movable control assemblies and soluble boric acid in the Reactor Coolant System (RCS). The Control Rod System can compensate for the reactivity effects of the fuel and water temperature changes accompanying power level changes over the range from full load to no load. In addition, the Control Rod System, together with the boration system, provides the SDM during power operation and is capable of making the core subcritical rapidly enough to prevent exceeding acceptable fuel damage limits, assuming that the rod of highest reactivity worth remains fully withdrawn. The soluble boron system can compensate for fuel depletion during operation and all xenon burnout reactivity changes and maintain the reactor subcritical under cold conditions. ② ②

INSERT 4 ②

INSERT 5

During power operation, SDM control is ensured by operating with the shutdown banks fully withdrawn and the control banks within the limits of LCO 3.1.6, "Control Bank Insertion Limits." When the unit is in the shutdown and refueling modes, the SDM requirements are met by means of adjustments to the RCS boron concentration. ③

MODE 3, 4, 5, or 6

INSERT 6 ③

2 **INSERT 1**

Plant Specific Design Criterion (PSDC) 27

2 **INSERT 2**

provided. According to PSDC 28 (Ref. 1), the reactivity controls must be

2 **INSERT 3**

from any hot standby or hot operating condition. According to PSDC 29 (Ref. 1), one of the reactivity control systems provided shall be capable of making the core subcritical under any anticipated operating condition (including anticipated operational transients) sufficiently fast enough to prevent exceeding acceptable fuel damage limits. SDM should assure subcriticality with the most reactive RCCA fully withdrawn. According to PSDC 30, the reactivity control systems provided shall be capable of making the core subcritical under credible accident conditions with appropriate margins for contingencies, and shall be capable of limiting any subsequent return to power such that there will be no undue risk to the health and safety of the public.

2 **INSERT 4**

along with the shutdown and control rods

3 **INSERT 5**

When the unit is in MODE 1 or MODE 2 with the reactor critical,

3 **INSERT 6**

When the unit is in MODE 2 with the reactor subcritical, SDM control is ensured by operating with the shutdown banks fully withdrawn and the control banks within the estimated critical control bank position.

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antipated operational transients

BASES

APPLICABLE SAFETY ANALYSES

The minimum required SDM is assumed as an initial condition in safety analyses. The safety analysis (Ref. 2) establishes a SDM that ensures specified acceptable fuel design limits are not exceeded for normal ~~operation and AOOs~~, with the assumption of the highest worth rod stuck out on scram. For MODE 5, the primary safety analysis that relies on the SDM limits is the boron dilution analysis. (2) (2)

The acceptance criteria for the SDM requirements are that specified acceptable fuel design limits are maintained. This is done by ensuring that:

a. The reactor can be made subcritical from all operating conditions, transients, and Design Basis Events, ; (5)

b. The reactivity transients associated with postulated accident conditions are controllable within acceptable limits (departure from nucleate boiling ratio (DNBR), fuel centerline temperature limits for AOOs, and ≤ 280 cal/gm energy deposition for the rod ejection accident), and ; (2) (5)

200

anticipated operational transients

c. The reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

The most limiting accident for the SDM requirements is based on a main steam line break (MSLB), as described in the accident analysis (Ref. 2). The increased steam flow resulting from a pipe break in the main steam system causes an increased energy removal from the affected steam generator (SG), and consequently the RCS. This results in a reduction of the reactor coolant temperature. The resultant coolant shrinkage causes a reduction in pressure. In the presence of a negative moderator temperature coefficient, this cooldown causes an increase in core reactivity. As RCS temperature decreases, the severity of an MSLB decreases until the MODE 5 value is reached. The most limiting MSLB, with respect to potential fuel damage before a reactor trip occurs, is a guillotine break of a main steam line inside containment initiated at the end of core life. The positive reactivity addition from the moderator temperature decrease will terminate when the affected SG boils dry, thus terminating RCS heat removal and cooldown. Following the MSLB, a post trip return to power may occur; however, no fuel damage occurs as a result of the post trip return to power, and THERMAL POWER does not violate the Safety Limit (SL) requirement of SL 2.1.1. (3) (2) (2)

In addition to the limiting MSLB transient, the SDM requirement must also protect against:

BASES

APPLICABLE SAFETY ANALYSES (continued)

a. Inadvertent boron dilution;

b. An uncontrolled rod withdrawal from subcritical or low power condition; and

c. ~~Startup of an inactive reactor coolant pump (RCP), and~~

c. ~~d.~~ Rod ejection.

(5)

Each of these events is discussed below.

INSERT 7

In the boron dilution analysis, the required SDM defines the reactivity difference between an initial subcritical boron concentration and the corresponding critical boron concentration. These values, in conjunction with the configuration of the RCS and the assumed dilution flow rate, directly affect the results of the analysis. This event is most limiting at the beginning of core life, when critical boron concentrations are highest. (2)

Depending on the system initial conditions and reactivity insertion rate, the uncontrolled rod withdrawal transient is terminated by either a high power level ~~trip or a high pressurizer pressure~~ trip. In all cases, power level, RCS pressure, linear heat rate, and the DNBR do not exceed allowable limits. (2)

(3)

INSERT 8

~~The startup of an inactive RCP will not result in a "cold water" criticality, even if the maximum difference in temperature exists between the SG and the core. The maximum positive reactivity addition that can occur due to an inadvertent RCP start is less than half the minimum required SDM. Startup of an idle RCP cannot, therefore, produce a return to power from the hot standby condition.~~ (2)

The ejection of a control rod rapidly adds reactivity to the reactor core, causing both the core power level and heat flux to increase with corresponding increases in reactor coolant temperatures and pressure. The ejection of a rod also produces a time dependent redistribution of core power.

SDM satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii). ~~Even though it is not directly observed from the control room, SDM is considered an initial condition process variable because it is periodically monitored to ensure that the unit is operating within the bounds of accident analysis assumptions.~~ (4)

2

INSERT 7

The boron dilution analysis covers operation during shutdown, refueling, startup, and power operation. The purpose of the analysis is to show that, from initiation of the event, sufficient time is available to allow the operator to determine the cause of the dilution and to take corrective action before the SDM is lost.

2

INSERT 8

, overtemperature ΔT, overpower ΔT, or pressurizer water level

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BASES

LCO

SDM is a core design condition that can be ensured during operation through control rod positioning (control and shutdown banks) and through the soluble boron concentration.

The MSLB (Ref. 2 3) and the boron dilution (Ref. 3 4) accidents analyses are the most limiting analyses that establish the SDM value of the LCO. For MSLB accidents, if the LCO is violated, there is a potential to exceed the DNBR limit and to exceed 10 CFR 100, "Reactor Site Criteria," limits (Ref. 4 5). For the boron dilution accident, if the LCO is violated, the minimum required time assumed for operator action to terminate dilution may no longer be applicable. ② ② ②

APPLICABILITY

In MODE 2 with k_{eff} < 1.0 and in MODES 3, 4, and 5, the SDM requirements are applicable to provide sufficient negative reactivity to meet the assumptions of the safety analyses discussed above. In MODE 6, the shutdown reactivity requirements are given in LCO 3.9.1, "Boron Concentration." In MODES 1 and 2 with keff ≥ 1.0, SDM is ensured by complying with LCO 3.1.5, "Shutdown Bank Insertion Limits," and LCO 3.1.6. ③

ACTIONS

A.1

If the SDM requirements are not met, boration must be initiated promptly. A Completion Time of 15 minutes is adequate for an operator to correctly align and start the required systems and components. It is assumed that boration will be continued until the SDM requirements are met.

In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. Since it is imperative to raise the boron concentration of the RCS as soon as possible, the boron concentration should be a highly concentrated solution, such as that normally found in the boric acid storage tank, or the borated refueling water storage tank. The operator should borate with the best source available for the plant unit conditions. ②

In determining the boration flow rate, the time in core life must be considered. For instance, the most difficult time in core life to increase the RCS boron concentration is at the beginning of cycle when the boron concentration may approach or exceed 2000 ppm. Assuming that a value of 1% Δk/k must be recovered and a boration flow rate of [ ] 34 gpm, it is possible to increase the boron concentration of the RCS by 100 ppm in approximately 35 44 minutes. If a boron worth of 10 pcm/ppm is assumed, this combination of parameters will increase the SDM by 1% Δk/k. These boration parameters of [ ] 34 gpm and [ ] 6550 ppm represent ⑥ ⑥ ⑥

BASES

ACTIONS (continued) INSERT 8a (2)

typical values and are provided for the purpose of offering a specific example.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

In MODES 1 and 2 with $K_{eff} \geq 1.0$, SDM is verified by observing that the requirements of LCO 3.1.5 and LCO 3.1.6 are met. In the event that a rod is known to be untrippable, however, SDM verification must account for the worth of the untrippable rod as well as another rod of maximum worth. INSERT 9 (3)

In MODES 3, 4, and 5, the SDM is verified by performing a reactivity balance calculation, considering the listed reactivity effects: (5)

a. RCS boron concentration, ;

b. Control bank position, (2) (5)

c. RCS average temperature, ;

d. Fuel burnup based on gross thermal energy generation, (5)

e. Xenon concentration, ;

f. Samarium concentration, and

g. Isothermal temperature coefficient (ITC). ; INSERT 10 (2)

INSERT 11

Using the ITC accounts for Doppler reactivity in this calculation because the reactor is subcritical, and the fuel temperature will be changing at the same rate as the RCS. (2)

The Frequency of 24 hours is based on the generally slow change in required boron concentration and the low probability of an accident occurring without the required SDM. This allows time for the operator to collect the required data, which includes performing a boron concentration analysis, and complete the calculation.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26. INSERT 12 (1)

2. U FSAR, Chapter 15. (14) (2) (6)

2 **INSERT 8a**

the current licensed values

2 **INSERT 9**

MODE 2 with keff < 1.0,

2 **INSERT 10**

h. Boron penalty (MODES 4 and 5 only).

2 **INSERT 11**

The boron penalty must be applied in MODES 4 and 5 since all reactor coolant pumps may be stopped in these MODES. This extra amount of boron ensures that minimum response times are met for the operator to diagnose and mitigate an inadvertent boron dilution event prior to loss of SDM.

1 **INSERT 12**

UFSAR, Section 1.4.5.

BASES

REFERENCES (continued) (u) Section 14.2.5

3. FSAR, ~~Chapter [15]~~. ② ⑥

INSERT 13 ②

⑤ ~~4~~ 10 CFR 100.

2 **INSERT 13**

4. UFSAR, Section 14.1.5.

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.1 BASES, SHUTDOWN MARGIN (SDM)

1. CNP Units 1 and 2 were designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. CNP Units 1 and 2 were designed and constructed to meet the intent of the proposed General Design Criteria, published in 1967. However, the CNP UFSAR contains discussions of the Plant Specific Design Criteria (PSDCs) used in the design of CNP Units 1 and 2. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

2. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to the Background section to be consistent with the discussion in the Applicability section.

4. The Applicable Safety Analyses discussion states that SDM satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii). It also says that even though SDM is not directly observed from the control room, SDM is considered an initial condition process variable because it is periodically monitored to ensure that the unit is operating within the bounds of the accident analysis assumptions. The additional sentence has been deleted. The NRC Final Policy Statement on Technical Improvements of July 22, 1993 (58 FR 39132) states that process variables captured by Criterion 2 are not limited to only those directly monitored and controlled from the control room. It also states that Criterion 2 includes other features or characteristics that are specifically assumed in Design Basis Accident and Transient analyses even if they cannot be directly observed in the control room (e.g., moderator temperature coefficient and hot channel factors). Since the Final Policy Statement provides guidance on which types of parameters satisfy Criterion 2, there is no reason to duplicate these words in the CNP ITS.

5. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

6. The brackets have been removed and the proper plant specific information/value has been provided.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 2

ITS 3.1.2, Core Reactivity

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.2

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL — Core Reactivity — A.2

~~SHUTDOWN MARGIN - TAVG GREATER THAN 200°F~~

LIMITING CONDITION FOR OPERATION — Add proposed LCO 3.1.2 — A.2

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k. — See ITS 3.1.1

APPLICABILITY: MODES 1, 2*, ~~3, and 4.~~ — L.1

ACTION:

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k: — See ITS 3.1.1

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. — See ITS 3.1.4 If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). — See ITS Chapter 1.0

b. When in MODE 1 or MODE 2 with Keff greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.5.

c. When in MODE 2 with Keff less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.5. — See ITS 3.1.6

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.5. — See ITS 3.1.1

Add proposed ACTIONS A and B — L.2

*See Special Test Exception 3.10.1. — See ITS 3.1.1

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ITS 3.1.2

A.1

ITS

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

e. When in MODES 3 or 4, at least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration,
6. Samarium concentration, and
7. Boron penalty (MODE 4 only).

See ITS 3.1.1

Prior to entering MODE 1 after refueling and

M.1

SR 3.1.2.1

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within plus or minus 1% Delta k/k at least ~~once per 31 Effective Full Power Days (EFPD).~~ ~~This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.e, above.~~ The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

L.3

LA.1

ITS 3.1.2

A.1

ITS

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

Core Reactivity — A.2

~~SHUTDOWN MARGIN~~ - T_{AVG} ~~GREATER THAN 200°F~~

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.1.2 — A.2

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k. — See ITS 3.1.1

APPLICABILITY: MODES 1, 2*, 3, and 4. — L.1

ACTION:

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored. — See ITS 3.1.1

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k:

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. — See ITS 3.1.4 If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). — See ITS Chapter 1.0

b. When in MODE 1 or MODE 2 with K_{eff} greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2 with K_{eff} less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6. — See ITS 3.1.6

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.6. — See ITS 3.1.1

Add proposed ACTIONS A and B — L.2

*See Special Test Exception 3.10.1. — See ITS 3.1.1

ITS 3.1.2

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

e. When in MODES 3 or 4, at least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration,
6. Samarium concentration, and
7. Boron penalty (MODE 4 only).

See ITS 3.1.1

M.1

Prior to entering MODE 1 after refueling and

L.3

LA.1

SR 3.1.2.1

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within plus or minus 1% Delta k/k at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.e, above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

DISCUSSION OF CHANGES
ITS 3.1.2, CORE REACTIVITY

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 CTS 4.1.1.1.2 requires the overall core reactivity balance be compared to predicted values to demonstrate agreement within +/- 1% $\Delta k/k$. However, this Surveillance is currently part of the SHUTDOWN MARGIN Specification. A new LCO, ITS LCO 3.1.2, requires the measured core reactivity to be within +/- 1% $\Delta k/k$ of predicted values. This changes the CTS by having a separate Specification for the Core Reactivity requirement.

This change is acceptable because the requirements have not changed. Converting the requirement from a Surveillance in the SHUTDOWN MARGIN Specification to an LCO is consistent with the ITS format and content guidance. Any technical changes resulting from this change are discussed in other DOCs. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M.1 ITS SR 3.1.2.1 requires the measured core reactivity to be determined to be within +/- 1% $\Delta k/k$ of the predicted value prior to entering MODE 1 after each refueling. The CTS does not contain a similar requirement. This changes the CTS by adding an additional performance requirement for the core reactivity balance SR.

This change is acceptable because it requires a test that demonstrates agreement between the core design and the core design predictions prior to raising core power above 5% after each refueling. This verification, which is currently performed as part of the startup physics testing program, gives additional confidence that the core design is acceptable for operation at full power. This change is designated as more restrictive because it adds a Surveillance Requirement that does not appear in the CTS.

RELOCATED SPECIFICATIONS

None

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DISCUSSION OF CHANGES
ITS 3.1.2, CORE REACTIVITY

REMOVED DETAIL CHANGES

LA.1 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.1.1.1.2 requires comparison of the actual and predicted core reactivity balance and specifically requires consideration of at least those factors stated in Specification 4.1.1.1.1.e. CTS 4.1.1.1.1.e requires determination of SDM and requires the consideration of the following factors: reactor coolant system boron concentration, control rod position, reactor coolant system average temperature, fuel burnup based on gross thermal energy generation, xenon concentration, and samarium concentration. ITS SR 3.1.2.1 requires comparison of the actual and predicted core reactivity, but does not describe the factors that must be considered in the calculation. This information is relocated to the Bases. This changes the CTS by removing details on how the core reactivity balance comparison calculation is performed from the CTS and placing the information in the Bases.

The removal of these details for performing Surveillance Requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that the core reactivity balance comparison be within +/- 1% $\Delta k/k$. The details of how this comparison is calculated does not need to appear in the Specification in order for the requirement to apply. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the CTS.

LESS RESTRICTIVE CHANGES

L.1 *(Category 2 – Relaxation of Applicability)* CTS 3.1.1.1 is applicable in MODES 1, 2, 3, and 4. ITS 3.1.2 is applicable in MODES 1 and 2. This changes the CTS by reducing the applicable MODES in which the core reactivity requirement must be met.

The purpose of CTS Surveillance 4.1.1.1.2 is to verify the core design by comparing the actual and predicted core reactivity. This change is acceptable because the requirements continue to ensure that the process variables are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. The core reactivity balance can only be determined when the reactor is critical (MODES 1 and 2). Additionally, the Surveillance Frequency is once per 31 EFPD, which only continues to accrue when the reactor is critical. Therefore, reducing the applicable MODES from MODES 1, 2, 3, and 4 to MODES 1 and 2 does not result in a reduction of the verification of this important measure of core design accuracy. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

DISCUSSION OF CHANGES
ITS 3.1.2, CORE REACTIVITY

L.2 *(Category 4 – Relaxation of Required Action)* CTS 3.1.1.1 does not contain Actions to follow if the core reactivity balance Surveillance is not met. If the core reactivity balance Surveillance was not met, LCO 3.0.3 would be entered. LCO 3.0.3 requires the plant to be in MODE 3 within 7 hours, MODE 4 within 13 hours, and MODE 5 within 37 hours. ITS 3.1.2 contains ACTIONS to follow if the core reactivity balance LCO is not met. If the LCO is not met, 7 days is provided to re-evaluate the core design and safety analysis, to determine that the reactor core is acceptable for continued operation, and to establish appropriate operating restrictions and SRs. If these actions are not completed within the 7 days, the plant must be in MODE 3 within 6 hours. This changes the CTS by providing 7 days to evaluate and provide compensatory measures for not meeting the core reactivity balance requirement and then requiring entry into MODE 3 instead of requiring an immediate shutdown and entry into MODE 5.

The purpose of CTS 4.1.1.1.2 is to verify the accuracy of the core design by comparing the predicted and actual core reactivity throughout core life. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. Should the core reactivity balance requirement not be met, time is required to determine the cause of the disagreement and what adjustments may be needed to the operating conditions of the core. The startup physics testing program is used to verify most of the critical core design parameters, such as control rod worth, boron worth, and moderator temperature coefficient. In addition, there is considerable conservatism in the application of these values in the accident analysis. Therefore, allowing a time to evaluate the difference and make any adjustments to the operational controls is acceptable. The 7 day Completion Time is reasonable considering the complexity of the evaluations and the time to meet administrative requirements, such as 10 CFR 50.59 safety evaluation preparation and approval. If it cannot be determined within 7 days that the core is acceptable for continued operation, the unit must be shutdown. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.3 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS Surveillance 4.1.1.1.2 requires the overall core reactivity balance to be compared with the predicted value once per 31 EFPD. The CTS also requires the predicted reactivity values to be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 EFPD after each fuel loading. ITS SR 3.1.2.1 also allows the measured core reactivity to be compared to the predicted values every 31 EFPD, but the ITS SR is only required after 60 EFPD of core burnup. The ITS also requires the adjustment of the predicted values to the actual values prior to exceeding a fuel burnup of 60 EFPD after each fuel loading. This changes the CTS by not requiring the periodic, at-power core reactivity comparison until core burnup reaches 60 EFPD.

DISCUSSION OF CHANGES
ITS 3.1.2, CORE REACTIVITY

The purpose of CTS 4.1.1.1.2 is to verify the agreement between the actual and predicted core reactivity. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The CTS and the ITS requires the predicted core reactivity values to be normalized to the actual values prior to exceeding 60 EFPD of core burnup. This allows sufficient time for core conditions to reach steady state, but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. The required subsequent Frequency of 31 EFPD, following the initial 60 EFPD after fuel loading, is acceptable, based on the slow rate of core reactivity changes due to fuel depletion and the presence of other indicators (QPTR, AFD, etc.) for prompt indication of an anomaly. In addition, a new Frequency has been added to ensure core reactivity is within limits prior to entering MODE 1 after each refueling (see DOC M.1). This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 Core Reactivity

DOC A.2

LCO 3.1.2 The measured core reactivity shall be within ± 1% $\Delta k/k$ of predicted values.

APPLICABILITY: MODES 1 and 2.

DOC L.1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Measured core reactivity not within limit.	A.1	Re-evaluate core design and safety analysis, and determine that the reactor core is acceptable for continued operation.	7 days
	AND		
	A.2	Establish appropriate operating restrictions and SRs.	7 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours

DOC L.2

DOC L.2

CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	- NOTE - The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading.	must
	Verify measured core reactivity is within ± 1% Δk/k of predicted values.	Prior to entering MODE 1 after each refueling AND - NOTE - Only required after 60 EFPD 31 EFPD thereafter

4.1.1.1.2

①

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.2, CORE REACTIVITY

1. ISTS SR 3.1.2.1 has been modified to be consistent with the current licensing basis. The predicted reactivity values must (not may) be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 EFPD after each refueling. This is necessary to ensure there is a benchmark for the design calculations. This change is also consistent with the ISTS Bases.

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Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.2 Core Reactivity

BASES

BACKGROUND

INSERT 1

and startup

According to GDC 26, GDC 28, and GDC 29 (Ref. 1), reactivity shall be controllable, such that subcriticality is maintained under cold conditions, and acceptable fuel design limits are not exceeded during normal operation and anticipated operational occurrences. Therefore, reactivity balance is used as a measure of the predicted versus measured core reactivity during power operation. The periodic confirmation of core reactivity is necessary to ensure that Design Basis Accident (DBA) and transient safety analyses remain valid. A large reactivity difference could be the result of unanticipated changes in fuel, control rod worth, or operation at conditions not consistent with those assumed in the predictions of core reactivity, and could potentially result in a loss of SDM or violation of acceptable fuel design limits. Comparing predicted versus measured core reactivity validates the nuclear methods used in the safety analysis and supports the SDM demonstrations (LCO 3.1.1, "SHUTDOWN MARGIN (SDM)") in ensuring the reactor can be brought safely to cold, subcritical conditions. ① ②

When the reactor core is critical or in normal power operation, a reactivity balance exists and the net reactivity is zero. A comparison of predicted and measured reactivity is convenient under such a balance, since parameters are being maintained relatively stable under steady state power conditions. The positive reactivity inherent in the core design is balanced by the negative reactivity of the control components, thermal feedback, neutron leakage, and materials in the core that absorb neutrons, such as burnable absorbers producing zero net reactivity. Excess reactivity can be inferred from the boron letdown curve (or critical boron curve), which provides an indication of the soluble boron concentration in the Reactor Coolant System (RCS) versus cycle burnup. Periodic measurement of the RCS boron concentration for comparison with the predicted value with other variables fixed (such as rod height, temperature, pressure, and power), provides a convenient method of ensuring that core reactivity is within design expectations and that the calculational models used to generate the safety analysis are adequate.

In order to achieve the required fuel cycle energy output, the uranium enrichment, in the new fuel loading and in the fuel remaining from the previous cycle, provides excess positive reactivity beyond that required to sustain steady state operation throughout the cycle. When the reactor is critical at RTP and moderator temperature, the excess positive reactivity is compensated by burnable absorbers (if any), control rods, whatever

1 INSERT 1

According to Plant Specific Design Criterion (PSDC) 28 (Ref. 1), the reactivity controls provided shall be capable of making and holding the core subcritical from any hot standby or hot operating condition. According to PSDC 29 (Ref. 1), one of the reactivity control systems provided shall be capable of making the core subcritical under any anticipated operating condition (including anticipated operational transients) sufficiently fast enough to prevent exceeding acceptable fuel damage limits. SDM should assure subcriticality with the most reactive RCCA fully withdrawn. According to PSDC 30 (Ref. 1) , the reactivity control systems provided shall be capable of making the core subcritical under credible accident conditions with appropriate margins for contingencies, and shall be capable of limiting any subsequent return to power such that there will be no undue risk to the health and safety of the public.

Core Reactivity
B 3.1.2

BASES

BACKGROUND (continued)

neutron poisons (mainly xenon and samarium) are present in the fuel, and the RCS boron concentration.

adjusted

When the core is producing THERMAL POWER, the fuel is being depleted and excess reactivity is decreasing. As the fuel depletes, the RCS boron concentration is reduced to ~~decrease negative reactivity and~~ maintain constant THERMAL POWER. The boron letdown curve is based on steady state operation at RTP. Therefore, deviations from the predicted boron letdown curve may indicate deficiencies in the design analysis, deficiencies in the calculational models, or abnormal core conditions, and must be evaluated. 2

APPLICABLE SAFETY ANALYSES

The acceptance criteria for core reactivity are that the reactivity balance limit ensures ~~plant~~ unit operation is maintained within the assumptions of the safety analyses. 2

Accurate prediction of core reactivity is either an explicit or implicit assumption in the accident analysis evaluations. Every accident evaluation (Ref. 2) is, therefore, dependent upon accurate evaluation of core reactivity. In particular, SDM and reactivity transients, such as control rod withdrawal accidents or rod ejection accidents, are very sensitive to accurate prediction of core reactivity. These accident analysis evaluations rely on computer codes that have been qualified against available test data, operating ~~plant~~ unit data, and analytical benchmarks. Monitoring reactivity balance additionally ensures that the nuclear methods provide an accurate representation of the core reactivity. 2

Design calculations and safety analyses are performed for each fuel cycle for the purpose of predetermining reactivity behavior and the RCS boron concentration requirements for reactivity control during fuel depletion.

The comparison between measured and predicted initial core reactivity provides a normalization for the calculational models used to predict core reactivity. If the measured and predicted RCS boron concentrations for identical core conditions at beginning of cycle (BOC) do not agree, then the assumptions used in the reload cycle design analysis or the calculational models used to predict soluble boron requirements may not be accurate. If reasonable agreement between measured and predicted core reactivity exists at BOC, then the prediction may be normalized to the measured boron concentration. Thereafter, any significant deviations in the measured boron concentration from the predicted boron letdown

BASES

APPLICABLE SAFETY ANALYSES (continued)

curve that develop during fuel depletion may be an indication that the calculational model is not adequate for core burnups beyond BOC, or that an unexpected change in core conditions has occurred.

The normalization of predicted RCS boron concentration to the measured value is typically performed after reaching RTP following startup from a refueling outage, with the control rods in their normal positions for power operation. The normalization is performed at BOC conditions, so that core reactivity relative to predicted values can be continually monitored and evaluated as core conditions change during the cycle.

Core reactivity satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Long term core reactivity behavior is a result of the core physics design and cannot be easily controlled once the core design is fixed. During operation, therefore, the LCO can only be ensured through measurement and tracking, and appropriate actions taken as necessary. Large differences between actual and predicted core reactivity may indicate that the assumptions of the DBA and transient analyses are no longer valid, or that the uncertainties in the Nuclear Design Methodology are larger than expected. A limit on the reactivity balance of ± 1% Δk/k has been established based on engineering judgment. A 1% deviation in reactivity from that predicted is larger than expected for normal operation and should therefore be evaluated.

When measured core reactivity is within 1% Δk/k of the predicted value at steady state thermal conditions, the core is considered to be operating within acceptable design limits. Since deviations from the limit are normally detected by comparing predicted and measured steady state RCS critical boron concentrations, the difference between measured and predicted values would be approximately 100 ppm (depending on the boron worth) before the limit is reached. These values are well within the uncertainty limits for analysis of boron concentration samples, so that spurious violations of the limit due to uncertainty in measuring the RCS boron concentration are unlikely.

APPLICABILITY

The limits on core reactivity must be maintained during MODES 1 and 2 because a reactivity balance must exist when the reactor is critical or producing THERMAL POWER. As the fuel depletes, core conditions are changing, and confirmation of the reactivity balance ensures the core is operating as designed. This Specification does not apply in MODES 3, 4,

BASES

APPLICABILITY (continued)

and 5 because the reactor is shut down and the reactivity balance is not changing.

In MODE 6, fuel loading results in a continually changing core reactivity. Boron concentration requirements (LCO 3.9.1, "Boron Concentration") ensure that fuel movements are performed within the bounds of the safety analysis. An SDM demonstration is required during the first startup following operations that could have altered core reactivity (e.g., fuel movement, control rod replacement, control rod shuffling).

ACTIONS

A.1 and A.2

Should an anomaly develop between measured and predicted core reactivity, an evaluation of the core design and safety analysis must be performed. Core conditions are evaluated to determine their consistency with input to design calculations. Measured core and process parameters are evaluated to determine that they are within the bounds of the safety analysis, and safety analysis calculational models are reviewed to verify that they are adequate for representation of the core conditions. The required Completion Time of 7 days is based on the low probability of a DBA occurring during this period, and allows sufficient time to assess the physical condition of the reactor and complete the evaluation of the core design and safety analysis.

Following evaluations of the core design and safety analysis, the cause of the reactivity anomaly may be resolved. If the cause of the reactivity anomaly is a mismatch in core conditions at the time of RCS boron concentration sampling, then a recalculation of the RCS boron concentration requirements may be performed to demonstrate that core reactivity is behaving as expected. If an unexpected physical change in the condition of the core has occurred, it must be evaluated and corrected, if possible. If the cause of the reactivity anomaly is in the calculation technique, then the calculational models must be revised to provide more accurate predictions. If any of these results are demonstrated, and it is concluded that the reactor core is acceptable for continued operation, then the boron letdown curve may be renormalized and power operation may continue. If operational restriction or additional SRs are necessary to ensure the reactor core is acceptable for continued operation, then they must be defined.

The required Completion Time of 7 days is adequate for preparing whatever operating restrictions or Surveillances that may be required to allow continued reactor operation.

BASES

ACTIONS (continued)

B.1

INSERT 2 (4)

~~If the core reactivity cannot be restored to within the 1% Δk/k limit~~, the ~~plant~~ Unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the ~~plant~~ must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then the boration required by SR 3.1.1.1 would occur. The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging ~~plant~~ unit systems. (2)

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made, considering that other core conditions are fixed or stable, including RCS boron concentration (2) control rod position, ~~moderator~~ RCS average (2) temperature, ~~fuel temperature~~, fuel ~~depletion~~ (2) INSERT 3, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 as an initial check on core conditions and design calculations at BOC. The SR is modified by a Note. The Note indicates that the normalization of predicted core reactivity to the measured value must take place within the first 60 effective full power days (EFPD) after each fuel loading. This allows sufficient time for core conditions to reach steady state, but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. The required subsequent Frequency of 31 EFPD, following the initial 60 EFPD after entering MODE 1, is acceptable, based on the slow rate of core changes due to fuel depletion and the presence of other indicators (QPTR, AFD, etc.) for prompt indication of an anomaly.

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 26, GDC 28, and GDC 29~~. UFSAR, Section 1.4.5 (1)

2. (U)FSAR, Chapter ~~15~~ 14 (2) (3)

4 **INSERT 2**

If any Required Action and associated Completion Time is not met

2 **INSERT 3**

burnup based on gross thermal energy generation

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.2 BASES, CORE REACTIVITY

1. CNP Units 1 and 2 were designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. CNP Units 1 and 2 were designed and constructed to meet the intent of the proposed General Design Criteria, published in 1967. However, the CNP UFSAR contains discussions of the Plant Specific Design Criteria (PSDCs) used in the design of CNP Units 1 and 2. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

2. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. Changes made to be consistent with the Specification.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.2, CORE REACTIVITY

There are no specific NSHC discussions for this Specification.

ATTACHMENT 3

ITS 3.1.3, Moderator Temperature Coefficient

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.3

ITS

A.1

REACTIVITY CONTROL SYSTEMS

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

LCO 3.1.3

3.1.1.4 The moderator temperature coefficient (MTC) shall be within the limits specified in the COLR. The maximum upper limit shall be less than or equal to the limit shown in Figure 3.1-2.

upper — A.2

APPLICABILITY: BOL Limit - MODES 1 and 2* only#
EOL Limit - MODES 1, 2 and 3 only#

A.3

lower — A.2

ACTION:

a. With the MTC more positive than the BOL limit specified in the COLR:

upper — A.2

MODE 2 with k_{eff} < 1.0 — A.4

ACTION A — ACTION B

1. Establish and maintain control rod withdrawal limits sufficient to restore the MTC to within its limit within 24 hours or be in HOT STANDBY within the next 6 hours. These withdrawal limits shall be in addition to the insertion limits of Specification 3.1.3.5.

A.5

2. Maintain the control rods within the withdrawal limits established above until subsequent measurement verifies that the MTC has been restored to within its limit for the all rods withdrawn condition.

L.1

3. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 10 days describing the value of the measured MTC, the interim control rod withdrawal limits and the predicted average core burnup necessary for restoring the positive MTC to within its limit for the all rods withdrawn condition.

L.2

ACTION C

b. With the MTC more negative than the EOL limit specified in the COLR, be in HOT SHUTDOWN within 12 hours.

lower — A.2

Applicability

* With K_{eff} greater than or equal to 1.0
\# See Special Test Exception 3.10.4

A.3

ITS 3.1.3

ITS

A.1

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

4.1.1.4 The MTC shall be determined to be within its limits during each fuel cycle as follows:

upper A.2

SR 3.1.3.1 a) The MTC shall be measured and compared to the BOL limit specified in the COLR prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

SR 3.1.3.2 b) The MTC shall be measured at any THERMAL POWER within 7 EFPD after reaching an equilibrium boron concentration of 300 ppm. The measured value shall be compared to the 300 ppm surveillance limit specified in the COLR. In the event this comparison indicates that the MTC will be more negative than the EOL limit, the MTC shall be remeasured at least once per 14 EFPD during the remainder of the fuel cycle and the MTC value compared to the EOL limit.

lower A.2

L.3

ITS 3.1.3

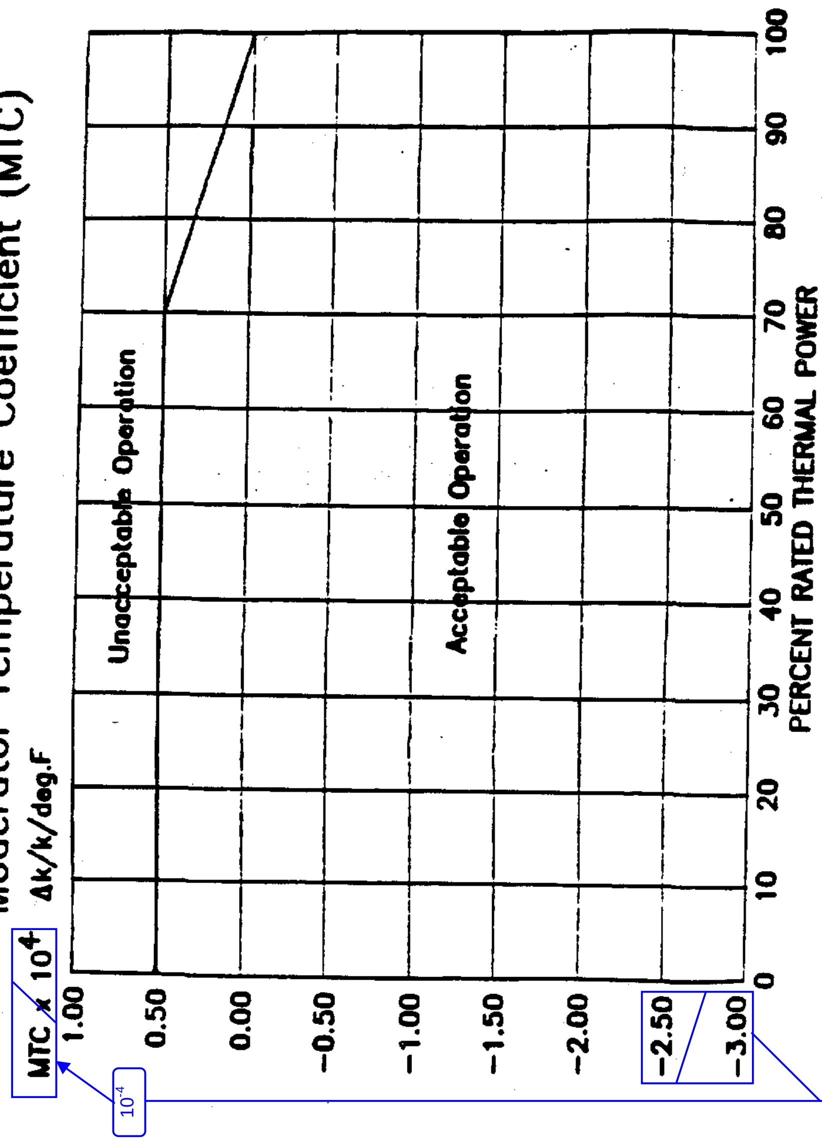
ITS

A.1

Figure 3.1.3-1

FIGURE 3.1–2

Moderator Temperature Coefficient (MTC)



ITS 3.1.3

ITS

A.1

REACTIVITY CONTROL SYSTEMS

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

LCO 3.1.3

3.1.1.4 The moderator temperature coefficient (MTC) shall be within the limits specified in the COLR. The maximum upper limit shall be less than or equal to the limit shown in Figure 3.1-2.

upper — A.2

APPLICABILITY: BOL Limit - MODES 1 and 2* only#
EOL Limit - MODES 1, 2 and 3 only#

A.3

lower

ACTION:

upper — A.2

a. With the MTC more positive than the BOL limit specified in the COLR:

MODE 2 with k_{eff} < 1.0 — A.4

ACTION A

ACTION B

1. Establish and maintain control rod withdrawal limits sufficient to restore the MTC to within its limit within 24 hours or be in HOT STANDBY within the next 6 hours. These withdrawal limits shall be in addition to the insertion limits of Specification 3.1.3.6.

A.5

2. Maintain the control rods within the withdrawal limits established above until subsequent measurement verifies that the MTC has been restored to within its limit for the all rods withdrawn condition.

L.1

3. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 10 days describing the value of the measured MTC, the interim control rod withdrawal limits and the predicted average core burnup necessary for restoring the positive MTC to within its limit for the all rods withdrawn condition.

L.2

ACTION C

b. With the MTC more negative than the EOL limit specified in the COLR, be in HOT SHUTDOWN within 12 hours.

lower — A.2

Applicability

* With K_{eff} greater than or equal to 1.0
# See Special Test Exception 3.10.3

A.3

ITS 3.1.3

A.1

ITS

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

4.1.1.4 The MTC shall be determined to be within its limits during each fuel cycle as follows:

upper

A.2

SR 3.1.3.1

a) The MTC shall be measured and compared to the BOL limit specified in the COLR prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

SR 3.1.3.2

b) The MTC shall be measured at any THERMAL POWER within 7 EFPD after reaching an equilibrium boron concentration of 300 ppm. The measured value shall be compared to the 300 ppm surveillance limit specified in the COLR. In the event this comparison indicates that the MTC will be more negative than the ~~EOL~~ limit, the MTC shall be remeasured at least once per 14 EFPD during the remainder of the fuel cycle and the MTC value compared to the ~~EOL~~ limit.

L.3

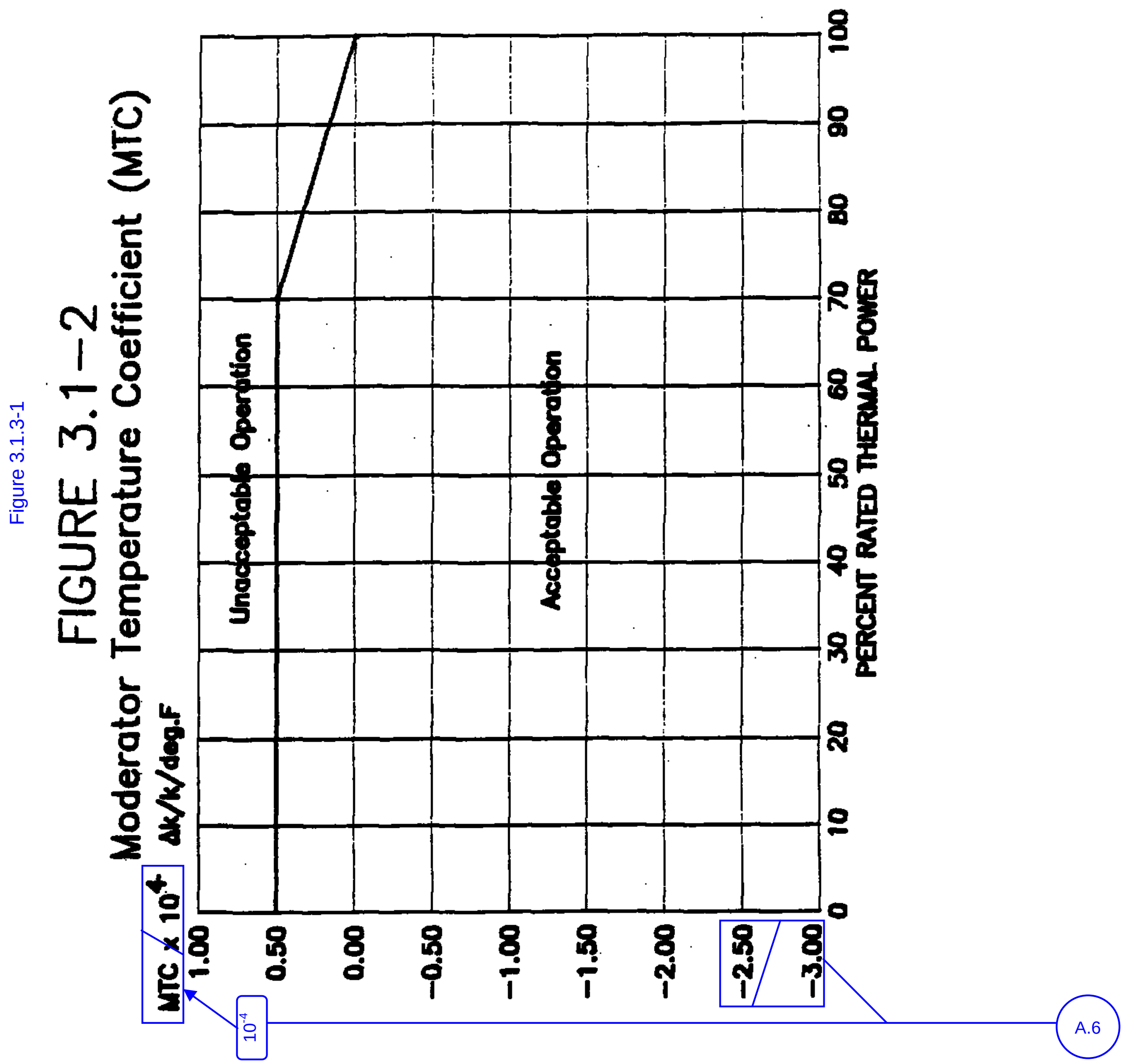
lower

A.2

ITS 3.1.3

ITS

A.1



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DISCUSSION OF CHANGES
ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 CTS 3.1.1.4 refers to the BOL MTC limit and the EOL MTC limit. ITS 3.1.3 refers to these values as the upper MTC limit and lower MTC limit, respectively.

This change is acceptable because the requirements have not changed. The BOL MTC value is the most positive, upper limit and the EOL MTC value is the most negative, lower limit. The terminology used in the ITS is an editorial preference selected for consistency with that used in NUREG-1431. This change is designated as administrative as it incorporates an ITS convention with no technical change to the CTS.

A.3 The Applicability of CTS 3.1.1.4 is modified by footnote # stating "See Special Test Exception 3.10.4." ITS 3.1.3 Applicability does not contain the footnote or a reference to the Special Test Exception.

The purpose of the footnote reference is to alert the reader that a Special Test Exception exists that may modify the Applicability of the Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative as it incorporates an ITS convention with no technical change to the CTS.

A.4 CTS 3.1.1.4 Action a.1 states that if the MTC is more positive than the BOL (i.e., upper) limit, control rod withdrawal limits must be imposed within 24 hours or the unit must be in HOT STANDBY within the next 6 hours. ITS 3.1.3 ACTION A states that with the MTC not within the upper limit, establish administrative control rod withdrawal limits within 24 hours or ACTION B requires the unit to be in MODE 2 with $k_{eff} < 1.0$ within the next 6 hours. This changes the CTS by requiring the plant to be in MODE 2 with $k_{eff} < 1.0$ instead of HOT SHUTDOWN (i.e., MODE 3).

This change is acceptable because the requirements have not changed. In accordance with CTS LCO 3.0.1, Actions are only required to be followed while in the MODE of applicability. The CTS upper MTC limit is applicable in MODE 1 and MODE 2 with $k_{eff} \geq 1.0$. Therefore, under the CTS, the unit does not have to enter MODE 3 because the applicability of the Action ends when in MODE 2 with $k_{eff} < 1.0$. As a result, there is no difference between the CTS and ITS requirements. This change is designated as administrative because it does not result in a technical change to the CTS.

A.5 CTS 3.1.1.4 Action a.1 states that if the MTC is more positive than the BOL limit, then control rod withdrawal limits must be established. It also states that these

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DISCUSSION OF CHANGES
ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

withdrawal limits shall be in addition to the insertion limits of Specification 3.1.3.5 (Unit 1) and Specification 3.1.3.6 (Unit 2). The ITS does not include this sentence.

This change is acceptable because the requirements have not changed. The CTS reference to Specification 3.1.3.5 (Unit 1) and Specification 3.1.3.6 (Unit 2) is an "information only" statement that neither adds, eliminates, or modifies requirements. The ITS convention is to not include these types of statements. This change is designated as administrative because it does not result in a technical change to the CTS.

A.6 CTS Figure 3.1-2 provides the maximum upper limit for MTC from 0% to 100% RATED THERMAL POWER (RTP). The Figure indicates that the value for MTC can vary from -3.00 to 1.00 x 10^4 Δk/k/°F. ITS Figure 3.1.3-1 includes the same curve however the range has changed to -2.00 to 1.00 (x 10^{-4} Δk/k/°F). This changes the CTS by using the correct exponential (10^4 in the CTS to 10^{-4} in the ITS) and changing the range for MTC.

This change is acceptable because the requirements have not changed. The maximum upper limit for MTC when < 70% RTP is 0.50 10^{-4} Δk/k/°F and the maximum upper limit at 100% RTP is zero. This change is consistent with how similar values are presented in the ITS. Since this curve only provides the maximum upper limit there is no need to provide a wide range from -3.00 x 10^{-4} Δk/k/°F to 1.00 x 10^{-4} Δk/k/°F. The lower value of -2.00 x 10^{-4} Δk/k/°F is sufficient. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L.1 *(Category 5 – Deletion of Surveillance Requirement)* CTS 3.1.1.4 Action a.2 states that if the measured MTC is more positive than the BOL (i.e., upper) limit, then the control rod withdrawal limits established in Action a.1 must be maintained until subsequent measurement verifies that the MTC has been restored to within its limits for the all rods withdrawn condition. ITS 3.1.3 does

DISCUSSION OF CHANGES
ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

not contain a requirement that the control rod withdrawal limits be maintained until MTC is confirmed to be within its limit by measurement. However, ITS LCO 3.0.2 states that the Required Actions shall be followed until the LCO is met or no longer applicable. The ITS Bases state that physics calculations may be used to determine the time in cycle life at which the calculated MTC will meet the LCO requirement, and at this point in core life the condition may be exited and the control rod withdrawal limits removed. This changes the CTS by eliminating the Surveillance Requirement verifying the MTC to be within its limit before removing the control rod withdrawal limits.

The purpose of CTS 3.1.1.4 Action a.2 is to ensure that the additional operational restrictions required to maintain the MTC within the assumptions in the safety analyses are maintained until the MTC value without the restrictions is within the LCO limits. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the values used to meet the LCO are consistent with the safety analyses. Thus, appropriate values continue to be tested in a manner and at a Frequency necessary to give confidence that the assumptions in the safety analyses are protected. The measurement of the MTC, boron endpoint, and control rod worth prior to entering MODE 1 is sufficient to verify the nuclear design so that it can be accurately predicted when the all rods out, full power equilibrium MTC is within the LCO limit. Performing another measurement of beginning of cycle MTC to confirm this prediction is not necessary to give confidence that MTC is within its limit. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L.2 *(Category 8 – Deletion of Reporting Requirements)* CTS 3.1.1.4 Action a.3 requires that a Special Report be prepared and submitted to the NRC within 10 days if the measured MTC is more positive than the BOL limit. The Special Report must describe the value of the measured MTC, the interim control rod withdrawal limits, and the predicted average core burnup necessary for restoring the positive MTC to within its limit for the all rods withdrawn condition. ITS 3.1.3 does not include this requirement.

The purpose of CTS 3.1.1.4 Action a.3 is to provide information describing the event to the NRC. This change is acceptable because the regulations provide adequate reporting requirements, or the reports do not affect continued plant operation. A Licensee Event Report is required to be submitted by 10 CFR 50.73(a)(2)(i)(B) for any operation or condition outside of the plant's Technical Specifications. Therefore, a report to the NRC is still required. This change is designated as less restrictive because reports that would be submitted under the CTS will not be required under the ITS.

L.3 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS 4.1.1.4.b) requires MTC to be determined to be within limits. MTC shall be measured at any THERMAL POWER within 7 EFPD after reaching an equilibrium boron concentration of 300 ppm. The measured value shall be compared to the 300 ppm Surveillance limit specified in the COLR. In the event this comparison indicates that the MTC will be more negative than the EOL (i.e., lower) limit, the MTC shall be remeasured at least once per 14 EFPD during the remainder of the fuel cycle and the MTC value compared to the EOL limit. ITS

DISCUSSION OF CHANGES
ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

SR 3.1.3.2 requires the verification that MTC is within the lower limit. The first proposed Frequency is once each cycle within 7 effective full power days (EFPD) after reaching an equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. The second Frequency is 14 EFPD thereafter if MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR until the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR. This changes the CTS by eliminating the requirement to verify that MTC is met at least once per 14 EFPD if the measured MTC at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR.

The purpose of CTS 4.1.1.4.b) is to periodically verify that the MTC EOL (i.e., lower) limit is within limit if the 300 ppm Surveillance limit in the COLR is not met. This change is acceptable because the Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of assurance that the MTC lower limit will not be exceeded. This will help ensure that the MTC EOL (lower) limit is not exceeded for the remainder of the cycle. The new 60 ppm Surveillance limit for RTP-ARO boron concentration of $\leq$ 60 ppm will be incorporated into the COLR. This new limit is conservative. If the measured MTC at 60 ppm is more positive than the 60 ppm Surveillance limit, then the MTC lower limit will not be exceeded because of the gradual manner in which MTC changes with core burnup. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.3 Moderator Temperature Coefficient (MTC)

LCO 3.1.1.4

LCO 3.1.3 The MTC shall be maintained within the limits specified in the COLR. The maximum upper limit shall be [≤ [ ] $\Delta k/k/°F$ at hot zero power] [that specified in Figure 3.1.3-1]. 1

APPLICABILITY: MODE 1 and MODE 2 with $k_{eff} \geq 1.0$ for the upper MTC limit, MODES 1, 2, and 3 for the lower MTC limit.

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
Action a.1	A. MTC not within upper limit.	A.1	Establish administrative withdrawal limits for control banks to maintain MTC within limit.	24 hours
Action a.1	B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 2 with $k_{eff} < 1.0$.	6 hours
Action b	C. MTC not within lower limit.	C.1	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.1.1.4.a)	SR 3.1.3.1	Verify MTC is within upper limit.	Prior to entering MODE 1 after each refueling

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MTC
3.1.3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.1.3.2	~~- NOTES -~~ ~~1. Not required to be performed until 7 effective full power days (EFPD) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm.~~ ~~2. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle.~~ ~~3. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of ≤ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR.~~ Verify MTC is within lower limit.	~~Once each cycle~~ INSERT 1

4.1.1.4.b)

2

2

INSERT 1

Once each cycle within 7 effective full power days (EFPD) after reaching an equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm

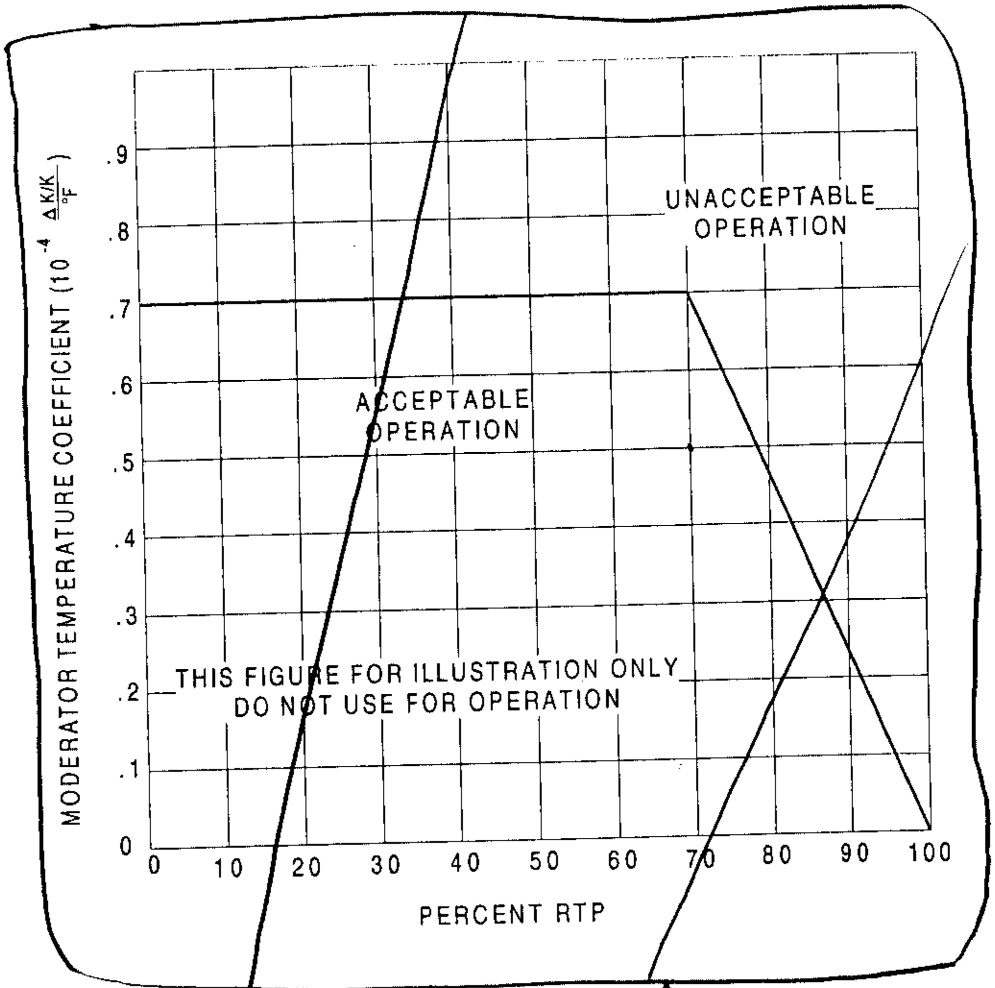
AND

14 EFPD thereafter if MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR until the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR

MTC
3.1.3

CTS

Figure 3.1-2



INSERT 2

3

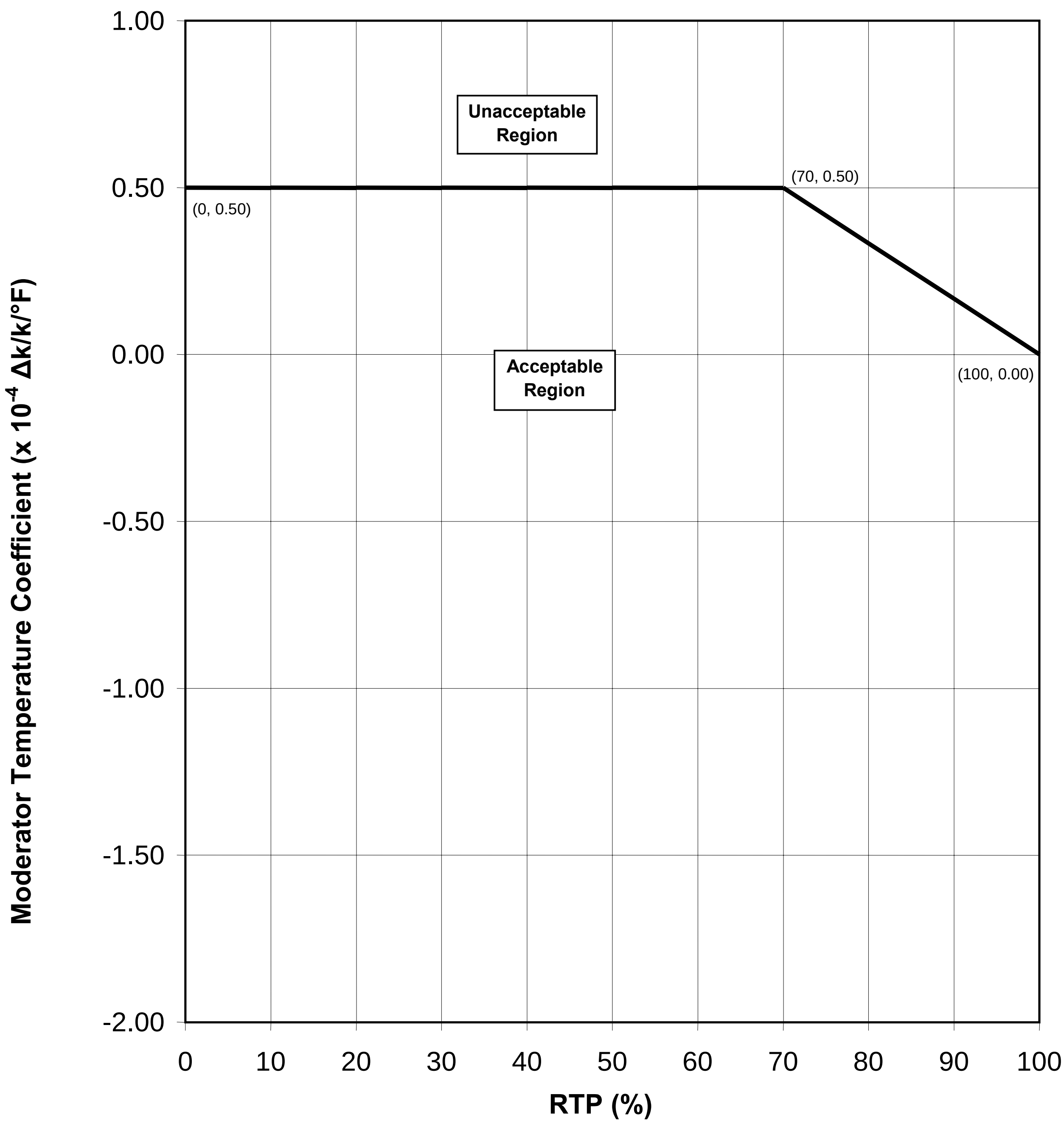
Figure 3.1.3 - 1 (page 1 of 1)
Moderator Temperature Coefficient Vs. Percent ~~Rated Thermal Power~~

4

3.1.3

3

INSERT 2



Insert Page 3.1.3-3

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

1. The brackets have been removed and the proper plant specific information/value has been provided.

2. The ISTS SR 3.1.3.2 Surveillance Notes and Frequency have been rewritten to be consistent with the usage rules in ITS Section 1.4, Frequency. In addition, the modified Frequency and Notes are consistent with the CTS.

3. The appropriate MTC vs. THERMAL POWER CURVE has been included consistent with the current licensing basis.

4. Typographical/grammatical error corrected.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.3 Moderator Temperature Coefficient (MTC)

BASES

Reference 1

BACKGROUND

According to GDC 11 (Ref. 1), the reactor core and its interaction with the Reactor Coolant System (RCS) must be designed for inherently stable power operation, even in the possible event of an accident. In particular, the net reactivity feedback in the system must compensate for any unintended reactivity increases.

The MTC relates a change in core reactivity to a change in reactor coolant temperature (a positive MTC means that reactivity increases with increasing moderator temperature; conversely, a negative MTC means that reactivity decreases with increasing moderator temperature). The reactor is designed to operate with a negative MTC over the largest possible range of fuel cycle operation. Therefore, a coolant temperature increase will cause a reactivity decrease, so that the coolant temperature tends to return toward its initial value. Reactivity increases that cause a coolant temperature increase will thus be self limiting, and stable power operation will result.

The

MTC values are predicted at selected burnups during the safety evaluation analysis and are confirmed to be acceptable by measurements. Both initial and reload cores are designed so that the beginning of cycle (BOC) MTC is less than zero when THERMAL POWER is at RTP. The actual value of the MTC is dependent on core characteristics, such as fuel loading and reactor coolant soluble boron concentration. The core design may require additional fixed distributed poisons to yield an MTC at BOC within the range analyzed in the plant accident analysis. The end of cycle (EOC) MTC is also limited by the requirements of the accident analysis. Fuel cycles ~~that are designed to achieve high burnups or that have changes to other characteristics~~ are evaluated to ensure that the MTC does not exceed the EOC limit.

or equal to

1

unit 1

1

The limitations on MTC are provided to ensure that the value of this coefficient remains within the limiting conditions assumed in the FSAR accident and transient analyses.

U 1

If the LCO limits are not met, the unit response during transients may not be as predicted. The core could violate criteria that prohibit a return to criticality, or the departure from nucleate boiling ratio criteria of the approved correlation may be violated, which could lead to a loss of the fuel cladding integrity.

BASES

BACKGROUND (continued)

The SRs for measurement of the MTC at the beginning and near the end of the fuel cycle are adequate to confirm that the MTC remains within its limits, since this coefficient changes slowly, due principally to the reduction in RCS boron concentration associated with fuel burnup. INSERT 1 1

APPLICABLE SAFETY ANALYSES

The acceptance criteria for the specified MTC are:

a. The MTC values must remain within the bounds of those used in the accident analysis (Ref. 2 3) and 1

b. The MTC must be such that inherently stable power operations result during normal operation and accidents, such as overheating and overcooling events.

The U FSAR, Chapter 15 14 (Ref. 2 3), contains analyses of accidents that result in both overheating and overcooling of the reactor core. MTC is one of the controlling parameters for core reactivity in these accidents. Both the most positive value and most negative value of the MTC are important to safety, and both values must be bounded. Values used in the analyses consider worst case conditions to ensure that the accident results are bounding (Ref. 3 4). 1

The consequences of accidents that cause core overheating must be evaluated when the MTC is positive. Such accidents include the rod withdrawal transient from either zero ~~(Ref. 4)~~ or RTP, loss of ~~main~~ normal feedwater flow, and loss of forced reactor coolant flow. The consequences of accidents that cause core overcooling must be evaluated when the MTC is negative. Such accidents include sudden feedwater flow increase and sudden decrease in feedwater temperature. 1

In order to ensure a bounding accident analysis, the MTC is assumed to be its most limiting value for the analysis conditions appropriate to each accident. The bounding value is determined by considering rodded and unrodded conditions, whether the reactor is at full or zero power, and whether it is the BOC or EOC life. The most conservative combination appropriate to the accident is then used for the analysis (Ref. 2 3). 1

MTC values are bounded in reload safety evaluations assuming steady state conditions at BOC and EOC. An EOC measurement is conducted at conditions when the RCS boron concentration reaches approximately 300 ppm. The measured value may be extrapolated to project the EOC value, in order to confirm reload design predictions.

---

1 **INSERT 1**

but also to a significant extent from the effects of buildup of plutonium and fission products

BASES

APPLICABLE SAFETY ANALYSES (continued)

MTC satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii). ~~Even though it is not directly observed and controlled from the control room, MTC is considered an initial condition process variable because of its dependence on boron concentration.~~ 6

LCO

LCO 3.1.3 requires the MTC to be within specified limits of the COLR to ensure that the core operates within the assumptions of the accident analysis. During the reload core safety evaluation, the MTC is analyzed to determine that its values remain within the bounds of the original accident analysis during operation.

Assumptions made in safety analyses require that the MTC be less positive than a given upper bound and more positive than a given lower bound. The MTC is most positive at BOC; this upper bound must not be exceeded. This maximum upper limit occurs (Near) at BOC, all rods out (ARO), hot zero power conditions. At EOC the MTC takes on its most negative value, when the lower bound becomes important. This LCO exists to ensure that both the upper and lower bounds are not exceeded. 1

During operation, therefore, the conditions of the LCO can only be ensured through measurement. The Surveillance checks at BOC and EOC on MTC provide confirmation that the MTC is behaving as anticipated so that the acceptance criteria are met.

The LCO establishes a maximum positive value that cannot be exceeded. The BOC positive (upper) limit and the EOC negative (lower) limit are established in the COLR (Figure 3.1.3-1) to allow specifying limits for each particular cycle. This permits the unit to take advantage of improved fuel management and changes in unit operating schedule. 2 4

APPLICABILITY

Technical Specifications place both LCO and SR values on MTC, based on the safety analysis assumptions described above.

In MODE 1, the limits on MTC must be maintained to ensure that any accident initiated from THERMAL POWER operation will not violate the design assumptions of the accident analysis. In MODE 2 with the reactor critical, the upper limit must also be maintained to ensure that startup and subcritical accidents (such as the uncontrolled CONTROL ROD assembly or group withdrawal) will not violate the assumptions of the accident analysis. The lower MTC limit must be maintained in MODES 2 and 3, in addition to MODE 1, to ensure that cooldown accidents will not violate the assumptions of the accident analysis. In MODES 4, 5, and 6, this LCO is 3

BASES

APPLICABILITY (continued)

not applicable, since no Design Basis Accidents using the MTC as an analysis assumption are initiated from these MODES.

ACTIONS

A.1

upper 2

If the BOC MTC limit is violated, administrative withdrawal limits for control banks must be established to maintain the MTC within its limits. The MTC becomes more negative with control bank insertion and decreased boron concentration. A Completion Time of 24 hours provides enough time for evaluating the MTC measurement and computing the required bank withdrawal limits.

As cycle burnup is increased, the RCS boron concentration will be reduced. The reduced boron concentration causes the MTC to become more negative. Using physics calculations, the time in cycle life at which the calculated MTC will meet the LCO requirement can be determined. At this point in core life Condition A no longer exists. The unit is no longer in the Required Action, so the administrative withdrawal limits are no longer in effect.

B.1

If the required administrative withdrawal limits at BOC are not established within 24 hours, the unit must be brought to MODE 2 with $k_{eff} < 1.0$ to prevent operation with an MTC that is more positive than that assumed in safety analyses.

The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems. 1

unit

C.1

lower 2

Exceeding the EOC MTC limit means that the safety analysis assumptions for the EOC accidents that use a bounding negative MTC value may be invalid. If the EOC MTC limit is exceeded, the plant must be brought to a MODE or condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE 4 within 12 hours.

lower unit 2 1

The allowed Completion Time is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems. unit 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

This SR requires measurement of the MTC at BOC prior to entering MODE 1 in order to demonstrate compliance with the most positive MTC LCO. Meeting the limit prior to entering MODE 1 ensures that the limit will also be met at higher power levels.

The BOC MTC value for ARO will be inferred from isothermal temperature coefficient measurements obtained during the physics tests
after refueling. The ARO value can be directly compared to the BOC upper (2)
MTC limit of the LCO. If required, measurement results and predicted design values can be used to establish administrative withdrawal limits for control banks.

SR 3.1.3.2

In similar fashion, the LCO demands that the MTC be less negative than the specified value for EOC full power conditions. This measurement may be performed at any THERMAL POWER, but its results must be extrapolated to the conditions of RTP and all banks withdrawn in order to make a proper comparison with the LCO value. Because the RTP MTC value will gradually become more negative with further core depletion and
boron concentration reduction, a 300 ppm SR value of MTC should lower (2)
necessarily be less negative than the EOC LCO limit. The 300 ppm SR value is sufficiently less negative than the EOC LCO limit value to ensure that the LCO limit will be met when the 300 ppm Surveillance criterion is met.

~~SR 3.1.3.2 is modified by three Notes that includes the following requirements:~~

~~a. The SR is not required to be performed until 7 effective full power days (EFPDs) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm.~~

~~b. If the 300 ppm Surveillance limit is exceeded, it is possible that the EOC limit on MTC could be reached before the planned EOC. Because the MTC changes slowly with core depletion, the Frequency of 14 effective full power days is sufficient to avoid exceeding the EOC limit.~~ INSERT 2 (4)

~~c. The Surveillance limit for RTP boron concentration of 60 ppm is conservative. If the measured MTC at 60 ppm is more positive than the 60 ppm Surveillance limit, the EOC limit will not be exceeded~~

4

INSERT 2

Performing the Surveillance once each cycle within 7 effective full power days (EFPD) after reaching an equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm is soon enough after the performance of SR 3.1.3.1 to ensure the lower limit will not be exceeded since the MTC changes after initial performance are gradual with core depletion and boron concentration reduction.

The Frequency of 14 EFPD thereafter, if MTC is more negative than 300 ppm Surveillance limit (not LCO limit) specified in the COLR or until the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of ≤ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR, is adequate for monitoring the change in MTC with core burnup since changes to MTC are relatively slow. The Surveillance limit for MTC at a RTP-ARO boron concentration of 60 ppm is conservative. If the measured MTC at 60 ppm is more positive than the 60 ppm Surveillance limit, the lower limit will not be exceeded because of the gradual manner in which MTC changes with core burnup.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

because of the gradual manner in which MTC changes with core burnup.

INSERT 3 1

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 11~~. INSERT 4

3 2. 4 FSAR, Chapter [15]. 14 1 5

4 3. WCAP 9272-NP-A, "Westinghouse Reload Safety Evaluation Methodology," ~~July 1985~~ March 1978. 2 1

~~4. FSAR, Chapter [15].~~ 1

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1

INSERT 3

UFSAR, Section 3.3.1 (Unit 1), 3.3.1.2 (Unit 2).

1

INSERT 4

2. UFSAR, Section 1.4.

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.3 BASES, MODERATOR TEMPERATURE COEFFICIENT (MTC)

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS Bases variously refer to the "upper MTC limit," the "BOC MTC limit," the "lower MTC limit," and the "EOC MTC limit." References to the BOC and EOC MTC limit are eliminated and "upper" and "lower" are substituted to eliminate confusion and to be consistent with the Specification.

3. Typographical/grammatical error corrected.

4. Changes are made to be consistent with changes made to the Specification.

5. The brackets have been removed and the proper plant specific information/value has been provided.

6. The Applicable Safety Analyses discussion states that MTC satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii). It also says that even though MTC is not directly observed and controlled from the control room, MTC is considered an initial condition process variable because of its dependence on boron concentration. The additional sentence has been deleted. The NRC Final Policy Statement on Technical Improvements of July 22, 1993 (58 FR 39132) states that process variables captured by Criterion 2 are not limited to only those directly monitored and controlled from the control room. It also states that Criterion 2 includes other features or characteristics that are specifically assumed in Design Basis Accident and Transient analyses even if they cannot be directly observed in the control room (e.g., moderator temperature coefficient and hot channel factors). Since the Final Policy Statement provides guidance on which types of parameters satisfy Criterion 2, there is no reason to duplicate these words in the CNP ITS.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 4

ITS 3.1.4, Rod Group Alignment Limits

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS

A.1

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

LCO 3.1.4

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:

- 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 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. A.2

APPLICABILITY: MODES 1* and 2* A.3

ACTION:

ACTION A

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. LA.1

Add proposed Required Action A.1.2 L.1

ACTION D

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. L.2

Add proposed Required Actions D.1.1 and D.1.2 M.1

ACTION B

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: L.2

1. The affected rod is restored to OPERABLE status within the above alignment requirements, or THERMAL POWER level is reduced to less than or equal to 85% of RATED THERMAL POWER for rod misalignments less than or equal to ±18 steps, or A.4

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: L.2

Add proposed Required Action B.1.2 L.1

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 L.3

*See Special Test Exceptions 3.10.2 and 3.10.4 A.3

ITS 3.1.4

A.1

ITS

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION B

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 $F^N_{\Delta H}$ are verified to be within their limits within 72 hours, and

two — L.4

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~~

L.5

~~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.~~

A.5

Add proposed ACTION C — M.2

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

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.~~

L.6

SR 3.1.4.2

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 92 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.~~

A.6

ITS 3.1.4

A.1

ITS

REACTIVITY CONTROL SYSTEMS

TABLE 3.1-1

ACCIDENT ANALYSES REQUIRING REEVALUATION
IN THE EVENT OF AN INOPERABLE
FULL LENGTH ROD

Rod Cluster Control Assembly Insertion Characteristics

Rod Cluster Control Assembly Misalignment

Loss of Reactor Coolant From Small Ruptured Pipes Or From Cracks In Large Pipes Which Actuates The Emergency Core Cooling System

Single Rod Cluster Control Assembly Withdrawal At Full Power

Major Reactor Coolant System Pipe Ruptures (Loss of Coolant Accident)

Major Secondary System Pipe Rupture

Rupture of a Control Rod Drive Mechanism Housing (Rod Cluster Control Assembly Ejection)

L.3

ITS 3.1.4

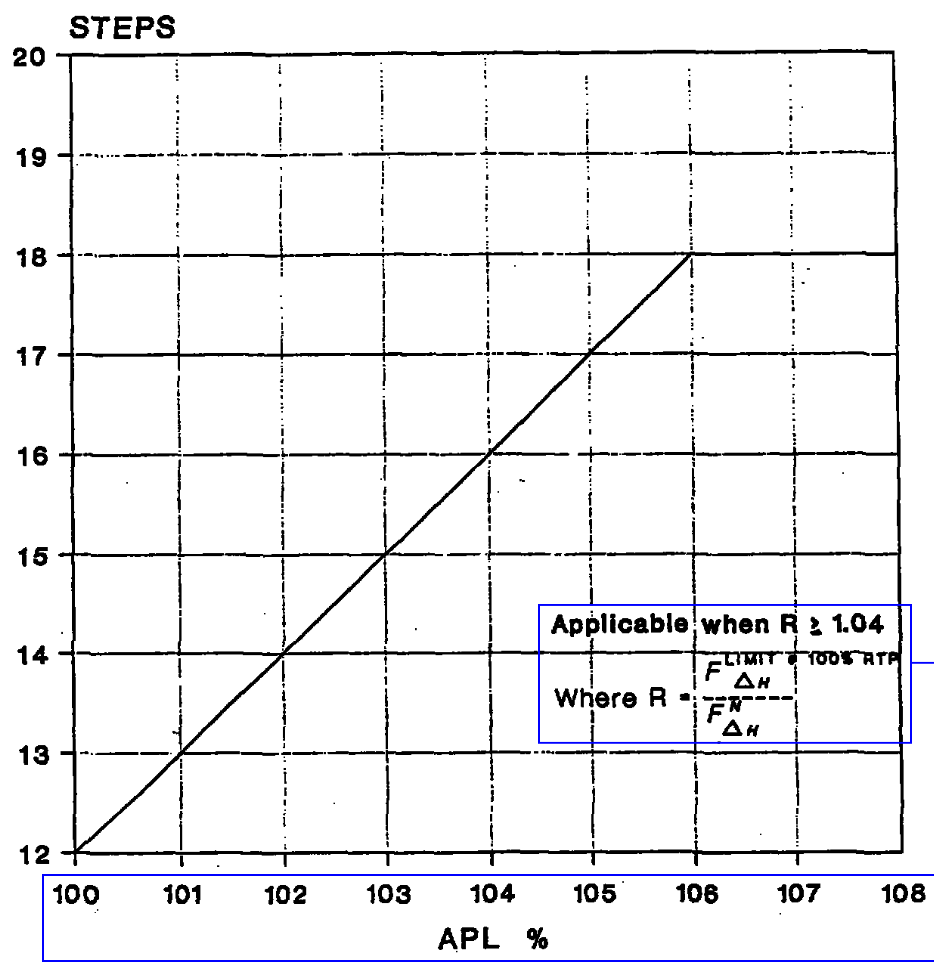
A.1

ITS

ALLOWED ROD MISALIGNMENT ABOVE 85% RTP

Figure 3.1.4-1

FIGURE 3.1-4



LCO 3.1.4 Note

A.2

A.6

ITS 3.1.4

A.1

ITS

REACTIVITY CONTROL SYSTEMS

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

SR 3.1.4.3 3.1.3.3 The individual full length (shutdown and control) rod drop time from the fully withdrawn position (specified in the COLR) shall be less than or equal to 2.4 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

500 L.11

a. T_{avg} greater than or equal to 541°F, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 AND 2

ACTION:

~~With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.~~ A.7

Add proposed ACTION A M.3

SURVEILLANCE REQUIREMENTS

SR 3.1.4.3 4.1.3.3 The rod drop time of full length rods shall be demonstrated through measurement prior to entering MODE 2:

criticality L.7

a. For all rods following each removal of the reactor vessel head,

~~b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and~~ L.8

~~c. At least once per 18 months.~~ L.9

ITS 3.1.4

A.1

ITS

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN - TAVG GREATER THAN 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k. See ITS 3.1.1

APPLICABILITY: MODES 1, 2*, 3, and 4.

ACTION:

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

Required Action A.1.1 4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k: L.10

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). See ITS Chapter 1.0

b. When in MODE 1 or MODE 2 with Keff greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.5.

c. When in MODE 2 with Keff less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.5. See ITS 3.1.6

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.5. See ITS 3.1.1

*See Special Test Exception 3.10.1. See ITS 3.1.1

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ITS 3.1.4

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN - TAVG LESS THAN OR EQUAL TO 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be greater than or equal to 1.0% Delta k/k.

See ITS 3.1.1

APPLICABILITY: MODE 5.

ACTION:

With the SHUTDOWN MARGIN less than 1.0% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.0% Delta k/k:

L.10

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s).

See ITS Chapter 1.0

b. At least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration
6. Samarium concentration, and
7. Boron penalty.

See ITS 3.1.1

ITS 3.1.4

ITS

A.1

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

LCO 3.1.4 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:

- 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 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.~~ A.2

APPLICABILITY: MODES 1~~*~~ and 2~~*~~ A.3

ACTION:

ACTION A 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. LA.1

Add proposed Required Action A.1.2 L.1

ACTION D 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. L.2

Add proposed Required Actions D.1.1 and D.1.2 M.1

ACTION B 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: L.2

1. ~~The affected rod is restored to OPERABLE status within the above alignment requirements, or THERMAL POWER level is reduced to less than or equal to 85% of RATED THERMAL POWER for rod misalignments less than or equal to ±18 steps, or~~ A.4

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: L.2

Add proposed Required Action B.1.2 L.1

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 L.3

~~*See Special Test Exceptions 3.10.2 and 3.10.3~~ A.3

ITS 3.1.4

A.1

ITS

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION B

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 $F^N_{\Delta H}$ are verified to be within their limits within 72 hours, and

two — L.4

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 — L.5

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. — A.5

Add proposed ACTION C — M.2

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

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. — L.6

SR 3.1.4.2

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 92 days.

4.1.3.1.3 The allowed 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. — A.6

ITS 3.1.4

A.1

ITS

TABLE 3.1-1

ACCIDENT ANALYSES REQUIRING REEVALUATION
IN THE EVENT OF AN INOPERABLE FULL LENGTH ROD

Rod Cluster Control Assembly Insertion Characteristics

Rod Cluster Control Assembly Misalignment

Loss Of Reactor Coolant From Small Ruptured Pipes Or From Cracks In Large Pipes Which Actuates The Emergency Core Cooling System

Single Rod Cluster Control Assembly Withdrawal At Full Power

Major Reactor Coolant System Pipe Ruptures (Loss Of Coolant Accident)

Major Secondary System Pipe Rupture

Rupture of a Control Rod Drive Mechanism Housing (Rod Cluster Control Assembly Ejection)

L.3

ITS 3.1.4

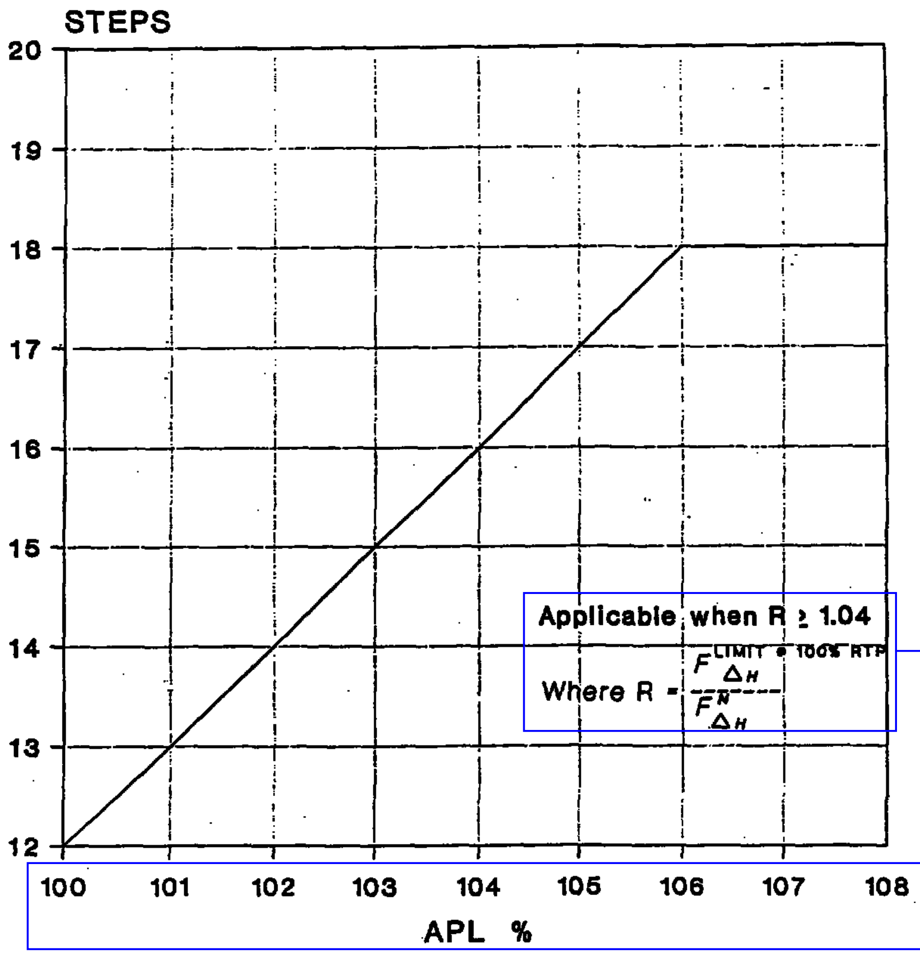
ITS

A.1

ALLOWED ROD MISALIGNMENT ABOVE 85% RTP

Figure 3.1.4-1

FIGURE 3.1-4



A.2

LCO 3.1.4
Note

A.6

ITS 3.1.4

ITS

A.1

REACTIVITY CONTROL SYSTEMS

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

SR 3.1.4.3 3.1.3.4 The individual full length (shutdown and control) rod drop time from the fully withdrawn position ~~(specified in the COLR)~~ shall be less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

500 L.11

a. T_{avg} greater than or equal to ~~541~~ °F, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 AND 2

ACTION:

~~With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.~~ A.7

Add proposed ACTION A M.3

SURVEILLANCE REQUIREMENTS

SR 3.1.4.3 4.1.3.4 The rod drop time of full length rods shall be demonstrated through measurement prior to ~~entering MODE 2~~:

criticality L.7

a. For all rods following each removal of the reactor vessel head,

~~b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and~~ L.8

~~c. At least once per 18 months.~~ L.9

ITS 3.1.4

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN - T_{AVG} GREATER THAN 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k.

See ITS 3.1.1

APPLICABILITY: MODES 1, 2*, 3, and 4.

ACTION:

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

Required Action A.1.1

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k:

L.10

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s).

See ITS Chapter 1.0

b. When in MODE 1 or MODE 2 with K_{eff} greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2 with K_{eff} less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6.

See ITS 3.1.6

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.6.

See ITS 3.1.1

*See Special Test Exception 3.10.1.

See ITS 3.1.1

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ITS 3.1.4

A.1

ITS

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

SHUTDOWN MARGIN - T_{AVG} LESS THAN OR EQUAL TO 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be greater than or equal to 1.0% Delta k/k.

See ITS 3.1.1

APPLICABILITY: MODE 5.

ACTION:

With the SHUTDOWN MARGIN less than 1.0% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.0% Delta k/k:

L.10

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s).

See ITS Chapter 1.0

b. At least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration,
6. Samarium concentration, and
7. Boron penalty.

See ITS 3.1.1

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 CTS 3.1.3.1 specifies the rod misalignment limits for full length (shutdown and control) rods at a THERMAL POWER > 85% RATED THERMAL POWER (RTP) and at THERMAL POWER ≤ 85% RTP. At a THERMAL POWER > 85% RTP the allowed rod misalignment is +/- 12 steps or as determined from Figure 3.1-4. In addition, CTS 3.1.3.1 states that Figure 3.1-4 permits an allowed rod misalignment from +/- 13 steps (for ALLOWABLE POWER LEVEL (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 ≥ 1.04. The R limit and definition are maintained in the ITS 3.1.4 Note and the range of rod misalignment allowed is maintained in ITS Figure 3.1.4-1. ITS LCO 3.1.4 states that with THERMAL POWER > 85% RTP, the individual rod positions shall be within 12 steps of their group step counter demand position or as determined from Figure 3.1.4-1, and the Note to ITS LCO 3.1.4 states the R limit and provides the definition. ITS LCO 3.1.4 does not contain the allowed misalignment range and ITS Figure 3.1.4-1 does not include the R limit or definition.

The purpose of the details of CTS 3.1.3.1 is to clarify the details provided in the CTS Figure. However, the information provided in the two locations is duplicative. This change is acceptable because the technical requirements have not changed. The R limit and definition are maintained in the ITS 3.1.4 Note and the range of rod misalignment allowed is maintained in ITS Figure 3.1.4-1. Since the details are duplicative there is no reason to maintain the information in both locations. This change is designated as administrative because it does not result in technical changes to the CTS.

A.3 The Applicability of CTS 3.1.3.1 is modified by footnote * that states "See Special Test Exceptions 3.10.2 and 3.10.4" (Unit 1) and "See Special Test Exceptions 3.10.2 and 3.10.3" (Unit 2). ITS 3.1.4 Applicability does not contain the footnote or a reference to the Special Test Exceptions.

The purpose of the footnote reference is to alert the user that a Special Test Exception exists that may modify the Applicability of the Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative because it does not result in technical changes to the CTS.

A.4 CTS 3.1.3.1 Action c.1 states that with one full length rod misaligned from the group step counter demand position by more than the rod misalignment requirements, POWER OPERATION may continue provided that within one hour, the affected rod is restored to OPERABLE status within the above alignment

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

requirements, the THERMAL POWER level is reduced to less than or equal to 85% RTP for rod misalignments less than or equal to $\pm$ 18 steps, or other compensatory measures described in the Action are taken. ITS 3.1.4 does not contain a Required Action stating that the rod must be restored to OPERABLE status within the alignment limits.

This change is acceptable because the technical requirements have not changed. Restoration of compliance with the LCO is always an available Required Action and it is the convention in the ITS to not state such “restore” options explicitly unless it is the only action or is required for clarity. This change is designated as administrative because it does not result in technical changes to the CTS.

A.5 CTS 3.1.3.1 Action c.2.e) states that with one full length rod misaligned from the group step counter demand position by more than the rod misalignment requirements, POWER OPERATION may continue provided that the remainder of the rods in the same group as 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 (Unit 1) and Specification 3.1.3.6 (Unit 2) during subsequent operation. ITS 3.1.4 does not contain a Required Action stating that the remainder of the rods in the group must be aligned with the misaligned rod.

This change is acceptable because the technical requirements have not changed. Moving the remainder of the rods in a group to within the LCO limit of the misaligned rod while maintaining compliance with all other rod position requirements is simply restoring compliance with the LCO. Restoration of compliance with the LCO is always an available Required Action and it is the convention in the ITS to not state such “restore” options explicitly unless it is the only action or is required for clarity. This change is designated as administrative because it does not result in technical changes to the CTS.

A.6 CTS Figure 3.1-4, Allowed Rod Misalignment above 85% RTP, is based upon the current Allowable Power Level (APL) as determined in CTS 3.2.6. In addition, CTS 4.1.3.1.3 requires the allowed rod misalignment for THERMAL POWER > 85% RTP to be determined in conjunction with the measurement of APL as defined in CTS 4.2.6.2. The term APL has been changed to $F_Q^W(Z)$, as described in the DOCs for ITS 3.2.1. Therefore, in the ITS, the allowed rod misalignment is being based upon $F_Q^W(Z)$. In order to maintain a similar value in the ITS Figure as is in the CTS Figure, the term in ITS Figure 3.1.4-1 is (CFQ x K(Z))/$F_Q^W(Z)$. In addition, the ITS does not include a specific SR in ITS 3.1.4 to calculate the new allowed rod misalignment every time an $F_Q^W(Z)$ determination is made. This changes the CTS by using the term $F_Q^W(Z)$ in lieu of the term APL, and not including a specific SR to calculate the allowed rod misalignment every time $F_Q^W(Z)$ is determined.

This change is acceptable since, as described in the DOCs for ITS 3.2.1, the term $F_Q^W(Z)$ is analogous to APL. Also, the specific SR is not needed because each time the $F_Q^W(Z)$ Surveillance is performed in ITS 3.2.1, the allowed rod alignment limit (if using ITS Figure 3.1.4-1) must be established based on the

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

most recently calculated actual value of $F_Q^W(Z)$. Thus, the technical requirements have not changed; the verification that the individual rod positions are within alignment limits must always be performed and compared to the existing limit. This change is designated as administrative because it does not result in a technical change to the CTS.

A.7 The CTS 3.1.3.3 (Unit 1) and CTS 3.1.3.4 (Unit 2) Action requires that with the drop time of any full length rod determined to exceed the limits of the LCO, to restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2. The ITS does not have a similar requirement.

CTS 4.0.4 and ITS SR 3.0.4 require verification that Surveillances are met prior to entering the MODE in which they apply. CTS 4.0.4 and ITS SR 3.0.4 also prohibit entering a MODE or condition with the Surveillance not met and while relying on Actions. Therefore, since the Applicability of CTS 3.1.3.3 (Unit 1) and CTS 3.1.3.4 (Unit 2) is MODES 1 and 2, the Action prohibiting entry into MODES 1 and 2 with the rod drop time requirements not met is redundant to CTS 4.0.4 and ITS SR 3.0.4. This change is acceptable because the technical requirements have not changed. This change is designated as administrative because it does not result in technical changes to the CTS.

<u>MORE RESTRICTIVE CHANGES</u>

M.1 CTS 3.1.3.1 Action b states that 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. ITS 3.1.4 ACTION D states that with more than one rod not within alignment limit, verify SDM is within limits or initiate boration to restore required SDM to within limit within one hour, and be in MODE 3 in 6 hours. This changes the CTS by adding new requirements to verify SDM limits or to initiate boration to restore SDM limits.

The purpose of CTS 3.1.3.1 Action b is to place the unit in a condition in which the equipment is not required. More than one control rod becoming misaligned from its group average position is not expected, and has the potential to reduce SDM. Therefore, SDM must be evaluated. One hour allows the operator adequate time to determine SDM. Restoration of the required SDM, if necessary, requires increasing the RCS boron concentration to provide negative reactivity. The required Completion Time of 1 hour for initiating boration is reasonable, based on the time required for potential xenon redistribution, the low probability of an accident occurring, and the steps required to complete the action. This allows the operator sufficient time to align the required valves and start the boric acid pumps. Boration will continue until the required SDM is restored. This change is acceptable because it is consistent with the requirements of the assumptions of the safety analyses to be within the SDM limit. The change has been designated as more restrictive because it adds explicit actions to verify SDM or to restore SDM within limits.

M.2 CTS 3.1.3.1 Action c states that with one full length rod misaligned, POWER OPERATION may continue provided that certain actions are completed within one hour. If those actions are not complete, CTS 3.0.3 would be entered

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

requiring entry into Hot Standby (MODE 3) within 7 hours, for a total time from condition discovery to entry into MODE 3 of 8 hours. ITS 3.1.4 ACTION C states that if any Required Action and associated Completion Time of Condition B (one rod not within alignment limits) is not met, the unit must be in MODE 3 within 6 hours. The shortest Completion Time in ITS ACTION B is one hour. Therefore, under the ITS, the shortest possible time from discovery of the condition to entry into MODE 3 is 7 hours. This changes the CTS by providing one less hour for entry into MODE 3 following discovery of a misaligned rod if Required Actions are not met.

The purpose of requiring a shutdown when a rod misalignment cannot be corrected is to bring the unit to a subcritical condition prior to the build up of an undesirable reactor core power distribution. This change is acceptable because it provides an adequate period of time to correct the condition or be in a MODE in which the requirement does not apply. The Completion Time of 6 hours is reasonable, based on operating experience, for reaching MODE 3 from full power in an orderly manner and without challenging unit systems.

M.3 The CTS 3.1.3.3 (Unit 1) and CTS 3.1.3.4 (Unit 2) Action requires that with the drop time of any full length rod determined to exceed the limits of the LCO, to restore the rod drop time to within the limit prior to proceeding to MODE 1 or 2. However, no specific actions are stated in CTS 3.1.3.3 (Unit 1) and CTS 3.1.3.4 (Unit 2) if the unit is in MODE 1 or 2 when the rod drop time is discovered to not be within limits. Therefore, a CTS 3.0.3 entry would be required. CTS 3.0.3 allows one hour to prepare for a shutdown and requires the unit to be in MODE 3 within 7 hours. ITS 3.1.4 ACTION A applies with one or more rod(s) inoperable. It requires the verification of SDM to be within limits or to initiate boration to restore SDM to within limit within 1 hour, and requires the unit to be in MODE 3 in 6 hours. This changes the CTS by adding new requirements associated with SDM and changing the requirement to be outside of the MODE of Applicability from 7 hours to 6 hours.

The purpose of requiring a shutdown when a drop time of any full length rod is not met is to bring the unit to a subcritical condition. With one or more slow control rod(s) there is a potential to reduce SDM. Therefore, SDM must be evaluated. One hour allows the operator adequate time to determine SDM. Restoration of the required SDM, if necessary, requires increasing the RCS boron concentration to provide negative reactivity. The required Completion Time of 1 hour for initiating boration is reasonable, based on the time required for potential xenon redistribution in the reactor core, the low probability of an accident occurring, and the steps required to complete the action. This allows the operator sufficient time to align the required valves and start the boric acid pumps. Boration will continue until the required SDM is restored. In addition, the new time to reach MODE 3 is consistent with the time provided in other Specifications. This change is acceptable because it is consistent with the requirements of the assumptions of the safety analyses to be within the SDM limit. The change has been designated as more restrictive because it adds explicit actions to verify SDM or to restore SDM within limits and reduces the time required to be in MODE 3.

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DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.1.3.1 Action a applies when one or more full length rods are inoperable "due to being immovable as a result of excessive friction or mechanical interferences or known to be untrippable." ITS 3.1.4 Condition A applies when one or more rod(s) are inoperable. ITS 3.1.4 Condition A does not list the ways in which the rods can be inoperable (i.e., "due to being immovable as a result of excessive friction or mechanical interferences or known to be untrippable"). This changes the CTS by moving the details of the reason the rod is considered inoperable to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the shutdown and control rods to be OPERABLE and provides a Condition for when the rod is inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program described in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.1 Actions a and c.2 require satisfying the SHUTDOWN MARGIN requirement in accordance with Specification 3.1.1.1. In the same conditions, ITS 3.1.4 requires verification that the SHUTDOWN MARGIN is within limits or initiating boration to restore SDM to within limits. This changes the CTS by providing the option to initiate action to establish compliance with the SDM requirement within 1 hour instead of declaring the Required Action not met and following ITS LCO 3.0.3.

The purpose of CTS 3.1.3.1 Actions a and c.2 is to ensure that adequate SHUTDOWN MARGIN exists. Following misalignment of a rod, boration may be required to reestablish compliance with the SHUTDOWN MARGIN requirements. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

the low probability of a DBA occurring during the repair period. Providing a short period of time to reestablish the SHUTDOWN MARGIN requirement instead of entering ITS LCO 3.0.3 is justified because of the existing conservatisms in the SHUTDOWN MARGIN calculations and the fact that the rod is still trippable. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.2 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.1 Action a specifies requirements for 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. CTS 3.1.3.1 Action b specifies requirements for more than one full length rod inoperable or misaligned from the group step counter demand position by more than the allowed rod misalignment. CTS 3.1.3.1 Action c specifies requirements for one full length rod inoperable due to causes other than those addressed by Action a, above, or misaligned from its group step counter demand position by more than the allowed rod misalignment. CTS 3.1.3.1 Action c.2 requires the affected rod to also be declared inoperable. ITS 3.1.4 ACTION A specifies requirements for one or more rod(s) inoperable. ITS 3.1.4 ACTION B specifies requirements for one rod not within alignment limits. ITS 3.1.4 ACTION D specifies requirements for more than one rod not within alignment limits. This changes the CTS by considering shutdown and control rods that are trippable but misaligned to be OPERABLE and excludes other types of control rod inoperabilies not addressed in CTS 3/4.1.3.1 (e.g., insertion times). The requirement to declare a misaligned rod inoperable in CTS 3.1.3.1, Action c.2, is deleted. The requirements for control rod drop times are addressed in DOC M.3.

The purpose of ITS 3.1.4 is to ensure that the shutdown and control rods are capable of performing their safety function of inserting into the core when required. A secondary function of the control rods is to maintain alignment so that the reactor core power distribution is consistent with the safety analyses. This change is acceptable because the LCO requirements continue to ensure that the structures, systems, and components are maintained consistent with the safety analyses and licensing basis. In the ITS, rod OPERABILITY is related only to trippability, and a misaligned rod is not considered inoperable if it can be tripped. Misalignment is addressed by the ITS 3.1.4 LCO, but is separate from OPERABILITY. In both cases, trippability and misalignment, the ITS continues to provide appropriate compensatory measures. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.3 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.1 Action c.2.a) states that when a rod is misaligned, POWER OPERATION may continue if a reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days. This re-evaluation shall confirm that the previous analyzed results of these accidents remain valid for the duration of operation under these conditions. ITS 3.1.4 Required Action B.6 states that when one rod is misaligned, re-evaluate the safety analyses and confirm results remain valid for the duration of operation under these conditions. This changes the CTS by eliminating Table 3.1-1, which lists the specific events to be re-evaluated and the Action to evaluate those specific events.

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

The purpose of CTS 3.1.3.1 Action c.2.a) is to ensure that the accident analyses performed for the reload core continue to be acceptable during operation with a misaligned rod. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. The elimination of a specific set of events to be re-evaluated does not change the requirement to verify continued operation is acceptable and places the responsibility on the licensee to re-evaluate all accident analyses which may be affected by a misaligned rod. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.4 *(Category 3 – Relaxation of Completion Time)* CTS 3.1.3.1 Action c.2.d) states that with one rod misaligned, reduce the THERMAL POWER level to $\leq$ 75% of RATED THERMAL POWER within one hour. ITS 3.1.4 Required Action B.2 requires THERMAL POWER to be reduced to $\leq$ 75% RTP within 2 hours. This changes the CTS by changing the Completion Time from one hour to two hours.

The purpose of CTS 3.1.3.1 Action c.2.d) is to reduce reactor core power to ensure that the increases in linear heat generation rate due to misalignment of a rod does not result in exceeding the design limits. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time. The Completion Time of 2 hours gives the operator sufficient time to accomplish an orderly power reduction without challenging the Reactor Trip System. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L.5 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.1 Action c.2.d) states that with one rod misaligned, reduce the THERMAL POWER level to $\leq$ 75% of RATED THERMAL POWER and reduce the high neutron flux trip setpoint to $\leq$ 85% of RTP within the next 4 hours. ITS 3.1.4 Required Action B.2 requires THERMAL POWER to be reduced to $\leq$ 75% RTP, but does not require the high neutron flux trip setpoint to be reduced. This changes the CTS by eliminating the Required Action to reduce the high neutron flux trip setpoint.

The purpose of CTS 3.1.3.1 Action c.2.d) is to reduce reactor core power to ensure that the increases in linear heat generation rate due to misalignment of a rod does not result in exceeding the design limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, the capacity and capability of remaining features, a

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. Lowering the high neutron flux trip setpoint increases the chance for an inadvertent reactor trip due to the changes being made to the Reactor Trip System without providing a commensurate amount of added safety. Administrative methods of maintaining reactor power below that allowed by the Required Action are sufficient to protect the core. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.6 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS 4.1.3.1.1 requires the position of each full length rod to 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. ITS SR 3.1.4.1 requires verification that the individual rod positions are within the alignment limits every 12 hours. This changes the CTS by eliminating the requirement to verify the individual rod positions to be within alignment limits every 4 hours when the Rod Position Deviation Monitor is inoperable.

The purpose of CTS 4.1.3.1.1 is to periodically verify that the rods are within the alignment limits specified in the LCO. This change is acceptable because the Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Increasing the Frequency of rod position verification when the Rod Position Deviation Monitor is inoperable is unnecessary, since an inoperability of the alarm does not increase the probability that the rods are misaligned. The Rod Position Deviation Monitor alarm is for indication only. Its use is not credited in any safety analyses. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L.7 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS 4.1.3.3 (Unit 1) and CTS 4.1.3.4 (Unit 2) require the rod drop time test to be performed prior to entering MODE 2 following each removal of the reactor vessel head. ITS SR 3.1.4.3 requires this test to be performed prior to criticality after each removal of the reactor head. This changes the CTS by allowing the rod drop test to be delayed from before entering MODE 2 to prior to criticality.

The purpose of the CTS and ITS is to confirm rod drop times as soon as practicable after the reactor vessel head is re-installed. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. MODE 2 begins at $k_{eff} \geq 0.99$. Criticality occurs when $k_{eff} = 1.0$. Therefore, this change only slightly extends the period when the test must be completed. The test must still be completed before any significant THERMAL POWER level is achieved. This change is designated as less restrictive because Surveillances will be completed at a later time after the reactor vessel head is re-installed and the plant is in MODE 2.

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

L.8 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.3.3.b (Unit 1) and CTS 4.1.3.4.b (Unit 2) require the rod drop time of full length rods to be demonstrated through measurement prior to entering MODE 2 for specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods. The ITS does not include this testing requirement.

The purpose of CTS 4.1.3.3.b (Unit 1) and CTS 3.1.3.4.b (Unit 2) is to verify OPERABILITY of the control rods following maintenance that could alter their operation. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a Frequency necessary to give confidence that the equipment can perform its assumed safety function. Any time the OPERABILITY of a system or component has been affected by repair, maintenance, modification, or replacement of a component, post-maintenance testing is required to demonstrate the OPERABILITY of the system or component. This is described in the Bases for ITS SR 3.0.1 and required under ITS SR 3.0.1. The OPERABILITY requirements for the rod control system are described in the Bases for ITS 3.1.4. In addition, the requirements of 10 CFR 50, Appendix B, Section XI (Test Control) provide adequate controls for test programs to ensure that testing incorporates applicable acceptance criteria. Compliance with 10 CFR 50, Appendix B, is required under the unit operating license. As a result, post-maintenance testing will continue to be performed and an explicit requirement in the Technical Specifications is not necessary. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L.9 *(Category 10 – 18 to 24 Month Surveillance Frequency Change, Non-Channel Calibration Type)* CTS 4.1.3.3.c (Unit 1) and CTS 4.1.3.4.c (Unit 2) require the rod drop time of full length rods to be demonstrated through measurement prior to entering MODE 2 following each removal of the reactor vessel head and at least once per 18 months. ITS SR 3.1.4.3 requires the test to be performed prior to criticality after each removal of the reactor head. The requirements in the CTS to perform the test following each removal of the reactor vessel head and at least once per 18 months normally coincide with one another. The head is removed once each cycle (approximately once every 18 months) unless there is a need to remove the head prior to the end of the cycle. This changes the CTS by extending the Frequency of the Surveillance from 18 months (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.2 and ITS SR 3.0.2) to prior to criticality after each removal of the reactor head. This new Surveillance could occur up to once every 24 months (i.e., a maximum of 30 months or greater accounting for the allowable grace period specified in CTS 4.0.2 and ITS SR 3.0.2) depending on when the head is removed.

The purpose of CTS 4.1.3.3.c (Unit 1) and CTS 4.1.3.4.c (Unit 2) is to ensure the rods insert within the rod drop criteria. This change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991. Reviews of historical surveillance data and maintenance data sufficient to determine failure modes have shown that these

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DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

tests normally pass their Surveillances at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. Extending the Surveillance test interval for the rod drop test SR is acceptable because the rods are tested during the cycle to ensure the rods are positioned within the rod alignment criteria and to ensure rod freedom of movement (trippability). This testing, which exercises the rods, helps to ensure the rods are able to drop into the core during the cycle and detect significant failures of the rods. Based on the inherent system and component reliability and the testing performed during the operating cycle, the impact, if any, from this change on system availability is minimal. The review of historical surveillance data also demonstrated that there are no failures that would invalidate this conclusion. In addition, the proposed Surveillance Frequency of prior to criticality after each removal of the reactor head even if performed at or greater than the maximum interval allowed by ITS SR 3.0.2 (30 months) does not invalidate any assumptions in the plant licensing basis. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L.10 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.1.1.1.a and CTS 4.1.1.2.a require verification of SHUTDOWN MARGIN within one hour after detection of inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) are inoperable. These requirements are applicable in MODES 1, 2, 3, 4, and 5. ITS 3.1.4 Required Action A.1.1 requires the verification of SDM to be within limits within 1 hour. These verifications are required in MODES 1 and 2 with one or more control rod(s) inoperable. This changes the CTS by not requiring any explicit SDM verifications for inoperable control rod(s) in MODES 3, 4, and 5 other than the normal verifications specified in ITS SR 3.1.1.1 (once every 24 hours). For MODE 1 and 2 operations, this changes the CTS by not requiring the verification of SDM on a once per 12 hour basis for one or more inoperable rod(s).

The purpose of CTS 4.1.1.1.1.a and CTS 4.1.1.2.a are to provide the appropriate compensatory measures to determine SDM when control rod(s) are inoperable during operations in MODES 1, 2, 3, 4, and 5. The purpose of the ITS 3.1.4 ACTIONS are to provide the appropriate compensatory actions for inoperable control rods in MODES 1 and 2. The purpose of ITS SR 3.1.1.1 is to provide the normal Frequency for verification of SDM regardless of the status of the control rod(s). When the plant is operating in MODES 1 and 2, with one or more rod(s) inoperable the unit must be in MODE 3 within 6 hours. After reaching MODE 3, ITS 3.1.4 no longer applies therefore it is inappropriate to specify additional actions after the unit is outside the Applicability of the Specification. Nevertheless, SDM must still be verified in accordance with ITS SR 3.1.1.1 every 24 hours. This SDM verification must also compensate for the reactivity worth of the control rod that is not fully inserted since it is required by the definition of SDM. Therefore, ITS 3.1.4 ACTIONS provide the appropriate compensatory measures. In MODES 3, 4, and 5, SDM will be monitored in accordance with ITS SR 3.1.1.1 every 24 hours. This change is acceptable since SDM will still be required to be monitored every 24 hours, and based on the definition of SDM the reactivity worth of any rod not capable of being fully inserted must be accounted for in the determination of SDM. Thus, SDM continues to be monitored in a

DISCUSSION OF CHANGES
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

manner and at a Frequency necessary to give confidence that the assumptions in the safety analyses are protected. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L.11 *(Category 1 - Relaxation of LCO Requirements)* CTS 3.1.3.3 (Unit 1) and CTS 3.1.3.4 (Unit 2) contains the specific requirements for rod drop time testing. The CTS specifies that the rod drop time be verified at an RCS T_{avg} of ≥ 541°F. ITS SR 3.1.4.3 specifies the rod drop time be verified at a RCS T_{avg} of ≥ 500°F. This changes the CTS by lowering the required temperature at which rod drop time must be verified.

The purpose of CTS 3.1.3.3 (Unit 1) and CTS 3.1.3.4 (Unit 2) is to ensure the rods insert within the rod drop time criteria. The performance of rod drop time tests ensure that the required negative reactivity insertion (amount and rate) from a reactor trip is within the values assumed in the safety analyses. This change will allow rod drop time testing to begin earlier during a startup following a refueling outage. The proposed change is acceptable because the specified rod drop time remains unchanged and the proposed 500°F test temperature is conservative compared to the CTS requirement of 541°F. Since the moderator becomes denser as the RCS temperature is decreased, a lower RCS temperature results in slower rod drops due to the density change of the water. However, the limiting rod drop time requirement of the CTS (≤ 2.4 seconds (Unit 1) and ≤ 2.7 seconds (Unit 2)) is maintained in the ITS and must still be met. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 Rod Group Alignment Limits

LCO 3.1.3.1

LCO 3.1.4 All shutdown and control rods shall be OPERABLE.

AND

Individual indicated rod positions shall be as follows: ~~within 12 steps of their group step counter demand position~~ INSERT 1 1

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.1.3.1 ACTION a A. One or more rod~~(s)~~ inoperable.	A.1.1 Verify SDM ~~to be~~ is within ~~the~~ limits ~~specified in the COLR~~. OR A.1.2 Initiate boration to restore SDM to within limit. 5 AND A.2 Be in MODE 3	1 hour 2 3 1 hour 2 6 hours
3.1.3.1 ACTION c.2 B. One rod not within alignment limits.	~~B.1 Restore rod to within alignment limits.~~ ~~OR~~ B.~~2~~1.1 Verify SDM to be within ~~the~~ limits ~~specified in the COLR~~. OR	~~1 hour~~ 4 1 hour 3

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1

INSERT 1

a. With THERMAL POWER $\leq$ 85% RTP, within 18 steps of their group step counter demand position; and

b. With THERMAL POWER > 85% RTP, within 12 steps of their group step counter demand position or as determined from Figure 3.1.4-1.

-NOTE-

The limits of Figure 3.1.4-1 are only applicable when $R \geq 1.04$, where $R = \frac{F_{\Delta H}^{Limit\,@\,100\%RTP}}{F_{\Delta H}^{N}}$.

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.1.3.1 Action C.2	B.2.1.2 Initiate boration to restore SDM to within limit. (5)	1 hour (2)
	AND	
	B.2.2 Reduce THERMAL POWER to ≤ 75% RTP.	2 hours
	AND	
	B.2.3 Verify SDM is within the limits specified in the COLR.	Once per 12 hours (3)
	AND	
	B.2.4 Perform SR 3.2.1.1 and SR 3.2.1.2.	72 hours (4) (2)
	AND	
	B.2.5 Perform SR 3.2.2.1.	72 hours
	AND	
	B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.	5 days
DOC M.2 — C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3.	6 hours
3.1.3.1 ACTION b. — D. More than one rod not within alignment limit. (5)	D.1.1 Verify SDM is within the limits specified in the COLR. OR	1 hour (2) (3)

CTS

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.1.3.1 Action b		D.1.2 Initiate boration to restore required SDM to within limit. (5) AND D.2 Be in MODE 3.	1 hour 6 hours	(2)

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY	
4.1.3.1.1	SR 3.1.4.1	Verify individual rod positions within alignment limit.	12 hours	(5) (2)
4.1.3.1.2	SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction. (8)	92 days	(5)
LCO 3.1.3.3 (Unit 1), LCO 3.1.3.4 (Unit 2), 4.1.3.3 (Unit 1), 4.1.3.4 (Unit 2)	SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.2 2.4 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. T_{avg} ≥ 500°F and (3) b. All reactor coolant pumps operating.	Prior to criticality after each removal of the reactor head	(6) (Unit 1) and 2.7 seconds (Unit 2) (7)

INSERT 2 (1)

1

INSERT 2

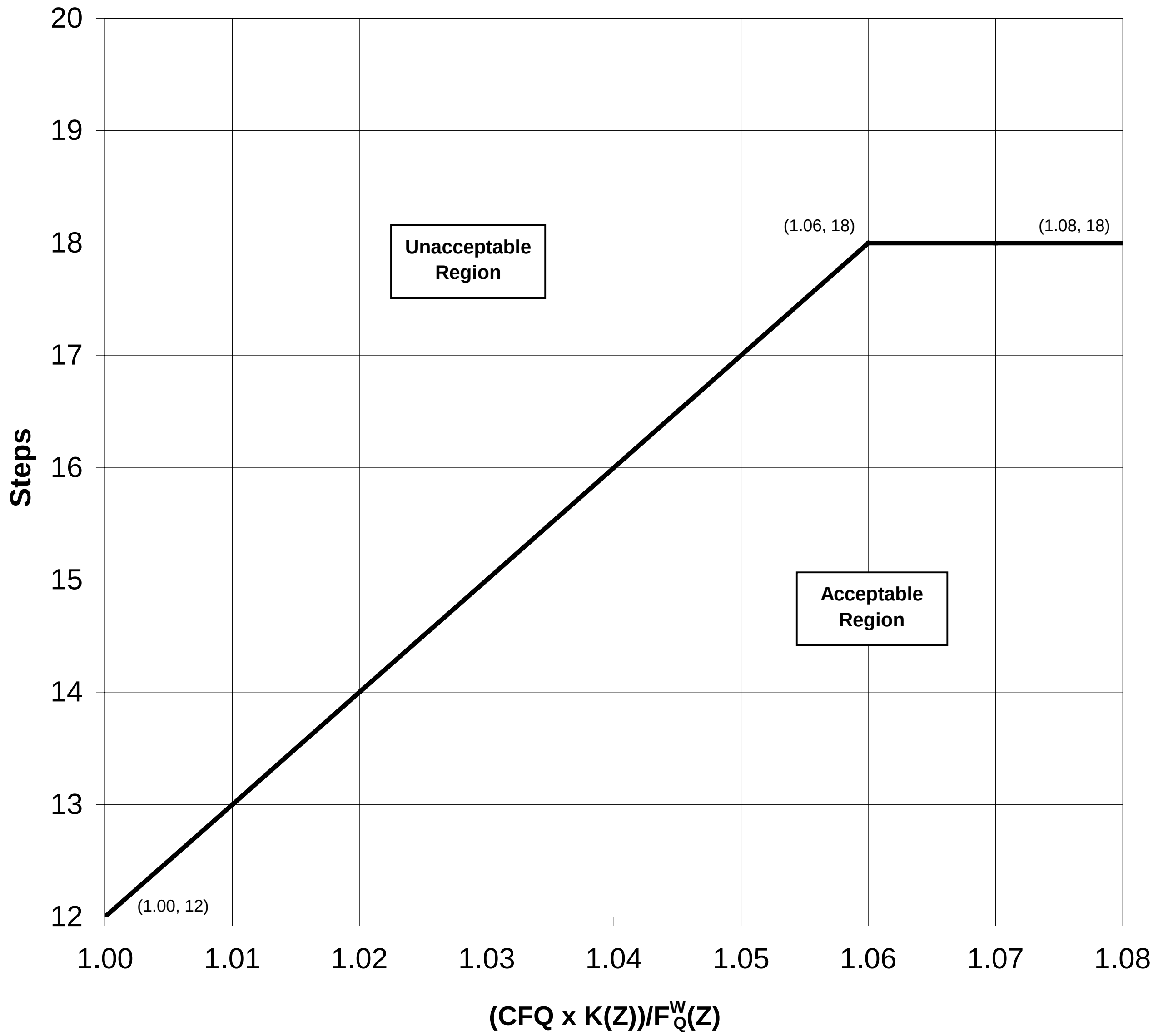

Figure 3.1.4-1
Allowed Rod Misalignment Above 85% RTP

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

1. The LCO has been modified to incorporate a CNP specific allowance. The change allows the alignment criteria to vary as a function of $F_Q^W(Z)$. This change to the LCO has been made consistent with the allowances in License Amendments 193 (Unit 1) and 179 (Unit 2) dated March 15, 1995 (as modified in the ITS 3.1.4 DOCs).

2. Typographical/grammatical error corrected.

3. Changes are made to be consistent with the format of the ITS. The location of where a parameter's limits reside, whether in the COLR or an actual LCO statement, is not normally specified in the Required Action. The Required Action normally states that the parameter shall be "within limits."

4. ISTS 3.1.4 Required Action B.1 requires restoration of a rod not within alignment limits within 1 hour or performance of a number of other actions, such as verification of SHUTDOWN MARGIN, reduction in reactor power, measurement of hot channel factors, and re-evaluation of the safety analyses. The Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 4.1.6.g, states "A Required Action which requires restoration, such that the Condition is no longer met, is considered superfluous. It is only included if it would be the only Required Action for the Condition or it is needed for presentation clarity." Neither exception applies in this case. In fact, the inclusion of Required Action B.1 requires an additional level of indenting and numbering for the remaining Required Actions in Condition B, which reduces its clarity. Therefore, Required Action B.1 is deleted and the subsequent Required Actions renumbered.

5. SR 3.1.4.2 has been modified to incorporate a CNP specific allowance, consistent with the CNP licensing basis. The amount of insertion to verify rod trippability has been changed from 10 steps to 8 steps.

6. The brackets have been removed and the proper plant specific information/value has been provided.

7. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.4 Rod Group Alignment Limits

BASES

BACKGROUND

The OPERABILITY (i.e., trippability) of the shutdown and control rods is an initial assumption in all safety analyses that assume rod insertion upon reactor trip. Maximum rod misalignment is an initial assumption in the safety analysis that directly affects core power distributions and assumptions of available SDM. (8)

The applicable criteria for these reactivity and power distribution design requirements are ~~10 CFR 50, Appendix A, GDC 10, "Reactor Design,"~~ GDC 26, "Reactivity Control System Redundancy and Capability" (Ref. 1), INSERT 1 (1) and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Plants" (Ref. ~~2~~ 3). (1)

Mechanical or electrical failures may cause a control or shutdown rod to become inoperable or to become misaligned from its group. Rod inoperability or misalignment may cause increased power peaking, due to the asymmetric reactivity distribution and a reduction in the total available rod worth for reactor shutdown. Therefore, rod alignment and OPERABILITY are related to core operation in design power peaking limits and the core design requirement of a minimum SDM.

Limits on rod alignment have been established, and all rod positions are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved.

Rod cluster control assemblies (RCCAs), or rods, are moved by their control rod drive mechanisms (CRDMs). Each CRDM moves its RCCA one step (approximately ⅝ inch) at a time, but at varying rates (steps per minute) depending on the signal output from the Rod Control System.

The RCCAs are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. If a bank of RCCAs consists of two groups, the groups are moved in a staggered fashion, but always within one step of each other. ~~All units have~~ There are four control banks and ~~at least two~~ four shutdown banks. (2)

The shutdown banks are maintained either in the fully inserted or fully withdrawn position. The control banks are moved in an overlap pattern, I

INSERT 1

Plant Specific Design Criterion (PSDC) 6, "Reactor Core Design" (Ref. 1), PSDC 28, "Reactivity Hot Shutdown Capability" (Ref. 2), PSDC 29, "Reactivity Shutdown Capability" (Ref. 2), PSDC 30, "Reactivity Holdown Capability" (Ref. 2)

BASES

BACKGROUND (continued)

using the following withdrawal sequence: When control bank A reaches a predetermined height in the core, control bank B begins to move out with control bank A. Control bank A stops at the position of maximum withdrawal, and control bank B continues to move out. When control bank B reaches a predetermined height, control bank C begins to move out with control bank B. This sequence continues until control banks A, B, and C are at the fully withdrawn position, and control bank D is approximately halfway withdrawn. The insertion sequence is the opposite of the withdrawal sequence. The control rods are arranged in a radially symmetric pattern, so that control bank motion does not introduce radial asymmetries in the core power distributions.

The axial position of shutdown rods and control rods is indicated by two separate and independent systems, which are the Bank Demand Position Indication System (commonly called group step counters) and the ~~Digital~~ Rod Position Indication (~~D~~RPI) System. (2)

The Bank Demand Position Indication System counts the pulses from the rod control system that moves the rods. There is one step counter for each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The Bank Demand Position Indication System is considered highly precise (± 1 step or ± ⅝ inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod. (2)

The ~~D~~RPI System provides a highly accurate indication of actual rod position, but at a lower precision than the step counters. This system is based on inductive analog signals from a series of coils spaced along a hollow tube. To increase the reliability of the system, the inductive coils are connected alternately to data system A or B. Thus, if one data system fails, the DRPI will go on half accuracy. The ~~D~~RPI system is capable of monitoring rod position within at least ± 12 steps with either full accuracy ~~or half accuracy~~. (2) (1) (2)

APPLICABLE SAFETY ANALYSES

Control rod misalignment accidents are analyzed in the safety analysis (4) (Ref. ~~3~~). The acceptance criteria for addressing control rod inoperability or misalignment are that: (2)

a. There be no violations of:

1. Specified acceptable fuel design limits, ~~or~~ (1) (3)

BASES

APPLICABLE SAFETY ANALYSES (continued)

; 3

2. Reactor Coolant System (RCS) pressure boundary integrity and

b. The core remains subcritical after accident transients.

INSERT 2 2

Two types of misalignment are distinguished. During movement of a control rod group, one rod may stop moving, while the other rods in the group continue. This condition may cause excessive power peaking.

Another

~~The second~~ type of misalignment occurs if one rod fails to insert upon a reactor trip and remains stuck fully withdrawn. This condition requires an evaluation to determine that sufficient reactivity worth is held in the control rods to meet the SDM requirement, with the maximum worth rod stuck fully withdrawn.

INSERT 3 2

Two types of analysis are performed in regard to static rod misalignment (Ref. 4). With control banks at their insertion limits, one type of analysis considers the case when any one rod is completely inserted into the core. The second type of analysis considers the case of a completely withdrawn single rod from a bank ~~inserted to its insertion limit~~. Satisfying limits on ~~departure from nucleate boiling ratio~~ in both of these cases bounds the situation when a rod is misaligned from its group ~~by 12 steps~~.

INSERT 4 2

1

DNBR

INSERT 5 2

2

~~Another type of misalignment occurs~~ if one RCCA fails to insert upon a reactor trip and remains stuck fully withdrawn. This condition is assumed in the evaluation to determine that the required SDM is met with the maximum worth RCCA also fully withdrawn (Ref. 5).

~~The Required Actions in this LCO ensure that either deviations from the alignment limits will be corrected or that THERMAL POWER will be adjusted so that excessive local linear heat rates (LHRs) will not occur, and that the requirements on SDM and ejected rod worth are preserved.~~

7

~~Continued operation of the reactor with a misaligned control rod is allowed if the heat flux hot channel factor ($F_Q(Z)$) and the nuclear enthalpy hot channel factor ($F^N_{\Delta H}$) are verified to be within their limits in the COLR and the safety analysis is verified to remain valid. When a control rod is misaligned, the assumptions that are used to determine the rod insertion limits, AFD limits, and quadrant power tilt limits are not preserved. Therefore, the limits may not preserve the design peaking factors, and $F_Q(Z)$ and $F^N_{\Delta H}$ must be verified directly by incore mapping. Bases Section 3.2 (Power Distribution Limits) contains more complete discussions of the relation of $F_Q(Z)$ and $F^N_{\Delta H}$ to the operating limits.~~

7

2

INSERT 2

There are three rod cluster control assembly (RCCA) misalignment accidents which are analyzed which include one or more dropped RCCAs, a dropped RCCA bank, and a statically misaligned RCCA (Ref. 4).

2

INSERT 3

For the dropped RCCA(s) or dropped RCCA bank misalignment accidents a negative reactivity insertion will result. Power may be reestablished either by reactivity feedback or control bank withdrawal. Following plant stabilization, normal rod retrieval or shutdown procedures are followed. For dropped RCCA events in the automatic rod control mode, the Rod Control System detects the drop in power and initiates control bank withdrawal. In all cases, the minimum departure from nucleate boiling ratio (DNBR) remains above the limit.

2

INSERT 4

and the remainder of the bank inserted

2

INSERT 5

within the limits specified in the LCO.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

Shutdown and control rod OPERABILITY and alignment are directly related to power distributions and SDM, which are initial conditions assumed in safety analyses. Therefore they satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The limits on shutdown or control rod alignments ensure that the assumptions in the safety analysis will remain valid. The requirements on control rod OPERABILITY ensure that upon reactor trip, the assumed reactivity will be available and will be inserted. The control rod OPERABILITY requirements (i.e., trippability) are separate from the alignment requirements, which ensure that the RCCAs and banks maintain the correct power distribution and rod alignment. The rod OPERABILITY requirement is satisfied provided the rod will fully insert in the required rod drop time assumed in the safety analysis. Rod control malfunctions that result in the inability to move a rod (e.g., rod lift coil failures), but that do not impact trippability, do not result in rod inoperability. INSERT 6 (4)

The requirement to maintain the rod alignment to within plus or minus 12 steps is conservative. ~~The minimum misalignment assumed in safety analysis is 24 steps (15 inches), and in some cases a total misalignment from fully withdrawn to fully inserted is assumed.~~ INSERT 7 (2)

Failure to meet the requirements of this LCO may produce unacceptable power peaking factors and LHRs, or unacceptable SDMs, all of which may constitute initial conditions inconsistent with the safety analysis.

APPLICABILITY

The requirements on RCCA OPERABILITY and alignment are applicable in MODES 1 and 2 because these are the only MODES in which neutron (or fission) power is generated, and the OPERABILITY (i.e., trippability) and alignment of rods have the potential to affect the safety of the ~~plant~~ unit. (2) In MODES 3, 4, 5, and 6, the alignment limits do not apply because the control rods are bottomed and the reactor is shut down and not producing fission power. In the shutdown MODES, the OPERABILITY of the shutdown and control rods has the potential to affect the required SDM, but this effect can be compensated for by an increase in the boron concentration of the RCS. See LCO 3.1.1, "SHUTDOWN MARGIN," for SDM in MODES 3, 4, and 5 and LCO 3.9.1, "Boron Concentration," for boron concentration requirements during refueling.

4

INSERT 6

or as determined from Figure 3.1.4-1 with THERMAL POWER ≥ 85% or within 18 steps of their group step counter demand position when THERMAL POWER is < 85% RTP

2

INSERT 7

The safety analysis assumes a misalignment of one or more RCCA(s) or an entire RCCA bank. A misalignment of 30 steps will not cause power distribution worse than the design limits. Power distribution evaluations for steady state and load following conditions with rod misalignment of 30 steps showed that the increase in peaking factors could be accommodated at or below 85% RTP. Evaluations also showed that above 85% RTP, a misalignment of 30 steps could be accommodated if the margin in (CFQ x K(Z))/F^W_Q(Z) is at least 1.06 and margin in $F^N_{\Delta H}$ is at least 4%. For lower (CFQ x K(Z))/F^W_Q(Z) values the allowable misalignment is reduced.

BASES

ACTIONS

A.1.1 and A.1.2

(2) INSERT 8

When one or more rods are inoperable (i.e. untrippable), there is a possibility that the required SDM may be adversely affected. Under these conditions, it is important to determine the SDM, and if it is less than the required value, initiate boration until the required SDM is recovered. The Completion Time of 1 hour is adequate for determining SDM and, if necessary, for initiating emergency boration and restoring SDM.

In this situation, SDM verification must include the worth of the untrippable rod, as well as a rod of maximum worth.

A.2

INSERT 9 (5)

~~If the inoperable rod(s) cannot be restored to OPERABLE status~~, the plant unit must be brought to a MODE or condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours. (2)

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant unit systems. (2)

~~B.1~~

~~When a rod becomes misaligned, it can usually be moved and is still trippable. If the rod can be realigned within the Completion Time of 1 hour, local xenon redistribution during this short interval will not be significant, and operation may proceed without further restriction.~~ (4)

~~An alternative to realigning a single misaligned RCCA to the group average position is to align the remainder of the group to the position of the misaligned RCCA. However, this must be done without violating the bank sequence, overlap, and insertion limits specified in LCO 3.1.5, "Shutdown Bank Insertion Limits," and LCO 3.1.6, "Control Bank Insertion Limits." The Completion Time of 1 hour gives the operator sufficient time to adjust the rod positions in an orderly manner.~~

B.2.1.1 and B.2.1.2 (4)

With a misaligned rod, SDM must be verified to be within limit or boration must be initiated to restore SDM to within limit.

2 **INSERT 8**

due to being immovable as a result of excessive friction or mechanical interference or otherwise known to be untrippable

5 **INSERT 9**

When one or more rods are inoperable

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BASES

ACTIONS (continued)

In many cases, realigning the remainder of the group to the misaligned rod may not be desirable. For example, realigning control bank B to a rod that is misaligned 15 steps from the top of the core would require a significant power reduction, since control bank D must be moved fully in and control bank C must be moved in ~~to~~ by approximately 100 ~~to ≤ 115~~ steps. 2

Power operation may continue with one RCCA ~~trippable~~ OPERABLE but misaligned, provided that SDM is verified within 1 hour. The Completion Time of 1 hour represents the time necessary for determining the actual unit SDM and, if necessary, aligning and starting the necessary systems and components to initiate boration. 5

B.2.2, B.2.3, B.2.4, B.2.5, and B.2.6 4 5

For continued operation with a misaligned rod, ~~RTP~~ power must be reduced, SDM must periodically be verified within limits, hot channel factors ($F_Q(Z)$ and $F^N_{\Delta H}$) must be verified within limits, and the safety analyses must be re-evaluated to confirm continued operation is permissible.

Reduction of power to 75% RTP ensures that local LHR increases due to a misaligned RCCA will not cause the core design criteria to be exceeded ~~(Ref. 7)~~. The Completion Time of 2 hours gives the operator sufficient time to accomplish an orderly power reduction without challenging the Reactor ~~Protection~~ Trip System. 2 2

When a rod is known to be misaligned, there is a potential to impact the SDM. Since the core conditions can change with time, periodic verification of SDM is required. A Frequency of 12 hours is sufficient to ensure this requirement continues to be met.

Verifying that $F_Q(Z)$, as approximated by $F^C_Q(Z)$ and $F^W_Q(Z)$, and $F^N_{\Delta H}$ are within the required limits ensures that current operation at 75% RTP with a rod misaligned is not resulting in power distributions that may invalidate safety analysis assumptions at full power. The Completion Time of 72 hours allows sufficient time to obtain flux maps of the core power distribution using the incore flux mapping system and to calculate $F_Q(Z)$ and $F^N_{\Delta H}$.

Once current conditions have been verified acceptable, time is available to perform evaluations of accident analysis to determine that core limits will not be exceeded during a Design Basis Event for the duration of operation under these conditions. The accident analyses presented in U FSAR Chapter 1~~5~~4 (Ref. ~~8~~6) that may be adversely affected will be 2

BASES

ACTIONS (continued)

evaluated to ensure that the analysis results remain valid for the duration of continued operation under these conditions. A Completion Time of 5 days is sufficient time to obtain the required input data and to perform the analysis.

C.1

any associated 5

When ~~Required Actions~~ cannot be completed within the ~~s~~ Completion Time, the unit must be brought to a MODE ~~or Condition~~ in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE ~~2 with K_{eff} < 1.0~~ within 6 hours, which obviates concerns about the development of undesirable xenon or power distributions. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging the ~~plant~~ unit systems. 5 5 3 2

D.1.1 and D.1.2

More than one control rod becoming misaligned from its group average position is not expected, and has the potential to reduce SDM. Therefore, SDM must be evaluated. One hour allows the operator adequate time to determine SDM. Restoration of the required SDM, if necessary, requires increasing the RCS boron concentration to provide negative reactivity, as described in the Bases ~~of~~ LCO 3.1.1. The required Completion Time of 1 hour for initiating boration is reasonable, based on the time required for potential xenon redistribution, the low probability of an accident occurring, and the steps required to complete the action. This allows the operator sufficient time to align the required valves and start the boric acid pumps. Boration will continue until the required SDM is restored. of 8

D.2

If more than one rod is found to be misaligned or becomes misaligned because of bank movement, the unit conditions fall outside of the accident analysis assumptions. Since automatic bank sequencing would continue to cause misalignment, the unit must be brought to a MODE ~~or Condition~~ in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE ~~2 with K_{eff} < 1.0~~ within 6 hours. 3 5 5

BASES

ACTIONS (continued)

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 2 with K_{eff} < 1.0 from full power conditions in an orderly manner and without challenging plant systems. (3) (5) unit (2)

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual rod positions are within alignment limits at a Frequency of 12 hours provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. The specified Frequency takes into account other rod position information that is continuously available to the operator in the control room, so that during actual rod motion, deviations can immediately be detected.

SR 3.1.4.2

Verifying each control rod is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2 with K_{eff} ≥ 1.0, tripping each control rod would result in radial or axial power tilts, or oscillations. Exercising each individual control rod every 92 days provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each control rod by (8) 10 steps will not cause radial or axial power tilts, or oscillations, to occur. The 92 day Frequency takes into consideration other information available to the operator in the control room and SR 3.1.4.1, which is performed more frequently and adds to the determination of OPERABILITY of the rods. Between required performances of SR 3.1.4.2 (determination of control rod OPERABILITY by movement), if a control rod(s) is discovered to be immovable, but remains trippable the control rod(s) is considered to be OPERABLE. At any time, if a control rod(s) is immovable, a determination of the trippability (OPERABILITY) of the control rod(s) must be made, and appropriate action taken. (5)

SR 3.1.4.3

Verification of rod drop times allows the operator to determine that the maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analysis. Measuring rod drop times prior to reactor criticality, after reactor vessel head removal, ensures that the reactor internals and rod drive mechanism will not interfere with rod motion or rod drop time, and that no degradation in these systems has occurred that would adversely affect control rod motion or drop time. This testing is performed with all RCPs operating and the average

Rod Group Alignment Limits
B 3.1.4

BASES

SURVEILLANCE REQUIREMENTS (continued)

moderator temperature ≥ 500°F to simulate a reactor trip under actual conditions.

This Surveillance is performed during a unit ~~plant~~ outage, due to the plant conditions needed to perform the SR and the potential for an unplanned unit ~~plant~~ transient if the Surveillance were performed with the reactor at power. 2 2

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 10 and GDC 26.~~ UFSAR, Section 1.4.2 1
2. UFSAR, Section 1.4.5. 1
3. ~~2.~~ 10 CFR 50.46.
4. ~~3.~~ UFSAR, ~~Chapter [15]~~ Section 14.1.3. 2 6
5. ~~4.~~ UFSAR, ~~Chapter [15]~~ Section 14.2.6. 2
~~5. FSAR, Chapter [15].~~ 6
6. UFSAR, Chapter 14 ~~[15]~~. 2 6
~~7. FSAR, Chapter [15].~~ 6

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.4 BASES, ROD GROUP ALIGNMENT LIMITS

1. CNP Units 1 and 2 were designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. CNP Units 1 and 2 were designed and constructed to meet the intent of the proposed General Design Criteria, published in 1967. However, the CNP UFSAR contains discussions of the Plant Specific Design Criteria (PSDCs) used in the design of CNP Units 1 and 2. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section and description in the UFSAR.

2. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

4. The Bases are changed to reflect changes made to the Specification.

5. Changes made to be consistent with the Specification.

6. The brackets have been removed and the proper plant specific information/value has been provided.

7. The discussion of the Required Actions when the LCO is not met has been deleted since it is not appropriate in the Applicable Safety Analyses Section. This information is adequately discussed in the Bases for ACTIONS B.2, B.3, B.4, B.5, and B.6. This is also consistent with the format of the ISTS.

8. Typographical/grammatical error corrected.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.4, ROD GROUP ALIGNMENT LIMITS

There are no specific NSHC discussions for this Specification.

ATTACHMENT 5

ITS 3.1.5, Shutdown Bank Insertion Limits

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.5

A.1

ITS

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

LCO 3.1.5 — 3.1.3.4 All shutdown rods shall be limited in physical insertion as specified in the COLR.

A.2

APPLICABILITY: MODES ~~1*~~ and ~~2*#~~

M.1

ACTION:

one or more shutdown banks

ACTION A — With ~~a maximum of one shutdown rod~~ inserted beyond the insertion limit specified in the COLR, except for surveillance testing pursuant to Specification 4.1.3.1.2, within ~~one~~ hour either:

Applicability Note

two

L.1

a. Restore the rod to within the insertion limit specified in the COLR, or

Add proposed Required Actions A.1.1 and A.1.2

~~b. Declare the rod to be inoperable and apply Specification 3.1.3.1.~~

L.1

Add proposed ACTION B

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1 — 4.1.3.4 Each shutdown rod shall be determined to be within the insertion limit specified in the COLR:

~~a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C or D during an approach to reactor criticality, and~~

L.2

b. At least once per 12 hours thereafter.

~~* See Special Test Exceptions 3.10.2 and 3.10.4.~~

A.2

~~# With K_{eff} greater than or equal to 1.0~~

M.1

ITS 3.1.5

A.1

ITS

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

LCO 3.1.5 3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the COLR.

A.2

APPLICABILITY: MODES 1~~*~~ and 2~~*#~~

M.1

ACTION:

one or more shutdown banks

ACTION A With ~~a maximum of one shutdown rod~~ inserted beyond the insertion limit specified in the COLR, except for surveillance testing pursuant to Specification 4.1.3.1.2, within ~~one~~ hour either:

Applicability Note

two

L.1

a. Restore the rod to within the insertion limit specified in the COLR. or

Add proposed Required Action A.1.1 and A.1.2

~~b. Declare the rod to be inoperable and apply Specification 3.1.3.1.~~

Add proposed ACTION B

L.1

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1 4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit specified in the COLR:

~~a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C or D during an approach to reactor criticality, and~~

L.2

b. At least once per 12 hours thereafter.

~~* See Special Test Exceptions 3.10.2 and 3.10.3.~~

A.2

~~# With K_{eff} greater than or equal to 1.0~~

M.1

DISCUSSION OF CHANGES
ITS 3.1.5, SHUTDOWN BANK INSERTION LIMITS

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 The Applicability of CTS 3.1.3.4 (Unit 1) and CTS 3.1.3.5 (Unit 2) is modified by footnote * that states "See Special Test Exceptions 3.10.2 and 3.10.4" (Unit 1) and "See Special Test Exceptions 3.10.2 and 3.10.3" (Unit 2). ITS 3.1.5 Applicability does not contain the footnote or a reference to the Special Test Exceptions.

The purpose of the footnote reference is to alert the user that Special Test Exceptions exist that may modify the Applicability of the Specification. This change is acceptable because it is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative as it incorporates an ITS convention with no technical change to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.1.3.4 (Unit 1) and CTS 3.1.3.5 (Unit 2) are applicable in MODE 1 and MODE 2 with $k_{eff} \geq 1.0$. ITS 3.1.5 is applicable in MODES 1 and 2. This changes the CTS by expanding the Applicability from MODE 2 with the reactor critical to all of MODE 2.

The purpose of CTS 3.1.3.4 (Unit 1) and CTS 3.1.3.5 (Unit 2) is to ensure that the shutdown banks are fully withdrawn prior to withdrawing the control banks in order to ensure that there is sufficient shutdown margin available to quickly shutdown the reactor. This change is acceptable because applying that requirement prior to removing the control banks and bringing the reactor critical ensures that the shutdown margin is available and is consistent with plant operation, in that the shutdown banks are completely withdrawn before beginning to withdraw the control banks and approaching criticality. This change is designated as more restrictive because it increases the conditions under which Technical Specification controls will be applied.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

DISCUSSION OF CHANGES
ITS 3.1.5, SHUTDOWN BANK INSERTION LIMITS

LESS RESTRICTIVE CHANGES

L.1 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.4 Action (Unit 1) and CTS 3.1.3.5 Action (Unit 2) provide compensatory actions for a maximum of one shutdown rod inserted beyond the insertion limit specified in the COLR. The actions require that within one hour, either restore the rod to within the insertion limit specified in the COLR or declare the rod inoperable and apply Specification 3.1.3.1. For more than one shutdown rod beyond the insertion limit the CTS would result in an CTS 3.0.3 entry. ITS 3.1.5 ACTION A provides Required Actions for one or more shutdown banks not within limits. ITS 3.1.5 Required Action A.1.1 requires the verification that SDM is within limits in one hour and ITS 3.1.5 Required Action A.1.2 requires the initiation of boration to restore SDM to within limits in one hour (only one of these Required Actions must be performed). In addition, ITS 3.1.5 Required Action A.2 requires the restoration of shutdown banks to within limits in 2 hours. With any Required Action and associated Completion Time (of Condition A) not met the unit must be in MODE 3 in the following 6 hours. This changes the CTS by allowing more than one shutdown rod to be outside the insertion limits specified in the COLR, provides an additional hour to restore the shutdown bank or control rods to within limits, eliminates the allowance to declare the rod inoperable and take the ACTIONS of Specification 3.1.3.1, and adds the requirement to verify SDM or to initiate boration within one hour. It also eliminates the requirement to enter LCO 3.0.3 if more than one shutdown rod is inserted beyond the insertion limits.

The purpose of CTS 3.1.3.4 Action (Unit 1) and CTS 3.1.3.5 Action (Unit 2) is to ensure that the shutdown banks are fully withdrawn in order to ensure that there is sufficient shutdown margin available to quickly shutdown the reactor. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering that only a small amount of time is provided to reestablish the required features and the low probability of a DBA occurring during the repair period. Allowing an additional hour to restore one or more shutdown banks (or more than one shutdown rod) inserted below the insertion limit is appropriate as it avoids a shutdown, a unit transient, while the rod control system is not in fully working order. The ITS requires verification that the shutdown margin requirement is met or actions to restore the shutdown margin to within its limit within 1 hour, so all safety analysis assumptions are being met. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.2 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.3.4.a (Unit 1) and CTS 4.1.3.5.a (Unit 2) require verification that each shutdown rod is within the insertion limit specified in the COLR within 15 minutes prior to withdrawal of any control rods in control rod banks A, B, C, and D during an approach to reactor criticality. ITS 3.1.5 does not require verification that the shutdown rods are above the insertion limits within 15 minutes prior to control bank withdrawal. This changes the CTS by eliminating the requirement that the shutdown banks be verified to be above the insertion limit within 15 minutes prior to withdrawing control banks A, B, C, and D.

DISCUSSION OF CHANGES
ITS 3.1.5, SHUTDOWN BANK INSERTION LIMITS

The purpose of CTS 4.1.3.4.a (Unit 1) and CTS 4.1.3.5.a (Unit 2) is to verify that the shutdown banks are withdrawn above the insertion limit prior to withdrawing the control banks. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a Frequency necessary to give confidence that the equipment can perform its assumed safety function. Under the ITS Applicability of MODE 2 and the requirement of ITS LCO 3.0.4, the shutdown banks must be above the insertion limit prior to entering the ITS Applicability of MODE 2. However, it is not required to verify compliance within a specified time prior to initial control bank withdrawal. Specifying a time is not necessary to ensure that the shutdown banks are above the insertion limit prior to initial control bank withdrawal as long as the shutdown banks are withdrawn before withdrawing the control banks. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

LCO 3.1.3.4(Unit 1), LCO 3.1.3.5(Unit 2)

LCO 3.1.5 Each shutdown bank shall be within insertion limits specified in the COLR.

APPLICABILITY: MODES 1 and 2.

3.1.3.4 Action (Unit 1), 3.1.3.5 Action (Unit 2)

- NOTE -
This LCO is not applicable while performing SR 3.1.4.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown banks not within limits.	A.1.1 Verify SDM is within the limits ~~specified in the COLR~~.	1 hour
	<u>OR</u>	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	<u>AND</u>	
	A.2 Restore shutdown banks to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

3.1.3.4 Action (Unit 1), 3.1.3.5 Action (Unit 2)

DOC L1

1

2

5

CTS

4.1.3.4 (unit 1),
4.1.3.5 (unit 2)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank is within the insertion limits specified in the COLR.	12 hours

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.5, SHUTDOWN BANK INSERTION LIMITS

1. Changes are made to be consistent with the format of the ITS. The location of where a parameter's limits reside, whether in the COLR or an actual LCO statement, is not normally specified in the Required Action. The Required Action normally states that the parameter shall be "within limits."

2. Typographical/grammatical error corrected.

Improved Standard Technical Specifications (ISTS) Bases Markup
and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.5 Shutdown Bank Insertion Limits

BASES

BACKGROUND

The insertion limits of the shutdown and control rods are initial assumptions in all safety analyses that assume rod insertion upon reactor trip. The insertion limits directly affect core power and fuel burnup distributions and assumptions of available ejected rod worth, SDM and initial reactivity insertion rate.

The applicable criteria for these reactivity and power distribution design requirements are ~~10 CFR 50, Appendix A, GDC 10, "Reactor Design," GDC 26, "Reactivity Control System Redundancy and Protection," GDC 28, "Reactivity Limits" (Ref. 1),~~ and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors" (Ref. 2). Limits on control rod insertion have been established, and all rod positions are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved. INSERT 1 (1) (4)

The rod cluster control assemblies (RCCAs) are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. A bank of RCCAs, consists of two groups that are moved in a staggered fashion, but always within one step of each other. All plants have four control banks and at least two shutdown banks. See LCO 3.1.4, "Rod Group Alignment Limits," for control and shutdown rod OPERABILITY and alignment requirements, and LCO 3.1.7, "Rod Position Indication," for position indication requirements. ing There are (2) four

The control banks are used for precise reactivity control of the reactor. The positions of the control banks are normally automatically controlled by the Rod Control System, but they can also be manually controlled. They are capable of adding negative reactivity very quickly (compared to borating). The control banks must be maintained above designed insertion limits and are typically near the fully withdrawn position during normal full power operations.

Hence, they are not capable of adding a large amount of positive reactivity. Boration or dilution of the Reactor Coolant System (RCS) compensates for the reactivity changes associated with large changes in RCS temperature. The design calculations are performed with the assumption that the shutdown banks are withdrawn first. The shutdown

1

INSERT 1

Plant Specific Design Criterion (PSDC) 6, "Reactor Core Design" (Ref. 1), PSDC 27, "Redundancy of Reactivity Control" (Ref. 2), PSDC 28, "Reactivity Hot Shutdown Capability" (Ref. 2), PSDC 29, "Reactivity Shutdown Capability" (Ref. 2), PSDC 30, "Reactivity Holdown Capability" (Ref. 2), PSDC 33, "Reactor Coolant Pressure Boundary Capability" (Ref. 3),

BASES

BACKGROUND (continued)

banks can be fully withdrawn without the core going critical. This provides available negative reactivity in the event of boration errors. The shutdown banks are controlled manually by the control room operator. During normal unit operation, the shutdown banks are either fully withdrawn or fully inserted. The shutdown banks must be completely withdrawn from the core, prior to withdrawing any control banks during an approach to criticality. The shutdown banks are then left in this position until the reactor is shut down. They affect core power and burnup distribution, and add negative reactivity to shut down the reactor upon receipt of a reactor trip signal.

APPLICABLE SAFETY ANALYSES

On a reactor trip, all RCCAs (shutdown banks and control banks), except the most reactive RCCA, are assumed to insert into the core. The shutdown banks shall be at or above their insertion limits and available to insert the maximum amount of negative reactivity on a reactor trip signal. The control banks may be partially inserted in the core, as allowed by LCO 3.1.6, "Control Bank Insertion Limits." The shutdown bank and control bank insertion limits are established to ensure that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM (see LCO 3.1.1, "SHUTDOWN MARGIN") following a reactor trip from full power. The combination of control banks and shutdown banks (less the most reactive RCCA, which is assumed to be fully withdrawn) is sufficient to take the reactor from full power conditions at rated temperature to zero power, and to maintain the required SDM at rated no load temperature (Ref. [illegible]). 2 The shutdown bank insertion limit also limits the reactivity worth of an ejected shutdown rod. 2

The acceptance criteria for addressing shutdown and control rod bank insertion limits and inoperability or misalignment is that:

a. There be no violations of:

1. Specified acceptable fuel design limits, or 3

2. RCS pressure boundary integrity, and

b. The core remains subcritical after accident transients.

As such, the shutdown bank insertion limits affect safety analysis involving core reactivity and SDM (Ref. [illegible]). 5 2

BASES

APPLICABLE SAFETY ANALYSES (continued)

The shutdown bank insertion limits preserve an initial condition assumed in the safety analyses and, as such, satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The shutdown banks must be within their insertion limits any time the reactor is critical or approaching criticality. This ensures that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM following a reactor trip.

The shutdown bank insertion limits are defined in the COLR.

APPLICABILITY

The shutdown banks must be within their insertion limits, with the reactor in MODES 1 and 2. This ensures that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM following a reactor trip. The shutdown banks do not have to be within their insertion limits in MODE 3, unless an approach to criticality is being made. In MODE 3, 4, 5, or 6, the shutdown banks are fully inserted in the core and contribute to the SDM. Refer to LCO 3.1.1 for SDM requirements in MODES 3, 4, and 5. LCO 3.9.1, "Boron Concentration," ensures adequate SDM in MODE 6.

The Applicability requirements have been modified by a Note indicating the LCO requirement is suspended during SR 3.1.4.2. This SR verifies the freedom of the rods to move, and requires the shutdown bank to move below the LCO limits, which would normally violate the LCO.

ACTIONS

A.1.1, A.1.2 and A.2

When one or more shutdown banks is not within insertion limits, 2 hours is allowed to restore the shutdown banks to within the insertion limits. This is necessary because the available SDM may be significantly reduced, with one or more of the shutdown banks not within their insertion limits. Also, verification of SDM or initiation of boration within 1 hour is required, since the SDM in MODES 1 and 2 is ensured by adhering to the control and shutdown bank insertion limits (see LCO 3.1.1). If shutdown banks are not within their insertion limits, then SDM will be verified by performing a reactivity balance calculation, considering the effects listed in the [BASES] for SR 3.1.1.1. (4)

The allowed Completion Time of 2 hours provides an acceptable time for evaluating and repairing minor problems without allowing the ~~plant~~ unit to remain in an unacceptable condition for an extended period of time. (2)

BASES

ACTIONS (continued)

B.1

INSERT 2 (5)

If ~~the shutdown banks cannot be restored to within their insertion limits within 2 hours,~~ the unit must be brought to a MODE where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging ~~plant~~ unit systems. (2)

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that the shutdown banks are within their insertion limits prior to an approach to criticality ensures that when the reactor is critical, or being taken critical, the shutdown banks will be available to shut down the reactor, and the required SDM will be maintained following a reactor trip. This SR and Frequency ensure that the shutdown banks are withdrawn before the control banks are withdrawn during a unit startup.

Since the shutdown banks are positioned manually by the control room operator, a verification of shutdown bank position at a Frequency of 12 hours, after the reactor is taken critical, is adequate to ensure that they are within their insertion limits. Also, the 12 hour Frequency takes into account other information available in the control room for the purpose of monitoring the status of shutdown rods.

REFERENCES

1. 10 CFR ~~50~~, Appendix A, ~~GDC~~ 10, GDC 26, and GDC 28. (1)

INSERT 3

(4) ~~2~~. 10 CFR 50.46. (1)

(5) ~~3~~. (U)FSAR, Chapter ~~15~~ (14). (2) (6)

5

INSERT 2

any Required Action and associated Completion Time is not met

1

INSERT 3

1. UFSAR, Section 1.4.2.

2. UFSAR, Section 1.4.5.

3. UFSAR, Section 1.4.6.

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.5 BASES, SHUTDOWN BANK INSERTION LIMITS

1. CNP Units 1 and 2 were designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. CNP Units 1 and 2 were designed and constructed to meet the intent of the proposed General Design Criteria, published in 1967. However, the CNP UFSAR contains discussions of the Plant Specific Design Criteria (PSDCs) used in the design of CNP Units 1 and 2. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section and description in the UFSAR.

2. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

4. Typographical/grammatical error corrected.

5. Change made to be consistent with the Specification.

6. The brackets have been removed and the proper plant specific information/value has been provided.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.5, SHUTDOWN BANK INSERTION LIMITS

There are no specific NSHC discussions for this Specification.

ATTACHMENT 6

ITS 3.1.6, Control Bank Insertion Limits

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.6

A.1

ITS

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

, sequence, and overlap limits

M.1

LCO 3.1.6

3.1.3.5 The control banks shall be limited in physical insertion as specified in the COLR.

A.2

APPLICABILITY: MODES 1* and 2*#.

ACTION:

ACTION A

Applicability Note

With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2; either:

Add proposed Required Actions A.1.1 and A.1.2

M.2

ACTION A

a. Restore the control banks to within the limits within two hours, or

b. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the group position using the insertion limits specified in the COLR, or

A.3

Add proposed ACTION B

M.1

ACTION C

c. Be in HOT STANDBY within 6 hours.

MODE 2 with k_{eff} < 1.0

A.4

SURVEILLANCE REQUIREMENTS

SR 3.1.6.2

4.1.3.5 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify the individual rod positions at least once per 4 hours.

L.1

Add proposed SR 3.1.6.3

M.1

* See Special Test Exceptions 3.10.2 and 3.10.4

A.2

Applicability

\# With K_{eff} greater than or equal to 1.0.

A.1

Figure 3.1-1 intentionally deleted.

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ITS 3.1.6

A.1

ITS

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN - TAVG GREATER THAN 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k. See ITS 3.1.1

APPLICABILITY: MODES 1, 2*, 3, and 4.

ACTION:

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k:

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). See ITS 3.1.4 See ITS Chapter 1.0

SR 3.1.6.2 b. When in MODE 1 or MODE 2 with Keff greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.5.

SR 3.1.6.1 c. When in MODE 2 with Keff less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.5.

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.5. See ITS 3.1.1

*See Special Test Exception 3.10.1. See ITS 3.1.1

ITS

A.1

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

, sequence, and overlap limits — M.1

LCO 3.1.6 3.1.3.6 The control banks shall be limited in physical insertion as specified in the COLR.

A.2

APPLICABILITY: MODES 1~~*~~ and 2~~*~~#.

ACTION:

ACTION A / Applicability Note / ACTION A

With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2; either:

Add proposed Required Actions A.1.1 and A.1.2 — M.2

a. Restore the control banks to within the limits within two hours, or

b. ~~Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the group position using the insertion limits specified in the COLR,~~ or — A.3

Add proposed ACTION B — M.1

ACTION C c. Be in at least ~~HOT STANDBY~~ within 6 hours.

MODE 2 with k_{eff} < 1.0 — A.4

SURVEILLANCE REQUIREMENTS

SR 3.1.6.2 4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours ~~except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify the individual rod positions at least once per 4 hours.~~ — L.1

Add proposed SR 3.1.6.3 — M.1

~~* See Special Test Exceptions 3.10.2 and 3.10.3~~ — A.2

Applicability # With K_{eff} greater than or equal to 1.0.

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A.1

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ITS 3.1.6

A.1

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

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ITS 3.1.6

A.1

ITS

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN - T_{AVG} GREATER THAN 200°F

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.3% Delta k/k. — See ITS 3.1.1

APPLICABILITY: MODES 1, 2*, 3, and 4.

ACTION:

With the SHUTDOWN MARGIN less than 1.3% Delta k/k, immediately initiate and continue boration at greater than or equal to 34 gpm of a solution containing greater than or equal to 6,550 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to 1.3% Delta k/k:

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. — See ITS 3.1.4
If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s). — See ITS Chapter 1.0

SR 3.1.6.2 b. When in MODE 1 or MODE 2 with K_{eff} greater than or equal to 1.0, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.6.

SR 3.1.6.1 c. When in MODE 2 with K_{eff} less than 1.0, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6.

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.6. — See ITS 3.1.1

*See Special Test Exception 3.10.1. — See ITS 3.1.1

DISCUSSION OF CHANGES
ITS 3.1.6, CONTROL BANK INSERTION LIMITS

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 The Applicability of CTS 3.1.3.5 (Unit 1) and CTS 3.1.3.6 (Unit 2) is modified by footnote * that states "See Special Test Exceptions 3.10.2 and 3.10.4" (Unit 1) and "See Special Test Exceptions 3.10.2 and 3.10.3" (Unit 2). ITS 3.1.6 Applicability does not contain the footnote or a reference to the Special Test Exceptions.

The purpose of the footnote reference is to alert the user that Special Test Exceptions exist that may modify the Applicability of the Specification. This change is acceptable because it is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative as it incorporates an ITS convention with no technical change to the CTS.

A.3 CTS 3.1.3.5 Actions a and b (Unit 1) and CTS 3.1.3.6 Actions a and b (Unit 2) state that with the control banks inserted beyond the insertion limits, restore the control banks to within the insertion limits within two hours or reduce the THERMAL POWER within 2 hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the group position using the insertion limits specified in the COLR. ITS 3.1.6 Required Action A.2 requires the control bank to be restored to within limits within 2 hours. This changes the CTS by eliminating the explicit statement that compliance with the LCO can be restored in order to exit the Action.

This change is acceptable because the requirements have not changed. Reducing THERMAL POWER so that the insertion limits, which are a function of power, are lowered and the control bank inserted below the insertion limits comes within the limit is the same as the CTS Action a option to "restore the control banks to within the insertion limit." This change is considered administrative because the technical requirements have not changed.

A.4 CTS 3.1.3.5 Action c (Unit 1) and CTS 3.1.3.6 Action c (Unit 2) require the unit to be in HOT STANDBY within 6 hours if Actions a or b are not met. The CTS Applicability is MODE 1 and 2 with $k_{eff} \geq 1.0$. ITS 3.1.6 ACTION C requires the unit to be in MODE 2 with $k_{eff} < 1.0$ within 6 hours. This changes the CTS by requiring the plant to be in MODE 2 with $k_{eff} < 1.0$ instead of HOT SHUTDOWN (i.e., MODE 3).

This change is acceptable because the requirements have not changed. In accordance with CTS LCO 3.0.1, Actions are only required to be followed while in the Mode of Applicability. The CTS control bank physical insertion limits are applicable in MODES 1 and 2 with $k_{eff} \geq 1.0$. Therefore, under the CTS, the unit does not have to enter MODE 3 because the Applicability of the CTS LCO has been exited when in MODE 2 with $k_{eff} < 1.0$. As a result, there is no difference

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between the CTS and ITS requirements. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.1.3.5 (Unit 1) and CTS 3.1.3.6 (Unit 2) require the control banks to be limited in physical insertion as specified in the COLR. ITS 3.1.6 requires the control banks to be within the insertion, sequence, and overlap limits specified in the COLR. ITS 3.1.6 ACTION B provides requirements when not meeting the overlap and sequence limits, and ITS SR 3.1.6.3 requires verification of the overlap and sequence every 12 hours. This changes the CTS by adding requirements on the control bank overlap and sequence limits to the Technical Specifications.

This change is acceptable because the control bank sequence and overlap are important assumptions in the core power distribution analyses. The addition of these requirements, ACTIONS, and Surveillance Requirement provides assurance that the core power distribution is maintained within the design predictions. This change is designated as more restrictive because new requirements are added to the CTS.

M.2 The CTS 3.1.3.5 Action (Unit 1) and the CTS 3.1.3.6 Action (Unit 2) require control banks inserted beyond the insertion limits to be restored within 2 hours. ITS 3.1.6 ACTION A contains the same requirement and adds the requirement to verify the SDM is within limits or initiate boration to restore SDM to within limits within 1 hour. This changes the CTS by adding the requirement to verify SDM or to initiate boration to restore the required SDM within one hour when control banks are below the insertion limits.

This change is acceptable because it verifies that the initial conditions of the accident analyses are maintained. In MODE 1 and MODE 2 with $k_{eff} \geq 1.0$, SDM is normally ensured by adhering to the control and shutdown bank insertion limits. If the control banks are not within their insertion limits, then SDM must be verified to be within limits or actions must be initiated to restore SDM to within limits. This change is designated as more restrictive because requirements are added to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

DISCUSSION OF CHANGES
ITS 3.1.6, CONTROL BANK INSERTION LIMITS

LESS RESTRICTIVE CHANGES

L.1 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS 4.1.3.5 (Unit 1) and CTS 4.1.3.6 (Unit 2) require the position of each control bank to be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify the individual rod positions at least once per 4 hours. ITS SR 3.1.6.2 requires verification that each control bank insertion is within the insertion limits specified in the COLR every 12 hours. This changes the CTS by eliminating the requirement to verify the control bank insertion to be within limits every 4 hours when the Rod Insertion Limit Monitor is inoperable.

The purpose of CTS 4.1.3.5 (Unit 1) and CTS 4.1.3.6 (Unit 2) is to periodically verify that the rods are within the alignment limit specified in the LCO. This change is acceptable because the Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Increasing the Frequency of rod position verification when the Rod Insertion Limit Monitor is inoperable is unnecessary because inoperability of the alarm does not increase the probability that the control banks are inserted below the limits. The Rod Insertion Limit Monitor alarm is for indication only; its use is not credited in any of the safety analyses. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Bank Insertion Limits

LCO 3.1.3.5 (Unit 1), LCO 3.1.3.6 (Unit 2)

LCO 3.1.6 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 with $k_{eff} \geq 1.0$.

3.1.3.5 Action (Unit 1), 3.1.3.6 Action (Unit 2)

- NOTE -
This LCO is not applicable while performing SR 3.1.4.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control bank insertion limits not met.	A.1.1 Verify SDM is within ~~the~~ limits ~~specified in the COLR~~.	1 hour
	OR	
	A.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	
	A.2 Restore control bank(s) to within limits.	2 hours
B. Control bank sequence or overlap limits not met.	B.1.1 Verify SDM is within ~~the~~ limits ~~specified in the COLR~~.	1 hour
	OR	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	

3.1.3.5 Action a (Unit 1), 3.1.3.6 Action a (Unit 2)

DOC M.1

1 3 5 1 3 5

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CTS

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION		COMPLETION TIME
DOC M.1		B.2	Restore control bank sequence and overlap to within limits.	2 hours
3.1.3.5 Action c (Unit 1), 3.1.3.6 Action c (Unit 2)	C. Required Action and associated Completion Time not met.	C.1	Be in MODE 2 with k_{eff} < 1.0.	6 hours

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY	
4.1.1.1.1.c	SR 3.1.6.1	Verify estimated critical control bank position is within the insertion limits specified in the COLR.	Within 4 hours prior to achieving criticality	2
4.1.3.5 (Unit 1), 4.1.3.6 (Unit 2), 4.1.1.1.1.b	SR 3.1.6.2	Verify each control bank insertion is within the insertion limits specified in the COLR.	12 hours	
DOC M.1	SR 3.1.6.3	Verify sequence and overlap limits specified in the COLR are met for control banks not fully withdrawn from the core.	12 hours	

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.6, CONTROL BANK INSERTION LIMITS

1. Changes are made to be consistent with changes made to the Specifications

2. SR 3.1.6.1 is clarified to state that the estimated critical control bank position must be verified to be within the "insertion limits," instead of just "limits," specified in the COLR. Many limits are specified in the COLR and the clarification is needed to avoid confusion. This is also consistent with the ISTS Bases, which clarifies that the limits to be met are the insertion limits.

3. Typographical/grammatical error corrected.

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Improved Standard Technical Specifications (ISTS) Bases Markup
and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.6 Control Bank Insertion Limits

BASES

BACKGROUND

The insertion limits of the shutdown and control rods are initial assumptions in all safety analyses that assume rod insertion upon reactor trip. The insertion limits directly affect core power and fuel burnup distributions and assumptions of available SDM, and initial reactivity insertion rate.

The applicable criteria for these reactivity and power distribution design requirements are ~~10 CFR 50, Appendix A, GDC 10, "Reactor Design," GDC 26, "Reactivity Control System Redundancy and Protection," GDC 28, "Reactivity Limits" (Ref. 1)~~ and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors" (Ref. 2). Limits on control rod insertion have been established, and all rod positions are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved. INSERT 1 (1) (4)

The rod cluster control assemblies (RCCAs) are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. A bank of RCCAs consists of two groups that are moved in a staggered fashion, but always within one step of each other. ~~All plants have~~ four control banks and ~~at least two~~ shutdown banks. See LCO 3.1.4, "Rod Group Alignment Limits," for control and shutdown rod OPERABILITY and alignment requirements, and LCO 3.1.7, "Rod Position Indication," for position indication requirements. ing There are four (2)

The control bank insertion limits are specified in the COLR. ~~An example is provided for information only in Figure B 3.1.6-1.~~ The control banks are required to be at or above the insertion limit lines. (3) INSERT 2 (3) (4)

~~Figure B 3.1.6-1 also indicates how~~ the control banks are moved in an ~~overlap pattern~~. Overlap is the distance travelled together by two control banks. ~~The predetermined position of control bank C, at which control bank D will begin to move with bank C on a withdrawal, will be at 118 steps for a fully withdrawn position of 231 steps. The fully withdrawn position is defined in the COLR.~~ INSERT 2A (2) (3)

The control banks are used for precise reactivity control of the reactor. The positions of the control banks are normally controlled automatically

1 **INSERT 1**

Plant Specific Design Criterion (PSDC) 6, "Reactor Core Design" (Ref. 1), PSDC 27, "Redundancy of Reactivity Control" (Ref. 2), PSDC 28, "Reactivity Hot Shutdown Capability" (Ref. 2), PSDC 29, "Reactivity Shutdown Capability" (Ref. 2), PSDC 30, "Reactivity Holdown Capability" (Ref. 2), PSDC 33, "Reactor Coolant Pressure Boundary Capability" (Ref. 3),

4 **INSERT 2**

The control bank sequence and overlap limits are specified in the COLR. Sequencing is the order in which the banks are moved.

2 **INSERT 2A**

as described in the Background section for Bases 3.1.4, "Rod Group Alignment Limits."

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BASES

BACKGROUND (continued)

by the Rod Control System, but can also be manually controlled. They are capable of adding negative reactivity very quickly (compared to borating or diluting). 2

The power density at any point in the core must be limited, so that the fuel design criteria are maintained. Together, LCO 3.1.4, LCO 3.1.5, "Shutdown Bank Insertion Limits," LCO 3.1.6, LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," provide limits on control component operation and on monitored process variables, which ensure that the core operates within the fuel design criteria.

The shutdown and control bank insertion and alignment limits, AFD, and QPTR are process variables that together characterize and control the three dimensional power distribution of the reactor core. Additionally, the control bank insertion limits control the reactivity that could be added in the event of a rod ejection accident, and the shutdown and control bank insertion limits ensure the required SDM is maintained.

Operation within the subject LCO limits will prevent fuel cladding failures that would breach the primary fission product barrier and release fission products to the reactor coolant in the event of a loss of coolant accident (LOCA), loss of flow, ejected rod, or other accident requiring termination by a Reactor Trip System (RTS) trip function.

APPLICABLE SAFETY ANALYSES

The shutdown and control bank insertion limits, AFD, and QPTR LCOs are required to prevent power distributions that could result in fuel cladding failures in the event of a LOCA, loss of flow, ejected rod, or other accident requiring termination by an RTS trip function.

The acceptance criteria for addressing shutdown and control bank insertion limits and inoperability or misalignment are that:

a. There be no violations of:

   1. Specified acceptable fuel design limits ~~or~~ ; 5

   2. Reactor Coolant System pressure boundary integrity ; and 5

b. The core remains subcritical after accident transients.

As such, the shutdown and control bank insertion limits affect safety analysis involving core reactivity and power distributions (Ref. ~~4~~ 5). 2

BASES

APPLICABLE SAFETY ANALYSES (continued)

The SDM requirement is ensured by limiting the control and shutdown bank insertion limits so that allowable inserted worth of the RCCAs is such that sufficient reactivity is available in the rods to shut down the reactor to hot zero power with a reactivity margin that assumes the maximum worth RCCA remains fully withdrawn upon trip (Ref. 4). 2 2

Operation at the insertion limits or AFD limits may approach the maximum allowable linear heat generation rate or peaking factor with the allowed QPTR present. Operation at the insertion limit may also indicate the maximum ejected RCCA worth could be equal to the limiting value in fuel cycles that have sufficiently high ejected RCCA worths.

The control and shutdown bank insertion limits ensure that safety analyses assumptions for SDM, ejected rod worth, and power distribution peaking factors are preserved (Ref. 5).

control bank The insertion limits satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii), in that they are initial conditions assumed in the safety analysis. 2

LCO

The limits on control banks sequence, overlap, and physical insertion, as defined in the COLR, must be maintained because they serve the function of preserving power distribution, ensuring that the SDM is maintained, ensuring that ejected rod worth is maintained, and ensuring adequate negative reactivity insertion is available on trip. The overlap between control banks provides more uniform rates of reactivity insertion and withdrawal and is imposed to maintain acceptable power peaking during control bank motion.

APPLICABILITY

The control bank sequence, overlap, and physical insertion limits shall be maintained with the reactor in MODES 1 and 2 with $k_{eff} \geq 1.0$. These limits must be maintained, since they preserve the assumed power distribution, ejected rod worth, SDM, and reactivity rate insertion assumptions. Applicability in MODE 2 with $k_{eff} < 1.0$, and MODES 3, 4, and 5 is not required, since neither the power distribution nor ejected rod worth assumptions would be exceeded in these MODES. 6

The applicability requirements have been modified by a Note indicating the LCO requirements are suspended during the performance of 4 SR 3.1.4.2. This SR verifies the freedom of the rods to move, and requires the control bank to move below the LCO limits, which would violate the LCO. 6

BASES

ACTIONS

A.1.1, A.1.2, A.2, B.1.1, B.1.2, and B.2

When the control banks are outside the acceptable insertion limits, they must be restored to within those limits. This restoration can occur in two ways:

a. Reducing power to be consistent with rod position ; or (5)

b. Moving rods to be consistent with power.

Also, verification of SDM or initiation of boration to regain SDM is required within 1 hour, since the SDM in MODES 1 and 2 normally ensured by adhering to the control and shutdown bank insertion limits (see LCO 3.1.1, "SHUTDOWN MARGIN") has been upset. If control banks are not within their insertion limits, then SDM will be verified by performing a reactivity balance calculation, considering the effects listed in the BASES for SR 3.1.1.1.

Similarly, if the control banks are found to be out of sequence or in the wrong overlap configuration, they must be restored to meet the limits.

Operation beyond the LCO limits is allowed for a short time period in order to take conservative action because the simultaneous occurrence of either a LOCA, loss of flow accident, ejected rod accident, or other accident during this short time period, together with an inadequate power distribution or reactivity capability, has an acceptably low probability.

The allowed Completion Time of 2 hours for restoring the banks to within the insertion, sequence, and overlaps limits provides an acceptable time for evaluating and repairing minor problems without allowing the plant unit (2) to remain in an unacceptable condition for an extended period of time.

C.1

INSERT 3 (6)

If Required Actions A.1 and A.2, or B.1 and B.2 cannot be completed within the associated Completion Times, the plant unit (2) must be brought to MODE 2 with $k_{eff} < 1.0$, where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant unit (2) systems.

6 **INSERT 3**

any Required Action and associated Completion Time is not met

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

This Surveillance is required to ensure that the reactor does not achieve criticality with the control banks below their insertion limits.

The estimated critical position (ECP) depends upon a number of factors, one of which is xenon concentration. If the ECP was calculated long before criticality, xenon concentration could change to make the ECP substantially in error. Conversely, determining the ECP immediately before criticality could be an unnecessary burden. There are a number of unit parameters requiring operator attention at that point. Performing the ECP calculation within 4 hours prior to criticality avoids a large error from changes in xenon concentration, but allows the operator some flexibility to schedule the ECP calculation with other startup activities.

SR 3.1.6.2

Verification of the control bank insertion limits at a Frequency of 12 hours is sufficient to detect control banks that may be approaching the insertion limits since, normally, very little rod motion occurs in 12 hours.

SR 3.1.6.3

When control banks are maintained within their insertion limits as checked by SR 3.1.6.2 above, it is unlikely that their sequence and overlap will not be in accordance with requirements provided in the COLR. A Frequency of 12 hours is consistent with the insertion limit check above in SR 3.1.6.2.

REFERENCES

1. 10 CFR ~~50~~, Appendix A, ~~GDC~~ 10, GDC 26, GDC 28. INSERT 4 1

4 ~~2~~. 10 CFR 50.46.

5 ~~3~~. U FSAR, Chapter ~~15~~ 14. 2 7

~~4. FSAR, Chapter [15].~~ 2 7

~~5. FSAR, Chapter [15].~~ 2 7

1

INSERT 4

1. UFSAR, Section 1.4.2.
2. UFSAR, Section 1.4.5.
3. UFSAR, Section 1.4.6.

3

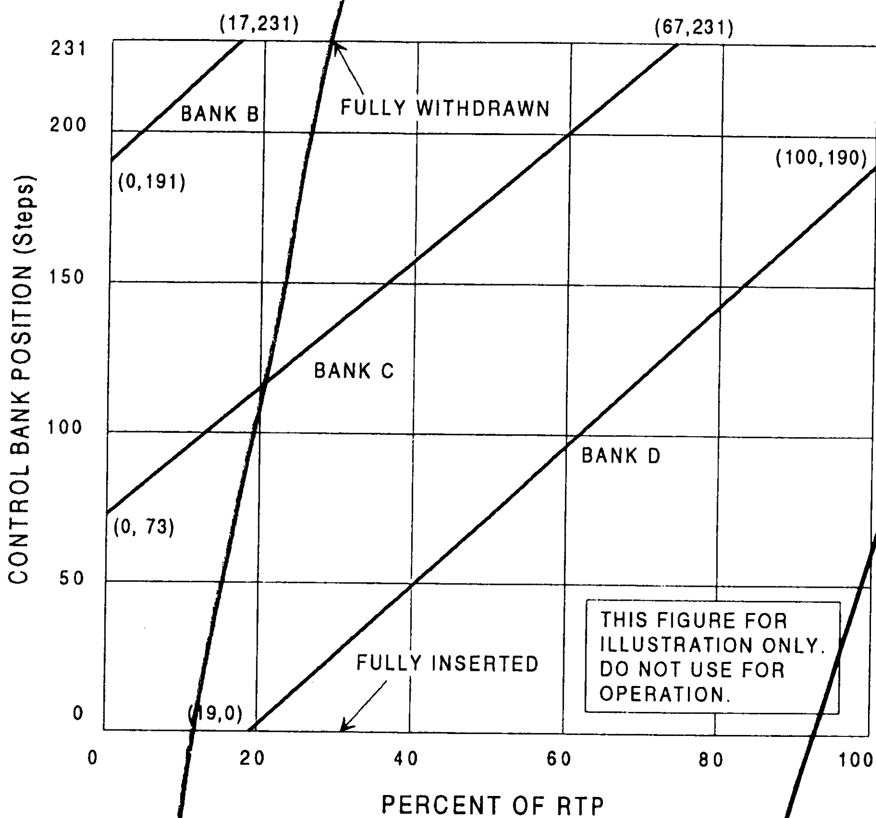

Figure B 3.1.6-1 (page 1 of 1)
Control Bank Insertion vs. Percent RTP

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.6 BASES, CONTROL BANK INSERTION LIMITS

1. CNP Units 1 and 2 were designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. CNP Units 1 and 2 were designed and constructed to meet the intent of the proposed General Design Criteria, published in 1967. However, the CNP UFSAR contains discussions of the Plant Specific Design Criteria (PSDCs) used in the design of CNP Units 1 and 2. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section and description in the UFSAR.

2. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Since the ITS states the actual control bank insertion limits are specified in the COLR, the example is not needed in the Bases and has been deleted.

4. LCO 3.1.6 governs control bank insertion, sequence, and overlap limits. The Background section of the ITS 3.1.6 Bases discusses insertion and overlap, but does not discuss sequence. A discussion of control bank sequence is added for completeness.

5. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

6. The Bases are changed to be consistent with the ITS.

7. The brackets have been removed and the proper plant specific information/value has been provided.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.6, CONTROL BANK INSERTION LIMITS

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 7

ITS 3.1.7, Rod Position Indication

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.7

ITS

A.1

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

LCO 3.1.7

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 the allowed rod misalignment specified in Specification 3.1.3.1.~~ LA.1

APPLICABILITY: MODES 1 and 2.

ACTION: Add proposed ACTIONS Note L.1

ACTION A

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~~ 4 hours 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 L.2

2. Reduce THERMAL POWER to less than or equal to 50% of RATED THERMAL POWER within 8 hours. L.3

ACTION C

b. With ~~a maximum of one~~ one or more demand position indicator ~~per bank~~ inoperable either: L.4

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 or equal to 50% of RATED THERMAL POWER within 8 hours. L.3

Add proposed ACTION B L.5

Add proposed ACTION D M.1

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.~~ M.2

Add proposed SR 3.1.7.1

ITS 3.1.7

ITS

A.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS-OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.1.7

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 the allowed rod misalignment specified in Specification 3.1.3.1.~~ LA.1

APPLICABILITY: MODES 1 and 2.

ACTION: Add proposed ACTIONS Note L.1

ACTION A

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~~ 4 hours 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 L.2

2. Reduce THERMAL POWER to less than or equal to 50% of RATED THERMAL POWER within 8 hours. L.3

ACTION C

b. With ~~a maximum of one~~ one or more demand position indicator ~~per bank~~ inoperable either: L.4

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 or equal to 50% of RATED THERMAL POWER within 8 hours. L.3

Add proposed ACTION B L.5

Add proposed ACTION D M.1

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.~~ M.2

Add proposed SR 3.1.7.1

DISCUSSION OF CHANGES
ITS 3.1.7, ROD POSITION INDICATION

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.1.3.2 does not contain an Action to follow if the provided Actions cannot be met. Therefore, CTS 3.0.3 would be entered, which would allow 1 hour to initiate a shutdown and to be in HOT STANDBY within 7 hours. ITS 3.1.7 contains ACTION D, which states that the plant must be in MODE 3 within 6 hours if any Required Action and associated Completion Time is not met. This changes the CTS by eliminating the one hour to initiate a shutdown and, consequently, allowing one hour less for the unit to be in MODE 3.

This change is acceptable because it provides an appropriate compensatory measure for the described conditions. If any Required Action and associated Completion Time cannot be met, the unit must be placed in a MODE in which the LCO does not apply. The LCO is applicable in MODES 1 and 2. Requiring a shutdown to MODE 3 is appropriate in this condition. The one hour allowed by CTS 3.0.3 to prepare for a shutdown is not needed because the operators have had time to prepare for the shutdown while attempting to follow the Required Actions and associated Completion Times. This change is designated as more restrictive because it allows less time to shutdown than does the CTS.

M.2 CTS 4.1.3.2 requires that each rod position indicator channel 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. ITS 3.1.7 does not contain this requirement because it is duplicative of the requirement in CTS 4.1.3.1.1 (ITS SR 3.1.4.1). A new Surveillance has been added (ITS SR 3.1.7.1) to perform a CHANNEL CALIBRATION of each rod position channel every 24 months. This changes the CTS by adding the ITS requirement of SR 3.1.7.1.

The purpose of ITS SR 3.1.7.1 is to provide additional assurance that the rod position indicator channels are calibrated. This change is acceptable because it provides additional assurance that the rod position indicator channels are OPERABLE. This change is designated as more restrictive, because it adds a new Surveillance Requirement to the CTS.

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DISCUSSION OF CHANGES
ITS 3.1.7, ROD POSITION INDICATION

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS LCO 3.1.3.2 requires all shutdown and control rod position indicator channels and the demand position indication system to be OPERABLE and capable of determining the control rod positions within the allowed rod misalignment specified in Specification 3.1.3.1. ITS LCO 3.1.7 requires both the Rod Position Indication System and the Demand Position Indication System to be OPERABLE, but the details of what constitutes an OPERABLE system are moved to the Bases. This changes the CTS by removing details of what constitutes an OPERABLE system to the Bases.

The removal of these details, which are related to the system design capabilities, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that the Rod Position Indication System and the Demand Position Indication System be OPERABLE. The details on the capability requirements of the systems do not need to appear in the specification in order for the requirement to apply. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.2 Action a covers the inoperabilities for a maximum of one rod position indicator channel per group. CTS 3.1.3.2 Action b covers the inoperabilities for a maximum of one demand position indicator per bank. ITS 3.1.7 ACTIONS are modified by a Note that states "Separate Condition entry is allowed for each rod position indicator and each demand position indicator." ITS ACTION A covers inoperabilities for one rod position indication (RPI) per group for one or more groups and ITS ACTION B covers inoperabilities for more than one RPI per group. ITS ACTION C covers the inoperabilities for one or more demand position indicators. This changes the CTS by allowing separate Condition entry for each inoperable rod position indicator and each inoperable demand position indicator instead of for a maximum of one rod position indicator channel per group and a maximum of one demand position indicator per bank. Other modifications associated with CTS 3.1.3.2 Action b (ITS 3.1.7 ACTION C) are discussed in DOC L.4, while the addition of ITS ACTION B is discussed in DOC L.5.

DISCUSSION OF CHANGES
ITS 3.1.7, ROD POSITION INDICATION

The purpose of CTS 3.1.3.2 Action a is to provide compensatory actions for a maximum of one inoperable rod position indicator channel per group while the purpose of CTS 3.1.3.2 Action b is to provide compensatory actions for a maximum of one inoperable demand position indicator per bank. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. This change will allow separate Condition entry for each inoperable rod position indicator and each inoperable demand position indicator while the CTS do not. CTS 3.1.3.2 Action a only allows the unit to operate in this Action for only one inoperable rod position indication per group, while CTS 3.1.3.2 Action b only allows the unit to operate in this Action for a maximum of one demand position indicator per bank. The ITS will allow each inoperable rod position indication or each inoperable demand position indicator inoperability to be tracked separately. This change is acceptable because the Required Actions for each Condition provide appropriate compensatory actions for each inoperable position indicator. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.2 *(Category 3 – Relaxation of Completion Time)* CTS 3.1.3.2 Action a.1 states that with a maximum of one individual rod position indicator channel per group inoperable, 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. ITS 3.1.7 Required Action A.1 states to verify the position of the rod with an inoperable position indicator by using the movable incore detectors once per 8 hours and "once within 4 hours" after a rod with an inoperable position indicator has been moved in excess of 24 steps in one direction since the last determination of the rod's position. This changes the CTS by allowing 4 hours to verify the rod position instead of requiring the verification immediately.

The purpose of CTS 3.1.3.2 Action a.1 is to verify rod position using the movable incore detector system after the rods have been moved significantly. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time. Using the movable incore detector system to determine the position of a rod cannot be performed immediately. Four hours is a reasonable time to use the movable incore detector system to measure the core flux around the control rod and analyze the data to determine the control rod position. This short period of time to determine the position will not result in significant perturbation of the core power distribution if the rod is misaligned, and since the probability of a DBA or transient that would be affected by the potentially misaligned rod is very low for

DISCUSSION OF CHANGES
ITS 3.1.7, ROD POSITION INDICATION

the short period of time allowed to determine the rod position. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L.3 *(Category 4 – Relaxation of Required Action)* CTS 3.1.2.1 Action a.2 and Action b.2 require the unit to reduce THERMAL POWER to less than 50% of RATED THERMAL POWER. ITS 3.1.7 Required Actions A.2 and C.2 require the unit to be at a THERMAL POWER of less than or equal to 50% RATED THERMAL POWER under the same conditions. This changes the CTS by allowing a unit to be at 50% RATED THERMAL POWER instead of less than 50% RATED THERMAL POWER.

The purpose of CTS 3.1.2.1 Action a.2 and Action b.2 is to place the unit into a condition where rod position or rod position demand is not significantly affecting core peaking factors. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. This change is acceptable since with THERMAL POWER at 50% RATED THERMAL POWER, rod position and rod position demand do not significantly affect core peaking factors. The specified THERMAL POWER is consistent with safe operation under the specified Condition. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.4 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.2 Action b covers the inoperabilities associated with a maximum of one demand position indicator per bank inoperable. ITS 3.1.7 ACTION C covers the inoperabilities for one or more demand position indicators. This changes the CTS by allowing more than one demand position indicator to be inoperable without requiring entry into LCO 3.0.3.

The purpose of CTS 3.1.3.2 Action b is to provide compensatory actions for a maximum of one inoperable demand position indicator per bank. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. This change will allow more than one demand position indicator to be inoperable without requiring entry into LCO 3.0.3. This is acceptable because the compensatory actions require the position of the control rods to be known by verification that the RPIs for the affected bank are OPERABLE and the most withdrawn rod and the least withdrawn rod of the affected bank are within the required misalignment limits, or THERMAL POWER is reduced to $\leq$ 50% RTP within 8 hours. These compensatory actions will assure the rods are in the correct position within a short period of time or THERMAL POWER is reduced so that core peaking is minimized. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.5 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.2 does not have an action for when more than one rod position indicator channel is inoperable per group. CTS 3.0.3 would be entered in this condition. CTS 3.0.3 requires a shutdown to HOT STANDBY within 7 hours. ITS 3.1.7 ACTION B applies when more than one RPI per group is inoperable and requires the rods to be placed under manual control immediately, monitoring and recording of RCS T_{avg} once per hour, and restoration of all but one RPI to OPERABLE status within 24 hours. This changes the CTS by allowing operation for an additional 24 hours with more than one RPI per group inoperable.

The purpose of ITS 3.1.7, ACTION B is to provide time to repair inoperable RPIs before requiring a plant shutdown. This change is acceptable because the ITS Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant indications. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. Providing time to repair multiple inoperable RPIs before requiring a shutdown is reasonable as the safest course of action with inoperable RPIs is to not move the control rods. The compensatory measures ensure that the rods are not moved unintentionally and monitor rod position using other indications. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

LCO 3.1.3.2

LCO 3.1.7 The ~~[Digital]~~ Rod Position Indication (~~[D]~~RPI) System and the Demand Position Indication System shall be OPERABLE. 1 2

APPLICABILITY: MODES 1 and 2.

ACTIONS

DOC L.1

- NOTE -
Separate Condition entry is allowed for each inoperable rod position indicator and each demand position indicator. 8

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [D]RPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable AN position indicators indirectly by using movable incore detectors. OR A.2 Reduce THERMAL POWER to ≤ 50% RTP.	Once per 8 hours INSERT 1 8 hours
B. More than one [D]RPI per group inoperable.	B.1 Place the control rods under manual control. AND B.2 Monitor and Record RCS T_{avg}. AND	Immediately Once per 1 hour

Action a

DOC L.5

2 3 4 2 5

INSERT 1

AND

Once within 4 hours after a rod with an inoperable position indicator has been moved in excess of 24 steps in one direction since the last determination of the rod's position

Rod Position Indication
3.1.7

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	B.3	Verify the position of the rods with inoperable position indicators indirectely by using the movable incore detectors. AND	Once per 8 hours
	B.4 3	Restore inoperable position indicators to OPERABLE status such that a maximum of one [D]RPI per group is inoperable. a	24 hours
C. One or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction since the last determination of the rod's position.	C.1	Verify the position of the rods with inoperable position indicators indirectly by using movable incore detectors. OR	[4] hours
	C.2	Reduce THERMAL POWER to ≤ 50% RTP.	8 hours
C D. One demand position indicator per bank inoperable for one or more banks. or more	D.1.1	Verify by administrative means all [D]RPIs for the affected banks are OPERABLE. AND	Once per 8 hours
	D.1.2	Verify the most withdrawn rod and the least withdrawn rod of the affected banks are ≤ 12 steps apart. within the required rod misalignment limits OR	Once per 8 hours

Action 6

3 3 5 2 3 2 3 4 4 6

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C ~~B~~.2 Reduce THERMAL POWER to ≤ 50% RTP.	8 hours 3
DOC M.1 D ~~B~~. Required Action and associated Completion Time not met.	D ~~B~~.1 Be in MODE 3.	6 hours 3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DOC M.2 SR 3.1.7.1	Verify each [D]RPI agrees within [12] steps of the group demand position for the [full indicated range] of rod travel.	Once prior to criticality after each removal of the reactor head

INSERT 2 — 7

7 **INSERT 2**

SR 3.1.7.1	-------------------------------NOTE------------------------------- The sensor may be excluded. --- Perform a CHANNEL CALIBRATION of each RPI.	24 months

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.7, ROD POSITION INDICATION

1. CNP utilizes an analog rod position indication system. Therefore, reference to a digital rod position indication system have been removed.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. ISTS 3.1.7 ACTION C has two Required Actions that are connected with an OR. However, the stated Completion Times for these two Required Actions are different (4 hours and 8 hours, respectively). Due to the convention in the ISTS as described in Section 1.3, the two Completion Times associated with the two Required Actions OR logical connector must be the same, since either Required Action can be chosen. Therefore, to be consistent with the format of the ISTS, ISTS 3.1.7 ACTION C has been deleted and a new, conditional Completion Time has been added to Required Action A.1. This ensures that the intent of the ISTS is maintained, in that a verification of the position of the rod with an inoperable position indicator is still being performed once within 4 hours after a rod with an inoperable position indicator has been moved in excess of 24 steps in one direction since the last determination of the rod's position. In addition, since the unit is in both Conditions A and B when more than one rod position indicators per group are inoperable, and Required Action A.1 requires the identical position check required by Required Action B.3, there is no reason to include the position check as Required Action B.3. This is also consistent with the format of the ISTS. Appropriate renumbering changes have also been made due to these deletions.

4. The words in ISTS Required Action A.1, ISTS Required Action D.1.1 (ITS Required Action C.1.1), and ISTS Required Action D.1.2 (ITS Required Action C.1.2) have been modified to be singular, versus plural, when referring to a rod or a bank. This has been done since the ACTIONS Note allows separate Condition entry for each rod position indicator and each demand position indicator; thus the Required Action only applies to the individual rod or bank whose indicator in inoperable. In addition, ISTS 3.1.7 Condition D (ITS 3.1.7 Condition C) has been modified consistent with proposed TSTF-437, Rev. 0.

5. Typographical/grammatical error corrected.

6. The ISTS Required Action D.1.2 alignment criteria has been revised to be consistent with the current licensing basis requirements. The CTS allows the alignment criteria to vary as a function of Allowable Power Level (changed to vary as a function of $F_Q^W(Z)$ as described in the ITS 3.1.4 DOCs) at THERMAL POWER levels $\geq$ 85% as indicated in CTS Figure 3.1.4-1. This change to the Required Action has been made consistent with the allowances in License Amendments 193 (Unit 1) and 179 (Unit 2) based on a Letter from the NRC dated March 15, 1995 (as modified in the ITS 3.1.4 DOCs). The alignment criteria is specified in ITS 3.1.4.

7. The ISTS requirement to verify each RPI agrees within 12 steps of the group demand position for the full indicated range of rod travel prior to criticality after each removal of the reactor vessel head is replaced with the requirement to perform a CHANNEL CALIBRATION of each RPI, except for the sensor. Because of the thermal drift characteristics of the CNP RPIs, performing a full range comparison of RPI and demand position before criticality is not useful, as the RPI response will change with RPI temperature. The ITS requires a CHANNEL CALIBRATION of each

RPI, which involves calibrating the electronics to known input voltages. Actual RPI position is adjusted for thermal drift.

8. Change made to be consistent with similar Notes in other places in the ISTS.

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Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.7 Rod Position Indication

BASES

INSERT 1

1

BACKGROUND

According to GDC 13 (Ref. 1), instrumentation to monitor variables and systems over their operating ranges during normal operation, anticipated operational occurrences, and accident conditions must be OPERABLE. LCO 3.1.7 is required to ensure OPERABILITY of the control rod position indicators to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. 2

The OPERABILITY, including position indication, of the shutdown and control rods is an initial assumption in all safety analyses that assume rod insertion upon reactor trip. Maximum rod misalignment is an initial assumption in the safety analysis that directly affects core power distributions and assumptions of available SDM. Rod position indication is required to assess OPERABILITY and misalignment.

Mechanical or electrical failures may cause a control rod to become inoperable or to become misaligned from its group. Control rod inoperability or misalignment may cause increased power peaking, due to the asymmetric reactivity distribution and a reduction in the total available rod worth for reactor shutdown. Therefore, control rod alignment and OPERABILITY are related to core operation in design power peaking limits and the core design requirement of a minimum SDM.

Limits on control rod alignment and OPERABILITY have been established, and all rod positions are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved.

Rod cluster control assemblies (RCCAs), or rods, are moved out of the core (up or withdrawn) or into the core (down or inserted) by their control rod drive mechanisms. The RCCAs are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control.

The axial position of shutdown rods and control rods are determined by two separate and independent systems: the Bank Demand Position Indication System (commonly called group step counters) and the (Digital) Rod Position Indication ((D)RPI) System. 3

The Bank Demand Position Indication System counts the pulses from the Rod Control System that move the rods. There is one step counter for

1 **INSERT 1**

Plant Specific Design Criterion (PSDC) 12 (Ref.1), instrumentation and controls shall be provided as required to monitor and maintain within prescribed operating ranges essential reactor operating variables.

BASES

BACKGROUND (continued)

each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The Bank Demand Position Indication System is considered highly precise (± 1 step or ± ⅝ inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod.

The [D]RPI System provides a highly accurate indication of actual control rod position, but at a lower precision than the step counters. This system is based on inductive analog signals from a series of coils spaced along a hollow tube. ~~with a center to center distance of 3.75 inches, which is 6 steps. To increase the reliability of the system, the inductive coils are connected alternately to data system A or B. Thus, if one system fails, the [D]RPI will go on half accuracy with an effective coil spacing of 7.5 inches, which is 12 steps. Therefore, the normal indication accuracy of the [D]RPI System is ± 6 steps (± 3.75 inches), and the maximum uncertainty is ± 12 steps (± 7.5 inches).~~ INSERT 2 With an indicated deviation of ~~12~~ up to 18 steps between the group step counter and [D]RPI, the maximum deviation between actual rod position and the demand position could be ~~24~~ 30 steps. ~~or 15 inches.~~ (3) (4) (4) (3)

APPLICABLE SAFETY ANALYSES

Control and shutdown rod position accuracy is essential during power operation. Power peaking, ejected rod worth, or SDM limits may be violated in the event of a Design Basis Accident (Ref. 2), with control or shutdown rods operating outside their limits undetected. Therefore, the acceptance criteria for rod position indication is that rod positions must be known with sufficient accuracy in order to verify the core is operating within the group sequence, overlap, design peaking limits, ejected rod worth, and with minimum SDM (LCO 3.1.5, "Shutdown Bank Insertion Limits," and LCO 3.1.6, "Control Bank Insertion Limits"). The rod positions must also be known in order to verify the alignment limits are preserved (LCO 3.1.4, "Rod Group Alignment Limits"). Control rod positions are continuously monitored to provide operators with information that ensures the plant is operating within the bounds of the accident analysis assumptions.

~~The control~~ Rod Position Indicat~~or~~ion ~~channels~~ satisf~~y~~ies Criterion 2 of 10 CFR 50.36(c)(2)(ii). The control rod position indicators monitor control rod position, which is an initial condition of the accident. (2)

4

INSERT 2

The RPI System is capable of monitoring rod position within at least +/- 12 steps.

BASES

LCO

the

LCO 3.1.7 specifies that one [D]RPI System and one Bank Demand Position Indication System be OPERABLE for each control rod. For the control rod position indicators to be OPERABLE requires meeting the SR of the LCO and the following: 2 2

~~a. The [D]RPI System indicates within 12 steps of the group step counter demand position as required by LCO 3.1.4, "Rod Group Alignment Limits,"~~ 8

a b. For the [D]RPI System there are no failed coils; and 8 3 6

b c. The Bank Demand Indication System has been calibrated either in the fully inserted position or to the [D]RPI System. 8 3

~~The 12 step agreement limit between the Bank Demand Position Indication System and the [D]RPI System indicates that the Bank Demand Position Indication System is adequately calibrated, and can be used for indication of the measurement of control rod bank position.~~ 8

~~A deviation of less than the allowable limit, given in LCO 3.1.4, in position indication for a single control rod, ensures high confidence that the position uncertainty of the corresponding control rod group is within the assumed values used in the analysis (that specified control rod group insertion limits).~~

These requirements ensure that control rod position indication during power operation and PHYSICS TESTS is accurate, and that design assumptions are not challenged. 2

OPERABILITY of the position indicator channels ensures that inoperable, misaligned, or mispositioned control rods can be detected. Therefore, power peaking, ejected rod worth, and SDM can be controlled within acceptable limits.

APPLICABILITY

The requirements on the [D]RPI and step counters are only applicable in MODES 1 and 2 (consistent with LCO 3.1.4, LCO 3.1.5, and LCO 3.1.6), because these are the only MODES in which power is generated, and the OPERABILITY and alignment of rods have the potential to affect the safety of the plant unit. In the shutdown MODES, the OPERABILITY of the shutdown and control banks has the potential to affect the required SDM, but this effect can be compensated for by an increase in the boron concentration of the Reactor Coolant System. 2 4

BASES

ACTIONS

The ACTIONS Table is modified by a Note indicating that a separate Condition entry is allowed for each inoperable rod position indicator and each demand position indicator. This is acceptable because the Required Actions for each Condition provide appropriate compensatory actions for each inoperable position indicator.

A.1

IN a

When one [D]RPI channel per group fails, the position of the rod may still be determined indirectly by use of the movable incore detectors. [The Required Action may also be satisfied by ensuring at least once per 8 hours that F_Q satisfies LCO 3.2.1, $F^N_{\Delta H}$ satisfies LCO 3.2.2, and SHUTDOWN MARGIN is within the limits provided in the COLR, provided the nonindicating rods have not been moved.] Based on experience, normal power operation does not require excessive movement of banks. [If a bank has been significantly moved, the Required Action of C.1 or C.2 below is required.] Therefore, verification of RCCA position within the Completion Time of 8 hours is adequate for allowing continued full power operation, since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small. (3) (2) (7) (2)

INSERT 3 (2)

A.2

Reduction of THERMAL POWER to ≤ 50% RTP puts the core into a condition where rod position is not significantly affecting core peaking factors (Ref. 2). (4)

The allowed Completion Time of 8 hours is reasonable, based on operating experience, for reducing power to ≤ 50% RTP from full power conditions without challenging ~~plant~~ unit systems and allowing for rod position determination by Required Action A.1 above. (4)

B.1, B.2, [B.3] and B.3 (5)

IN a (5) (3) (2)

When more than one [D]RPI per group fails, additional actions are necessary to ensure that acceptable power distribution limits are maintained, minimum SDM is maintained, and the potential effects of rod misalignment on associated accident analyses are limited. Placing the Rod Control System in manual assures unplanned rod motion ~~may~~ will not occur. Together with the indirect position determination available via movable incore detectors will minimize the potential for rod misalignment. The immediate Completion Time for placing the Rod Control System in manual reflects the urgency with which unplanned rod motion must be prevented while in this condition. (6) (6)

2

INSERT 3

If a rod has been significantly moved (in excess of 24 steps in one direction, since the position was last determined), Required Action A.1 is still appropriate but must be initiated promptly to begin verifying that the rod is still properly positioned, relative to their group positions. The allowed Completion Time of 4 hours provides an acceptable period of time to verify the rod position with inoperable position indicator indirectly by using movable incore detectors. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. One RPI per group inoperable for one or more groups; and

b. A rod with an inoperable position indicator has been moved in excess of 24 steps in one direction since the last determination of the rod's position.

If at any time during the existence of Condition A (one RPI per group inoperable for one or more groups) a rod with an inoperable position indicator has been moved in excess of 24 steps in one direction since the last determination of the rod's position, this Completion Time begins to be tracked.

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BASES

ACTIONS (continued)

Monitoring and recording reactor coolant T_{avg} help assure that significant changes in power distribution and SDM are avoided. The once per hour Completion Time is acceptable because only minor fluctuations in RCS temperature are expected at steady state plant operating conditions.

(Required Action A.1)

The position of the rods may be determined indirectly by use of the movable incore detectors. ~~The Required Action may also be satisfied by ensuring at least once per 8 hours that F_Q satisfies LCO 3.2.1, $F^N_{\Delta H}$ satisfies LCO 3.2.2, and SHUTDOWN MARGIN is within the limits provided in the COLR, provided the nonindicating rods have not been moved.~~ Verification of control rod position once per 8 hours is adequate for allowing continued full power operation for a limited, 24 hour period, since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small. The 24 hour Completion Time provides sufficient time to troubleshoot and restore the ~~[D]~~RPI system to operation while avoiding the ~~plant~~ unit challenges associated with the shutdown without full rod position indication. (2) INSERT 4 (3) (4)

~~Based on operating experience, normal power operation does not require excessive rod movement. If one or more rods has been significantly moved, the Required Action of C.1 and C.2 below is required.~~ (2)

~~C.1 and C.2~~

~~These Required Actions clarify that when one or more rods with inoperable position indicators have been moved in excess of 24 steps in one direction, since the position was last determined, the Required Actions of A.1 and A.2 or B.1, as applicable are still appropriate but must be initiated promptly under Required Action C.1 to begin verifying that these rods are still properly positioned, relative to their group positions.~~

~~If, within [4] hours, the rod positions have not been determined, THERMAL POWER must be reduced to ≤ 50% RTP within 8 hours to avoid undesirable power distributions that could result from continued operation at > 50% RTP, if one or more rods are misaligned by more than 24 steps. The allowed Completion Time of [4] hours provides an acceptable period of time to verify the rod positions.~~ (2)

C ~~D~~.1.1 and ~~D~~.1.2 (2)

With one or more demand position indicator ~~per bank~~ inoperable, the rod positions can be determined by the ~~[D]~~RPI System. Since normal power operation does not require excessive movement of rods, verification by (3) (5) (3)

2 **INSERT 4**

and once within 4 hours after a rod with an inoperable position indicator has been moved in excess of 24 steps in one direction since the last determination of the rod's position

BASES

ACTIONS (continued)

INSERT 5

administrative means that the rod position indicators are OPERABLE and the most withdrawn rod and the least withdrawn rod are ~~≤ 12 steps apart~~ within the allowed Completion Time of once every 8 hours is adequate. (5)

C.2 (2)

Reduction of THERMAL POWER to ≤ 50% RTP puts the core into a condition where rod position is not significantly affecting core peaking factor limits (Ref. 2). The allowed Completion Time of 8 hours provides an acceptable period of time to verify the rod positions per Required Actions C.1.1 and C.1.2 or reduce power to ≤ 50% RTP. (4)

D.1 (2)

If ~~the~~ any Required Action~~s~~ cannot be completed within the associated Completion Time, the ~~plant~~ unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the ~~plant~~ unit must be brought to at least MODE 3 within 6 hours. The allowed Completion Time is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging ~~plant~~ unit systems. (2) (4) (4)

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

~~Verification that the [D]RPI agrees with the demand position within [12] steps ensures that the [D]RPI is operating correctly. Since the [D]RPI does not display the actual shutdown rod positions between 18 and 210 steps, only points within the indicated ranges are required in comparison.~~ (3)

~~This surveillance is performed prior to reactor criticality after each removal of the reactor head, as there is the potential for unnecessary plant transients if the SR were performed with the reactor at power.~~

INSERT 6 (5)

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 13.~~ INSERT 7 (1)

2. UFSAR, Chapter ~~[15]~~ 14. (4) (3)

3. ~~FSAR, Chapter [15].~~ (4)

5 **INSERT 5**

within the required rod misalignment limits

5 **INSERT 6**

SR 3.1.7.1 is the performance of a CHANNEL CALIBRATION for each RPI channel.

The calibration verifies the accuracy of each RPI channel. The Frequency of 24 months is based on operating experience and considers channel reliability.

The SR is modified by a Note stating that the sensors are excluded from the CHANNEL CALIBRATION. This is acceptable since the RPIs are adjusted as necessary to compensate for thermal effects.

1 **INSERT 7**

UFSAR, Section 1.4.3.

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.7 BASES, ROD POSITION INDICATION

1. CNP Units 1 and 2 were designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. CNP Units 1 and 2 were designed and constructed to meet the intent of the proposed General Design Criteria, published in 1967. However, the CNP UFSAR contains discussions of the Plant Specific Design Criteria (PSDCs) used in the design of CNP Units 1 and 2. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section and description in the UFSAR.

2. The Bases are changed to reflect the Specification.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

5. The Bases are changed to reflect changes made to the Specification.

6. Typographical/grammatical error corrected.

7. The description in the Bases of ACTIONS A.1 of the alternate manner to perform Required Action A.1 (by verifying LCO 3.2.1, LCO 3.2.2, and LCO 3.1.1 are met every 8 hours) has been deleted. This option will not be used at CNP.

8. The requirement that the RPI indicates within the agreement limit of the group step counter demand position has been deleted since the requirement is already covered by ITS LCO 3.1.4. If the agreement limit is not met, then the ACTIONS of LCO 3.1.4, "Rod Group Alignment Limits," should be entered. As written in these Bases, both the ACTIONS of ITS LCO 3.1.4 and ITS LCO 3.1.7 would have to be entered if not within the agreement limit. The appropriate ACTIONS are those of ITS LCO 3.1.4. ITS LCO 3.1.7 should only cover the actual RPI System, not the agreement limits.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.7, ROD POSITION INDICATION

There are no specific NSHC discussions for this Specification.

ATTACHMENT 8

ITS 3.1.8, PHYSICS TESTS Exceptions - MODE 2

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

ITS 3.1.8

A.1

ITS

SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

and the number of required channels for LCO 3.3.1 Functions 2, 3, and 6 may be reduced to 3

A.2

Add LCO 3.4.2

L.1

LIMITING CONDITION FOR OPERATION

LCO 3.1.8

3.10.4 The limitations of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.4 and 3.1.3.5 may be suspended during the performance of PHYSICS TESTS provided:

Add proposed LCO 3.1.8.a

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER, and

b. ~~The Reactor Trip Setpoints for the OPERABLE Intermediate Range, Neutron Flux and the Power Range, Neutron Flux, Low Setpoint are set at less than or equal to 25% of RATED THERMAL POWER.~~

A.3

Add proposed LCO 3.1.8.b

M.1

APPLICABILITY: MODE 2.

During PHYSICS TEST initiated in

A.4

ACTION:

ACTION B

With the THERMAL POWER greater than 5% of RATED THERMAL POWER, immediately open the reactor trip breakers.

Add proposed ACTION A

M.1

Add proposed ACTIONS C and D

L.1

SURVEILLANCE REQUIREMENTS

SR 3.1.8.2

4.10.4.1 The THERMAL POWER shall be determined to be less than or equal to 5% of RATED THERMAL POWER at least once per ~~hour~~ during PHYSICS TESTS.

30 minutes

M.2

~~4.10.4.2 Each Intermediate and Power Range Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.~~

L.2

Add proposed SR 3.1.8.1

L.1

Add proposed SR 3.1.8.3

M.1

ITS 3.1.8

ITS

A.1

SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

and the number of required channels for LCO 3.3.1 Functions 2, 3, and 6 may be reduced to 3 A.2

Add LCO 3.4.2 L.1

LCO 3.1.8

3.10.3 The limitations of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.5 and 3.1.3.6 may be suspended during the performance of PHYSICS TESTS provided:

Add proposed LCO 3.1.8.a

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER, and

b. ~~The Reactor Trip Setpoints for the OPERABLE Intermediate Range, Neutron Flux and the Power Range, Neutron Flux, Low Setpoint are set at less than or equal to 25% of RATED THERMAL POWER.~~ A.3

Add proposed LCO 3.1.8.b M.1

APPLICABILITY: MODE 2.

During PHYSICS TEST initiated in A.4

ACTION:

ACTION B

With the THERMAL POWER greater than 5% of RATED THERMAL POWER, immediately open the reactor trip breakers.

Add proposed ACTION A M.1

Add proposed ACTIONS C and D L.1

SURVEILLANCE REQUIREMENTS

SR 3.1.8.2

4.10.3.1 The THERMAL POWER shall be determined to be less than or equal to 5% of RATED THERMAL POWER at least once per ~~hour~~ during PHYSICS TESTS.

30 minutes M.2

~~4.10.3.2 Each Intermediate and Power Range Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.~~ L.2

Add proposed SR 3.1.8.1 L.1

Add proposed SR 3.1.8.3 M.1

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DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 2

ADMINISTRATIVE CHANGES

A.1 In the conversion of the CNP Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 2, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A.2 CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) state that the limitations of certain Specifications may be suspended during the performance of PHYSICS TESTS. ITS LCO 3.1.8 includes an allowance to reduce the required number of channels for ITS LCO 3.3.1, "RTS Instrumentation," Function 2 (Power Range Neutron Flux), Function 3 (Power Range Neutron Flux Rate), and Function 6 (Overtemperature ΔT), from "4" to "3." This changes CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) by adding an allowance to reduce the number of required RTS channels from "4" to " 3" for the specified Functions.

The purpose of CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) is to allow some flexibility during the performance of PHYSICS TESTS while ensuring appropriate limitations are in place to help ensure safe operation. This change is acceptable because the minimum channels required for OPERABILITY for these RTS Functions in CTS Table 3.3-1 is currently "3." This allowance is needed since the "Required Channels" in ITS 3.3.1, Reactor Trip System Instrumentation, is "4." This change from the CTS is discussed in the Discussion of Changes for ITS 3.3.1. This change is designated as administrative because it does not result in technical changes to the CTS.

A.3 CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) state that the limitations of certain Specifications may be suspended during the performance of PHYSICS TESTS provided the Reactor Trip Setpoints on the OPERABLE Intermediate and Power Range Channels are set at ≤ 25% of RATED THERMAL POWER. ITS 3.1.8 states that the requirement of certain Specifications may be suspended but contains no requirements on the Intermediate and Power Range Channels. The ITS contains the same requirements on the Intermediate and Power Range Channels in ITS LCO 3.3.1. This changes the CTS by eliminating the requirement that the Reactor Trip Setpoints on the OPERABLE Intermediate and Power Range Channels are set at ≤ 25% of RATED THERMAL POWER from the test exception.

This change is acceptable because the Reactor Trip Setpoints on the OPERABLE Intermediate and Power Range Channels are contained in ITS LCO 3.3.1, "RTS Instrumentation." Repeating that requirement in the test exception LCO is unnecessary. This change is designated administrative as it eliminates a repeated requirement from the CTS, resulting in no technical change to the CTS.

A.4 CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) are applicable in MODE 2. ITS 3.1.8 is applicable "During PHYSICS TESTS initiated in MODE 2." This changes the CTS such that the Specification is applicable in MODE 2 only when a PHYSICS TEST is initiated.

The purpose of the ITS 3.1.8 Applicability is to ensure that the Actions contained in the Specification are followed. The wording of the CTS appears to be contradictory because, if THERMAL POWER exceeds 5% RTP, then the test exception Specification Applicability is exited and the Actions no longer apply. However, it is clear that the CTS Action should be applied if THERMAL POWER exceeds 5% RTP and PHYSICS TESTS are in progress. The ITS Applicability eliminates this apparent contradiction and allows the test exception Conditions and Required Actions to be applied when the LCO is not met. This is consistent with the wording of the CTS Action. This change is designated as administrative because it clarifies the current wording of the Specification with no change in intent.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) state that limitations of certain Specifications may be suspended during the performance of PHYSICS TESTS and provides restrictions that must be followed when utilizing the CTS exception. ITS 3.1.8 adds a requirement that SHUTDOWN MARGIN must be within the limits provided in ITS LCO 3.1.1 for MODE 2 with $k_{eff} < 1.0$. A Surveillance (SR 3.1.8.3) to verify the SHUTDOWN MARGIN every 24 hours and an ACTION (ACTION A) to follow if the SHUTDOWN MARGIN limit is not met are also added. This changes the CTS by imposing an additional requirement on the application of the test exception LCO.

This change is acceptable because it imposes reasonable restrictions on the performance of PHYSICS TESTS when the control rod and RCS minimum temperature Specifications are allowed to be violated. The Bases for ITS 3.1.1, "SHUTDOWN MARGIN," state that in MODE 2 with $k_{eff} > 1.0$, the SHUTDOWN MARGIN is ensured by compliance with the rod insertion limit Specifications. Under the test exception, those control rod insertion limits are allowed to be violated. Therefore, additional actions must be taken to ensure that sufficient SHUTDOWN MARGIN is available to shutdown the reactor and keep it subcritical if needed when in MODE 2 with $k_{eff} > 1.0$. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

M.2 CTS 4.10.4.1 (Unit 1) and CTS 4.10.3.1 (Unit 2) require THERMAL POWER to be verified to be < 5% RTP once per hour. ITS SR 3.1.8.2 requires the same verification be performed every 30 minutes. This changes the CTS by increasing the Frequency of the THERMAL POWER verification.

This change is acceptable because the increased Frequency is consistent with similar verifications performed in the Specification. ITS SR 3.1.8.1, which verifies that the RCS lowest loop average temperature is $\geq 531°F$, is also performed every 30 minutes. THERMAL POWER is a parameter readily available in the control room, so imposition of this more stringent requirement will have no effect

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on safety. This change is designated as more restrictive because a Surveillance will be performed more frequently in the ITS than in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L.1 *(Category 1 – Relaxation of LCO Requirements)* CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) state that limitations of certain Specifications may be suspended during the performance of PHYSICS TESTS. ITS 3.1.8 provides an additional exception to LCO 3.4.2, "RCS Minimum Temperature for Criticality," provided the RCS lowest loop average temperature is $\geq$ 531°F. A Surveillance to verify the RCS lowest loop average temperature is $\geq$ 531°F every 30 minutes (proposed SR 3.1.8.1) has been added. In addition, ACTION C has been added to cover the situation when RCS lowest loop average temperature is not within limit. The Required Action is to restore RCS lowest loop average temperature to within limit within 15 minutes. If this is not met, then ACTION D requires the unit to be in MODE 3 within 15 minutes. This changes the CTS by allowing the suspension of LCO 3.4.2, "RCS Minimum Temperature for Criticality." However, it places a limitation on the RCS lowest loop average temperature that is allowed.

The purpose of CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) is to allow some flexibility during the performance of PHYSICS TESTS, while ensuring appropriate limitations are in place to help maintain safe operation. This change is acceptable because the LCO requirements continue to ensure that the process variables are maintained consistent with the safety analyses and licensing basis. This changes the CTS by allowing the suspension of LCO 3.4.2, "RCS Minimum Temperature for Criticality." However, it places a limitation on the RCS lowest loop average temperature that is allowed. CTS 3.1.1.5 (ITS 3.4.2, "RCS Minimum Temperature for Criticality") requires the RCS lowest operating loop temperature to be $\geq$ 541°F. Therefore, this change reduces the temperature for criticality by 10°F during the performance of PHYSICS TESTS. This is necessary to help facilitate the performance of certain tests, such as the determination of the Isothermal Temperature Coefficient. The lower limit on RCS average temperature is provided in the test exception LCO to ensure that the RCS temperature stays within the analyzed range. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 2

L.2 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS 4.10.4.2 (Unit 1) and CTS 4.10.3.2 (Unit 2) require that CHANNEL FUNCTIONAL TESTS be performed on each Intermediate and Power Range channel within 12 hours prior to initiating PHYSICS TESTS. ITS SR 3.3.1.8 for the Power Range channels and ITS SR 3.3.1.10 for the Intermediate Range channels require the tests to be performed every 92 days and every 184 days, respectively. Since ITS 3.3.1 requires these channels to be OPERABLE in MODE 2 and in MODE 2 above the P-6 Interlock, respectively, this effectively ensures the tests are performed within their required Frequency prior to entering MODE 2 (i.e., prior to performing the PHYSICS TESTS). This changes the CTS by eliminating the time period prior to initiation of PHYSICS TESTS within which the testing must be performed.

The purpose of CTS 3.10.4 (Unit 1) and CTS 3.10.3 (Unit 2) is to allow the performance of PHYSICS TESTS on the reactor. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The performance of the normally scheduled CHANNEL OPERATIONAL TEST is sufficient to ensure the equipment is OPERABLE. LCO 3.3.1 requires a CHANNEL OPERATIONAL TEST on the Power Range channels (SR 3.3.1.8) every 92 days and on the Intermediate Range channels (SR 3.3.1.10) every 184 days. These Frequencies have been determined to be sufficient for verification that the equipment is working properly. The initiation of PHYSICS TESTS does not affect the ability of the equipment to perform its function, does not affect the trip setpoints or the RTS trip capability, and does not invalidate the previous Surveillances. Therefore, requiring this testing to be performed at a fixed time before the initiation of PHYSICS TESTS has no benefit. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

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Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 PHYSICS TESTS Exceptions - MODE 2

CTS

LCO 3.10.4 (unit 1)
LCO 3.10.3 (unit 2)

LCO 3.1.8 During the performance of PHYSICS TESTS, the requirements of:

LCO 3.1.3, "Moderator Temperature Coefficient,"
LCO 3.1.4, "Rod Group Alignment Limits,"
LCO 3.1.5, "Shutdown Bank Insertion Limits,"
LCO 3.1.6, "Control Bank Insertion Limits," and
LCO 3.4.2, "RCS Minimum Temperature for Criticality"

; ①

may be suspended and the number of required channels for LCO 3.3.1, "RTS Instrumentation," Functions 2,3,6 and 18.e, may be reduced to 3, provided that:

a. RCS lowest loop average temperature is ≥ 531°F, ②

b. SDM is within the limits specified in the COLR, and ; ①

c. THERMAL POWER is ≤ 5% RTP. INSERT 1 ⑤ ③

APPLICABILITY: During PHYSICS TESTS initiated in MODE 2.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M.1	A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit. AND A.2 Suspend PHYSICS TESTS exceptions.	15 minutes 1 hour
Action	B. THERMAL POWER not within limit.	B.1 Open reactor trip breakers.	Immediately
DOC L.1	C. RCS lowest loop average temperature not within limit.	C.1 Restore RCS lowest loop average temperature to within limit.	15 minutes

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3.1.8

3

INSERT 1

for MODE 2 with k_{eff} < 1.0 specified in LCO 3.1.1, "SHUTDOWN MARGIN (SDM)"

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	15 minutes

DOC L.1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
~~SR 3.1.8.1~~	~~Perform a CHANNEL OPERATIONAL TEST on power range and intermediate range channels per [SR 3.3.1.7, SR 3.3.1.8, and Table 3.3.1-1].~~	~~Prior to initiation of PHYSICS TESTS~~
SR 3.1.8.2 1	Verify the RCS lowest loop average temperature is ≥ [531]°F.	30 minutes
SR 3.1.8.3 2	Verify THERMAL POWER is ≤ 5% RTP.	30 minutes
SR 3.1.8.4 3	Verify SDM is within the limits for MODE 2 with k_{eff} < 1.0 specified in the COLR LCO 3.1.1.	24 hours

4 | DOC L.1 | 4 2 | 4.10.4.1 (unit 1), 4.10.3.1 (unit 2) | 4 5 | DOC M.1 | 4 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 2

1. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. Changes are made to accurately reflect the requirement that must met, since the COLR lists more than one SDM limit.

4. ISTS SR 3.1.8.1 requires a CHANNEL OPERATIONAL TEST be performed on the Intermediate and Power Range channels "prior to initiation of PHYSICS TESTS." However, no finite time as to how soon prior to the PHYSICS TESTS is stated. The ITS Applicability for the Intermediate and Power Range channels includes MODE 2 above the P-6 Interlock and MODE 2, respectively, thus the normal, periodic Frequencies for SR 3.3.1.11 and SR 3.3.1.8 must be met prior to entering or soon after entering MODE 2. Therefore, the normal periodic Frequencies already ensure the "prior to initiation of PHYSICS TESTS" is met, and ISTS SR 3.1.8.1 is not necessary and has been deleted. Due to this deletion, the remaining SRs have been renumbered. In addition, ISTS LCO 3.1.8 references LCO 3.3.1 Function 18.e. In ITS Table 3.3.1-1, Function 18.d only has one channel per train, thus an exemption is not necessary in ISTS LCO 3.1.8 for this Function.

5. ISTS LCO 3.1.8.c and ISTS SR 3.1.8.3 have been revised to require THERMAL POWER $\leq$ 5% RTP. TSTF-14, Rev. 4, approved this change on May 2, 1997, but it was not properly adopted in NUREG-1431, Rev.2.

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Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.8 PHYSICS TESTS Exceptions - MODE 2

BASES

BACKGROUND

The primary purpose of the MODE 2 PHYSICS TESTS exceptions is to permit relaxations of existing LCOs to allow certain PHYSICS TESTS to be performed.

Section XI of 10 CFR 50, Appendix B (Ref. 1), requires that a test program be established to ensure that structures, systems, and components will perform satisfactorily in service. All functions necessary to ensure that the specified design conditions are not exceeded during normal operation and anticipated operational occurrences must be tested. This testing is an integral part of the design, construction, and operation of the ~~plant~~ unit. Requirements for notification of the NRC, for the purpose of conducting tests and experiments, are specified in 10 CFR 50.59 (Ref. 2). 1

The key objectives of a test program are to (Ref. 3):

a. Ensure that the facility has been adequately designed ;

b. Validate the analytical models used in the design and analysis ;

c. Verify the assumptions used to predict unit response ;

d. Ensure that installation of equipment in the facility has been accomplished in accordance with the design ; and

e. Verify that the operating and emergency procedures are adequate. 2

To accomplish these objectives, testing is performed prior to initial criticality, during startup, during low power operations, during power ascension, at high power, and after each refueling. The PHYSICS TESTS requirements for reload fuel cycles ensure that the operating characteristics of the core are consistent with the design predictions and that the core can be operated as designed (Ref. 4).

PHYSICS TESTS procedures are written and approved in accordance with established formats. The procedures include all information necessary to permit a detailed execution of the testing required to ensure that the design intent is met. PHYSICS TESTS are performed in accordance with these procedures and test results are approved prior to continued power escalation and long term power operation.

BASES

BACKGROUND (continued)

Some of The PHYSICS TESTS required for reload fuel cycles (Ref. 4) in MODE 2 are listed below: 8

a. Critical Boron Concentration - Control Rods Withdrawn; 3

b. ~~Critical Boron Concentration - Control Rods Inserted;~~ 1

b c. Control Rod Worth; 3 2

c d. Isothermal Temperature Coefficient (ITC); and

d e. Neutron Flux Symmetry. 1

The first ~~four~~ three tests are performed in MODE 2, and the last test can be performed in either MODE 1 or 2. These and other supplementary tests may be required to calibrate the nuclear instrumentation or to diagnose operational problems. These tests may cause the operating controls and process variables to deviate from their LCO requirements during their performance. 1

a. The Critical Boron Concentration - Control Rods Withdrawn Test measures the critical boron concentration at hot zero power (HZP). With all rods out, the lead control bank is at or near its fully withdrawn position. HZP is where the core is critical ($k_{eff} = 1.0$), and the Reactor Coolant System (RCS) is at design temperature and pressure for zero power. Performance of this test should not violate any of the referenced LCOs. 4

~~b. The Critical Boron Concentration - Control Rods Inserted Test measures the critical boron concentration at HZP, with a bank having a worth of at least 1% Δk/k when fully inserted into the core. This test is used to measure the boron reactivity coefficient. With the core at HZP and all banks fully withdrawn, the boron concentration of the reactor coolant is gradually lowered in a continuous manner. The selected bank is then inserted to make up for the decreasing boron concentration until the selected bank has been moved over its entire range of travel. The reactivity resulting from each incremental bank movement is measured with a reactivity computer. The difference between the measured critical boron concentration with all rods fully withdrawn and with the bank inserted is determined. The boron reactivity coefficient is determined by dividing the measured bank worth by the measured boron concentration difference. Performance of this test could violate~~ 4

BASES

BACKGROUND (continued)

LCO 3.1.4, "Rod Group Alignment Limits," LCO 3.1.5, "Shutdown Bank Insertion Limit," or LCO 3.1.6, "Control Bank Insertion Limits."

(i.e., Rod Bank Worth Test)

b → a. The Control Rod Worth Test is used to measure the reactivity worth of selected control banks. This test is performed at HZP and has three alternative methods of performance. The first method, the Boron Exchange Method, varies the reactor coolant boron concentration and moves the selected control bank in response to the changing boron concentration. The reactivity changes are measured with a reactivity computer. This sequence is repeated for the remaining control banks. The second method, the Rod Swap Method, measures the worth of a predetermined reference bank using the Boron Exchange Method above. The reference bank is then nearly fully inserted into the core. The selected bank is then inserted into the core as the reference bank is withdrawn. The HZP critical conditions are then determined with the selected bank fully inserted into the core. The worth of the selected bank is inferred, based on the position of the reference bank with respect to the selected bank. This sequence is repeated as necessary for the remaining control banks. The third method, the Boron Endpoint Method, moves the selected control bank over its entire length of travel and then varies the reactor coolant boron concentration to achieve HZP criticality again. The difference in boron concentration is the worth of the selected control bank. This sequence is repeated for the remaining control banks. Performance of this test could violate LCO 3.1.4, LCO 3.1.5, or LCO 3.1.6. ① ④

INSERT 1

① ④

c → d. The ITC Test measures the ITC of the reactor. This test is performed at HZP and has two methods of performance. The first method, the Slope Method, varies RCS temperature in a slow and continuous manner. The reactivity change is measured with a reactivity computer as a function of the temperature change. The ITC is the slope of the reactivity versus the temperature plot. The test is repeated by reversing the direction of the temperature change, and the final ITC is the average of the two calculated ITCs. The second method, the Endpoint Method, changes the RCS temperature and measures the reactivity at the beginning and end of the temperature change. The ITC is the total reactivity change divided by the total temperature change. The test is repeated by reversing the direction of the temperature change, and the final ITC is the average of the two calculated ITCs. Performance of this test could violate LCO 3.4.2, "RCS Minimum Temperature for Criticality." ①

1 4 **INSERT 1**

the Dynamic Rod Worth Measurement Method (Ref. 5), moves the selected control bank over its entire length of travel. The worth of the bank is inferred from the change in the flux level upon insertion of the bank.

BASES

BACKGROUND (continued)

d e. The Flux Symmetry Test measures the degree of azimuthal symmetry of the neutron flux at as low a power level as practical, depending on the test method employed. This test can be performed at HZP (Control Rod Worth Symmetry Method) or at ≤ 30% RTP (Flux Distribution Method). The Control Rod Worth Symmetry Method inserts a control bank, which can then be withdrawn to compensate for the insertion of a single control rod from a symmetric set. The symmetric rods of each set are then tested to evaluate the symmetry of the control rod worth and neutron flux (power distribution). A reactivity computer is used to measure the control rod worths. Performance of this test could violate LCO 3.1.4, LCO 3.1.5, or LCO 3.1.6. The Flux Distribution Method uses the incore flux detectors to measure the azimuthal flux distribution at selected locations with the core at ≤ 30% RTP. 4

APPLICABLE SAFETY ANALYSES

The fuel is protected by LCOs that preserve the initial conditions of the core assumed during the safety analyses. The ~~methods for development~~ purpose of the LCOs that are excepted by this LCO are described in the ~~Westinghouse Reload Safety Evaluation Methodology Report (Ref. 5)~~ Bases for the individual LCOs. 1 1 The above mentioned PHYSICS TESTS~~, and other tests that may be required to calibrate nuclear instrumentation or to diagnose operational problems,~~ may require the operating control or process variables to deviate from their LCO limitations. 5

The (a) FSAR defines requirements for initial testing of the facility (s), including PHYSICS TESTS. Tables ~~14.1-1 and 14.1-2~~ 13.3-1 summarize the zero, low power, and power tests. Requirements for reload fuel cycle PHYSICS TESTS are defined in ANSI/ANS-19.6.1-~~1985~~ 1997 (Ref. 4). INSERT 1A Although these PHYSICS TESTS are generally accomplished within the limits for all LCOs, conditions may occur when one or more LCOs must be suspended to make completion of PHYSICS TESTS possible or practical. This is acceptable as long as the fuel design criteria are not violated. When one or more of the requirements specified in LCO 3.1.3, "Moderator Temperature Coefficient (MTC)," LCO 3.1.4, LCO 3.1.5, LCO 3.1.6, and LCO 3.4.2 are suspended for PHYSICS TESTS, the fuel design criteria are preserved as long as the power level is limited to ≤ 5% RTP, the reactor coolant temperature is kept ≥ 531°F, and SDM is within the limits for MODE 2 with Keff < 1.0 provided in ~~the COLR~~ LCO 3.1.1, "SHUTDOWN MARGIN (SDM)." 1 3 1 6

The PHYSICS TESTS include measurement of core nuclear parameters or the exercise of control components that affect process variables. Among the process variables involved are AFD and QPTR, which represent initial conditions of the unit safety analyses. Also involved are

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1

INSERT 1A

and WCAP-13360-P-A, Revision 1 (Ref. 5)

BASES

APPLICABLE SAFETY ANALYSES (continued)

the movable control components (control and shutdown rods), which are required to shut down the reactor. The limits for these variables are specified for each fuel cycle in the COLR.

As described in LCO 3.0.7, compliance with Test Exception LCOs is optional, and therefore no criteria of 10 CFR 50.36(c)(2)(ii) apply. Test Exception LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs. A discussion of the criteria satisfied for the other LCOs is provided in their respective Bases.

Reference ~~8~~ 5 allows special test exceptions (STEs) to be included as part of the LCO that they affect. It was decided, however, to retain this STE as a separate LCO because it was less cumbersome and provided additional clarity. (1)

LCO

This LCO allows the reactor parameters of MTC and minimum temperature for criticality to be outside their specified limits. In addition, it allows selected control and shutdown ~~rods~~ banks to be positioned outside of their specified alignment and insertion limits. Operation beyond specified limits is permitted for the purpose of performing PHYSICS TESTS and poses no threat to fuel integrity, provided the SRs are met. (1)

The requirements of LCO 3.1.3, LCO 3.1.4, LCO 3.1.5, LCO 3.1.6, and LCO 3.4.2 may be suspended INSERT 2 during the performance of PHYSICS TESTS provided: (7)

a. RCS lowest loop average temperature is ≥ [531] °F, (4)

b. SDM is within the limits for MODE 2 with keff < 1.0 provided in ~~the COLR~~ LCO 3.1.1, and (6)

c. THERMAL POWER is ≤ 5% RTP. (9)

APPLICABILITY

This LCO is applicable when performing low power PHYSICS TESTS. The Applicability is stated as "During PHYSICS TESTS initiated in MODE 2" to ensure that the 5% ~~RPT~~ RTP maximum power le~~b~~vel is not exceeded. Should the THERMAL POWER EXCEED 5% ~~RPT~~ RTP, and consequently the unit enter MODE 1, this Applicability statement prevents exiting this Specification and its Required Actions. (8)

7

INSERT 2

and the number of required channels for LCO 3.3.1, "RTS Instrumentation," Functions 2, 3, and 6 may be reduced to 3

BASES

ACTIONS

A.1 and A.2

If the SDM requirement is not met, boration must be initiated promptly. A Completion Time of 15 minutes is adequate for an operator to correctly align and start the required systems and components. The operator should begin boration with the best source available for the plant unit conditions. Boration will be continued until SDM is within limit. 1

7

INSERT 3

Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification.

B.1 8

When THERMAL POWER is ≥ 5% RTP, the only acceptable action is to open the reactor trip breakers (RTBs) to prevent operation of the reactor beyond its design limits. Immediately opening the RTBs will shut down the reactor and prevent operation of the reactor outside of its design limits.

C.1

When the RCS lowest T_{avg} is < 531°F, the appropriate action is to restore T_{avg} to within its specified limit. The allowed Completion Time of 15 minutes provides time for restoring T_{avg} to within limits without allowing unit the plant to remain in an unacceptable condition for an extended period of time. Operation with the reactor critical and with temperature below 531°F could violate the assumptions for accidents analyzed in the safety analyses. 1

D.1

of Condition C 7

If the Required Actions cannot be completed within the associated Completion Time, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within an additional 15 minutes. The Completion Time of 15 additional minutes is reasonable, based on operating experience, for reaching MODE 3 in an orderly manner and without challenging plant systems. unit 1

unit 1

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

The power range and intermediate range neutron detectors must be verified to be OPERABLE in MODE 2 by LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." A CHANNEL OPERATIONAL TEST is 6

7

INSERT 3

In addition, the PHYSICS TEST exception must be suspended within 1 hour.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

~~performed on each power range and intermediate range channel prior to initiation of the PHYSICS TESTS. This will ensure that the RTS is properly aligned to provide the required degree of core protection during the performance of the PHYSICS TESTS.~~ 6

SR 3.1.8.~~2~~ 1 6

Verification that the RCS lowest loop T_{avg} is ≥ 531°F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. Verification of the RCS temperature at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.

SR 3.1.8.~~3~~ 2 6

Verification that the THERMAL POWER is ≤ 5% RTP will ensure that the ~~plant~~ unit is not operating in a condition that could invalidate the safety analyses. Verification of the THERMAL POWER at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated. 9 1

SR 3.1.8.~~4~~ 3 6

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration;

b. ~~Control~~ bank position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration;

g. Isothermal temperature coefficient (ITC), when below the point of adding heat (POAH);

h. ~~Moderate~~ Moderator Temperature Defect, when above the POAH; and

1 2 8

BASES

SURVEILLANCE REQUIREMENTS (continued)

i. Doppler Defect, when above the POAH.

Using the ITC accounts for Doppler reactivity in this calculation when the reactor is subcritical or critical but below the POAH, and the fuel temperature will be changing at the same rate as the RCS.

The Frequency of 24 hours is based on the generally slow change in required boron concentration and on the low probability of an accident occurring without the required SDM.

REFERENCES

1. 10 CFR 50, Appendix B, Section XI.
2. 10 CFR 50.59.
3. Regulatory Guide 1.68, Revision 2, August, 1978.
4. ANSI/ANS-19.6.1-~~1985~~ 1997, ~~December 13, 1985~~ August 22, 1997. (1)
5. ~~WCAP-9273-NP-A, "Westinghouse Reload Safety Evaluation Methodology Report," July 1985.~~ (1)
~~6~~ 5. WCAP-~~11618, including Addendum 1, April 1989~~. (1)
INSERT 4

1

INSERT 4

13360-P-A, "Westinghouse Dynamic Rod Worth Measurement Technique," Revision 1, October 1998.

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.8 BASES, PHYSICS TESTS EXCEPTIONS – MODE 2

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, NEI 01-03, Section 5.1.3.

3. The description of PHYSICS TESTS required for reload fuel cycles is revised to be consistent with the current guidelines, ANSI/ANS 19.6.1-1997, and the CNP startup physics testing program.

4. The brackets have been removed and the proper plant specific information/value has been provided.

5. The Applicable Safety Analyses description about "other tests" has been deleted since ITS 3.1.8 allows the suspension of the LCOs only for PHYSICS TESTS.

6. The Bases are changed to reflect changes made to the Specifications.

7. The Bases are revised to be consistent with the Specification.

8. Editorial/grammatical error corrected.

9. The LCO and SR 3.1.8.3 Bases Sections have been revised to require THERMAL POWER $\leq$ 5% RTP. TSTF-14, Rev. 4, approved this change on May 2, 1997, but it was not properly adopted in NUREG-1431, Rev. 2.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 2

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 9

Relocated/Deleted Current Technical Specifications (CTS)

CTS 3/4.1.1.3, Boron Dilution

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

CTS 3/4.1.1.3

REACTIVITY CONTROL SYSTEMS

BORON DILUTION

LIMITING CONDITION FOR OPERATION

3.1.1.3 The flow rate of reactor coolant through the reactor coolant system shall be greater than or equal to 2000 gpm whenever a reduction in Reactor Coolant System boron concentration is being made.*

APPLICABILITY: ALL MODES.

ACTION:

With the flow rate of reactor coolant through the reactor coolant system less than 2000 gpm, immediately suspend all operations involving a reduction in boron concentration of the Reactor Coolant System.

L.1

SURVEILLANCE REQUIREMENTS

4.1.1.3 The flow rate of reactor coolant through the reactor coolant system shall be determined to be greater than or equal to 2000 gpm within one hour prior to the start of and at least once per hour during a reduction in the Reactor Coolant System boron concentration by either:

a. Verifying at least one reactor coolant pump is in operation, or

b. Verifying that at least one RHR pump is in operation and supplying greater than or equal to 2000 gpm through the reactor coolant system.

*For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2 (MODES 1, 2, 3, and 4) or 3.1.2.7.b.2 (MODES 5 and 6).

CTS 3/4.1.1.3

REACTIVITY CONTROL SYSTEMS

BORON DILUTION

LIMITING CONDITION FOR OPERATION

3.1.1.3 The flow rate of reactor coolant through the reactor coolant system shall be greater than or equal to 2000 gpm whenever a reduction in Reactor Coolant System boron concentration is being made.*

APPLICABILITY: ALL MODES.

ACTION:

With the flow rate of reactor coolant through the reactor coolant system less than 2000 gpm, immediately suspend all operations involving a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.1.1.3 The flow rate of reactor coolant through the reactor coolant system shall be determined to be greater than or equal to 2000 gpm within one hour prior to the start of and at least once per hour during a reduction in the Reactor Coolant System boron concentration by either:

a. Verifying at least one reactor coolant pump is in operation, or

b. Verifying that at least one RHR pump is in operation and supplying greater than or equal to 2000 gpm through the reactor coolant system.

L.1

* For purposes of this specification, addition of water from the RWST does not constitute a dilution activity provided the boron concentration in the RWST is greater than or equal to the minimum required by specification 3.1.2.8.b.2 (MODES 1, 2, 3, and 4) or 3.1.2.7.b.2 (MODES 5 and 6).

DISCUSSION OF CHANGES
CTS 3/4.1.1.3, BORON DILUTION

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L.1 *(Category 1 – Relaxation of LCO Requirements)* CTS 3.1.1.3 requires the flow rate of reactor coolant through the Reactor Coolant System (RCS) to be greater than or equal to 2000 gpm whenever a reduction in RCS boron concentration is being made. With the flow rate not within limit, immediate suspension of all operations involving a reduction in boron concentration is required. CTS 4.1.1.3 requires the RCS flow rate to be monitored prior to the start of a reduction in the RCS born concentration. The ITS does not include this Specification. This changes the CTS by eliminating this Specification.

The purpose of CTS 3.1.1.3 is to ensure there is enough flow to support adequate mixing, prevent stratification, and prevent and ensure that reactivity changes will be gradual during boron concentration reductions in the RCS. This flow rate will circulate the RCS volume in approximately 30 minutes. Therefore, the reactivity change rate associated with boron reductions will therefore be within the capability for operator recognition and control.

This change is acceptable since the ITS contains several Specifications, each applicable during different MODES of operations, that require a certain number of RCS and/or residual heat removal (RHR) loops to be OPERABLE and in operation regardless of whether or not a reduction in RCS boron concentration is being made. These ITS Specifications also include the appropriate Surveillance to ensure the loops are OPERABLE and in operation. The flow limit is not included in most of the ITS Specifications because the capacity of the RCS pumps is significantly greater than 2000 gpm and because operation of the RHR System is controlled by plant operating procedures to ensure adequate flow. The reactor coolant flow rate of 2000 gpm is retained for MODE 6 operations as indicated in ITS SR 3.9.4.1 and SR 3.9.5.1.

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DISCUSSION OF CHANGES
CTS 3/4.1.1.3, BORON DILUTION

In MODES 1 and 2, if any RCS loop is not OPERABLE and in operation, ITS LCO 3.4.4 ACTION A requires the unit to be in MODE 3 within 6 hours. If the unit is operating in MODES 3, 4, and 5 (with the RCS loops filled) and the required loops are not in operation, the associated ITS LCOs provide limitations that prohibit operations that would cause introduction of coolant with boron concentration less than required to meet SDM of ITS LCO 3.1.1. If the required loop is not in operation in MODE 5 (with the RCS loops not filled), ITS LCO 3.4.8 prohibits operations that can cause introduction of coolant with boron concentration less than required to meet ITS LCO 3.1.1 and prohibits draining operations that could further reduce the RCS water volume. If the unit is operating in MODE 6 with high reactor water level and the required loop is not in operation, ITS LCO 3.9.4 prohibits operations that would cause introduction of coolant with boron concentration less than required to meet ITS LCO 3.9.1. If the unit is operating in MODE 6 with low reactor water level and the required loops are not in operation, ITS LCO 3.9.5 prohibits operation that would cause introduction of coolant with boron concentration less than required to meet ITS LCO 3.9.1 and prohibits draining operations which can further reduce the RCS water volume. Since the requirements have been included in various Specifications, the change is appropriate. This change is designated as less restrictive because less stringent LCO requirements (explicit flow rates) are being applied in the ITS than were applied in the CTS.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.1.3, BORON DILUTION

There are no specific NSHC discussions for this Specification.

CTS 3/4.1.2.1, Flow Paths - Shutdown

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE:

a. A flow path from the boric acid tanks via a boric acid transfer pump and charging pump to the Reactor Coolant System if only the boric acid storage tank in Specification 3.1.2.7a is OPERABLE, or

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if only the refueling water storage tank in Specification 3.1.2.7b is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2. R.1

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperatures of the areas containing the flow path components from the boric acid tank to the blending tee are greater than or equal to 63°F when a flow path from the boric acid tanks is used.

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

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CTS 3/4.1.2.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE:

a. A flow path from the boric acid tanks via a boric acid transfer pump and charging pump to the Reactor Coolant System if only the boric acid storage tank in Specification 3.1.2.7.a is OPERABLE, or

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if only the refueling water storage tank in Specification 3.1.2.7.b is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2. R.1

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperatures of the areas containing the flow path components from the boric acid tank to the blending tee are greater than or equal to 63°F when a flow path from the boric acid tanks is used.

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

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DISCUSSION OF CHANGES
CTS 3/4.1.2.1, FLOW PATHS - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.1 provides requirements on the boration systems flow paths during shutdown. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.1 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Flow Paths - Shutdown Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Flow Paths - Shutdown Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Flow Paths - Shutdown Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-6) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-

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DISCUSSION OF CHANGES
CTS 3/4.1.2.1, FLOW PATHS - SHUTDOWN

significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Flow Paths - Shutdown Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Flow Paths - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Flow Paths - Shutdown Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.1, FLOW PATHS - SHUTDOWN

There are no specific NSHC discussions for this Specification.

CTS 3/4.1.2.2, Flow Paths - Operating

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 Each of the following boron injection flow paths shall be OPERABLE:

a. The flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System, and

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the flow path from the boric acid tanks inoperable, restore the inoperable flow path to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F within the next 6 hours; restore the flow path to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours. R.1

b. With the flow path from the refueling water storage tank inoperable, restore the flow path to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.2 Each of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperatures of the areas containing the flow path components from the boric acid tank to the blending tee are greater than or equal to 63°F.

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on an RWST sequencing signal.

d. At least once per 18 months shutdown by verifying that the flow path required by specification 3.1.2.2.a delivers at least 34 gpm to the Reactor Coolant System.

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FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 Each of the following boron injection flow paths shall be OPERABLE:

a. The flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System, and

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the flow path from the boric acid tanks inoperable, restore the inoperable flow path to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F within the next 6 hours; restore the flow path to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours. R.1

b. With the flow path from the refueling water storage tank inoperable, restore the flow path to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.2 Each of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperatures of the areas containing the flow path components from the boric acid tank to the blending tee are greater than or equal to 63°F.

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on a RWST sequencing signal.

d. At least once per 18 months during shutdown by verifying that the flow path required by specification 3.1.2.2.a delivers at least 34 gpm to the Reactor Coolant System.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

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DISCUSSION OF CHANGES
CTS 3/4.1.2.2, FLOW PATHS - OPERATING

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.2 provides requirements on the boration systems flow paths during operation. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.2 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Flow Paths - Operating Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Flow Paths - Operating Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Flow Paths - Operating Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-8) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-

significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Flow Paths - Operating Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Flow Paths - Operating LCO and Surveillances may be relocated out of the Technical Specifications. The Flow Paths - Operating Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.2, FLOW PATHS - OPERATING

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.3, Charging Pump - Shutdown

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

CTS 3/4.1.2.3

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3

a. One charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus.

b. One charging flowpath associated with support of Unit 2 shutdown functions shall be available.[*]

R.1

See ITS 3.4.12

L.1

APPLICABILITY: Specification 3.1.2.3.a. - MODES 5 and 6
Specification 3.1.2.3.b. - At all times when Unit 2 is in MODES 1, 2, 3, or 4.

R.1

L.1

ACTION:

a. With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3/1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2.

R.1

b. With more than one charging pump OPERABLE or with a safety injection pump(s) OPERABLE when the temperature of any RCS cold leg is less than or equal to 152°F, unless the reactor vessel head is removed, remove the additional charging pump(s) and the safety injection pump(s) motor circuit breakers from the electrical power circuit within one hour.

See ITS 3.4.12

c. The provisions of Specification 3.0.3 are not applicable.

R.1

d. In addition to the above, when Specification 3.1.2.3.b is applicable and the required flow path is not available, return the required flow path to available status within 7 days, or provide equivalent shutdown capability in Unit 2 and return the required flow path to available status within the next 60 days, or have Unit 2 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours.

e. The requirements of Specification 3.0.4 are not applicable when Specification 3.1.2.3.b applies.

L.1

SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above required charging pump shall be demonstrated OPERABLE by verifying that the pump's developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5.

R.1

* A maximum of one centrifugal charging pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is less than or equal to 152°F.

See ITS 3.4.12

CTS 3/4.1.2.3

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

R.1

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

4.1.2.3.2 All charging pumps and safety injection pumps, excluding the above required OPERABLE charging pump, shall be demonstrated inoperable by verifying that the motor circuit breakers have been removed from their electrical power supply circuits at least once per 12 hours, except when:

a. The reactor vessel head is removed, or

b. The temperature of all RCS cold legs is greater than 152°F.

See ITS 3.4.12

4.1.2.3.3 Charging line cross-tie valves to Unit 2 will be cycled full travel at least once per 18 months. Following cycling, the valves will be verified to be in their closed positions.

L.1

CTS 3/4.1.2.3

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3

a. One charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency bus. R.1

b. One charging flow path associated with support of Unit 1 shutdown functions shall be available.* L.1 See ITS 3.4.12

APPLICABILITY: Specification 3.1.2.3 a. - MODES 5 and 6 R.1
Specification 3.1.2.3.b - At all times when Unit 1 is in MODES 1, 2, 3, or 4. L.1

ACTION:

a. With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2. R.1

b. With more than one charging pump OPERABLE or with a safety injection pump(s) OPERABLE when the temperature of any RCS cold leg is less than or equal to 152°F, unless the reactor vessel head is removed, remove the additional charging pump(s) and the safety injection pump(s) motor circuit breakers from the electrical power circuit within one hour. See ITS 3.4.12

c. The provisions of Specification 3.0.3 are not applicable. R.1

d. In addition to the above, when Specification 3.1.2.3.b is applicable and the required flow path is not available, return the required flow path to available status within 7 days, or provide equivalent shutdown capability in Unit 1 and return the required flow path to available status within the next 60 days, or have Unit 1 in HOT STANDBY within the next 12 hours and HOT SHUTDOWN within the following 24 hours. L.1

e. The requirements of Specification 3.0.4 are not applicable when Specification 3.1.2.3.b applies.

SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above required charging pump shall be demonstrated OPERABLE by verifying that the pump's developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5 R.1

* A maximum of one centrifugal charging pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is less than or equal to 152°F. See ITS 3.4.12

CTS 3/4.1.2.3

3/4 ~~LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS~~
3/4.1 ~~REACTIVITY CONTROL SYSTEMS~~

~~SURVEILLANCE REQUIREMENTS~~

R.1

4.1.2.3.2 All charging pumps and safety injection pumps, excluding the above-required OPERABLE charging pump, shall be demonstrated inoperable by verifying that the motor circuit breakers have been removed from their electrical power supply circuits at least once per 12 hours, except when:

a. The reactor vessel head is removed, or

b. The temperature of all RCS cold legs is greater than 152°F.

See ITS 3.4.12

~~4.1.2.3.3 Charging line cross-tie valves to Unit 1 will be cycled full travel at least once per 18 months. Following cycling, the valves will be verified to be in their closed positions.~~

L.1

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DISCUSSION OF CHANGES
CTS 3/4.1.2.3, CHARGING PUMP - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.3 provides requirements on the charging pumps during shutdown when used as part of the boration system. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual. It should be Noted that this Specification also has requirements concerning the maximum number of charging and safety injection pumps that can be OPERABLE. This Discussion of Change does not address these requirements; they are covered in ITS 3.4.12. It should also be Noted that this Specification has requirements associated with the safe shutdown requirements of 10 CFR 50 Appendix R. These requirements are discussed in DOC L.1.

This change is acceptable because CTS 3/4.1.2.3 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Charging Pumps - Shutdown Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Charging Pumps - Shutdown Specification does not satisfy criterion 2.

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DISCUSSION OF CHANGES
CTS 3/4.1.2.3, CHARGING PUMP - SHUTDOWN

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Charging Pumps - Shutdown Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-6) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Charging Pumps - Shutdown Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Charging Pumps - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Charging Pumps - Shutdown Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L.1 *(Category 1 – Relaxation of LCO Requirements)* CTS 3.1.2.3.b states that one charging flow path associated with support of Unit 2 (Unit 1) and Unit 1 (Unit 2) shutdown functions shall be available. The ITS does not include these requirements. This changes the CTS by deleting these requirements from the CTS.

The purpose of CTS 3.1.2.3.b is to satisfy the safe shutdown requirements of 10 CFR 50 Appendix R. This change is acceptable because the LCO requirements in the Technical Requirements Manual continue to ensure that the structures, systems, and components are maintained consistent with the safety analyses and licensing basis. This change deletes the safe shutdown requirements of 10 CFR 50 Appendix R from the CTS. The opposite unit charging flow path requirements are not needed to satisfy the requirements of the unit safety analyses. CNP is still committed to the safe shutdown requirements of 10 CFR 50 Appendix R. In addition to this change, the Applicability and Action associated with CTS 3.1.2.3.b have been deleted, as well as CTS 4.1.2.3.3, which tests the capability of the unit cross tie valves to cycle. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.3, CHARGING PUMP – SHUTDOWN

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.4, Charging Pumps - Operating

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4 At least two charging pumps shall be demonstrated OPERABLE by verifying that the pumps' developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5.

R.1

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% $\Delta k/k$ at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4 At least two charging pumps shall be demonstrated OPERABLE by verifying that the pumps'developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5.

R.1

DISCUSSION OF CHANGES
CTS 3/4.1.2.4, CHARGING PUMPS - OPERATING

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.4 provides requirements on the charging pumps during operation when used as part of the boration system. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.4 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Charging Pumps - Operating Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Charging Pumps - Operating Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Charging Pumps - Operating Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-8) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-

DISCUSSION OF CHANGES
CTS 3/4.1.2.4, CHARGING PUMPS - OPERATING

significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Charging Pumps - Operating Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Charging Pumps - Operating LCO and Surveillances may be relocated out of the Technical Specifications. The Charging Pumps - Operating Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.4, CHARGING PUMPS - OPERATING

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.5, Boric Acid Transfer Pumps - Shutdown

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

BORIC ACID TRANSFER PUMPS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.5 At least one boric acid transfer pump shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if only the flow path through the boric acid transfer pump of Specification 3.1.2.1a is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no boric acid transfer pump OPERABLE as required to complete the flow path of Specification 3.1.2.1a, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2.

R.1

SURVEILLANCE REQUIREMENTS

4.1.2.5 No additional surveillance requirements other than those required by Specification 4.0.5.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

BORIC ACID TRANSFER PUMPS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.5 At least one boric acid transfer pump shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if only the flow path through the boric acid transfer pump of Specification 3.1.2.1a is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no boric acid transfer pump OPERABLE as required to complete the flow path of Specification 3.1.2.1a, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2.

R.1

SURVEILLANCE REQUIREMENTS

4.1.2.5 No additional Surveillance Requirements other than those required by Specification 4.0.5.

DISCUSSION OF CHANGES
CTS 3/4.1.2.5, BORIC ACID TRANSFER PUMPS - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.5 provides requirements on the boric acid transfer pumps during shutdown. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.5 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Boric Acid Transfer Pumps - Shutdown Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Boric Acid Transfer Pumps - Shutdown Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Boric Acid Transfer Pumps - Shutdown Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-6) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-

DISCUSSION OF CHANGES
CTS 3/4.1.2.5, BORIC ACID TRANSFER PUMPS - SHUTDOWN

significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Boric Acid Transfer Pumps - Shutdown Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Boric Acid Transfer Pumps - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Boric Acid Transfer Pumps - Shutdown Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.5, BORIC ACID TRANSFER PUMPS - SHUTDOWN

There are no specific NSHC discussions for this Specification.

CTS 3/4.1.2.6, Boric Acid Transfer Pumps - Operating

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

REACTIVITY CONTROL SYSTEMS

BORIC ACID TRANSFER PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 At least one boric acid transfer pump in the boron injection flow path required by Specification 3.1.2.2a shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if the flow path through the boric acid pump in Specification 3.1.2.2a is OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With no boric acid transfer pump OPERABLE, restore at least one boric acid transfer pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F; restore at least one boric acid transfer pump to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

R.1

SURVEILLANCE REQUIREMENTS

4.1.2.6 No additional surveillance requirements other than those required by Specification 4.0.5.

REACTIVITY CONTROL SYSTEMS

BORIC ACID TRANSFER PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.6 At least one boric acid transfer pump in the boron injection flow path required by Specification 3.1.2.2a shall be OPERABLE and capable of being powered from an OPERABLE emergency bus if the flow path through the boric acid pump in Specification 3.1.2.2a is OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With no boric acid transfer pump OPERABLE, restore at least one boric acid transfer pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to 1% Δk/k at 200°F; restore at least one boric acid transfer pump to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

R.1

SURVEILLANCE REQUIREMENTS

4.1.2.6 No additional Surveillance Requirements other than those required by Specification 4.0.5.

DISCUSSION OF CHANGES
CTS 3/4.1.2.6, BORIC ACID TRANSFER PUMPS - OPERATING

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.6 provides requirements on the boric acid transfer pumps during operation. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.6 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Boric Acid Transfer Pumps - Operating Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Boric Acid Transfer Pumps - Operating Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Boric Acid Transfer Pumps - Operating Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-8) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-

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DISCUSSION OF CHANGES
CTS 3/4.1.2.6, BORIC ACID TRANSFER PUMPS - OPERATING

significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Boric Acid Transfer Pumps - Operating Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Boric Acid Transfer Pumps - Operating LCO and Surveillances may be relocated out of the Technical Specifications. The Boric Acid Transfer Pumps - Operating Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.6, BORIC ACID TRANSFER PUMPS - OPERATING

There are no specific NSHC discussions for this Specification.

CTS 3/4.1.2.7, Borated Water Sources - Shutdown

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.7 As a minimum, one of the following borated water sources shall be OPERABLE:

a. A boric acid storage system with:

1. A minimum usable borated water volume of 5000 gallons,
2. Between 6,550 and 6,990 ppm of boron, and
3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum usable borated water volume of 90,000 gallons,
2. A minimum boron concentration of 2400 ppm, and
3. A minimum solution temperature of 70°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2. R.1

SURVEILLANCE REQUIREMENTS

4.1.2.7 The above required borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,
2. Verifying the water level volume of the tank, and
3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when it is the source of borated water.

CTS 3/4.1.2.7

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.1 REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.7 As a minimum, one of the following borated water sources shall be OPERABLE:

a. A boric acid storage system with:

1. A minimum usable borated water volume of 5,000 gallons,

2. Between 6,550 and 6,990 ppm of boron, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum usable borated water volume of 90,000 gallons,

2. A minimum boron concentration of 2400 ppm, and

3. A minimum solution temperature of 70°F.

R.1

APPLICABILITY: *MODES* 5 and 6.

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes except: 1) heatup or cooldown of the reactor coolant volume provided that SHUTDOWN MARGIN sufficient to accommodate the change in temperature is maintained in accordance with Specification 3.1.1.2 in MODE 5 or Specification 3.9.1 in MODE 6, and the heatup or cooldown rate is restricted to 50°F or less in any one-hour period in MODE 5, or 2) addition of water from the RWST, provided the boron concentration in the *RWST is greater than or equal to the minimum required by Specification 3.1.2.7.b.2.*

SURVEILLANCE REQUIREMENTS

4.1.2.7 The above required borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,

2. Verifying the contained borated water volume, and

3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when it is the source of borated water.

DISCUSSION OF CHANGES
CTS 3/4.1.2.7, BORATED WATER SOURCES - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.7 provides requirements on the borated water sources during shutdown. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.7 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Borated Water Sources - Shutdown Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Borated Water Sources - Shutdown Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Borated Water Sources - Shutdown Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-10) and summarized in Table 1 of WCAP-11618, the loss of the CVCS System was found to be a

DISCUSSION OF CHANGES
CTS 3/4.1.2.7, BORATED WATER SOURCES - SHUTDOWN

non-significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Borated Water Sources - Shutdown Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Borated Water Sources - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Borated Water Sources - Shutdown Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.7, BORATED WATER SOURCES - SHUTDOWN

There are no specific NSHC discussions for this Specification.

CTS 3/4.1.2.8, Borated Water Sources - Operations (Unit 1)/ Operating (Unit 2)

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

BORATED WATER SOURCES - OPERATIONS

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. A boric acid storage system with:

1. A minimum usable borated water volume of 8,500 gallons,*
2. Between 6,550 and 6,990 ppm of boron, and
3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum contained volume of 375,500 gallons of water,
2. Between 2400 and 2600 ppm of boron, and
3. A minimum solution temperature of 70°F and a maximum solution temperature of 100°F. R.1

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

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* Not required when borated water is injected into the RCS to meet SHUTDOWN MARGIN requirements of MODES 3 and 4.

CTS 3/4.1.2.8

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

a. At least once per 7 days by:

1. Verifying the boron concentration in each water source,

2. Verifying the water level of each water source, and

3. Verifying the boric acid storage system solution temperature.

b. At least once per 24 hours by verifying the RWST temperature.

R.1

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BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

a. A boric acid storage system with:

1. A minimum contained borated water volume of 8500 gallons,*
2. Between 6,550 and 6,990 ppm of boron, and
3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 375,500 gallons of water,
2. Between 2400 and 2600 ppm of boron, and
3. A minimum solution temperature of 70°F and a maximum solution temperature of 100°F. R.1

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% Delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the refueling water storage tank inoperable, restore the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

*Not required when borated water is injected into the RCS to meet SHUTDOWN MARGIN requirements of MODES 3 and 4.

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

a. At least once per 7 days by:

1. Verifying the boron concentration in each water source,
2. Verifying the contained borated water volume of each water source, and
3. Verifying the boric acid storage system solution temperature.

b. At least once per 24 hours by verifying the RWST temperature.

R.1

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DISCUSSION OF CHANGES
CTS 3/4.1.2.8, BORATED WATER SOURCES - OPERATIONS (UNIT 1)/ OPERATING (UNIT 2)

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R.1 CTS 3/4.1.2.8 provides requirements on the borated water sources during operation. The boration subsystem of the Chemical and Volume Control System (CVCS) provides the means to meet one of the functional requirements of the CVCS, i.e., to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. To accomplish this functional requirement, the CTS requires a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

The boration subsystem is not assumed to be OPERABLE to mitigate the consequences of a DBA or transient. In the case of a malfunction of the CVCS that causes a boron dilution event, the response required by the operator is to close the appropriate valves in the reactor makeup system. This action is required before the SHUTDOWN MARGIN is lost. Operation of the boration subsystem is not assumed to mitigate this event. This Specification does not meet the criteria for retention in the ITS; therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.1.2.8 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The CVCS is not used for, nor is capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Borated Water Sources - Operations/Operating Specification does not satisfy criterion 1.

2. The CVCS is not used to indicate status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. The Borated Water Sources - Operations/Operating Specification does not satisfy criterion 2.

3. The CVCS is not part of a primary success path in the mitigation of a DBA or transient. The Borated Water Sources - Operations/Operating Specification does not satisfy criterion 3.

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DISCUSSION OF CHANGES
CTS 3/4.1.2.8, BORATED WATER SOURCES - OPERATIONS (UNIT 1)/ OPERATING (UNIT 2)

4. As discussed in Section 4.0 (Appendix A, page A-10) and summarized in Table 1 of WCAP-11618, the loss of the CVCS was found to be a non-significant risk contributor to core damage frequency and offsite releases. I&M has reviewed this evaluation, considers it applicable to CNP Units 1 and 2, and concurs with the assessment. The Borated Water Sources - Operations/Operating Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Borated Water Sources - Operations/Operating LCO and Surveillances may be relocated out of the Technical Specifications. The Borated Water Sources - Operations/Operating Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.8, BORATED WATER SOURCES - OPERATIONS (UNIT 1)/ OPERATING (UNIT 2)

There are no specific NSHC discussions for this Specification.

CTS 3/4.10.1, Shutdown Margin

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.10.1 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of control rod worth and shutdown margin provided the reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s).

APPLICABILITY: MODE 2.

ACTION:

a. With the reactor critical ($K_{eff} \geq 1.0$) and with less than the above reactivity equivalent available for trip insertion, immediately initiate and continue boration at $\geq$ 34 gpm of 6,550 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With the reactor subcritical ($K_{eff} < 1.0$) by less than the above reactivity equivalent, immediately initiate and continue boration at $\geq$ 34 gpm of 6,550 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored. M.1

SURVEILLANCE REQUIREMENTS

4.10.1.1 The position of each full length rod either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each full length rod not fully inserted shall be demonstrated OPERABLE by verifying its rod drop time to be $\leq$ 2.4 seconds within 7 days prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.10.1 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of control rod worth and shutdown margin provided the reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion for OPERABLE control rod(s).

APPLICABILITY: MODE 2.

ACTION:

a. With any full length control rod not fully inserted and with less than the above reactivity equivalent available for trip insertion, immediately initiate and continue boration at ≥ 34 gpm of 6,550 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all full length control rods inserted and the reactor subcritical by less than the above reactivity equivalent, immediately initiate and continue boration at ≥ 34 gpm of 6,550 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

M.1

SURVEILLANCE REQUIREMENTS

4.10.1.1 The position of each full length rod either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each full length rod not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position within 7 days prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

DISCUSSION OF CHANGES
CTS 3/4.10.1, SHUTDOWN MARGIN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

M.1 CTS 3/4.10.1 provides an exception to the SHUTDOWN MARGIN requirements in CTS 3.1.1.1 in MODE 2 for the purpose of measurement of rod worth and shutdown margin provided the reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s). According to the Bases, this special test exception is required to permit the periodic verification of the actual versus predicted core reactivity condition occurring as a result of fuel burnup or fuel cycling operations. The ITS does not contain this special test exception. This changes the CTS by eliminating a special test exception.

This change is acceptable because this method of testing is no longer used. As a result, the CTS special test exception is not needed. Other rod worth measurement techniques that do not violate the SHUTDOWN MARGIN requirements are used. This change is designated as more restrictive because an exception to the CTS is being deleted.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.10.1, SHUTDOWN MARGIN

There are no specific NSHC discussions for this Specification.

CTS 3/4.10.2, Group Height, Insertion, and Power Distribution Limits

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

SPECIAL TEST EXCEPTIONS

GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

3.10.2 The group height, insertion and power distribution limits of Specifications 3.1.3.1, 3.1.3.4, 3.1.3.5, 3.2.1, and 3.2.4 may be suspended during the performance of PHYSICS TESTS provided:

a. The THERMAL POWER is maintained less than or equal to 85% of RATED THERMAL POWER, and

b. The limits of Specifications 3.2.2 and 3.2.3 are maintained and determined at the frequencies specified in Specification 4.10.2.2 below.

APPLICABILITY: MODE 1

ACTION:

With any of the limits of Specifications 3.2.2 or 3.2.3 being exceeded while the requirements of Specifications 3.1.3.1, 3.1.3.4, 3.1.3.5, 3.2.1 and 3.2.4 are suspended, either:

a. Reduce THERMAL POWER sufficient to satisfy the ACTION requirements of Specifications 3.2.2 and 3.2.3, or

b. Be in HOT STANDBY within 6 hours.

M.1

SURVEILLANCE REQUIREMENTS

4.10.2.1 The THERMAL POWER shall be determined to be less than or equal to 85% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.2.2 The Surveillance Requirements of Specifications 4.2.2.2 and 4.2.3 shall be performed at the following frequencies during PHYSICS TESTS:

a. Specification 4.2.2.2 - At least once per 12 hours.

b. Specification 4.2.3 - At least once per 12 hours.

CTS 3/4.10.2

SPECIAL TEST EXCEPTIONS

GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

3.10.2 The group height, insertion and power distribution limits of Specifications 3.1.3.1, 3.1.3.5, 3.1.3.6, 3.2.1, and 3.2.4 may be suspended during the performance of PHYSICS TESTS provided:

a. The THERMAL POWER is maintained ≤ 85% of RATED THERMAL POWER, and

b. The limits of Specifications 3.2.2 and 3.2.3 are maintained and determined at the frequencies specified in Specification 4.10.2.2 below.

APPLICABILITY: MODE 1

ACTION:

With any of the limits of Specifications 3.2.2 or 3.2.3 being exceeded while the requirements of Specifications 3.1.3.1, 3.1.3.5, 3.1.3.6, 3.2.1 and 3.2.4 are suspended, either:

M.1

a. Reduce THERMAL POWER sufficient to satisfy the ACTION requirements of Specifications 3.2.2 and 3.2.3, or

b. Be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.10.2.1 The THERMAL POWER shall be determined to be ≤ 85% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.2.2 The Surveillance Requirements of Specifications 4.2.2.2 and 4.2.3 shall be performed at the following frequencies during PHYSICS TESTS:

a. Specification 4.2.2.2 - At least once per 12 hours.

b. Specification 4.2.3 - At least once per 12 hours.

DISCUSSION OF CHANGES
CTS 3/4.10.2, GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

M.1 CTS 3/4.10.2 provides an exception to the rod group height, rod insertion, and power distribution limits Specifications. This special test exception permits individual control rods to be positioned outside of their normal group heights and insertion limits during the performance of such PHYSICS TESTS as those required to 1) measure control rod worth and, 2) determine the reactor stability index and damping factor under xenon oscillation conditions. The ITS does not contain this special test exception. This changes the CTS by eliminating a special test exception.

This change is acceptable because these types of PHYSICS TESTS (measurement of control rod worth and determination of the reactor stability index as well as the damping factor under xenon oscillation conditions) are only performed during initial plant startup test programs. These tests are never performed during post-refueling PHYSICS TESTS. As a result, the CTS special test exception is not needed. This change is designated as more restrictive because an exception to the CTS is being deleted.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.10.2, GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

There are no specific NSHC discussions for this Specification.

CTS 3/4.10.3, Pressure/Temperature Limitation - Reactor Criticality (Unit 1)

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

CTS 3/4.10.3

M.1

SPECIAL TEST EXCEPTIONS

PRESSURE/TEMPERATURE LIMITATION - REACTOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.10.3 The minimum temperature and pressure conditions for reactor criticality of Specifications 3.1.1.5 and 3.4.9.1 may be suspended during low temperature PHYSICS TESTS provided:

a. The THERMAL POWER does not exceed 5 percent of RATED THERMAL POWER,

b. The Reactor Trip Setpoints for the OPERABLE Intermediate Range, Neutron Flux and the Power Range, Neutron Flux, Low Setpoint are set at less than or equal to 25% of RATED THERMAL POWER, and

c. The Reactor Coolant System temperature and pressure relationship is maintained within the region of acceptable operation shown on Figures 3.4-2 and 3.4-3.

APPLICABILITY: MODE 2

ACTION:

a. With the THERMAL POWER greater than 5 percent of RATED THERMAL POWER, immediately open the reactor trip breakers.

b. With the Reactor Coolant System temperature and pressure relationship within the region of unacceptable operation on Figures 3.4-2 and 3.4-3, immediately open the reactor trip breakers and restore the temperature-pressure relationship to within its limit within 30 minutes; perform the analysis required by Specification 3.4.9.1 prior to the next reactor criticality.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The Reactor Coolant System shall be verified to be within the acceptable region for operation of Figures 3.4-2 and 3.4-3 at least once per hour.

4.10.3.2 The THERMAL POWER shall be determined to be less than or equal to 5% of RATED THERMAL POWER at least once per hour.

CTS 3/4.10.3

M.1

SPECIAL TEST EXCEPTIONS

SURVEILLANCE REQUIREMENTS (Continued)

4.10.3.3 Each Intermediate and Power Range Nuclear Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating low temperature PHYSICS TESTS.

DISCUSSION OF CHANGES
CTS 3/4.10.3, PRESSURE/TEMPERATURE LIMITATION – REACTOR CRITICALITY

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

M.1 (Unit 1 only) CTS 3/4.10.3 provides an exception to the minimum temperature and pressure conditions for reactor criticality of Specifications 3.1.1.5 and 3.4.9.1 during low temperature PHYSICS TESTS provided some other restrictions are enforced. These restrictions are that THERMAL POWER does not exceed 5% of RATED THERMAL POWER, the reactor trip setpoints for the OPERABLE Intermediate Range, Neutron Flux and the Power Range, Neutron Flux, Low Setpoints are set at $\leq$ 25% of RATED THERMAL POWER, and the Reactor Coolant System temperature and pressure relationship is maintained within the region of acceptable operation shown on Figures 3.4-2 and 3.4-3. The ITS does not contain this special test exception. This changes the Unit 1 CTS by eliminating a special test exception.

This change is acceptable because low temperature PHYSICS TESTS are no longer performed. This allowance is not available for Unit 2 and is not needed for Unit 1. Future PHYSICS TESTS will be performed under ITS 3.1.8, "PHYSICS TESTS Exceptions – MODE 2," which has been developed from CTS 3/4.10.4, PHYSICS TESTS. As a result, the CTS special test exception is not needed. This change is designated as more restrictive because an exception to the Unit 1 CTS is being deleted.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.10.3, PRESSURE/TEMPERATURE LIMITATION – REACTOR CRITICALITY

There are no specific NSHC discussions for this Specification.