ATTACHMENT 1

VOLUME 6

DAVIS-BESSE IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.1 REACTIVITY CONTROL SYSTEMS

Revision 0

LIST OF ATTACHMENTS

ATTACHMENT 1

ITS 3.1.1, SHUTDOWN MARGIN (SDM)

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

ITS

A01

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

within the limits specified in the COLR — LA01

3.1.1 3.1.1.1 The SHUTDOWN MARGIN shall be ~~≥ 1% Δk/k~~. — A02

APPLICABILITY: MODES ~~1, 2~~#, 3##, 4 and 5. — A03 — A04

ACTION:

not within limits — within 15 minutes — LA01 — L01

ACTION A With the SHUTDOWN MARGIN ~~< 1% Δk/k~~, ~~immediately~~ initiate ~~and continue~~ boration ~~at ≥ 25 gpm of 7875 ppm boron or its equivalent,~~ until the required SHUTDOWN MARGIN is restored. — L02

SURVEILLANCE REQUIREMENTS

within the limits specified in the COLR — LA01

SR 3.1.1.1 4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be ~~≥ 1% Δk/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is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s). (See ITS 1.0)

b. When in MODES 1 or 2#, at least once per 12 hours, by verifying that regulating rod groups withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2## 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 3.2.1)

d. ~~Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading by consideration of the factors of e. below, with the regulating rod groups at the maximum insertion limit of Specification 3.1.3.6.~~ — L03

~~*See Special Test Exception 3.10.4~~ — A02

~~**See LCO 3.7.9, Steam Generator Level, for additional SHUTDOWN MARGIN requirements.~~ — A03

#With $k_{eff} \geq 1.0$

##With $k_{eff} < 1.0$

(See ITS 3.2.1)

ITS

A01

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.1.1.1

e. When in MODES 3, 4 or 5, 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, and~~
~~6. Samarium concentration.~~

LA02

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within ± 1% Δk/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

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 The Applicability of CTS 3.1.1.1 is MODES 1, 2, 3, 4, and 5, and includes a footnote (*) to the MODE 2 Applicability stating, "See Special Test Exception 3.10.4." ITS 3.1.1 does not contain this footnote, or a reference to Special Test Exception 3.10.4. This changes the CTS by deleting the reference footnote.

The purpose of the footnote references 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.

A03 The Applicability of CTS 3.1.1.1 is MODES 1, 2, 3, 4, and 5, and includes a footnote (**) to the MODE 3 Applicability stating, "See LCO 3.7.9, Steam Generator Level, for additional SHUTDOWN MARGIN requirements." CTS 3.7.9 establishes maximum steam generator level requirements in MODE 3 that, in conjunction with adjusted SDM requirements specified in operating procedures, provide adequate SDM to ensure the reactor will remain subcritical during a MODE 3 Main Steam Line Break. ITS 3.1.1 does not contain this footnote, or a reference to CTS 3.7.9. This changes the CTS by deleting the reference footnote.

The purpose of the footnote reference is to alert the user that additional SDM requirements exist that may affect satisfying the requirements of the Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is considered administrative because the technical requirements have not changed.

A04 CTS 3.1.1.1 provides SDM requirements in MODES 1, 2, 3, 4 and 5. CTS 4.1.1.1.1.b states that when in MODE 1 or 2 with $k_{eff} \geq 1.0$, SDM is determined by verifying that the regulating rod groups withdrawal is within the limits of CTS 3.1.3.6, Regulating Rod Insertion Limits. ITS 3.1.1 is Applicable in MODES 3, 4, and 5. ITS 3.2.1, "Regulating Rod Insertion Limits," contains the regulating rod insertion limits in MODES 1 and 2. CTS 4.1.1.1.2 requires the core reactivity balance to be compared to the predicted values at least once every 31 EFPD. ITS 3.1.2, "Reactivity Balance," contains the reactivity balance limits in MODES 1 and 2. This changes the CTS by placing the SDM requirements applicable in MODES 3, 4 and 5 in ITS 3.1.1, and placing the SDM requirements applicable in MODES 1 and 2 in ITS 3.1.2 and ITS 3.2.1.

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

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 regulating rods are above the regulating rod insertion limits and that the reactivity balance is within limits. The ITS 3.1.1 Applicability Bases states that in MODES 1 and 2, SDM is ensured by complying with LCO 3.1.5 and LCO 3.2.1. 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 state that adequate SDM is determined by meeting the regulating rod insertion limits and reactivity balance limits. The ITS also verifies SDM in MODES 1 and 2 by requiring compliance with the regulating rod insertion limits and reactivity balance limits. Changes to the reactivity balance limits requirements will be discussed in Discussion of Changes for ITS 3.1.2 and changes to the regulating rod insertion limit requirements will be discussed in Discussion of Changes for ITS 3.2.1. This change is considered administrative because the technical requirements have not changed.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of Cycle-Specific Parameter Limits from the Technical Specifications to the Core Operating Limits Report)* CTS 3.1.1.1 states that the SDM shall be ≥ 1.0% Δk/k. The specific value of 1.0% Δk/k also appears in the CTS 3.1.1.1 Actions and Surveillance Requirements. ITS 3.1.1 states that SDM shall be within the limits provided in the Core Operating Limits Report (COLR). The Actions and Surveillance Requirements of ITS 3.1.1 also reference SDM values located in the COLR. This changes the CTS by relocating the SDM limit, 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 5.6.3, "CORE OPERATING LIMITS REPORT." ITS 5.6.3 ensures that the applicable limits (e.g., fuel thermal mechanical limits, core

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

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.

LA02 (*Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.1.1.1.1.e requires determination that SDM is within limit by 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 3.1.1.1 requires a determination that SDM is within limit but does not describe the factors that must be considered in the calculation. This changes the CTS by removing details of how to perform the SDM verification to the Bases.

The removal of these details for performing a Surveillance Requirement 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 to verify SDM is within the limit. 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 Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 3 – Relaxation of Completion Time)* CTS 3.1.1.1 Action states that when the SDM is less than the applicable limit, boration must be initiated immediately. Under the same conditions in the ITS, ITS 3.1.1 Required Action A.1 states that boration must be initiated within 15 minutes. This changes the CTS by relaxing the Completion Time from "immediately" to 15 minutes.

The purpose of the CTS 3.1.1.1 Action is to restore the SDM to within its limit promptly. 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. 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.

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.1.1.1 Action states that when the SDM is not within the applicable limits, boration must be initiated and continued at ≥ 25 gpm of 7875 ppm boron or its equivalent until the required SDM is restored. ITS 3.1.1 Required Action A.1 states that with 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 Action 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 3.1.1 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 addition tank or the borated water storage tank. The operator should borate with the best source available for the plant 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.

L03 *(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 regulating rod groups at the maximum insertion limit of Specification 3.1.3.6." The ITS does not contain a similar requirement. This changes the CTS by deleting the CTS Surveillance Requirement to verify 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 regulating rod groups at the maximum insertion limit of Specification 3.1.3.6."

The purpose of CTS Surveillance 4.1.1.1.1.d is to verify the core design predictions by determining the SDM with the regulating rod groups at the insertion limits. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the parameter used to meet the LCO is within limit. SDM is periodically verified in MODES 3, 4, and 5 by ITS SR 3.1.1.1 and in MODES 1 and 2 by ITS SR 3.2.1.1, SR 3.2.1.2, and SR 3.2.1.3. Thus, the parameter continues to be tested in a manner and at a frequency necessary to give confidence that the parameter is within limit. The core design predictions, such as rod worth, boron worth, and critical boron

DISCUSSION OF CHANGES
ITS 3.1.1, SHUTDOWN MARGIN (SDM)

concentration, are verified during the startup physics test program. No changes to the predicted worths of RCS boron, rod worths, or fuel worths (which include transient poison worths) are required when the measurements meet acceptance criteria. In this way, physics testing assures that the design core SHUTDOWN MARGIN is maintained. Therefore, the core design parameters upon which SDM relies are verified before exceeding 5% RATED THERMAL POWER (RTP) after each refueling outage. This change is designated as less restrictive because less stringent Surveillance 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

3.1.1 SHUTDOWN MARGIN (SDM)

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

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY
4.1.1.1.e	SR 3.1.1.1	Verify SDM is within the limits specified in the COLR.	24 hours

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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

BACKGROUND

INSERT 1

~~The reactivity control systems must be redundant and capable of holding the reactor core subcritical when shut down under cold conditions GDC 26 (Ref. 1).~~ 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). ~~In MODES 3, 4, and 5,~~ the SDM defines the degree of subcriticality that would be obtained immediately following the insertion of all safety and regulating rods, assuming the single CONTROL ROD assembly of highest reactivity worth is fully withdrawn. INSERT 1A 1 5 8

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 RODS 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 RODS, together with the Chemical Addition System and Makeup and Purification System, provide SDM during power operation ~~and~~. The CONTROL RODS are 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. INSERT 2 2 2

The Chemical Addition System and Makeup and Purification System can compensate for fuel depletion, during operation and all xenon burnout reactivity changes, and maintain the reactor subcritical under cold conditions. 2

During ~~power operation~~ MODES 1 and 2, SDM control is ensured by operating with the safety rods fully withdrawn (LCO 3.1.5, "Safety Rod Insertion Limits") and the regulating rods within the limits of LCO 3.2.1, "Regulating Rod Insertion Limits." When the unit is in ~~the shutdown and refueling modes~~ MODES 3 and 4, the SDM requirements are met by means of adjustments to the RCS boron concentration ~~. Adjusted SDM limits defined in the COLR preclude recriticality in the event of a main steam line break (MSLB) in MODE 3, 4, or 5 when high steam generator levels exist.~~ 5 2 2

and maintaining the steam generator levels within the maximum level limits of LCO 3.7.18, "Steam Generator Level." When the unit is in MODES 5 and 6, the SDM requirements are met by means of adjustments to the RCS boron concentration.

1 INSERT 1

Two independent reactivity control systems of different design principles are provided. The Control Rod Drive System utilizes control rods and is capable of reliably controlling the rate of reactivity changes and ensures that, under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified fuel design limits are not exceeded. The Makeup and Purification System is capable of controlling the rate of reactivity changes resulting from planned normal power changes (including xenon burnout) to ensure that acceptable fuel design limits are not exceeded. The Makeup and Purification System has the ability to initiate and maintain the cold shutdown condition in the reactor (Ref. 1).

8 INSERT 1A

(except it is not necessary to account for a stuck CONTROL ROD when all CONTROL RODS are verified inserted by two independent means)

2 INSERT 2

The Chemical Addition System and Makeup and Purification System maintain the SDM as the temperature of the reactor coolant is decreased. The Chemical Addition System and Makeup and Purification System are not Technical Specification required systems, but are utilized to support the SDM requirements in MODES 3, 4, and 5.

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BASES

APPLICABLE SAFETY ANALYSES

the 6

The minimum required SDM is assumed as an initial condition in safety analysis. The safety analysis (Ref. 2) establishes an SDM that ensures specified acceptable fuel design limits are not exceeded for normal operation and AOOs, with assumption of the highest worth rod stuck out following a reactor trip.

The acceptance criteria for SDM requirements are that specified acceptable fuel design limits are maintained. The SDM requirements must ensure that:

a. The reactor can be made subcritical from all operating conditions, transients, and Design Basis Events, ; 3

b. The reactivity transients associated with postulated accident conditions are controllable with 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 ; 3

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 ~~an~~ a main steam line break (MSLB), as described in the accident analysis (Ref. 2). 2

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

a. Inadvertent boron dilution, ; 3

b. An uncontrolled rod withdrawal from a subcritical or low power condition, ; 3

c. Startup of an inactive reactor coolant pump, ; 3

d. Rod ejection, and ; 3

e. Return to criticality if an MSLB occurs ~~during high~~ when steam generator level ~~operations in MODE 3, 4, or 5~~ is within the limits of LCO 3.7.18 when in MODE 3. 2

BASES

APPLICABLE SAFETY ANALYSES (continued)

INSERT 3

~~The basis for the shutdown requirement when high steam generator levels exist is the heat removal potential in the secondary system fluid and the negative reactivity added via MTC. At any given initial primary system temperature and its associated secondary system pressure, the secondary system liquid levels can be equated to a final primary system temperature assuming the entire mass is boiled. The resulting RCS temperature determines the required SDM.~~ 2

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

LCO

Shutdown boron concentration requirements assume the highest worth rod is stuck in the fully withdrawn position to account for a postulated inoperable or untrippable rod prior to reactor shutdown.

SDM is a core design condition that can be ensured through CONTROL ROD positioning (~~control~~ regulating and shutdown groups) and through the soluble boron concentration. 2

The MSLB (Ref. 2) accident is the most limiting analysis that establishes 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 limits (Ref. 3).

To compensate for the potential heat removal associated with an MSLB accident, the maximum ~~when high~~ steam generator level ~~s exist during secondary system chemistry control and steam generator cleaning, the initial SDM in the core must be adjusted. The Figure in the COLR represents a series of initial conditions that~~ is controlled by LCO 3.7.18. Maintaining the steam generator level within the limits of LCO 3.7.18 will ensure the core will remain subcritical following an MSLB accident ~~from those conditions~~. 2

APPLICABILITY

In MODES 3, 4, and 5, the SDM requirements are applicable to provide sufficient negative reactivity to meet the assumptions of the safety analysis discussed above. ~~The Figure in the COLR is used to define the SDM when high steam generator levels exist during secondary system chemistry control and steam generator cleaning in MODES 3, 4, and 5.~~ In MODES 1 and 2, SDM is ensured by complying with LCO 3.1.5 and LCO 3.2.1. In MODE 6, the shutdown reactivity requirements are given in LCO 3.9.1, "Boron Concentration." 2

2 **INSERT 3**

An MSLB with increased inventory in the steam generators results in rapid overcooling of the RCS, thereby adding positive reactivity to the reactor. The LCO 3.7.18 limits ensure adequate margin is present to prevent the reactor from attaining criticality during any postulated MSLB.

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BASES

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. If the SDM ~~is below the limit for the steam generator level and RCS temperature specified in the COLR~~ limit is not met due to high steam generator level, RCS boration must be continued until the ~~limit specified in the COLR is met~~ SDM for an RCS average temperature of ≤ 280°F is achieved. 2

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~~ addition tank(s) or the borated water storage tank. The operator should borate with the best source available for the plant 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 is [ ] gpm, it is possible to increase the boron concentration of the RCS by 100 ppm in approximately 35 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 [ ] gpm and [ ] ppm represent typical values and are provided for the purpose of offering a specific example.~~ 7

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

The SDM is verified by performing a reactivity balance calculation, considering, but not limited to, the listed reactivity effects: 2

a. RCS boron concentration; 3

b. ~~Regulating rod~~ CONTROL ROD position; 2 3

c. RCS average temperature; 3

d. Fuel burnup based on gross thermal energy generation; 3

e. Xenon concentration; 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

:

f. Samarium concentration, and (3)

g. Isothermal temperature coefficient (ITC).

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.

The Frequency of 24 hours is based on the generally slow change in required boron concentration, and also allows sufficient 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~~ UFSAR, Appendix 3D.1.22 (1)
2. U FSAR, ~~Chapter [14]~~ Section 15 (4) (2)
3. 10 CFR 100, "Reactor Site Criteria."

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

1. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. 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. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

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

5. Editorial changes made with no change in intent.

6. Typographical/grammatical correction has been made.

7. Reference to a specific volumetric flow rate, a specific boron concentration, and a specific differential boron worth in deriving an example for approximate boration duration is inappropriate. All of these factors are a function of system operating characteristics, limitations, time in core life or available boration source. The more appropriate method is to establish boration from an appropriate source and to maximize the injection to the extent possible with consideration for reactor coolant system inventory and makeup and letdown system capacities. Further, this boration is required to continue until the boron concentration is verified to be sufficient to achieve the required shutdown margin.

8. Changes made to be consistent with another Specification.

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, REACTIVITY BALANCE

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

ITS 3.1.2

ITS

A01

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

A02

Add proposed LCO 3.1.2

See ITS 3.1.1 and ITS 3.2.1

3.1.2 3.1.1.1 The SHUTDOWN MARGIN shall be ≥ 1% Δk/k.

APPLICABILITY: MODES 1, 2*, 3**, 4 and 5.

L01

ACTION:

With the SHUTDOWN MARGIN < 1% Δk/k, immediately initiate and continue boration at ≥ 25 gpm of 7875 ppm boron or its equivalent, until the required SHUTDOWN MARGIN is restored.

See ITS 3.1.1, ITS 3.1.8, ITS 3.1.9, and ITS 3.2.1

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be ≥ 1% Δk/k:

See ITS 3.1.1 and ITS 3.2.1

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 increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

See ITS 3.1.4

See ITS 1.0

b. When in MODES 1 or 2#, at least once per 12 hours, by verifying that regulating rod groups withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2## 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 3.2.1

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

See ITS 3.1.1

Add proposed ACTIONS A and B

L02

*See Special Test Exception 3.10.4

See ITS 3.1.1 and ITS 3.2.1

**See LCO 3.7.9, Steam Generator Level, for additional SHUTDOWN MARGIN requirements.

See ITS 3.1.1

#With $k_{eff} \geq 1.0$

##With $k_{eff} < 1.0$

See ITS 3.2.1

ITS 3.1.2

ITS

A01

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

e. When in MODES 3, 4 or 5, 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, and
6. Samarium concentration.

See ITS 3.1.1

Prior to entering MODE 1 after each fuel loading and

M01

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 ± 1% Δk/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.

LA01

NOTE Only required after 60 EFPD

L03

DISCUSSION OF CHANGES
ITS 3.1.2, REACTIVITY BALANCE

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 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 balance to be within ± 1% $\Delta k/k$ of predicted values. This changes the CTS by having a separate Specification for the core reactivity balance 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 are discussed in other Discussion of Changes (DOCs). This change is considered administrative because the technical requirements have not changed.

MORE RESTRICTIVE CHANGES

M01 ITS SR 3.1.2.1 requires the core reactivity balance 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 requirement to perform a core reactivity balance prior to entering MODE 1 after each refueling. 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% RATED THERMAL POWER (RTP) after each refueling. This verification, which is currently performed as part of the startup physics testing program, provides 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 which does not appear in the CTS.

RELOCATED SPECIFICATIONS

None

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DISCUSSION OF CHANGES
ITS 3.1.2, REACTIVITY BALANCE

REMOVED DETAIL CHANGES

LA01 (*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 balance, 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 a Surveillance Requirement 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 to verify measured core reactivity balance is within ± 1% $\Delta k/k$ of predicted values. 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 Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 2 – Relaxation of Applicability)* CTS 3.1.1.1 is applicable in MODES 1, 2, 3, 4, and 5. 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 balance 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 balance. 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, 4, and 5 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, REACTIVITY BALANCE

L02 *(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 balance 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, if any, adjustments are 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.

L03 *(Category 7 – Relaxation of Surveillance Frequency - Non-24 Month Type Change)* CTS 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 core 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 balance to be compared to the predicted values every 31 EFPD, but the ITS SR is only required after 60 EFPD of core burnup, consistent with the CTS. The ITS also allows the adjustment of the predicted values to the actual values prior to exceeding a fuel burnup of 60 EFPD after each fuel loading. In addition, Note 2 to SR 3.1.2.1 is included which states that the SR is not required to be performed

DISCUSSION OF CHANGES
ITS 3.1.2, REACTIVITY BALANCE

in MODE 2. This changes the CTS by not requiring the periodic, at-power core reactivity balance comparison until core burnup reaches 60 EFPD.

The purpose of CTS 4.1.1.1.2 is to verify the agreement between the actual and predicted core reactivity balance. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of 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 changes due to fuel depletion and the presence of other indicators (QUADRANT POWER TILT, etc.) for prompt indication of an anomaly. In addition, a new Frequency has been added to ensure core reactivity balance is within limits prior to entering MODE 1 after each fuel loading (see DOC M01). Furthermore, a Note has been included that states the SR is not required to be performed prior to entry into MODE 2. This allowance clarifies that the SR is to be performed at power conditions and not when the reactor is critical. 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 Reactivity Balance

DOC A02 LCO 3.1.2 The measured core reactivity balance shall be within ± 1% $\Delta k/k$ of predicted values.

3.1.1.1 Applicability APPLICABILITY: MODES 1 and 2.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L02	A. Measured core reactivity balance not within limit.	A.1 Re-evaluate core design and safety analysis and determine that the reactor core is acceptable for continued operation. AND A.2 Establish appropriate operating restrictions and SRs.	7 days 7 days
DOC L02	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

CTS

SURVEILLANCE REQUIREMENTS

CTS		SURVEILLANCE	FREQUENCY
4.1.1.1.2	SR 3.1.2.1	-----NOTES----- shall 1. The predicted reactivity values $\boxed{\text{may}}$ 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. 2. This Surveillance is not required to be performed prior to entry into MODE 2. ----------	
DOC M01		Verify measured core reactivity balance is within ± 1% Δk/k of predicted values.	Prior to entering MODE 1 after each fuel loading AND -----NOTE----- Only required after 60 EFPD ---------- 31 EFPD thereafter

1

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.2, REACTIVITY BALANCE

1. SR 3.1.2.1 has been modified to be consistent with the current licensing basis. The predicted reactivity values shall (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 Reactivity Balance

BASES

BACKGROUND

INSERT 1

~~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.~~ 4 Therefore, the reactivity balance is used as a measure of the predicted versus measured core reactivity during startup and power operation. The periodic confirmation of core reactivity is necessary to ensure that safety analyses of design basis transients and accidents remain valid. A large reactivity difference could be the result of unanticipated changes in fuel, CONTROL ROD, or burnable poison worth, or operation at conditions not consistent with those assumed in the predictions of core reactivity. These 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

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.

4

INSERT 1

Two independent reactivity control systems of different design principles are provided. The Control Rod Drive System utilizes control rods and is capable of reliably controlling the rate of reactivity changes and ensures that, under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified fuel design limits are not exceeded. The Makeup and Purification System is capable of controlling the rate of reactivity changes resulting from planned normal power changes (including xenon burnout) to ensure that acceptable fuel design limits are not exceeded. The Makeup and Purification System has the ability to initiate and maintain the cold shutdown condition in the reactor (Ref. 1).

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BASES

BACKGROUND (continued)

In order to achieve the required fuel cycle energy output, the uranium enrichment in the new fuel loading and 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 neutron poisons (mainly xenon and samarium) are present in the fuel, and the RCS boron concentration.

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.

APPLICABLE SAFETY ANALYSES

The acceptance criteria for core reactivity are the establishment of the reactivity balance limit to ensure that plant operation is maintained within the assumptions of the safety analyses.

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 which have been qualified against available test data, operating plant data, and analytical benchmarks. Monitoring reactivity balance ensures that the nuclear methods provide an accurate representation of the core reactivity.

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

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 curve, which is developed 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.

Reactivity balance 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 conditions of 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 Design Basis Accident (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 of ± 1% $\Delta k/k$ has been established, based on engineering judgment. A ± 1% $\Delta k/k$ 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% $\Delta k/k$ 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.

BASES

APPLICABILITY

In MODES 1 and 2 during fuel cycle operation with $k_{eff} \geq 1$, the limits on core reactivity must be maintained 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, and 5, because the reactor is shutdown and changes to core reactivity due to fuel depletion cannot occur.

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

BASES

ACTIONS (continued)

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 restrictions or additional surveillance requirements 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 operating restrictions or surveillances that may be required to allow continued reactor operation.

B.1 any Required Action and associated Completion Time cannot be met

If the ~~core~~ reactivity ~~cannot~~ be restored ~~to~~ within the 1% ~~Δk/k~~ limit, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then boration required by Required Action A.1 of LCO 3.1.1 would occur. The allowed Completion Time of 6 hours is reasonable, based on operating experience to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. 2

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

THERMAL POWER

RCS average

and APSR

burnup based on gross thermal energy generation

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 CONTROL ROD positions, ~~moderator~~ temperature, ~~fuel temperature~~, fuel ~~depletion~~, 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. A Note is included in the SR to indicate 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 reactivity changes due to fuel depletion and the presence of other indicators (QPT, etc.) for prompt indication of an anomaly. Another Note is included in the SRs to indicate that the performance of the Surveillance is not required for entry into MODE 2. 1

UFSAR, Appendices 3D.1.22, 3D.1.24, and 3D.1.25

BASES

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 26, GDC 28, and GDC 29~~. (4)

2. U FSAR, ~~Chapter [14]~~ Section 15. (1) (3)

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.2 BASES, REACTIVITY BALANCE

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. Changes have been made to be consistent with the Specification.

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

4. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.2, REACTIVITY BALANCE

There are no specific NSHC discussions for this Specification.

ATTACHMENT 3

ITS 3.1.3, MODERATOR TEMPERATURE COEFFICIENT (MTC)

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

ITS 3.1.3

A01

ITS

REACTIVITY CONTROL SYSTEMS

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

LCO 3.1.3 3.1.1.3 The moderator temperature coefficient (MTC) shall be:

a. Less positive than 0.9 x 10^{-4} $\Delta k/k/°F$ whenever THERMAL POWER is < 95% of RATED THERMAL POWER,

b. Less positive than 0.0 x 10^{-4} $\Delta k/k/°F$ whenever THERMAL POWER is ≥ 95% of RATED THERMAL POWER, and M01

c. Equal to or less negative than the limit provided in the CORE OPERATING LIMITS REPORT at RATED THERMAL POWER.

APPLICABILITY: MODES 1 and 2*#. A02

ACTION: M02

ACTION A With the moderator temperature coefficient outside any of the above limits, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

SR 3.1.3.2 4.1.1.3.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits. A03

SR 3.1.3.1, SR 3.1.3.2 4.1.1.3.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

SR 3.1.3.1 a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

SR 3.1.3.2 b. At any THERMAL POWER, within 7 days after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm.

M01

*With $k_{eff} \geq 1.0$.

#See Special Test Exception 3.10.2. A02

DAVIS-BESSE, UNIT 1 3/4 1-4 Amendment No. ~~45~~, 154

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

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 The Applicability of CTS 3.1.1.3 is modified by footnote # that states "See Special Test Exception 3.10.1." 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 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.

A03 CTS 4.1.1.3.1 requires MTC to be determined to be within limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits. CTS 4.1.1.3.2.a requires MTC to be determined prior to initial operation above 5% RTP after each fuel loading and CTS 4.1.1.3.2.b requires MTC to be determined at any THERMAL POWER, within 7 days after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm. ITS SR 3.1.3.1 requires verification that MTC is within the upper limit specified in the COLR prior to entering MODE 1 after each fuel loading and ITS SR 3.1.3.2 requires verification that the extrapolated MTC is within the lower limit specified in the COLR each fuel cycle within 7 effective full power days (EFPDs) after reaching an equilibrium boron concentration equivalent to 300 ppm. In addition, ITS SR 3.1.3.2 includes a Note that states "If the MTC is more negative than the COLR limit when extrapolated to the end of cycle, SR 3.1.3.2 may be repeated. Shutdown must occur prior to reducing below the boron concentration at which MTC is projected to exceed the lower limit." This changes the CTS by clarifying that during the performance of CTS 4.1.1.3.2.a (ITS SR 3.1.3.1) the upper MTC limit is checked and during the performance of CTS 4.1.1.3.2.b (ITS SR 3.1.3.2) the lower limit is checked. In addition, the change clarifies that if the MTC is more negative than the COLR limit when extrapolated to the end of cycle, SR 3.1.3.2 may be repeated and a shutdown is not required until MTC is projected to exceed the lower limit.

This change is acceptable because the requirements have not changed. The change clarifies that during the performance of CTS 4.1.1.3.2.a (ITS SR 3.1.3.1) the upper MTC limit is checked and during the performance of CTS 4.1.1.3.2.b (ITS SR 3.1.3.2) the lower limit is checked. This is consistent with the predicted values of MTC. The predicted values of MTC at the beginning of the cycle (prior to entering MODE 1 after each fuel loading) are higher than the predicted values at the end of the cycle. The Note to SR 3.1.3.2 clarifies the current purpose of CTS 4.1.1.3.1. CTS 4.1.1.3.1 requires MTC to be determined to be within limits

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

by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits. The Note to ITS SR 3.1.3.2 states if the MTC is more negative than the COLR limit when extrapolated to the end of cycle SR 3.1.3.2 may be repeated. A Surveillance Requirement can always be repeated to clarify the results or to obtain a more precise prediction of MTC. CTS 3.1.1.3 requires MTC to be met and the CTS 3.1.1.3 Action only requires entry when MTC is not within limit. Since ITS SR 3.1.3.2 states to verify the extrapolated MTC is within limit, the remainder of the Note to SR 3.1.3.2 clarifies that a shutdown is not required until the actual limit is exceeded. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS LCO 3.1.1.3.a and LCO 3.1.1.3.b provide the maximum limits of the upper (positive) value for the moderator temperature coefficient (MTC). ITS LCO 3.1.3 maintains these maximum upper limits, but also includes a requirement that the MTC must be within the limit specified in the COLR. This changes the CTS by placing a cycle-specific upper limit (which may be less than the limit maintained in ITS LCO 3.1.3) in the COLR.

The purpose of the CTS LCO 3.1.1.3 upper MTC limits is to ensure inherently stable power operations result during normal operation and accidents, such as overheating and overcooling events. MTC values are bounded in reload safety evaluations, assuming steady state conditions. This change is acceptable because the ITS will still maintain the maximum limits of the upper MTC value. The COLR will now contain the cycle-specific value for the upper MTC value, which may be less than the maximum allowed in ITS 3.1.3. This change is designated as more restrictive because the cycle-specific upper limit in the COLR may be more restrictive than the maximum value of the upper limit in ITS LCO 3.1.3.

M02 CTS 3.1.1.3 requires MTC to be applicable in MODES 1 and MODE 2 with keff $\geq$ 1.0. ITS 3.1.3 requires MTC to be within limits in MODES 1 and 2. This changes the CTS by expanding the applicability of the MTC requirements to include MODE 2 with k_{eff} < 1.0.

The purpose of the CTS 3.1.1.3 is to ensure that MTC is within limit. This change is acceptable because the ITS requires MTC to apply at all times in MODES 1 and 2 to help ensure MTC is maintained. This change is designated as more restrictive because it expands the conditions for MTC.

RELOCATED SPECIFICATIONS

None

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

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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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)

3.1.1.3 LCO 3.1.3 The MTC shall be maintained within the limits specified in the COLR. The maximum ~~positive~~ upper limit shall be ~~[≤ [ ] Δk/k/°F at RTP]~~ < 0.9 x 10^{-4} Δk/k/°F at < 95% RTP and < 0.0 x 10^{-4} Δk/k/°F at ≥ 95% RTP. 1 2

APPLICABILITY: MODES 1 and 2.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.1.1.3 Action	A. MTC not within limits.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.1.1.3.2.a	SR 3.1.3.1	Verify MTC is within the upper limit specified in the COLR.	Prior to entering MODE 1 after each fuel loading
4.1.1.3.1, 4.1.1.3.2.b	SR 3.1.3.2	------------------------------NOTE------------------------------ If the MTC is more negative than the COLR limit when extrapolated to the end of cycle, SR 3.1.3.2 may be repeated. Shutdown must occur prior to ~~exceeding~~ reducing below the ~~minimum allowable~~ boron concentration at which MTC is projected to exceed the lower limit. --- Verify extrapolated MTC is within the lower limit specified in the COLR.	Each fuel cycle within 7 EFPDs after reaching an equilibrium boron concentration equivalent to 300 ppm

3

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

1. ISTS LCO 3.1.3 specifies requirements for the “maximum positive limit” of MTC. ITS LCO 3.1.3 specifies requirements for the “maximum upper limit.” This change is necessary to match up with the terminology in ISTS SR 3.1.3.1 (ITS SR 3.1.3.1).

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

3. The Note to ITS SR 3.1.3.2 has been modified for clarity with no change in intent.

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

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.3 Moderator Temperature Coefficient (MTC)

UFSAR, Appendix 3D.1.7

INSERT 1

BASES

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.~~ 7

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 same characteristic is true when the MTC is positive and coolant temperature decreases occur.

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 95% RTP or greater. 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 burnable absorbers 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 the MTC does not exceed the EOC limit.

APPLICABLE SAFETY ANALYSES

Reference 2 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 initial conditions in the safety analyses, and both values must be bounded. Values used in the analyses consider worst case conditions, such as very large soluble boron concentrations, to ensure the accident results are bounding (Ref. 3).

7 **INSERT 1**

the reactor core and associated coolant systems are designed so that in the power operating range the net effect of the prompt inherent nuclear feedback characteristics tends to compensate for rapid increase in reactivity. The overall power coefficient, which is the fractional change in neutron multiplication per unit change in core power level, is negative in the power operating range.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

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), and : (4)

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

Accidents that cause core overheating (either decreased heat removal or increased power production) must be evaluated for results when the MTC is positive. Reactivity accidents that cause increased power production include the CONTROL ROD withdrawal transient from either zero or full THERMAL POWER. The limiting overheating event relative to plant response is based on the maximum difference between core power and steam generator heat removal during a transient. The most limiting event with respect to positive MTC at 0% RTP is a [rod withdrawal ~~accident~~ from zero power, also ~~referred~~ to as a startup accident (Ref. 4)]. The most limiting event with respect to positive MTC at power is a large break Loss of Coolant Accident (Ref. 5). (1) (2) (3)

Accidents that cause core overcooling must be evaluated for results when the MTC is most negative. The event that produces the most rapid cooldown of the RCS, and is therefore the most limiting event with respect to the negative MTC, is a main steam line break (MSLB) event. Following the reactor trip for the postulated EOC MSLB event, the large moderator temperature reduction, combined with the large negative MTC, may produce reactivity increases that are as much as the shutdown reactivity. When this occurs, a substantial fraction of core power is produced with all CONTROL ROD assemblies inserted, except the most reactive one. Even if the reactivity increase produces slightly subcritical conditions, a large fraction of core power may be produced through the effects of subcritical neutron multiplication. (2) (1)

MTC values are bounded in reload safety evaluations, assuming steady state conditions at BOC and EOC. A near 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.

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

BASES

LCO

LCO 3.1.3 requires the MTC to be within specified limits in the COLR to ensure 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~~ UFSAR accident analysis during operation. (2) The LCO establishes a maximum positive value that can not be exceeded. The limit of +0.9E-4 ~~[~~%Δk/k~~]~~/°F on positive MTC, (2) (5) when THERMAL POWER is < 95% RTP, ensures that core overheating accidents will not violate the accident analysis assumptions. The requirement for a negative MTC, when THERMAL POWER is ≥ 95% RTP, ensures that core operation will be stable. The negative MTC limit for EOC specified in the COLR ensures that core overcooling accidents will not violate the accident analysis assumptions.

MTC is a core physics parameter determined by the fuel and fuel cycle design and cannot be easily controlled once the core design is fixed during operation, therefore, 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.

APPLICABILITY

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, the limits 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. In MODES 3, 4, 5, and 6, this LCO is not applicable, since no Design Basis Accidents (DBAs) using the MTC as an analysis assumption are initiated from these MODES. However, the variation of MTC with temperature in MODES 3, 4, and 5 for DBAs initiated in MODES 1 and 2 is accounted for in the subject accident analysis. The variation of MTC with temperature assumed in the safety analysis, is accepted as valid once the BOC ~~and middle of cycle measurements are~~ measurement is used for normalization. (2)

ACTIONS

A.1

MTC is a function of the fuel and fuel cycle designs, and cannot be controlled directly once the designs have been implemented in the core. If MTC exceeds its limits, the reactor must be placed in MODE 3. This eliminates the potential for violation of the accident analysis ~~bounds~~. (1) The associated Completion Time of 6 hours is reasonable, considering the probability of an accident occurring during the time period that would require an MTC value within the LCO limits, for reaching MODE 3 conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

SURVEILLANCE REQUIREMENTS

The following two SRs for measurement of the MTC at the beginning and end of each fuel cycle provide for confirmation of the limiting MTC values. The MTC changes slowly from most positive (least negative) to most negative value during fuel cycle operation, as the RCS boron concentration is reduced with fuel depletion.

SR 3.1.3.1

The requirement for measurement, prior to initial operation above 5% RTP, satisfies the confirmatory check on the most positive (least negative) MTC value.

SR 3.1.3.2

The requirement for measurement, within 7 effective full power days (EFPD) after reaching an equilibrium boron concentration of 300 ppm for RTP, satisfies the confirmatory check on the lower (most negative ~~(~~ least positive) MTC value. The measurement is performed at any THERMAL or POWER equivalent to an RCS boron concentration of 300 ppm (for steady state operation at RTP with all CONTROL RODS fully withdrawn) so that the projected EOC MTC may be evaluated before the reactor actually reaches the EOC condition. MTC values are extrapolated and compensated to permit direct comparison to the specified MTC limits. 5

The SR is modified by a Note. The Note indicates reducing that SR 3.1.3.2 may be repeated, and shutdown must occur, prior to ~~exceeding~~ the ~~minimum~~ allowable boron concentration at which MTC is projected to exceed the lower limit. The ~~minimum allowable~~ boron concentration at which MTC is projected to exceed the lower limit is obtained from the EOC MTC versus boron concentration slope with appropriate conservatisms. Thus, the projected EOC MTC is evaluated before the lower limit is actually reached. 6

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 11~~ UFSAR, Appendix 3.D.1.7. 7
2. U FSAR, ~~Chapter [14]~~ Section 15.
3. U FSAR, ~~Section [ ]~~ Appendix 4B.
4. U FSAR, Section ~~[/]~~ 15.2.1.
5. UFSAR, Section 15.4.6.8.2.

2 3

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

1. Typographical/grammatical error corrected.

2. 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.

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

4. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

5. Changes are made to reflect the Specification.

6. Changes are made to reflect changes made to the Specification.

7. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

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, CONTROL ROD GROUP ALIGNMENT LIMITS

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

ITS 3.1.4

A01

ITS

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT - SAFETY AND REGULATING ROD GROUPS -

LIMITING CONDITION FOR OPERATIONS

LCO 3.1.4 3.1.3.1 All control (safety and regulating) rods shall be OPERABLE and positioned within ± 6.5% (indicated position) of their group average height.

APPLICABILITY: MODES 1* and 2*. A02

ACTION:

ACTION D a. With one or more control 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 one hour and be in at least HOT STANDBY within 6 hours. LA01 L01

Add proposed Required Action D.1.2

ACTION C b. With more than one control rod ~~inoperable or~~ misaligned from its group average height by more than ± 6.5% (indicated position), be in at least HOT STANDBY within 6 hours. L02

Add proposed Required Actions C.1.1 and C.1.2 M01

ACTION A c. With one control rod ~~inoperable due to causes other than addressed by ACTION a, above, or~~ misaligned from its group average height by more than ± 6.5% (indicated position), POWER OPERATION may continue provided that within one hour either: L02

1. ~~The control rod is restored to OPERABLE status within the above alignment requirements, or~~ A03

2. ~~The control rod is declared inoperable~~ and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that: L02

Add proposed Required Action A.1.2 L01

a) An analysis of the potential ejected rod worth is performed within 72 hours ~~and the rod worth is determined to be < 1.0% Δk at zero power and < 0.65% Δk at RATED THERMAL POWER for the remainder of the fuel cycle~~, and LA02

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and

~~*See Special Test Exceptions 3.10.1 and 3.10.2.~~ A02

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A01

ITS

REACTIVITY CONTROL SYSTEMS

GROUP HEIGHT - SAFETY AND REGULATING ROD GROUPS

LIMITING CONDITION FOR OPERATIONS

ACTION: (Continued) — Add proposed Note to Required Action A.6 — L03

ACTION A

c) A power distribution map is obtained from the incore detectors and F_Q and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours, and

d) Either the THERMAL POWER level is reduced to ≤ 60% of the THERMAL POWER allowable for the reactor coolant pump combination within ~~one hour~~ 2 hours (L04) and within ~~the next 4~~ 10 (L04) hours the High Flux Trip Setpoint is reduced to ≤ 70% of the THERMAL POWER allowable for the reactor coolant pump combination, or

~~e) The remainder of the rods in the group with the inoperable rod are aligned to within ± 6.5% of the inoperable rod within one hour while maintaining the position of the rods within the limits provided in the CORE OPERATING LIMITS REPORT; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation.~~ — A04

Add proposed ACTION B — M02

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1 4.1.3.1.1 The position of each control rod shall be determined to be within the group average height limit by verifying the individual rod positions at least once per 12 hours ~~except during time intervals when the asymmetric rod monitor is inoperable, then verify the individual rod position(s) of the rod(s), with the inoperable asymmetric rod monitor at least once per 4 hours.~~ — L05

SR 3.1.4.2 4.1.3.1.2 Each control rod not fully inserted shall be determined to be OPERABLE by movement of at least ~~2~~ 3% in any one direction at least once every 92 days. — M04

ITS 3.1.4

A01

ITS

REACTIVITY CONTROL SYSTEMS

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

SR 3.1.4.3 3.1.3.4 The individual safety and regulating rod drop time from the fully withdrawn position shall be ≤ 1.58 seconds from power interruption at the control rod drive cabinets to 3/4 insertion with:

a. $T_{avg} \geq 525°F$, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

ACTION: Add proposed ACTION D M03

a. ~~With the drop time of any safety or regulating rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 and 2.~~ L09

SR 3.1.4.3 Note b. With the rod drop times within limits but determined with less than 4 reactor coolant pumps operating, operation may proceed provided that THERMAL POWER is restricted to less than or equal to the THERMAL POWER allowable for the reactor coolant pump combination operating at the time of rod drop time measurement.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.3 4.1.3.4 The rod drop time of safety and regulating rods shall be demonstrated through measurement prior to reactor criticality:

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~~ L06

c. ~~At least once each REFUELING INTERVAL.~~ L07

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ITS 3.1.4

ITS

A01

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

See ITS 3.1.1, ITS 3.1.8, and ITS 3.1.9

3.1.1.1 The SHUTDOWN MARGIN shall be ≥ 1% Δk/k.

APPLICABILITY: MODES 1, 2*, 3**, 4 and 5.

See ITS 3.1.1, ITS 3.1.2, ITS 3.1.8, ITS 3.1.9, and ITS 3.2.1

ACTION:

With the SHUTDOWN MARGIN < 1% Δk/k, immediately initiate and continue boration at ≥ 25 gpm of 7875 ppm boron or its equivalent, until the required SHUTDOWN MARGIN is restored.

See ITS 3.1.1, ITS 3.1.8, ITS 3.1.9, and ITS 3.2.1

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be ≥ 1% Δk/k:

See ITS 3.1.1 and ITS 3.2.1

Required Action D.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. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

L08

See ITS 1.0

b. When in MODES 1 or 2#, at least once per 12 hours, by verifying that regulating rod groups withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2## 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 3.2.1

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

See ITS 3.1.1

*See Special Test Exception 3.10.4

See ITS 3.1.1 and ITS 3.2.1

**See LCO 3.7.9, Steam Generator Level, for additional SHUTDOWN MARGIN requirements.

See ITS 3.1.1

#With $k_{eff} \geq 1.0$
##With $k_{eff} < 1.0$

See ITS 3.2.1

DISCUSSION OF CHANGES
ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 The Applicability of CTS 3.1.3.1 is modified by footnote * that states "See Special Test Exceptions 3.10.1 and 3.10.2." 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 Exceptions 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.

A03 CTS 3.1.3.1 Action c.1 states that with one control rod misaligned from its group average height 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 requirements. 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.

A04 CTS 3.1.3.1 Action c.2.e states that with one control rod misaligned from its group average height 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 position of the rods within the limits as specified in the COLR; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation. ITS 3.1.4 does not contain a similar Required Action.

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

DISCUSSION OF CHANGES
ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

only action or is required for clarity. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.1.3.1 Action b states that with more than one control rod inoperable or misaligned from its group average height by more than the allowed rod misalignment, be in HOT STANDBY within 6 hours. ITS 3.1.4 ACTION C states that with more than one CONTROL 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.

M02 CTS 3.1.3.1 Action c states that with one control 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 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 B states that if any Required Action and associated Completion Time of Condition A (one CONTROL ROD not within alignment limits) is not met, the unit must be in MODE 3 within 6 hours. The shortest Completion Time in ITS 3.1.4 ACTION A 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. This change

DISCUSSION OF CHANGES
ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

has been designated as more restrictive because it reduces the Completion Time to be in MODE 3.

M03 The CTS 3.1.3.4 Action requires that with the drop time of any CONTROL 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. No specific Actions are stated in CTS 3.1.3.4 if the unit is in MODE 1 or 2 when the rod drop time is discovered to not be within limits. CTS 3.1.3.1.c provides compensatory actions for when a control rod is inoperable for reasons other than due to being immovable as a result of excessive friction or mechanical interference or know to be untrippable. CTS 3.1.3.1 Action c allows the plant to operate at a reduced power level as long as other compensatory actions are performed including a requirement to verify SDM. ITS 3.1.4 ACTION D applies with one or more CONTROL RODs 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 not allowing the plant to enter CTS 3.1.3.1 Action c under the same conditions in the ITS and includes requirements for SDM and being in MODE 3.

The purpose of requiring a shutdown when a drop time of any CONTROL ROD is not met is to bring the unit to a subcritical condition. With one or more CONTROL RODs slow the assumptions of the accident analyses will not be met. Therefore it is necessary to place the plant outside of the MODE of Applicability for CONTROL RODs. With one or more CONTROL RODs slow 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 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 that the drop time of all CONTROL RODs must be within limit and SDM must be met. The change has been designated as more restrictive because it does not allow the plant to continue to operate in MODES 1 and 2 under the same conditions.

M04 CTS 4.1.3.1.2 requires each control rod not fully inserted to be moved at least 2% in any one direction every 92 days. ITS SR 3.1.4.2 requires the same verification every 92 days, except a 3% rod movement acceptance criterion is provided. This changes the CTS by requiring each control rod not fully inserted to be moved 3% in any direction in lieu of the current 2% requirement.

The purpose of CTS 4.1.3.1.2 is to ensure that each control rod not fully inserted is capable of tripping. The proposed 3% acceptance criterion is acceptable because it will provide more positive indication that each control rod not fully inserted is capable of tripping by requiring the control rods to be moved further to verify their freedom of movement. The change has been designated as more

DISCUSSION OF CHANGES
ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

restrictive because the ITS requires a more stringent acceptance criterion than is currently required by the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(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 control rods are inoperable "due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable." ITS 3.1.4 Condition D applies when one or more CONTROL RODs are inoperable. ITS 3.1.4 Condition D 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. While the ITS Bases will not include the specific words being removed from the CTS, the words used in the ITS Bases, "(i.e., untrippable)" is synonymous to the removed CTS words, and provides clarity. The ITS still retains the requirement for the CONTROL RODs to be OPERABLE and provides a Condition for when one or more CONTROL RODs are 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.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.1.3.1 Action c.2.a) requires an analysis of the potential ejected rod worth to be determined to be ≤ 1.0% Δk at zero power and ≤ 0.65%Δk at RATED THERMAL POWER for the remainder of the cycle. ITS 3.1.4 Required Action A.4 requires the verification that the potential ejected rod worth is within the assumptions of the rod ejection analysis. This changes the CTS by moving the potential ejected rod worth limits (≤ 1.0% Δk at zero power and ≤ 0.65%Δk at RATED THERMAL POWER for the remainder of the cycle) 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 to

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ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

verify the potential ejected rod worth is within the assumptions of the rod ejection analysis. 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

L01 *(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. Under the same conditions in the ITS, ITS 3.1.4 ACTION A and ACTION D require 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 CONTROL ROD or if a CONTROL ROD is inoperable, 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 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 may still be 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.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.1 Action a specifies requirements for one or more control 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 control rod inoperable or misaligned from its group average height by more than the allowed rod misalignment. CTS 3.1.3.1 Action c specifies requirements for one control rod inoperable due to causes other than those addressed by Action a, above, or misaligned from its group average height 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 D specifies requirements for one or more CONTROL RODs inoperable. ITS 3.1.4 ACTION A specifies requirements for one CONTROL ROD not within alignment limits. ITS 3.1.4 ACTION C

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ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

specifies requirements for more than one CONTROL ROD not within alignment limits. This changes the CTS by considering CONTROL RODs that are trippable but misaligned to be OPERABLE and excludes other types of control rod inoperabilities not addressed in CTS 3/4.1.3.4 (e.g., drop 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 M03.

The purpose of ITS 3.1.4 is to ensure that the 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, CONTROL 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.

L03 *(Category 4 – Relaxation of Required Action)* When one control rod is misaligned CTS 3.1.3.1 Action c.2.c) requires a power distribution map to be obtained from the incore detectors and F_Q and $F^N_{\Delta H}$ verified to be within their limits within 72 hours. ITS 3.1.4 Required Action A.6 includes the same requirement however it is only required to be performed when THERMAL POWER is > 20% RTP. This changes the CTS by only requiring the Required Action to be performed when THERMAL POWER is > 20% RTP.

The purpose of CTS 3.1.3.1 Action c.2.c) is to ensure that excessive local LHRs will not occur due to CONTROL ROD misalignment. 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 addition of the Note is acceptable because at low power levels the reactor has insufficient stored energy in the fuel or energy being transferred to the coolant to require a limit on the distribution of core power. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 *(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 ≤ 60% of the THERMAL POWER allowable within one hour and within the next 4 hours to reduce the High Flux Trip Setpoint to ≤ 70% of the THERMAL POWER allowable for the reactor coolant pump combination. ITS 3.1.4 ACTION A requires

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ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

THERMAL POWER to be reduced to ≤ 60% of ALLOWABLE THERMAL POWER within 2 hours and to reduce the High Flux trip setpoint to ≤ 70% of the ALLOWABLE THERMAL POWER within 10 hours. This changes the CTS by changing the Completion Times to reduce THERMAL POWER and the high flux trip setpoint from 1 hour to 2 hours and from 5 hours (1 hour plus 4 hours) to 10 hours, respectively.

The purpose of CTS 3.1.3.1 Action c.2.d is to reduce THERMAL POWER to help ensure that local LHR increases, due to a misaligned rod, will not cause the core design criteria to be exceeded. The purpose of the reduction of the high flux trip setpoint is to maintain both core protection and an operating margin at reduced power similar to that at RTP. 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. The Completion Time of 10 hours allows the operator 8 additional hours after completion of the THERMAL POWER reduction to adjust the trip setpoint. 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.

L05 *(Category 7 – Relaxation Of Surveillance Frequency, Non-24 Month Type Change)* CTS 4.1.3.1.1 requires the position of each control 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 asymmetric rod monitor is inoperable. In this situation the position of each CONTORL ROD is monitored at least once per 4 hours. ITS SR 3.1.4.1 requires verification that the individual CONTROL ROD positions are within the alignment limits every 12 hours. This changes the CTS by eliminating the requirement to verify the individual CONTROL ROD positions to be within alignment limits every 4 hours when the asymmetric rod 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 increasing the Frequency of rod position verification when the asymmetric rod monitor is inoperable is unnecessary. An inoperability of the monitor does not increase the probability that the rods are misaligned. The routine 12 hour Frequency (ITS SR 3.1.4.1) continues to ensure the control rods are aligned properly. Furthermore, the asymmetric rod monitor is for indication only. Its use is not credited in any safety analyses. Thus, any response determined necessary by plant personnel due to an inoperable alarm is more appropriately controlled by plant procedures, not Technical Specifications. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L06 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.3.4.b requires the rod drop time of CONTROL RODs to be demonstrated through measurement prior to reactor criticality for specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect

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ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

the drop time of those specific rods. The ITS does not include this testing requirement.

The purpose of CTS 4.1.3.4.b 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.

L07 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.3.4 requires the rod drop time of safety and regulating rods to be demonstrated through measurement prior to reactor criticality following each removal of the reactor vessel head and at least once per REFUELING INTERVAL (24 months). ITS SR 3.1.4.3 requires the test to be performed prior to criticality after each removal of the reactor head. This changes the CTS by deleting the Surveillance Requirement.

The purpose of CTS 4.1.3.4 is to ensure the safety and regulating rods insert within the rod drop criteria. 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. The requirements in the CTS to perform the test following each removal of the reactor vessel head and at least once per 24 months normally coincide with one another. The head is removed once each cycle (approximately once every 24 months) unless there is a need to remove the head prior to the end of the cycle. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L08 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.1.1.1.a requires 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 D.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

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ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

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 is 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 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.

L09 *(Category 4 - Relaxation of Required Action)* CTS 3.1.3.4 Action a requires that with the drop time of any control 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. ITS 3.1.4 does not have a similar requirement, however ITS LCO 3.0.4 states "When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this Specification are stated in the individual Specifications." This changes the CTS by providing an allowance for entry into a MODE or other specified condition in the Applicability when the drop time of any control rod is not met.

The purpose of CTS 3.1.3.4 Action a is to not allow entry into the Applicability of the Specification if the drop time of any control rod is not within limits. ITS LCO 3.0.4 provides guidance when an LCO is not met and entry into a MODE or other specified condition in the Applicability is desired. The change is acceptable because ITS LCO 3.0.4 provides the appropriate guidance to enter the Applicability when an LCO is not met. ITS LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an

DISCUSSION OF CHANGES
ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

LCO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when unit conditions are such that the requirements of the LCO would not be met. ITS LCO 3.0.4.b allows entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate. The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10 CFR 50.65(a)(4), which requires that risk impacts of maintenance activities to be assessed and managed. The risk assessment, for the purposes of ITS LCO 3.0.4.b, must take into account all inoperable Technical Specification equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." Regulatory Guide 1.182 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed MODE change is acceptable. Consideration should also be given to the probability of completing restoration such that the requirements of the LCO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability. ITS 3.1.4 ACTION D requires the verification that SDM is within limit or to initiate boration to restore SDM to within limit in one hour and to be in MODE 3 in 6 hours. Therefore, entry will only be made if the drop time of the inoperable control rod can be restored within a short time period of time and the SDM requirements are met. This change is designated as less restrictive because entry into MODES or other specified conditions in the Applicability of a Specification might be made with an LCO not met as long as the plant is in compliance with ITS LCO 3.0.4.

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

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.4 CONTROL ROD Group Alignment Limits

3.1.3.1 LCO 3.1.4 Each CONTROL ROD shall be OPERABLE.

AND

Each CONTROL ROD shall be aligned to within [6.5]% of its group average height. 1

APPLICABILITY: MODES 1 and 2.

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.1.3.1 Action c	A. One CONTROL ROD not aligned to within [6.5]% of its group average height. 1	A.1 Restore CONTROL ROD alignment. OR	1 hour	2
		A.[2.]1.1 Verify SDM is within ~~the limits specified in the COLR~~. 3	1 hour AND Once per 12 hours thereafter	2, 6
		OR		
		A.[2.]1.2 Initiate boration to restore SDM to within limit.	1 hour	2
		AND		2
		A.[2.]2 Reduce THERMAL POWER to ≤ 60% of the ALLOWABLE THERMAL POWER.	2 hours	
		AND		2

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CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.1.3.1 Action c		A.2.3 Reduce the nuclear overpower trip setpoint to ≤ 70% of the ALLOWABLE THERMAL POWER. High Flux	10 hours	2 7
		AND A.4 Verify SDM is within limit.	Once per 12 hours	6
6 5		AND A.2.4 Verify the potential ejected rod worth is within the assumptions of the rod ejection analysis.	72 hours	2
		AND 6 A.2.5 --------------NOTE-------------- Only required when THERMAL POWER is > 20% RTP. ------------------------------------ Perform SR 3.2.5.1.	72 hours	6 2
DOC M02 of	B. Required Action and associated Completion Time for Condition A not met.	B.1 Be in MODE 3.	6 hours	5
3.1.3.1 Action b	C. More than one CONTROL ROD not aligned within [6.5]% of its group average height.	C.1.1 Verify SDM is within the limits specified in the COLR. OR C.1.2 Initiate boration to restore SDM to within limit. AND C.2 Be in MODE 3.	1 hour 1 hour 6 hours	3 1

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CTS

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION		COMPLETION TIME	
3.1.3.1 Action a, 4.1.1.1.1.a	D. One or more rods inoperable. CONTROL RODS	D.1.1	Verify SDM is within the limits specified in the COLR.	1 hour	4 3
		OR			
		D.1.2	Initiate boration to restore SDM to within limit.	1 hour	
		AND			
		D.2	Be in MODE 3.	6 hours	

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY	
4.1.3.1.1	SR 3.1.4.1	Verify individual CONTROL ROD positions are within [6.5]% of their group average height.	12 hours	1
4.1.3.1.2	SR 3.1.4.2	Verify CONTROL ROD freedom of movement (trippability) by moving each individual CONTROL ROD that is not fully inserted ≥ 3% in any direction.	92 days	
4.1.3.4, 3.1.3.4, 3.1.3.4 Action b	SR 3.1.4.3	-----------------------------NOTE----------------------------- With rod drop times determined with less than four reactor coolant pumps operating, operation may proceed provided operation is restricted to the pump combination operating during the rod drop time determination. --		
	cabinets	1.58 Verify the rod drop time for each CONTROL ROD, from the fully withdrawn position, is ≤ [1.66] seconds from power interruption at the CONTROL ROD drive breakers to 3/4 insertion (25% withdrawn position) with T_{avg} ≥ 525°F.	Prior to reactor criticality after each removal of the reactor vessel head	1 1

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.4, CONTROL ROD GROUP ALIGNMENT LIMITS

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

2. ISTS 3.1.4 Required Action A.1 requires restoration of a CONTROL 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, TSTF-GG-05-01, 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 A.1 requires an additional level of indenting and numbering for the remaining Required Actions in Condition A, which reduces its clarity. Therefore, Required Action A.1 is deleted and the subsequent Required Actions renumbered.

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. Changes are made to be consistent with the LCO.

5. Typographical error corrected.

6. The second Completion Time of ISTS 3.1.4 Required Action A.2.1.1. (ITS 3.1.4 Required Action A.2.1) has been deleted and a new Required Action A.4 has been added to ITS 3.1.4 ACTION A. The Required Action is to verify SDM is within limits once per 12 hours. This change is necessary and consistent with CTS 3.1.3.1 Action c.2.b and also consistent with the ISTS for the Westinghouse plants (NUREG-1431, Rev. 3, "Standard Technical Specifications-Westinghouse Plants").

7. Changes are made which reflect the plant specific nomenclature.

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

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.4 CONTROL ROD Group Alignment Limits

BASES

BACKGROUND

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

UFSAR Appendices 3D.1.6, 3D.1.21, 3D.1.22, 3D.1.23, and 3D.1.24

The applicable criteria for these design requirements are 10 CFR 50, Appendix A, GDC 10, "Reactor Design," and GDC 26, "Reactivity Control System Redundancy and Capability" (Ref. 1), and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Plants" (Ref. 2). 7

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 within 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.

CONTROL RODS are moved by their CONTROL ROD drive mechanisms (CRDMs). Each CRDM moves its rod ¾ inch for one revolution of the leadscrew, but at varying rates depending on the signal output from the Control Rod Drive Control System (CRDCS). 1

roller nut assembly around the

The CONTROL RODS are arranged into rod groups that are radially symmetric. Therefore, movement of the CONTROL RODS does not introduce radial asymmetries in the core power distribution. The safety rods and the regulating rods provide required reactivity worth for immediate reactor shutdown upon a reactor trip. The regulating rods provide reactivity (power level) control during normal operation and transients, and their movement is normally governed by the ~~automatic~~ control system. 1

in automatic

BASES

BACKGROUND (continued)

The axial position of safety rods and regulating rods is indicated by two separate and independent systems, which are the relative position indicator transducers and the absolute position indicator transducers (see LCO 3.1.7, "Position Indicator Channels").

potentiometer

The relative position indicator transducer is a potentiometer that is driven by electrical pulses from the CRDCS. There is one counter for each CONTROL ROD drive. Individual rods in a group all receive the same signal to move; therefore, the counters for all rods in a group should indicate the same position. The Relative Position Indicator System is considered highly precise (one rotation of the leadscrew is ¾ inch in rod motion). If a rod does not move for each demand pulse, the counter will still count the pulse and incorrectly reflect the position of the rod.

rotor rotation results in 3/4 inch leadscrew and

move with

potentiometer

1

The Absolute Position Indicator System provides a highly accurate indication of actual CONTROL ROD position, but at a lower precision than relative position indicators. This system is based on inductive analog signals from a series of reed switches spaced along a tube with a center to center distance of 3.75 inches. 4

1

APPLICABLE SAFETY ANALYSES

CONTROL ROD misalignment and inoperability accidents are analyzed in the safety analysis (Ref. 3). The acceptance criteria for addressing CONTROL ROD inoperability or misalignment are that:

1

1

a. There shall be no violations of:

THERMAL POWER shall not exceed 110.2% of 2817 MWT

1

a → 1. Specified acceptable fuel design limits or ← ; and

2

b → 2. Reactor Coolant System (RCS) pressure boundary damage, and

shall not exceed code pressure limit.

1

b. The core must remain subcritical after accident transients.

1

Two → Three 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. 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. If a CONTROL ROD is stuck in the fully

1

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BASES

APPLICABLE SAFETY ANALYSES (continued)

withdrawn position, its worth is accounted for in the calculation of SDM, since the safety analysis does not take two stuck rods into account. The second third type of misalignment occurs when one rod drops partially or fully into the reactor core. This event causes an initial power reduction followed by a return towards the original power due to positive reactivity feedback from the negative moderator temperature coefficient. Increased peaking during the power increase may result in excessive local linear heat rates (LHRs). 1

The accident analysis and reload safety evaluations define regulating rod insertion limits that ensure the required SDM can always be achieved if the maximum worth CONTROL ROD is stuck fully withdrawn (Ref. 4). If a CONTROL ROD is stuck in or dropped in, continued operation is permitted if the increase in local LHR is within the design limits. The Required Action statements in the LCOs provide conservative reductions in THERMAL POWER and verification of SDM to ensure continued operation remains within the bounds of the safety analysis (Ref. 5).

Continued operation of the reactor with a misaligned or dropped CONTROL ROD is allowed if the $F_Q(Z)$ and the $F^N_{\Delta H}$ are verified to be within their limits in the COLR. When a CONTROL ROD is misaligned, the assumptions that are used to determine the regulating rod insertion limits, APSR insertion limits, AXIAL POWER IMBALANCE limits, and QPT 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 a more complete discussion of the relation of $F_Q(Z)$ and $F^N_{\Delta H}$ to the operating limits. 3

INSERT 1 1

The CONTROL ROD group alignment limits and OPERABILITY requirements satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The limits on CONTROL ROD group alignment, safety rod insertion, and APSR alignment, together with the limits on regulating rod insertion, APSR insertion, AXIAL POWER IMBALANCE, and QPT, ensure the reactor will operate within the fuel design criteria. The Required Actions in these LCOs ensure that deviations from the alignment limits will either be corrected or that THERMAL POWER will be adjusted, so that excessive local LHRs will not occur and the requirements on SDM and ejected rod worth are preserved.

1

INSERT 1

The CONTROL ROD OPERABILITY requirement is satisfied provided the rod will insert within the required rod drop time assumed in the safety analysis (Ref. 4).

BASES

LCO (continued)

The requirements on rod OPERABILITY ensure that upon reactor trip, the assumed reactivity will be available and will be inserted. The rod OPERABILITY requirements (i.e., trippability) are separate from the alignment requirements. 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. 1 1

The limit for individual CONTROL ROD misalignment is [6.5]% (9 inches) deviation from the group average position. This value is established, based on the distance between reed switches, with additional allowances for uncertainty in the absolute position indicator amplifiers, [group maximum or minimum synthesizer,] and asymmetric alarm or fault circuits detector outputs. The position of an inoperable misaligned rod is not included in the calculation of the rod group average position. 4 1 8

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

APPLICABILITY

The requirements on CONTROL ROD 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. In MODES 3, 4, 5, and 6, the alignment limits do not apply because the CONTROL RODS are typically bottomed, and the reactor is shut down and not producing fission power. In the shutdown MODES, the OPERABILITY of the safety and regulating 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 (SDM)," for SDM in MODES 3, 4, and 5, and LCO 3.9.1, "Boron Concentration," for boron concentration requirements during refueling.

ACTIONS

A.1

Alignment of the misaligned CONTROL ROD may be accomplished by either moving the single CONTROL ROD to the group average position, or by moving the remainder of the group to the position of the single misaligned CONTROL ROD. Either action can be used to restore the 5

BASES

ACTIONS (continued)

~~CONTROL RODS to a radially symmetric pattern. However, this must be done without violating the CONTROL ROD group sequence, overlap, and insertion limits of LCO 3.2.1, "Regulating Rod Insertion Limits," given in the COLR. THERMAL POWER must also be restricted, as necessary, to the value allowed by the insertion limits of LCO 3.2.1. The required Completion Time of 1 hour is acceptable because local xenon redistribution during this short interval will not cause a significant increase in LHR. This option is not available if a safety rod is misaligned, since the limits of LCO 3.1.5, "Safety Rod Insertion Limits," would be violated.~~ 5

INSERT 2

A.2.1.1

6

Restoration of the CONTROL ROD is allowed. however

~~C~~compliance with Required Actions A.2.1.1 through A.2.5 allows for continued power operation with one CONTROL ROD misaligned from its group average position. ~~These Required Actions comprise the final alternate for Condition A.~~ 5

Since the rod may be inserted farther than the group average insertion for a long time, SDM must be evaluated. Ensuring the SDM meets the minimum requirement within 1 hour is adequate to determine that further degradation of the SDM is not occurring.

A.2.1.2 5

Restoration of the required SDM requires increasing the RCS boron concentration, since the CONTROL ROD may remain misaligned and not be providing its normal negative reactivity on tripping. RCS boration must occur as described in Bases Section 3.1.1. The required Completion Time of 1 hour to initiate 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 for aligning the required valves and starting the boric acid pumps. Boration will continue until the required SDM is restored.

5 **INSERT 2**

When a CONTROL ROD is misaligned, re-alignment of the CONTROL ROD may be accomplished by either moving the single CONTROL ROD to the group average position, or by moving the remainder of the group to the position of the single misaligned CONTROL ROD. Either action can be used to restore the CONTROL RODS to a radially symmetric pattern. However, this must be done without violating the CONTROL ROD group sequence, overlap, and insertion limits of LCO 3.2.1, "Regulating Rod Insertion Limits." THERMAL POWER must also be restricted, as necessary, to the value allowed by the insertion limits of LCO 3.2.1.

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BASES

ACTIONS (continued)

A.2.2 5

Reduction of THERMAL POWER to ≤ 60% ALLOWABLE THERMAL POWER ensures that local LHR increases, due to a misaligned rod, will not cause the core design criteria to be exceeded. The required Completion Time of 2 hours allows the operator sufficient time for reducing THERMAL POWER.

A.2.3

High Flux 5

Reduction of the nuclear overpower trip setpoint to ≤ 70% ALLOWABLE THERMAL POWER, after THERMAL POWER has been reduced to 60% ALLOWABLE THERMAL POWER, maintains both core protection and an operating margin at reduced power similar to that at RTP. The required Completion Time of 10 hours allows the operator 8 additional hours after completion of the THERMAL POWER reduction in Required Action A.2.2 5 to adjust the trip setpoint.

INSERT 3 5

A.2.4 5 5

The existing CONTROL ROD configuration must not cause an ejected rod to exceed the limit of 0.65% Δk/k at RTP or 1.00% Δk/k at zero power 5 (Ref. 5). This evaluation may require a computer calculation of the 1 maximum ejected rod worth based on nonstandard configurations of the CONTROL ROD groups. The evaluation must determine the ejected rod worth for the remainder of the fuel cycle to ensure a valid evaluation, should fuel cycle conditions at some later time become more bounding than those at the time of the rod misalignment. The required Completion Time of 72 hours is acceptable because LHRs are limited by the THERMAL POWER reduction and sufficient time is provided to perform the required evaluation.

A.2.5 6 5

Performance of SR 3.2.5.1 provides a determination of the power peaking factors using the Incore Detector System. Verification of the $F_Q(Z)$ and 1 $F^N_{\Delta H}$ from an incore power distribution map is necessary to ensure that excessive local LHRs will not occur due to CONTROL ROD misalignment. This is necessary because the assumption that all

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5 **INSERT 3**

A.4

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.

BASES

ACTIONS (continued)

CONTROL RODS are aligned (used to determine the regulating rod insertion, AXIAL POWER IMBALANCE, and QPT limits) is not valid when the CONTROL RODS are not aligned. The required Completion Time of 72 hours is acceptable because LHRs are limited by the THERMAL POWER reduction and adequate time is allowed to obtain an incore power distribution map.

6

Required Action A.2.5 is modified by a Note that requires the performance of SR 3.2.5.1 only when THERMAL POWER is greater than 20% RTP. This establishes a Required Action that is consistent with the Applicability of LCO 3.2.5, "Power Peaking Factors." 5 5

B.1

any of

If the Required Actions and associated Completion Times for Condition A cannot be met, the plant 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. 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 plant systems. 8 5

C.1.1

More than one CONTROL ROD becoming misaligned, is not expected and may violate the minimum SDM requirement. Therefore, SDM must be evaluated. Ensuring the SDM meets the minimum requirement within 1 hour allows the operator adequate time to determine the SDM.

C.1.2

Restoration of the required SDM requires increasing the RCS boron concentration to provide negative reactivity. RCS boration must occur as described in Bases Section 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 for aligning the required valves and starting the boric acid pumps. Boration will continue until the required SDM is restored. 8

the LCO 3.1.1

BASES

ACTIONS (continued)

C.2

If more than one CONTROL ROD is misaligned, continued operation of the reactor may cause the misalignment to increase, as the regulating rods insert or withdraw to control reactivity. If the CONTROL ROD misalignment increases, local power peaking may also increase, and local LHRs will also increase if the reactor continues operation at THERMAL POWER. The SDM is decreased when one or more CONTROL RODS become misaligned by insertion from the group average position.

Therefore, it is prudent to place the reactor in MODE 3. LCO 3.1.4 does not apply in MODE 3 since excessive power peaking cannot occur and the minimum required SDM is ensured. 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 plant systems.

D.1.1 and D.1.2

CONTROL RODs

When one or more ~~rods~~ are inoperable, the 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 to restore SDM. 5

In this situation, SDM verification must include the worth of the inoperable rod(s) as well as a rod of maximum worth.

D.2

CONTROL RODs

If the inoperable ~~rod(s)~~ cannot be restored to OPERABLE status, the plant must be brought to a MODE or condition in which the LCO requirements are not applicable. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. 5

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 systems.

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual rods are aligned within [6.5]% of their group average height limits at a 12 hour Frequency 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. 4

SR 3.1.4.2

Verifying each CONTROL ROD is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each CONTROL ROD could result in radial tilts. Exercising each individual CONTROL ROD that is not fully inserted 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 3% 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 is determined to be 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. 6

SR 3.1.4.3

Verification of rod drop time 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. The rod drop time given in the safety analysis is ~~1.4 seconds to~~ 2/3 ~~[ ]~~ insertion. Using the identical rod drop curve gives a value of 1.56 ~~[1.66]~~ seconds to ¾ insertion. The latter value is used in the Surveillance because the zone reference lights are located at ¾ insertion, which provides the most accurate position indication ~~25% insertion intervals~~. The zone reference lights will activate at ¾ insertion to give an indication of the rod drop time and rod location. Measuring rod drop times, prior to reactor criticality after reactor vessel head removal ~~and after CONTROL ROD drive system maintenance or modification~~, ensures that the reactor internals and CRDM will not 1 4 5 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

interfere with CONTROL ROD motion or rod drop time. This Surveillance is performed during a plant outage, due to the plant conditions needed to perform the SR and the potential for an unplanned plant transient if the Surveillance were performed with the reactor at power.

This testing is normally performed with all reactor coolant pumps operating and average moderator temperature ≥ 525°F to simulate a reactor trip under actual conditions. However, if the rod drop times are determined with less than four reactor coolant pumps operating, a Note allows power operation to continue, provided operation is restricted to the pump combination utilized during the rod drop time determination.

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 10 and GDC 26~~. UFSAR, Appendices 3D.1.6, 3D.1.21, 3D.1.22, 3D.1.23, and 3D.1.24 7
2. 10 CFR 50.46.
3. U FSAR, ~~Chapter [14]~~ Section 15.2.3. 1 4
4. U FSAR, Section ~~[ ]~~ 15.1.2. 1 4
5. ~~5. FSAR, Section [ ].~~ 1
6. ~~6~~ 5. U FSAR, Section ~~[ ]~~ 15.4.3. 1 4

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.4 BASES, CONTROL ROD GROUP ALIGNMENT LIMITS

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, TSTF-GG-05-01, Section 5.1.3.

3. The Applicable Safety Analyses discussions concerning the Required Actions have been deleted since the Bases for the Required Action provides the associated justification.

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

5. Changes have been made to be consistent with changes made to the Specification.

6. Changes have been made to be consistent the Specification.

7. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

8. Editorial change made for consistency.

Specific No Significant Hazards Considerations (NSHCs)

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

There are no specific NSHC discussions for this Specification.

ATTACHMENT 5

ITS 3.1.5, SAFETY ROD INSERTION LIMITS

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

ITS 3.1.5

ITS

A01

REACTIVITY CONTROL SYSTEMS

SAFETY ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

LCO 3.1.5 — 3.1.3.5 All safety rods shall be fully withdrawn. A02

APPLICABILITY: 1* and 2#. M01

LCO 3.1.5 NOTE — ACTION:

ACTION A — With a maximum of one safety rod not fully withdrawn, ~~except for surveillance testing pursuant to Specification 4.1.3.1.2,~~ within one hour either: M02

Add proposed Required Actions A.1.1 and A.1.2

~~a. Fully withdraw the rod or~~ A03

b. Declare the rod to be inoperable and apply Specification 3.1.3.1. A04

misaligned

Add proposed ACTION B M03

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1 — 4.1.3.5 Each safety rod shall be determined to be fully withdrawn:

~~a. Within 15 minutes prior to withdrawal of any regulating rod during an approach to reactor criticality.~~ L01

b. At least once per 12 hours thereafter.

~~*See Special Test Exception 3.10.1 and 3.10.2.~~ A02

~~#With $K_{eff} \geq 1.0$.~~ M01

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DISCUSSION OF CHANGES
ITS 3.1.5, SAFETY ROD INSERTION LIMITS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 The Applicability of CTS 3.1.3.5 is modified by footnote * that states "See Special Test Exceptions 3.10.1 and 3.10.2." 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.

A03 If a maximum of one safety rod is not fully withdrawn, CTS 3.1.3.5 Action a requires the rod to be fully withdrawn. ITS 3.1.5 does not contain a Required Action stating fully withdraw the rod.

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 (in this case withdraw) 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.

A04 If a maximum of one safety rod is not fully withdrawn, CTS 3.1.3.5 Action b allows the rod to be declared inoperable and apply Specification 3.1.3.1. Specification 3.1.3.1 requires the control (safety and regulating) rods to be OPERABLE and positioned within the alignment limits. For a safety rod not fully withdrawn CTS 3.1.3.1 Action c would be entered and the plant is allowed to continue to operate as long as the compensatory actions are taken. ITS 3.1.5 Required Action A.2 requires the rod to be declared misaligned. This changes the CTS by clarifying the type of Actions to take when one safety rod cannot be fully withdrawn. Changes to the actions in CTS 3.1.3.1 Action c are discussed in the Discussion of Changes for ITS 3.1.4, "Control Rod Group Alignment Limits."

This change is acceptable because the technical requirements have not changed. With a maximum of one safety rod inoperable, CTS 3.1.3.5 and ITS 3.1.5 will require the same Condition to be entered. This change is designated as administrative because it does not result in technical changes to the CTS.

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DISCUSSION OF CHANGES
ITS 3.1.5, SAFETY ROD INSERTION LIMITS

MORE RESTRICTIVE CHANGES

M01 CTS 3.1.3.5 is 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 times in MODE 2.

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

M02 With one safety rod not fully withdrawn, CTS 3.1.3.5 Action b requires the safety rod to be declared inoperable within 1 hour. Under the same condition, ITS 3.1.5 ACTION A not only requires a similar action, but also requires either a verification that SDM is within the limit within 1 hour (ITS 3.1.5 Required Action A.1.1) or to initiate boration to restore SDM to within the limit within 1 hour (ITS 3.1.5 Required Action A.1.2). This changes the CTS by adding additional Required Actions when one safety rod is not fully withdrawn.

The purpose of CTS 3.1.3.5 Action b is to provide appropriate compensatory measures when a safety rod is not fully withdrawn when required. With a safety rod not fully withdrawn as assumed in the accident analysis, there is a possibility that the required SDM may be adversely affected. Therefore, SDM must be evaluated. One hour allows the operator adequate time to determine SDM. If SDM is not within limit, then restoration of the SDM limit is required by initiating boration within 1 hour. The 1 hour Completion Time to initiate 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 provides additional compensatory measures to take due to the possibility of SDM limit not being met when one safety rod is not fully withdrawn. This change is designated as more restrictive because additional Required Actions are required in the ITS than in the CTS.

M03 CTS 3.1.3.5 Action only provides compensatory actions for a maximum of one safety rod not fully withdrawn. If two rods or more rods are not fully withdrawn entry into CTS 3.0.3 is required. CTS 3.0.3 requires the plant to be in Hot Standby (MODE 3) within 7 hours. ITS 3.2.4 ACTION B requires entry when more than one safety rod is not fully withdrawn and requires a verification of SDM to be within limit or to initiate boration to restore SDM to within limit within one hour and requires the plant to be in MODE 3 within 6 hours. This changes the CTS by establishing the SDM requirements and to place the unit in MODE 3 within 6 hours instead of 7 hours.

DISCUSSION OF CHANGES
ITS 3.1.5, SAFETY ROD INSERTION LIMITS

The purpose of requiring a shutdown is to place the unit in condition where the requirements do not apply. With more than one safety rod not fully withdrawn, there is a possibility that the required SDM may be adversely affected. 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 provides an adequate period of time to 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. This change is designated as more restrictive because it reduces the Completion Time to be in MODE 3.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L01 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.1.3.5.a requires verification that each safety rod be fully withdrawn within 15 minutes prior to withdrawal of any regulating rod during an approach to reactor criticality. ITS 3.1.5 does not require verification that each safety rod be fully withdrawn within 15 minutes prior to withdrawal of any regulating rod during an approach to reactor criticality. This changes the CTS by eliminating the requirement that each safety rod be fully withdrawn within 15 minutes prior to withdrawal of any regulating rod during an approach to reactor criticality.

The purpose of CTS 4.1.3.5.a is to verify that the safety rods are withdrawn prior to withdrawal of any regulating rod during an approach to reactor criticality. 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 safety groups must be withdrawn prior to entering the ITS Applicability of MODE 2. Furthermore, ITS SR 3.1.5.1 requires a verification that the safety rods are fully withdrawn every 12 hours. Since ITS SR 3.0.4 requires Surveillances to be met prior to entering the Applicability of an

DISCUSSION OF CHANGES
ITS 3.1.5, SAFETY ROD INSERTION LIMITS

LCO, ITS SR 3.1.5.1 is required to be performed within 12 hours prior to entering MODE 2. This ensures that prior to entering the Applicability the shutdown rods are at their correct position (fully withdrawn). However, it is not required to verify compliance within a much shorter (15 minutes) specified time just prior to initial regulating group withdrawal. Specifying a much shorter time is not necessary to ensure that the safety groups are above the insertion limit prior to initial regulating group withdrawal, as long as the safety groups are withdrawn prior to entering MODE 2. In addition, the ITS Bases identifies that safety rods are fully withdrawn prior to withdrawing any regulating rods. 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 Safety Rod Insertion Limits

3.1.3.5 LCO 3.1.5 Each safety rod shall be fully withdrawn.

3.1.3.5 Action

---NOTE---
Not required for any safety rod inserted to perform SR 3.1.4.2.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.1.3.5 Action	A. One safety rod not fully withdrawn.	A.1.1 Verify SDM is within ~~the~~ limits ~~specified in the COLR~~.	1 hour	2
		OR		
		A.1.2 Initiate boration to restore SDM to within limit.	1 hour	
		AND		
		A.2 Declare the rod ~~inoperable~~ misaligned.	1 hour	1
DOC M03	B. More than one safety rod not fully withdrawn.	B.1.1 Verify SDM is within ~~the~~ limits ~~specified in the COLR~~.	1 hour	2
		OR		
		B.1.2 Initiate boration to restore SDM to within limit.	1 hour	
		AND		

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
DOC M03		B.2	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.1.3.5	SR 3.1.5.1	Verify each safety rod is fully withdrawn.	12 hours

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.5, SAFETY ROD INSERTION LIMITS

1. ISTS 3.1.5 Required Action A.2 requires the safety rod that is not fully withdrawn to be declared inoperable. The ISTS 3.1.5 Bases states that "This requires entry into LCO 3.1.4, "CONTROL ROD Group Alignment Limits." ITS 3.1.4 includes an ACTION for one control rod not aligned to within 6.5% of its group average height (ACTION A), more than one CONTROL ROD not aligned within 6.5% of its group average height (ACTION C), and one or more rod inoperable (ACTION D). ITS 3.1.5 Required Action A.2 requires the rod to be declared misaligned. This change is necessary to be consistent with the current licensing basis in CTS 3.1.3.5 Action b and CTS 3.1.3.1 Action c. Declaring the rod to be misaligned will require entry into ITS 3.1.4 ACTION A (One CONTROL ROD not aligned within 6.5% of its group average height), rather than ISTS 3.1.4 ACTION D, which requires the plant to shutdown.

2. 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."

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

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.5 Safety Rod Insertion Limits 4

BASES

BACKGROUND

The insertion limits of the safety ~~and regulating~~ rods are initial condition assumptions in all safety analyses that assume rod insertion upon reactor trip. The insertion limits directly affect core power distributions and assumptions of available SDM, ejected rod worth, and initial reactivity insertion rate. 4

UFSAR, Appendices 3D.1.6, 3D.1.21, 3D.1.22, 3D.1.23, and 3D.1.24

The applicable criteria for the reactivity and power distribution design requirements are ~~10 CFR 50, Appendix A, GDC 10, "Reactor Design," GDC 26, "Reactivity Control System Redundancy and Capability," 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). 5

Limits on safety rod insertion have been established, and all rod positions are monitored and controlled during power operation to ensure that the reactivity limits, ejected rod worth, and SDM limits are preserved.

The regulating groups are used for precise reactivity control of the reactor. The positions of the regulating groups are normally automatically controlled by the ~~automatic~~ control system, but they can also be manually controlled. They are capable of adding negative reactivity very quickly (compared to borating). The regulating groups must be maintained above designed insertion limits and are typically near the fully withdrawn position during normal 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 and fuel burnup. 1

The safety groups can be fully withdrawn without the core going critical. This provides available negative reactivity in the event of boration errors. The safety groups are controlled manually by the control room operator. During normal full power operation, the safety groups are fully withdrawn. The safety groups must be completely withdrawn from the core prior to withdrawing any regulating groups during an approach to criticality. The safety groups remain in the fully withdrawn position until the reactor is shut down or if being tested in accordance with SR 3.1.4.2. They add negative reactivity to shut down the reactor upon receipt of a reactor trip signal. 4

BASES

APPLICABLE SAFETY ANALYSES

On a reactor trip, all rods (safety groups and regulating groups), except the most reactive rod, are assumed to insert into the core. The safety groups shall be at their fully withdrawn limits and available to insert the maximum amount of negative reactivity on a reactor trip signal. The regulating groups may be partially inserted in the core as allowed by LCO 3.2.1, "Regulating Rod Insertion Limits." The safety group and regulating rod 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 (SDM)") following a reactor trip from full power. The combination of regulating groups and safety groups (less the most reactive rod, 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. 3). The safety group insertion limit also limits the reactivity worth of an ejected safety rod.

~~The acceptance criteria for addressing safety and regulating rod group insertion limits and inoperability or misalignment are that:~~

~~a. There shall be no violations of:~~

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

~~2. RCS pressure boundary integrity and~~

~~b. The core must remain subcritical after accident transients.~~ 1

The safety rod insertion limits satisfy ~~Criteria~~ on 2 ~~and 3~~ of 10 CFR 50.36(c)(2)(ii). 1

LCO

The safety groups must be fully withdrawn 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.

This LCO has been modified by a Note indicating the LCO requirement is suspended for those safety rods which are inserted solely due to testing in accordance with SR 3.1.4.2. This SR verifies the freedom of the rods to move, and requires the safety group to move below the LCO limits, which would normally violate the LCO.

BASES

APPLICABILITY

The safety groups 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. 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.

ACTIONS

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

misaligned

Condition A of

The safety rod must be declared ~~inoperable~~ within a 1 hour time frame. This requires entry into LCO 3.1.4, "CONTROL ROD Group Alignment Limits." In addition, since the safety rod may be inserted farther than the group average insertion for a long time, SDM must be evaluated. Ensuring the SDM meets the minimum requirement within 1 hour is adequate to determine that further degradation of the SDM is not occurring. 2

Restoration of the required SDM requires increasing the boron concentration, since the safety rod may remain misaligned and not be providing its normal negative reactivity on tripping. RCS boration must occur as described in Bases ~~Section 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 for aligning the required valves and starting the boric acid pumps. Boration will continue until the required SDM is restored. 6

the LCO 3.1.1

The allowed Completion Time of 1 hour provides an acceptable time for evaluating and repairing minor problems without allowing the plant to remain in an unacceptable condition for an extended period of time.

B.1.1 and B.1.2

not fully withdrawn

When more than one safety rod is ~~inoperable~~ 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 to restore SDM. 4

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

BASES

ACTIONS (continued)

B.2

not fully withdrawn

If more than one safety rod is ~~inoperable~~ 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 systems. 4

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that each safety rod is fully withdrawn ensures the rods are available to provide reactor shutdown capability.

Verification that individual safety rod positions are fully withdrawn at a 12 hour Frequency allows the operator to detect a rod beginning to deviate from its expected position. Also, the 12 hour Frequency takes into account other information available in the control room for the purpose of monitoring the status of the safety rods.

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 10 and GDC 26~~. UFSAR, Appendices 3D.1.6, 3D.1.21, 3D.1.22, 3D.1.23, and 3D.1.24 5
2. 10 CFR 50.46.
3. U FSAR, Section ~~[ ]~~ 15.4.3. 1 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.5 BASES, SAFETY ROD INSERTION LIMITS

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. Changes have been made to be consistent with changes made to the Specification.
3. The brackets have been removed and the proper plant specific information/value has been provided.
4. Changes have been made to be consistent with the Specification.
5. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.
6. Editorial changes made for clarity.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.5, SAFETY ROD INSERTION LIMITS

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 6

ITS 3.1.6, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

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

ITS

A01

REACTIVITY CONTROL SYSTEMS

GROUP HEIGHT - AXIAL POWER SHAPING ROD GROUP

LIMITING CONDITION FOR OPERATION

LCO 3.1.6 3.1.3.2 All axial power shaping rods (APSR) shall be OPERABLE, unless fully withdrawn, and shall be positioned within ± 6.5% (indicated position) of their group average height.

A02

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

ACTION:

ACTION A With a maximum of one APSR inoperable or misaligned from its group average height by more than ± 6.5% (indicated position), operation may continue provided that within 2 hours~~:~~ and 2 hours after each APSR movement L01

a. ~~The APSR group is positioned such that the misaligned rod is restored to within limits for the group average height, or~~ A03

b. It is determined that the imbalance limits of Specification 3.2.1 are satisfied ~~and movement of the APSR group is prevented while the rod remains inoperable or misaligned~~. L01

SURVEILLANCE REQUIREMENTS Add proposed ACTION B M01

SR 3.1.6.1 4.1.3.2.1 The position of each APSR rod shall be determined to be within the group average height limit by verifying the individual rod positions at least once per 12 hours ~~except during time intervals when the asymmetric rod monitor is inoperable, then verify the individual rod position(s) of the rod(s), with the inoperable asymmetric rod monitor at least once per 4 hours~~. L02

~~*See Special Test Exceptions 3.10.1 and 3.10.2~~ A02

DISCUSSION OF CHANGES
ITS 3.1.6, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 The Applicability of CTS 3.1.3.2 is MODES 1 and 2 with footnote * stating "See Special Test Exception 3.10.1 and 3.10.2." ITS 3.1.6 Applicability is MODES 1 and 2 and does not contain the footnote or a reference to the Special Test Exception. This changes the CTS by deleting explicit reference to the Special Test Exception.

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.

A03 CTS 3.1.3.2 Action a states that with a maximum of one APSR inoperable or misaligned from its group average height by more than the alignment requirements, operation may continue provided that within 2 hours the APSR group is positioned such that the misaligned rod is restored to within limits of the group average height requirements. ITS 3.1.6 does not contain a Required Action stating that the APSR group must be positioned such that the misalignment rod is restored to within limits. This changes the CTS by deleting the explicit action to restore to within 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” operations 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.

MORE RESTRICTIVE CHANGES

M01 CTS 3.1.3.2 Action states that with a maximum of one APSR inoperable or misaligned, operation may continue provided certain actions are completed within 2 hours. If those actions are not complete, CTS 3.0.3 would be entered requiring entry into Hot Standby (MODE 3) within 7 hours, for a total time from condition discovery to entry into MODE 3 of 9 hours. ITS 3.1.6 ACTION B states that if any Required Action and associated Completion Time of Condition A (one APSR not within alignment limits) is not met, the unit must be in MODE 3 within 6 hours. The shortest Completion Time in ITS 3.1.6 ACTION A is 2 hours. Therefore, under the ITS, the shortest possible time from discovery of the

DISCUSSION OF CHANGES
ITS 3.1.6, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

condition to entry into MODE 3 is 8 hours. This changes the CTS by providing one less hour for entry into MODE 3 following discovery of a misaligned APSR if Required Actions are not met.

The purpose of requiring a shutdown with a maximum of one APSR inoperable or misaligned is to place the plant in a condition where the requirements for APSR OPERABILITY and alignment limits are not required. 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. This change has been designated as more restrictive because it reduces the Completion Time to be in MODE 3.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* When there is a maximum of one APSR inoperable or misaligned from its group average, CTS 3.1.3.2 Action b requires the imbalance limits of Specification 3.2.1 to be verified to be within limit in 2 hours. However, the Action does not allow movement of the APSR group while the rod remains inoperable or misaligned. ITS 3.1.6 ACTION A requires the performance of SR 3.2.3.1, the AXIAL POWER IMBALANCE operating limit verification, within 2 hours and within 2 hours after each APSR movement. This changes the CTS by allowing the movement of the APSRs however adds a requirement to verify the AXIAL POWER IMBALANCE is within limit within 2 hours after each APSR movement.

The purpose of CTS 3.1.3.2 Action is to monitor the AXIAL POWER IMBALANCE when an APSR is misaligned or inoperable. 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. The ITS requires the performance of SR 3.2.3.1, the AXIAL POWER IMBALANCE operating limit verification, within 2 hours and within 2 hours after each APSR movement. Verification of the AXIAL POWER IMBALANCE after APSR movement ensures the movement of the APSR has not resulted in a violation of the AXIAL POWER IMBALANCE limit.

DISCUSSION OF CHANGES
ITS 3.1.6, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

This is acceptable because significant xenon redistribution will not occur in this short period. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 7 – Relaxation of Surveillance Frequency - Non-24 Month Type Change)* CTS 4.1.3.2.1 requires the position of each APSR to be determined to be within group average height limits at least once every 12 hours except during time intervals when the asymmetric rod monitor is inoperable. When the asymmetric rod monitor is inoperable, CTS 4.1.3.2.1 requires verification of the individual rod position(s) of the rod(s), with the inoperable asymmetric rod monitor at least once per 4 hours. ITS SR 3.1.6.1 requires verification of the position of each APSR is within limit every 12 hours. This changes the CTS by eliminating the requirement to verify the individual rod position(s) of the rod(s), with the inoperable asymmetric rod monitor at least once per 4 hours

The purpose of CTS 4.1.3.2.1 is to periodically verify that the APSRs are within the alignment limit. This change is acceptable because increasing the Frequency of verification of the position of an APSR when the asymmetric rod monitor is inoperable is unnecessary. The inoperability of the monitor does not increase the probability that the APSR is not within the alignment limit. The routine 12 hour Frequency (ITS SR 3.1.6.1) continues to ensure the APSRs are within the alignment limit. Furthermore, the monitor is used for indication only. The use of the asymmetric rod monitor is not credited in any safety analysis. Thus, any response determined necessary by plant personnel due to an inoperable alarm is more appropriately controlled by plant procedures, not Technical Specifications. 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 AXIAL POWER SHAPING ROD (APSR) Alignment Limits

, unless fully withdrawn, shall be 1

3.1.3.2 LCO 3.1.6 Each APSR shall be OPERABLE and aligned within [6.5]% of its group average height. 2

APPLICABILITY: MODES 1 and 2.

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.1.3.2 Action	A. One APSR inoperable, not aligned within its limits, or both.	A.1 Perform SR 3.2.3.1.	2 hours AND 2 hours after each APSR movement
DOC M01	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE	FREQUENCY	
4.1.3.2.1	SR 3.1.6.1 Verify position of each APSR is within [6.5]% of the group average height.	12 hours	2

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.6, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

1. The LCO statement has been modified to exclude, from the OPERABILITY requirement, when the APSR is fully withdrawn. APSR Insertion Limits in the COLR prohibit inserting APSRs once they are fully withdrawn. To ensure this requirement is maintained, current Davis-Besse practice is to disable the normal power supply to the fully withdrawn APSRs, which essentially renders the associated APSRs inoperable. This allowance is consistent with current licensing basis, since CTS LCO 3.1.3.2 only requires non-fully withdrawn APSRs to be OPERABLE.

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

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

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.6 AXIAL POWER SHAPING ROD (APSR) Alignment Limits

BASES

UFSAR, Appendices 3D.1.6, 3D.1.21, 3D.1.22, 3D.1.23, and 3D.1.24

BACKGROUND

The OPERABILITY of the APSRs and rod misalignment are initial condition assumptions in the safety analysis that directly affect core power distributions. The applicable criteria for these power distribution design requirements are 10 CFR 50, Appendix A, GDC 10, "Reactor Design," and GDC 26, "Reactivity Limits" (Ref. 1), and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors" (Ref. 2). 6

Mechanical or electrical failures may cause an APSR to become inoperable or to become misaligned from its group. APSR inoperability or misalignment may cause increased power peaking, due to the asymmetric reactivity distribution. Therefore, APSR alignment and OPERABILITY are related to core operation within design power peaking limits.

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

CONTROL RODS and APSRs are moved by their CONTROL ROD drive mechanisms (CRDMs). Each CRDM moves its rod ¾ inch for one ~~revolution of the~~ roller nut assembly around the leadscrew at varying rates depending on the signal output from the Rod Control System. 1

The APSRs are arranged into rod groups that are radially symmetric. Therefore, movement of the APSRs does not introduce radial asymmetries in the core power distribution. The APSRs, which control the axial power distribution, are positioned manually and do not trip.

~~LCO 3.1.6 is conservatively based on use of black (Ag-In-Cd) APSRs and bounds use of gray (Inconel) APSRs. The reactivity worth of black APSRs is greater than that of gray APSRs; thus the impact of black APSR misalignment on the core power distribution is greater.~~ 1

BASES

APPLICABLE SAFETY ANALYSES

INSERT 1

APSR misalignment and inoperability are analyzed in the safety analysis (Ref. 3). The acceptance criteria for addressing APSR inoperability or misalignment are that there shall be no violations of:

a. Specified acceptable fuel design limits and

b. Reactor Coolant System (RCS) pressure boundary integrity.

Two types of misalignment or inoperability are distinguished. During movement of an APSR group, one rod may stop moving while the other rods in the group continue. This condition may cause excessive power peaking. The second type of misalignment occurs when one rod drops partially or fully into the reactor core. This event causes an initial power reduction, followed by a return towards the original power, due to positive reactivity feedback from the negative moderator temperature coefficient. Increased peaking during the power increase may result in excessive local linear heat rates (LHRs). The accident analysis and reload safety evaluations define APSR insertion limits that ensure that if an APSR is stuck in or dropped in, the increase in local LHR is within the design limits. The Required Action statement in the LCO provides a conservative approach to ensure that continued operation remains within the bounds of the safety analysis (Ref. 4). 1

Continued operation of the reactor with a misaligned APSR is allowed if AXIAL POWER IMBALANCE limits are preserved.

The APSR alignment limits satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The limits on CONTROL ROD group alignment, safety rod insertion, and APSR alignment, together with the limits on regulating rod insertion, APSR insertion, AXIAL POWER IMBALANCE, and QPT, ensure the reactor will operate within the fuel design criteria. The Required Action in this LCO ensures deviations from the alignment limits will be adjusted so that excessive local LHRs will not occur.

The limit for individual APSR misalignment is [6.5]% (9 inches) deviation from the group average position. This value is established based on the distance between reed switches, with additional allowances for uncertainty in the absolute position indicator amplifiers ~~group maximum or minimum synthesizer,~~ and asymmetric alarm or fault ~~detector outputs~~ circuits. The position of ~~an inoperable~~ misaligned rod is not included in the calculation of the rod group's average position. 4 1 7

INSERT 1

There are no explicit safety analyses associated with misalignment of APSRs. The LCOs governing APSR alignment are provided because the power distribution analysis supporting LCO 3.2.1, "Regulating Rod Insertion Limits," LCO 3.2.3, "AXIAL POWER IMBALANCE Operating Limits," and LCO 3.2.4, "QUADRANT POWER TILT (QPT)," assumes the APSRs are OPERABLE and aligned within limits.

Misaligned APSRs may cause excessive power peaking. Continued operation of the reactor with a misaligned APSR is allowed if the power distribution limits of Section 3.2, "Power Distribution Limits," are preserved.

BASES

LCO (continued)

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

, unless fully withdrawn.

APPLICABILITY

The requirements on APSR 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 and alignment of rods have the potential to affect the safety of the plant. In MODES 3, 4, 5, and 6, the alignment limits do not apply because the reactor is shut down and not producing fission power, and excessive local LHRs cannot occur from APSR misalignment. 8

8

The APSRs are not required to be OPERABLE when fully withdrawn because, once they are fully withdrawn, they are prohibited by the APSR insertion limits from being inserted and the normal power supply is normally disabled to prevent their movement. While APSRs are not required OPERABLE when fully withdrawn, they are still required to meet the alignment limits.

ACTIONS

A.1

inoperable, not aligned within its limit, or both

The ACTIONS described below are required if one APSR is ~~inoperable~~. The plant is not allowed to operate with more than one inoperable APSR. This would require the reactor to be shut down, in accordance with LCO 3.0.3. 5

An alternate to realigning a single misaligned APSR to the group average position is to align the remainder of the APSR group to the position of the misaligned or inoperable APSR, while maintaining APSR insertion, in accordance with the limits in the COLR. This restores the alignment requirements. Deviations up to 2 hours will not cause significant xenon redistribution to occur. This alternative assumes the APSR group movement does not cause the limits of LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits," to be exceeded. For this reason, APSR group movement is only practical for instances where small movements of the APSR group are sufficient to re-establish APSR alignment.

The reactor may continue in operation with the APSR misaligned if the limits on AXIAL POWER IMBALANCE are surveilled within 2 hours to determine if the AXIAL POWER IMBALANCE is still within limits. Also, since any additional movement of the APSRs may result in additional imbalance, Required Action A.1 also requires the AXIAL POWER IMBALANCE Surveillance to be performed again within 2 hours after each APSR movement. The required Completion Time of up to 2 hours will not cause significant xenon redistribution to occur.

BASES

ACTIONS (continued)

B.1

The plant must be brought to a MODE in which the LCO does not apply if the Required Actions and associated Completion Times cannot be met. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, for reaching MODE 3 from RTP in an orderly manner and without challenging plant systems. In MODE 3, APSR group alignment limits are not required because the reactor is not generating THERMAL POWER and excessive local LHRs cannot occur from APSR misalignment.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

Verification at a 12 hour Frequency that individual APSR positions are within [6.5]% of the group average height limits allows the operator to detect an APSR beginning to deviate from its expected position. In addition, APSR position is continuously available to the operator in the control room so that during actual rod motion, deviations can immediately be detected. 4

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 10 and GDC 26~~. UFSAR, Appendices 3D.1.6, 3D.1.21, 3D.1.22, 3D.1.23, and 3D.1.24 6

2. 10 CFR 50.46.

3. U FSAR, Section ~~[ ]~~ 15.2.3. 1 4

~~4. FSAR, Section [ ].~~ 1

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.6 BASES, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

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, TSTF-GG-05-01, Section 5.1.3.

3. The Applicable Safety Analyses discussions concerning the Required Actions have been deleted since the Bases for the Required Action provides the associated justification.

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

5. Changes have been made to be consistent with the Specification.

6. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

7. Editorial change made for consistency.

8. Changes have been made to be consistent with changes made to the Specification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.6, AXIAL POWER SHAPING ROD (APSR) ALIGNMENT LIMITS

There are no specific NSHC discussions for this Specification.

ATTACHMENT 7

ITS 3.1.7, POSITION INDICATOR CHANNELS

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

A01

ITS

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS

LIMITING CONDITION FOR OPERATION

LCO 3.1.7

3.1.3.3 All safety, regulating and axial power shaping control rod absolute position indicator channels and relative position indicator channels shall be OPERABLE ~~and capable of determining the control rod group average positions within ± 1.5%.~~ LA01

APPLICABILITY: MODES 1 and 2.

Add proposed ACTIONS Note L01

ACTION:

ACTIONS A and B

a. With a maximum of one absolute position indicator channel per control rod group or one relative position indicator channel per control rod group inoperable either:

ACTION B.1.1

~~1. Reduce THERMAL POWER to ≤ 60% of the THERMAL POWER allowable for the reactor coolant pump combination and reduce the High Flux Trip Setpoint to ≤ 70% of the THERMAL POWER allowable for the reactor coolant pump combination within 8 hours, or~~ M01

2. STARTUP and POWER OPERATION may continue provided: Add proposed ACTION A L02

a) The position of the control rod with the inoperable position indicator is verified within 8 hours by actuating its 0%, 25%, 50%, 75% or, 100% position reference indicator, and zone reference indicator LA02

ACTION B

b) The control rod group(s) containing the inoperable position indicator channel is subsequently maintained at the 0%, 25%, 50%, 75% or, 100% withdrawn position and verified at this position at least once per 1/2 8 hours thereafter, and M02

c) Operation is within the limits of Specification 3.1.3.5, 3.1.3.6, or 3.1.3.9, as applicable. Add Required Action B.1.2 second Completions Time M03

Add proposed Required Actions B.2.1 and B.2.2 L03

ACTION A

b. With more than one relative position indicator channel per control rod group inoperable, STARTUP and POWER OPERATION may continue provided ~~that the requirements of either Action a.1 or a.2 above have been complied with and~~ the absolute position indicator channels are OPERABLE for the affected control rod assemblies. L02 Add Required Action A.1 Completion Times M04

~~c. The provisions of Specification 3.0.4 are not applicable.~~ A02

Add proposed ACTION C L04 M05

ITS 3.1.7

A01

ITS

REACTIVITY CONTROL SYSTEMS

POSITION INDICATOR CHANNELS (Continued)

SURVEILLANCE REQUIREMENTS

the limits specified in the COLR

LA03

SR 3.1.7.1 4.1.3.3 Each absolute and relative position indicator channel shall be determined to be OPERABLE by verifying that the relative position indicator channels and the absolute position indicator channels agree within ~~3.46%~~ at least once per 12 hours ~~except during time intervals when the asymmetric rod monitor is inoperable, then compare the relative position indicator and absolute position indicator channel(s) of the rod(s) with the inoperable asymmetric rod monitor at least once per 4 hours.~~

L05

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 CTS 3.1.3.3 Action a covers the inoperabilities for a maximum of one absolute position indicator channel per control rod group or one relative position indicator channel per control rod group. CTS 3.1.3.3 Action b covers the inoperabilities for more than one relative position indicator channel per control rod group. CTS 3.1.3.3 Action c states, "The provisions of Specification 3.0.4 are not applicable." The allowance in CTS 3.1.3.3 Action c applies to CTS 3.1.3.3 Action a and CTS 3.1.3.3 Action b. ITS 3.1.7ACTION A covers inoperabilities for the relative position indicator channels for one or more rods and ITS ACTION B covers inoperabilities the absolute position indicator channels for one or more rods. ITS ACTION C covers the inoperabilities for absolute position indicator channel and relative position indicator channels for one or more rods. ITS 3.1.7 ACTION A and ACTION B allow continuous operation in the Applicability if the Required Actions are met. The ITS 3.1.7 ACTIONS do not include a Note similar to the allowance in CTS 3.1.3.3 Action c. This changes the CTS by deleting the explicit allowance in CTS 3.1.3.3 Action c.

The purpose of the CTS 3.1.3.3 Action c is to allow entry into the Applicability of the Specification with one or more relative position indicator channels per control rod group inoperable or with one absolute position indicator channel inoperable. ITS LCO 3.0.4 has been added in accordance with the Discussion of Changes for ITS Section 3.0, DOC L01. This LCO allows entry into a MODE or other specified condition in the Applicability under certain conditions when a Technical Specification required component is inoperable. ITS LCO 3.0.4.a allows entry into a MODE or other specified condition in the Applicability of a Specification when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. ITS LCO 3.0.4.c allows entry into a MODE or other specified condition in the Applicability of a Specification when an allowance is stated in the individual value, parameter, or other Specification. ITS 3.1.7 ACTIONS A and B allow continuous operation for an unlimited period of time in MODE 1 and 2 as long as the applicable Required Actions are met. The allowances in ITS LCO 3.0.4.a apply to this ACTION and entry into the MODE or other specified condition in the Applicability will be allowed in the ITS. This change is acceptable because the allowances of CTS 3.1.3.3 Action c will apply in the ITS. This change is considered administrative because it does not result in technical changes to the CTS.

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

MORE RESTRICTIVE CHANGES

M01 CTS 3.1.3.3 Action a covers the inoperabilities for a maximum of one absolute position indicator channel per control rod group or one relative position indicator channel per control rod group and CTS 3.1.3.3 Action a.1 requires the reduction in THERMAL POWER to ≤ 60% of the THERMAL POWER allowable for the reactor coolant pump combination and a reduction of the High Flux Trip Setpoint to ≤ 70% of the THERMAL POWER allowable for the reactor coolant pump combination within 8 hours. ITS 3.1.7 does not include this option to reduce THERMAL POWER and to reduce the High Flux Trip Setpoint. This changes the CTS by deleting the allowance to reduce THERMAL POWER and the High Flux Trip Setpoint.

This change is acceptable because the CTS 3.1.3.3 Action a.2 and ITS 3.1.7 ACTIONS A and B provide appropriate compensatory actions for inoperable absolute and relative position indicators. This change deletes an allowance to reduce THERMAL POWER and the High Flux Trip Setpoint when a maximum of one absolute or relative position indicator channel per control rod group is inoperable. CTS 3.1.3.3 Action a.2 provides an alternative action that allows operation to continue provided the position of the control rod with the inoperable position indicator is verified within 8 hours by actuating one of the position reference indicators, the control rod group(s) containing the inoperable position indicator channel is verified to be maintained at the position reference indicators at least once per 12 hours, and operation is within the limits provided in Specification 3.1.3.5 (Safety Rod Insertion Limit), Specification 3.1.3.6 (Regulating Rod Insertion Limits), and Specification 3.1.3.9 (Axial Power Shaping Rod Insertion Limits). ITS 3.1.7 provides specific Required Actions for inoperable relative position indicator channels (ITS 3.1.7 ACTION A) and absolute position indicator channels (ITS 3.1.7 ACTION B). These Actions do not allow operation to continue by reducing THERMAL POWER and the High Flux Trip Setpoint. Therefore, to be able to continue to operate in the ITS under the same conditions, ITS 3.1.7 ACTION A and ACTION B must be met, as applicable. This change is designated as more restrictive because an option that allows the reduction of THERMAL POWER and the High Flux Trip Setpoint in the CTS is not allowed in the ITS.

M02 CTS 3.1.3.3 Action a.2.a requires the position of the control rod with the inoperable position indicator to be verified within 8 hours by actuating one of the position reference indicators and CTS 3.1.3.3 Action a.2.b requires the control rod group(s) containing the inoperable position indicator channel to be verified to be maintained at the position reference indicators at least once per 12 hours thereafter. ITS 3.1.7 ACTION B includes the same requirements however the Completion Time of 12 hours has been changed to 8 hours. This changes the CTS by requiring the Action to be performed more frequently.

The purpose of CTS 3.1.3.3 Action a.2.b is to verify that the control rod group(s), containing the inoperable position indicator channel is at the position reference indicator position at a regular frequency. This change requires the position of the control rods to be confirmed more frequently when the absolute position indicator channel is inoperable for one or more rods. This change is acceptable based on the fact that during normal power operation excessive movement of the groups is

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

not required. Also, if the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability. Also, the Frequency of 12 hours is consistent with the Frequency of CTS 4.1.3.3. (ITS SR 3.1.7.1) and therefore an accelerated Frequency is considered necessary when the position channel is inoperable. This change has been designated as more restrictive because it reduces the Completion Time from 12 hours to 8 hours.

M03 CTS 3.1.3.3 Action a.2.c requires verification that operation is with the limits in Specification 3.1.3.5 (Safety Rod Insertion Limit), Specification 3.1.3.6 (Regulating Rod Insertion Limits), and Specification 3.1.3.9 (Axial Power Shaping Rod Insertion Limits). CTS 3.1.3.3 Action a.1 requires this verification within 8 hours. ITS 3.1.7 Required Action B.1.2 requires the same verification however a Completion Time of 8 hours and once per 8 hours thereafter is specified. This changes the CTS by adding the Completion Time of "once per 8 hours."

The purpose of CTS 3.1.3.3 Action a.2.c is to ensure the applicable limits are met. This change is acceptable because the 8 hour Completion Time is reasonable for allowing the operator adequate time to determine the affected rods are in compliance with these LCOs. Continuing to verify the rod positions every 8 hours thereafter is reasonable for ensuring that rod alignment and insertion are not changing and because during normal power operation excessive movement of the groups is not required. Also, if the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability. Furthermore, the Completion Times are consistent with the times specified to determine the position of the rods. This change is designated as more restrictive because it adds a new Completion Time to the CTS.

M04 CTS 3.1.3.3 Action b covers the inoperabilities for more than one relative position indicator channel per control rod group and requires verification that the absolute position indicators channels for the affected control rod assemblies are OPERABLE. ITS 3.1.7 ACTION A covers inoperabilities for the relative position indicator channels for one or more rods and it requires the determination that the absolute position indicator channel for the rod(s) is OPERABLE within 8 hours and once per 8 hours thereafter. This changes the CTS by adding specific Completion Time to verify the absolute position indicator channels are OPERABLE.

The purpose of CTS 3.1.3.3 Action b, in part, is to ensure the absolute position indicator channels are OPERABLE. CTS 3.1.3.3 Action b does not provide any explicit Completion Times to perform the applicable verifications. This change is acceptable because the Completion Time of 8 hours is reasonable to provide adequate time for the operator to determine position indicator channel status. Continuing the verification every 8 hours thereafter in the applicable condition is acceptable, based on the fact that during normal power operation excessive movement of the groups is not required. Also, if the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability. Also, the Frequency of 12 hours is consistent with the normal Frequency of CTS 4.1.3.3. (ITS SR 3.1.7.1) and therefore an accelerated Frequency is considered necessary when the relative position

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

indication channel is inoperable. This change is designated as more restrictive because it adds new Completion Times to the CTS.

M05 CTS 3.1.3.3 does not contain an Action to follow if the provided Actions cannot be met and does not provide an Action to follow with both absolute and relative position indicator channels inoperable for one or more rods. 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 C, which states that the plant must immediately declare the rod(s) inoperable. For CONTROL RODs (regulating rods and safety rods) this will require entry into ITS 3.1.4 ACTION D and the plant is required to verify SDM is within limits or initiate boration to restore SDM to with limit within one hour and to be in MODE 3 within 6 hours. 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 and adds the SDM requirements.

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. The additional requirements for SDM are necessary because SDM may be adversely affected. This change is designated as more restrictive because it allows less time to shutdown and adds additional requirements associated with SDM.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.1.3.3 requires the safety, regulating, and axial power shaping rod absolute position indicator channels and relative position indicator channels to be OPERABLE "and capable of determining the control rod group average positions within +/- 1.5%." ITS LCO 3.1.7 requires the absolute position indicator channel and the relative position indicator channel for each CONTROL ROD and APSR to be OPERABLE. This changes the CTS by deleting the detail of the capability of the indicators "and capable of determining the control rod group average positions within +/- 1.5%" and relocating this detail to the UFSAR.

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 requires the absolute position indicator channel and the relative position indicator channel for each CONTROL

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

ROD and APSR to be OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the UFSAR. The UFSAR is controlled under 10 CFR 50.59 or 10 CFR 50.71(e), which ensures changes are properly evaluated. 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.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.1.3.3 Action a.2.a requires the position of the control rod to be verified with the 0%, 25%, 50%, 75%, or 100% position reference indicator channels and CTS 3.1.3.3 Action a.2.b requires the position of the control rod to be maintained at the 0%, 25%, 50%, 75%, or 100% position reference indicator positions. ITS 3.1.7 Required Actions B.1.1 requires actuation of the affected rod's zone reference indicators and ITS 3.1.7 Required Action B.1.2 requires the rods to be maintained at the zone reference indicator position, but the details of where the rod's zone reference indicators are located (i.e., 0%, 25%, 50%, 75%, or 100%) 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 to actuate the affected rod's zone reference indicators and to maintain the control rod at the zone reference indicator position. The details on the location of the rod's zone reference indicators 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.

LA03 *(Type 5 – Removal of Cycle-Specific Parameter Limits from the Technical Specifications to the Core Operating Limits Report)* CTS 4.1.3.3 requires each absolute and relative position indicator to be determined OPERABLE by verifying that the relative position indicator channels and the absolute position indicator channels agree within "3.46%." ITS SR 3.1.7.1 requires the verification that the absolute position indicator channels and the relative position indicator channels agree within the limit specified in the COLR. This changes the CTS by relocating the agreement criteria, 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

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ITS 3.1.7, POSITION INDICATOR CHANNELS

still retains the requirement to verify that the absolute position indicator channels and the relative position indicator channels agree within the limit. 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 5.6.3, "CORE OPERATING LIMITS REPORT." ITS 5.6.3 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.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.3 Action a covers the inoperabilities for a maximum of one absolute position indicator channel per control rod group or one relative position indicator channel per control rod group. CTS 3.1.3.3 Action b covers the inoperabilities for more than one relative position indicator channel per control rod group. ITS 3.1.7 ACTIONS are modified by a Note that states "Separate Condition entry is allowed for each inoperable position indicator channel." ITS ACTION A covers inoperabilities for the relative position indicator channels for one or more rods and ITS ACTION B covers inoperabilities for the absolute position indicator channels for one or more rods. ITS ACTION C covers the inoperabilities for absolute position indicator channel and relative position indicator channels for one or more rods. This changes the CTS by allowing separate Condition entry for each inoperable absolute position indicator channel and relative position indicator.

The purpose of CTS 3.1.3.3 Action a is to provide compensatory actions for a maximum of one absolute position indicator channel per control rod group or one relative position indicator channel per control rod group while the purpose of CTS 3.1.3.3 Action b is to provide compensatory actions for more than one relative position indicator channel per control rod group. 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 both the relative and absolute inoperable position indicator channels while the CTS only allows this for inoperable relative position indicator channels. The ITS will allow each inoperable relative or absolute rod position indication 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

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.3 Action a, in part, covers the inoperabilities for a maximum of one relative position indicator channel per control rod group. CTS 3.1.3.3 Action a.2 provides an action that allows operation to continue provided the position of the control rod with the inoperable position indicator is verified within 8 hours by actuating one of the position reference indicators, the control rod group(s) containing the inoperable position indicator channel is verified to be maintained at the position reference indicators at least once per 12 hours, and operation is within the limits provided in Specification 3.1.3.5 (Safety Rod Insertion Limit), Specification 3.1.3.6 (Regulating Rod Insertion Limits), and Specification 3.1.3.9 (Axial Power Shaping Rod Insertion Limits). CTS 3.1.3.3 Action b covers the inoperabilities for more than one relative position indicator channel per control rod group and requires the application of CTS 3.1.3.3 Action a.1 or a.2 and verification that the absolute position indicators channels for the affected control rod assemblies are OPERABLE. ITS 3.1.7 ACTION A covers inoperabilities for the relative position indicator channels for one or more rods and it requires the determination that the absolute position indicator channel for the rod(s) is OPERABLE. This changes the CTS by replacing the CTS 3.1.3.3 Action a.2 requirements for the inoperable relative position indicator channels and replacing it with a Required Action to determine the absolute position indicator channel for the rod(s) is OPERABLE consistent with the requirements in CTS 3.1.3.3 Action b.

The purpose of CTS 3.1.3.3 Action a.2, in part, is to provide compensatory actions for a maximum of one inoperable relative rod position indicator channel per group while the purpose of CTS 3.1.3.3 Action b is to provide compensatory actions for more than one relative position indicator channel per control rod group. 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 replaces the CTS 3.1.3.3 Action a.2 requirements for the inoperable relative position indicator channels with a Required Action to determine the absolute position indicator channel for the rod(s) is OPERABLE consistent with the requirements in CTS 3.1.3.3 Action b. If the relative position indicator channel is inoperable for one or more rods, the position of the rod(s) is still monitored by the absolute position indicator channel for each affected rod. The absolute position indicator channel may be used if it is determined to be OPERABLE. This change is acceptable because the Required Action provide appropriate compensatory actions for each inoperable relative 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.

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ITS 3.1.7, POSITION INDICATOR CHANNELS

L03 *(Category 4 – Relaxation of Required Action)* ITS 3.1.7 ACTION B covers inoperabilities associated with the absolute position indicator channel for one or more rods. ITS 3.1.7 Required Action B.2.1 requires the control groups with nonindicating rods to be placed under manual control within 8 hours and ITS 3.1.7 Required Action B.2.2 requires the determination of the position of the noninidicating rods indirectly with fixed incore instrumentation within 8 hours, once per 8 hours thereafter, and 1 hour after motion of nonindicating rods which exceeds 11% in one direction since the last determination of the rod's position (Not applicable during the first 8 hour period). This changes the CTS by providing alternative Required Actions when an absolute position indicator channel is inoperable for one or more rods.

The purpose of ITS 3.1.7 Required Action B.2.1 and B.2.2 is to monitor and control the movement of rods associated with inoperable absolute position indicators. 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 provides alternative compensatory actions when an absolute position indicator channel is inoperable for one or more rods. If the absolute position indicator is inoperable for one or more rods, the position of the rod is monitored by the relative position indicator channel for each affected rod. However, the relative position indicator channel is not as reliable a method of monitoring rod position as the absolute position indicator because it counts electrical pulse steps. The fixed incore system can be used to indirectly determine the absolute position of the affected rod. The fixed incore instrumentation can provide a continual update of CONTROL ROD position, therefore this method can be used to allow continued operation of the reactor with a manual rod movement, while maintaining verification of rod insertion and alignment. Required Action B.2.1 restricts rod motion by placing the groups with nonindicating rods in manual control; thus, even if the rod fails to move in alignment with the group, misalignment is limited. The required Completion Time of 8 hours provides the operator adequate time for placing the rods in manual control, and is consistent with the required Completion Time for Required Action B.1.1. If the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability. Continuing to verify the rod positions every 8 hours is reasonable for ensuring that rod alignment and insertion are not changing, and provides the operator adequate time to correct any deviation that may occur. The additional Completion Time of 1 hour after motion of nonindicating rods, which exceeds 11% in one direction since the last determination of the rod's position, ensures that the rod with inoperable position indication will not be misaligned for a significant period of time, in the event the rod is moved. The specified Completion Times are acceptable because the simultaneous occurrence of a mispositioned rod and an event sensitive to the rod position has a small probability. This change is acceptable because the Required Actions provide appropriate compensatory actions for inoperable absolute position indicators.

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This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 *(Category 4 – Relaxation of Required Action)* CTS 3.1.3.3 does not contain an Action to follow if the provided Actions cannot be met and does not provide an Action to follow with both absolute and relative position indicator channels inoperable for one or more rods. 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 C that requires the plant to immediately declare the rod(s) inoperable. For AXIAL POWER SHAPING RODs this will require entry into ITS 3.1.6 ACTION A and the plant is required to perform SR 3.2.3.1 (the verification of AXIAL POWER IMBALANCE) within 2 hours and 2 hours after each APSR movement. This changes the CTS by eliminating the requirement to enter CTS 3.0.3 and commence a plant shutdown.

The purpose of ITS 3.1.7 ACTION C is to provide the appropriate default action for inoperable rod position indication channel(s) associated with AXIAL POWER SHAPING RODs. 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 eliminates the requirement to enter CTS 3.0.3 and commence a plant shutdown. CTS 3.1.3.3 does not contain an Action to follow if the provided Actions cannot be met and does not provide an Action to follow with both absolute and relative position indicator channels inoperable for one or more AXIAL POWER SHAPING RODS. ITS 3.1.7 contains ACTION C that requires the plant to immediately declare the rod(s) inoperable. This will require entry into ITS 3.1.6 ACTION A and the plant is required to perform SR 3.2.3.1 (the verification of AXIAL POWER IMBALANCE) within 2 hours and 2 hours after each APSR movement. Verification of the AXIAL POWER IMBALANCE after APSR movement ensures the movement of the APSR group has not resulted in violation of the AXIAL POWER IMBALANCE limit, if the APSR was misaligned. This change is designated as less restrictive because additional time is allowed to operate in MODES 1 and 2 with inoperable APSR position indication channels than in the CTS.

L05 *(Category 7 – Relaxation Of Surveillance Frequency - Non-24 Month Type Change)* CTS 4.1.3.3 requires each absolute and relative position indicator channel to be determined to be OPERABLE by verifying that the relative position indicator channels and the absolute position indicator channels agree at least once per 12 hours. However, if the asymmetric rod monitor is inoperable, then a comparison of the relative position indicator and absolute position indicator channel(s) of the rod(s) with the inoperable asymmetric rod monitor must be performed at least once per 4 hours. ITS SR 3.1.7.1 requires the verification that the absolute position indicator channels and the relative position indicator channels agree within the limit every 12 hours. This changes the CTS by

DISCUSSION OF CHANGES
ITS 3.1.7, POSITION INDICATOR CHANNELS

eliminating the requirement to verify the individual control rod positions to be within limit every 4 hours when the asymmetric rod monitor is inoperable.

The purpose of CTS 4.1.3.3 is to periodically verify that the rods are within the position agreement criteria. This change is acceptable because increasing the Frequency of rod position agreement verification when the asymmetric rod monitor is inoperable is unnecessary, since an inoperability of the monitor does not increase the probability that the position channels are not within the agreement criteria. The routine 12 hour Frequency (ITS SR 3.1.7.1) continues to ensure the control rods are within the agreement criterion. Furthermore, the asymmetric rod monitor is for indication only. Its use is not credited in any safety analyses. Thus, any response determined necessary by plant personnel due to an inoperable alarm is more appropriately controlled by plant procedures, not Technical Specifications. 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

3.1.7 Position Indicator Channels

3.1.3.3 LCO 3.1.7 The absolute position indicator channel and the relative position indicator channel for each CONTROL ROD and APSR shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

-----NOTE-----

3.1.3.3 Action a, 3.1.3.3 Action b. DOC L01

Separate Condition entry is allowed for each inoperable position indicator channel.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L02, 3.1.3.3 Action b	A. The relative position indicator channel inoperable for one or more rods.	A.1 Determine the absolute position indicator channel for the rod(s) is OPERABLE.	8 hours AND Once per 8 hours thereafter
3.1.3.3 Action a.2	B. The absolute position indicator channel inoperable for one or more rods.	B.1.1 Determine position of the rods with inoperable absolute position indicator by actuating the affected rod's zone position reference indicators. AND	8 hours

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CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.1.3.3 Action a.2.b). 3.1.3.3 Action a.2.c)		B.1.2 Determine rods with inoperable position indicators are maintained at the zone reference indicator position and within the limits specified in LCO 3.1.5, "Safety Rod Insertion Limit," LCO 3.2.1, "Regulating Rod Insertion Limits," or LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits," as applicable. OR	8 hours AND Once per 8 hours thereafter
DOC L03		B.2.1 Place the control groups with nonindicating rods under manual control. AND	8 hours

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
DOC L03		B.2.2	Determine the position of the nonindicating rods indirectly with fixed incore instrumentation.	8 hours AND Once per 8 hours thereafter AND -----------NOTE---------- Not applicable during first 8 hour period ----------------------------- 1 hour after motion of nonindicating rods, which exceeds [15 inches] 11% in one direction since the last determination of the rod's position	1
DOC M05, DOC L04	C. The absolute position indicator channel and the relative position indicator channel inoperable for one or more rods. OR Required Action and associated Completion Time of Condition A or B not met.	C.1	Declare the rod(s) inoperable.	Immediately	2

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CTS

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY
4.1.3.3	SR 3.1.7.1	Verify the absolute position indicator channels and the relative position indicator channels agree within the limit specified in the COLR.	12 hours

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.7, POSITION INDICATOR CHANNELS

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

2. This correction has been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 4.1.6.b and 4.1.6.i.5.v.

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

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.7 Position Indicator Channels

UFSAR, Appendix 3D.1.9

BASES

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 and APSR position indicators, and thereby ensure compliance with the CONTROL ROD and APSR alignment and insertion limits. 4

The OPERABILITY, including position indication, of the safety and regulating rods is an initial condition assumption in all safety analyses that assume rod insertion upon reactor trip. Maximum rod misalignment for the safety rods, regulating rods, and APSRs is assumed in the safety analysis, which directly affect core power distributions and assumptions of available SDM.

Mechanical or electrical failures may cause a CONTROL ROD or APSR to become misaligned from its group. CONTROL ROD or APSR 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 and APSR alignment are related to core operation within design power peaking limits and the core design requirement of a minimum SDM. Rod position indication is needed to assess rod OPERABILITY and alignment.

Limits on CONTROL ROD alignment, APSR alignment, and safety rod position 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.

is essentially fully redundant consisting of two independent voltage dividers, each with

Two methods of CONTROL ROD and APSR position indication are provided in the CONTROL ROD Drive Control System. The two means are by absolute position indicator and relative position indicator transducers. The absolute position indicator transducer consists of a series of magnetically operated reed switches mounted in a tube parallel to the CONTROL ROD drive mechanism (CRDM) motor tube extension. Switch contacts close when a permanent magnet mounted on the upper end of the CONTROL ROD assembly (CRA) leadscrew extension comes near. As the leadscrew and CRA move, the switches operate 1

This analog voltage consists of two output channels that are averaged and buffered by the analog position indicator amplifier to form a single composite analog position indicator signal. Incorporating isolation switches at the input to the analog position indicator amplifier allows either of the independent position indication circuits to be totally isolated from the other circuit in the event either circuit should fail.

BACKGROUND (continued)

sequentially, producing an analog voltage proportional to position. Other reed switches included in the same tube with the position indicator matrix provide full in and full out limit indications, and absolute position indications at 0%, 25%, 50%, 75%, and 100% travel (called zone reference indicators). The relative position indicator transducer is a potentiometer, driven by a step motor that produces a signal proportional to CONTROL ROD position, based on the electrical pulse steps that drive the CRDM. 1 1

Two absolute position indicator channel designs may be used in the unit: type A absolute position indicators and type A-R4C absolute position indicators. The type A absolute position indicator transducer is a voltage divider circuit made up of 48 resistors of equal value connected in series. One end of 48 reed switches is connected at a junction between each of the resistors, so that as the magnet mounted on the leadscrew moves, either one or two reed switches are closed in the vicinity of the magnet. The type A-R4C (redundant four channel) absolute position indicator transducer has two parallel sets of voltage divider circuits made up of 36 resistors each, connected in series (channels A and B). One end of 36 reed switches is connected at a junction between each of the resistors of the two parallel circuits. The reed switches making up each circuit are offset, such that the switches for channel A are staggered with the switches for channel B. The type A-R4C is designed such that either two or three reed switches are closed in the vicinity of the magnet. By its design, the type A-R4C absolute position indicator provides redundancy, with the two three sequence of pickup and drop out of reed switches to enable a continuity of position signal when a single reed switch fails to close. 1

indicators on a control panel

sub-

or

operator

~~CONTROL~~ ~~ROD~~ position indicating readout devices located in the control room consist of single CRA position ~~meters on a wall~~ mounted position indication panel and four group average position meters on the console. A selector switch permits either relative or absolute position indication to be displayed on all of the single rod meters. Indicator lights are provided on the single CRA meter panel to indicate when each CRA is fully withdrawn, fully inserted, enabled, ~~or transferred,~~ and whether a CRA position asymmetry alarm condition is present. Indicators on the console show full insertion, full withdrawal, and enabled for motion for each ~~CONTROL~~ ~~ROD~~ group. Identical instrumentation and devices exist for the APSR group. The consequence of continued operation with an inoperable absolute position indicator or relative position indicator channel is a decreased reliability in determining ~~CONTROL~~ ~~ROD~~ position. Therefore, the potential for operation in violation of design peaking factors or SDM is increased. 1

BASES

APPLICABLE SAFETY ANALYSES

CONTROL ROD and APSR 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 RODS or APSRs operating outside their limits undetected. Regulating rod, safety rod, and APSR positions must be known 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, "Safety Rod Insertion Limits," LCO 3.2.1, "Regulating Rod Insertion Limits," and LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits"). The rod positions must also be known in order to verify the alignment limits are preserved (LCO 3.1.4, "CONTROL ROD Group Alignment Limits," and LCO 3.1.6, "AXIAL POWER SHAPING ROD (APSR) Alignment Limits"). CONTROL ROD and APSR 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 indicator channels satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii). The CONTROL ROD position indicators monitor CONTROL ROD position, which is an accident initial condition. 1

LCO

LCO 3.1.7 specifies that one absolute position indicator channel and one relative position indicator channel be OPERABLE for each CONTROL ROD and APSR.

The agreement between the relative position indicator channel and the absolute position indicator channel, within the limit given in the COLR, indicates that relative position indicators are adequately calibrated and can be used for indication of the measurement of CONTROL ROD group position. A deviation of less than the allowable limit, given in the COLR, in position indication for a single CONTROL ROD or APSR, ensures confidence that the position uncertainty of the corresponding CONTROL ROD group or APSR group is within the assumed values used in the analysis that specifies CONTROL ROD group and APSR insertion limits.

and APSR

These requirements ensure that CONTROL ROD position indication during power operation and PHYSICS TESTS is accurate, and that design assumptions are not challenged. OPERABILITY of the position indicator channels ensures that inoperable, misaligned, or mispositioned CONTROL RODS or APSRs can be detected. Therefore, power peaking and SDM can be controlled within acceptable limits. 5

BASES

APPLICABILITY

In MODES 1 and 2, OPERABILITY of position indicator channels is required, since the reactor is, or is capable of, generating THERMAL POWER in these MODES. In MODES 3, 4, 5, and 6, Applicability is not required because the reactor is shut down with the required minimum SDM and is not generating THERMAL POWER.

ACTIONS

A.1

If the relative position indicator channel is inoperable for one or more rods, the position of the rod(s) is still monitored by the absolute position indicator channel for each affected rod. The absolute position indicator channel may be used if it is determined to be OPERABLE. The required Completion Time of 8 hours is reasonable to provide adequate time for the operator to determine position indicator channel status. Continuing the verification every 8 hours thereafter in the applicable condition is acceptable, based on the fact that during normal power operation excessive movement of the groups is not required. Also, if the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability.

B.1.1 and B.1.2 6

If the absolute position indicator channel is inoperable for one or more rods, the position of the rod(s) is monitored by the relative position indicator channel for each affected rod. However, the relative position indicator channel is not as reliable a method of monitoring rod position as the absolute position indicator because it counts electrical pulse steps driving the CRDM motor rather than actuating a switch located at a known elevation. Therefore, the affected rod's position can be determined with more certainty by actuating one of its zone reference indicator switches located at discrete elevations (Required Action B.1.1). The required Completion Time of 8 hours provides the operator adequate time for adjusting the affected rod's position to an appropriate zone reference indicator location. If the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability. 6

~~B.1.2~~ 6

To allow continued operation, Required Action B.1.2 requires the rods with inoperable absolute position indicator channels ~~are~~ to be maintained at the zone reference indicator position. In addition, the affected rods ~~are~~ must be maintained within the limits of LCO 3.1.5 (when the affected rod is a safety rod), LCO 3.2.1 (when the affected rod is a regulating rod), or LCO 3.2.2 (when the affected rod is

BASES

ACTIONS (continued)

an APSR). This Required Action ensures safety rods remain fully withdrawn, and that regulating rods and APSRs remain aligned within their insertion limits. The required Completion Time of 8 hours is reasonable for allowing the operator adequate time to determine the affected rods are in compliance with these LCOs. Continuing to verify the rod positions every 8 hours thereafter is reasonable for ensuring that rod alignment and insertion are not changing, and provides the operator adequate time to correct any deviation that may occur. Continuing the verification every 8 hours thereafter in the applicable condition is acceptable, based on the fact that during normal power operation excessive movement of the groups is not required. Also, if the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability.

Note: Davis-Besse does not currently have the computer software installed to allow use of the fixed incore instrumentation, as described below. Therefore, before this option is used, the proper software must be installed.

B.2.1 and B.2.2 6

If the absolute position indicator is inoperable for one or more rods, the position of the rod is monitored by the relative position indicator channel for each affected rod. However, the relative position indicator channel is not as reliable a method of monitoring rod position as the absolute position indicator because it counts electrical pulse steps. Therefore, Required Actions B.2.1 and B.2.2 provide the option to indirectly determine the position of the rod. 6 The fixed incore system can be used to indirectly determine the absolute position of the affected rod. The fixed incore instrumentation can provide a continual update of ~~CONTROL ROD~~ position, therefore this method can be used to 1 allow continued operation of the reactor with a manual ~~CONTROL ROD~~ movement, while maintaining verification of ~~CONTROL ROD~~ insertion 1 and alignment. Required Action B.2.1 restricts rod motion by placing the 2 groups with nonindicating rods in manual control; thus, even if the rod fails to move in alignment with the group, misalignment is limited. The required Completion Time of 8 hours provides the operator adequate time for placing the rods in manual control, and is consistent with the required Completion Time for Required Action B.1.1. If the rod is out of position during this 8 hour period, the simultaneous occurrence of an event sensitive to the rod position has a small probability.

BASES

ACTIONS (continued)

B.2.2 (Required Action B.2.2) 6

Continuing to verify the rod positions every 8 hours is reasonable for ensuring that rod alignment and insertion are not changing, and provides the operator adequate time to correct any deviation that may occur. The additional Completion Time of 1 hour after motion of nonindicating rods, which exceeds 15 inches 11% in one direction since the last determination of the rod's position, ensures that the rod with inoperable position indication will not be misaligned for a significant period of time, in the event the rod is moved. The specified Completion Times are acceptable because the simultaneous occurrence of a mispositioned rod and an event sensitive to the rod position has a small probability. 3

C.1

or If both the absolute position indicator channel and relative position indicator channel are inoperable for one or more rods, or if the any Required Actions and associated Completion Times are is not met, the position of the rod(s) is not known with certainty. Therefore, each affected rod must be declared inoperable, and the limits of LCO 3.1.4 or LCO 3.1.6 apply. The required Completion Time for declaring the rod(s) inoperable is immediately. Therefore LCO 3.1.4 or LCO 3.1.6 is entered immediately, and the required Completion Times for the appropriate Required Actions in those LCOs apply without delay. 3

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

Verification is required that the Absolute Position Indicator channels and Relative Position Indicator channels agree within the limit given in the COLR. This verification ensures that the Relative Position Indicator channels, which are regarded as the potentially less reliable means of position indication, remain OPERABLE and accurate. The required Frequency of 12 hours is adequate for verifying that no degradation in system OPERABILITY has occurred.

BASES

UFSAR. Appendix 3D.1.9

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 13~~. UFSAR, Section 15. (4)

2. ~~FSAR, Section [14.1.2.2], Section [14.1.2.3], Section [14.1.2.6], Section [14.1.2.7], Section [14.2.2.4], and Section [14.2.2.5]~~. (1)

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JUSTIFICATION FOR DEVIATIONS
ITS 3.1.7 BASES, POSITION INDICATOR CHANNELS

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. Typographical error corrected.

3. Changes have been made to be consistent with changes made to the Specification.

4. Davis-Besse was designed and under construction prior to the promulgation of 10 CFR 50, Appendix A. The design of Davis-Besse meets the intent of 10 CFR 50, Appendix A published in the Federal Register on February 20, 1971, and as amended in Federal Register on July 7, 1971. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

5. Changes are made to be consistent with the Specification requirements.

6. Changes have been made for clarity. Required Actions B.1.1 and B.1.2 provide one option, while Required Actions B.2.1 and B 2.2 provide a second option. Therefore, the Bases discussions of each option have been combined into one discussion.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.7, POSITION INDICATOR CHANNELS

There are no specific NSHC discussions for this Specification.

ATTACHMENT 8

ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

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

ITS

A01

3/4.10 SPECIAL TEST EXCEPTIONS

GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

M05

LIMITING CONDITION FOR OPERATION

A03

LCO 3.1.8

3.10.1 The group height, insertion and power ~~distribution~~ limits of Specifications 3.1.3.1, 3.1.3.2, 3.1.3.5, ~~3.1.3.6~~, ~~3.1.3.7~~, 3.1.3.9, 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,

b. The High Flux Trip Setpoint is ≤ 10% of RATED THERMAL POWER higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% of RATED THERMAL POWER, and

Add proposed Note LCO 3.1.8 part c. — L01

c. The limits of Specifications 3.2.2 and 3.2.3 are maintained and determined at the frequencies specified in 4.10.1.2 below.

Add proposed LCO 3.1.8 part d — A02

APPLICABILITY: MODE 1.

ACTION:

Add proposed Note to Condition B Note to part 4 — L01

ACTION B

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, 3.1.3.2, 3.1.3.5, 3.1.3.6, 3.1.3.7, 3.1.3.9, 3.2.1 or 3.2.4 are suspended, either:

~~a. Reduce THERMAL POWER sufficiently to satisfy the ACTION requirements of Specifications 3.2.2 and 3.2.3, or~~

~~b. Be in at least HOT STANDBY within 6 hours.~~

Add proposed Required Action B.1 — M01

Add Condition B parts 1 through 4 and Required Action B.1 — M02

SURVEILLANCE REQUIREMENTS

SR 3.1.8.3

4.10.1.1 The High Flux Trip Setpoint shall be determined to be set within the limits specified within 8 hours prior to the initiation of and at least once per 8 hours during PHYSICS TESTS.

Add proposed Note to SR 3.1.8.2 — L01

SR 3.1.8.2

4.10.1.2 The Surveillance Requirements of Specifications 4.2.2 and 4.2.3 shall be performed at least once per two hours during PHYSICS TESTS.

Add proposed SR 3.1.8.1 and SR 3.1.8.4 — M03

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ITS

A01

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

LA01

See ITS 3.1.1, ITS 3.1.2, ITS 3.1.9, and ITS 3.2.1

LCO 3.1.8.d 3.1.1.1 The SHUTDOWN MARGIN shall be ~~$\geq$ 1% Δk/k~~. within limits specified in the COLR

APPLICABILITY: MODES 1, 2*, 3**, 4 and 5.

ACTION:

LA01

not within limits

within 15 minutes

L02

ACTION A With the SHUTDOWN MARGIN ~~< 1% Δk/k~~, ~~immediately~~ initiate ~~and continue~~ boration ~~at $\geq$ 25 gpm of 7875 ppm boron or its equivalent~~, until the required SHUTDOWN MARGIN is restored.

L03

Add proposed Required Action A.2

M04

SURVEILLANCE REQUIREMENTS

See ITS 3.1.1 and ITS 3.2.1

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be $\geq$ 1% Δk/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 increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

See ITS 3.1.4

See ITS 1.0

b. When in MODES 1 or 2#, at least once per 12 hours, by verifying that regulating rod groups withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2## 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 3.2.1

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

See ITS 3.1.1

See ITS 3.1.1 and ITS 3.2.1

*See Special Test Exception 3.10.4

**See LCO 3.7.9, Steam Generator Level, for additional SHUTDOWN MARGIN requirements.

See ITS 3.1.1

#With $k_{eff} \geq 1.0$

##With $k_{eff} < 1.0$

See ITS 3.2.1

DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 CTS 3.10.1 does not specify any requirements for SDM. CTS 3.1.1.1 requires SDM to be met in MODE 1. ITS LCO 3.1.8 part d requires SDM to be within limits specified in the COLR. This changes the CTS by adding the SDM requirements to the PHYSICS TEST Exception LCO.

This change is acceptable because the requirements have not changed. CTS 3.1.1.1 requires SDM to met at all times in MODE 1. In the ITS, LCO 3.1.1 is not applicable in MODE 1 since compliance with LCO 3.1.5, "Safety Rod Insertion Limit," and LCO 3.2.1, "Regulating Rod Insertion Limits," ensures SDM is being met. This change is considered administrative because the technical requirements have not changed.

A03 CTS 3.10.1 allows the limitations of Specification 3.1.3.7 to be suspended during the performance of the PHYSICS TEST. ITS 3.1.8 does not include this specific allowance to suspend Specification 3.1.3.7 during the performance of the PHYSICS test.

This change is acceptable because the requirements have not changed. CTS 3.1.3.7, Rod Program, requirements have been relocated to the TRM. The TRM will continue to allow the Rod Program requirements of CTS 3.1.3.7 to be suspended during the PHYSICS test. This change is considered administrative because the technical requirements have not changed.

MORE RESTRICTIVE CHANGES

M01 CTS 3.10.1 Action specifies requirements for when Specification 3.2.2 (F_Q) or Specification 3.2.3 ($F^N_{\Delta H}$) limits are exceeded and requires a reduction in THERMAL POWER sufficiently to satisfy the ACTION requirements of Specifications 3.2.2 and 3.2.3 or to be in at least MODE 3 within 6 hours. ITS 3.1.8 Required Action B.1 requires the PHYSICS TEST exception to be suspended within 1 hour. This changes the CTS by replacing the current Action with a requirement to suspend the PYSICS TESTS exceptions within 1 hour.

The purpose of the CTS 3.10.1 Action is to place the plant in a safe condition when the limits are not met. Currently, the CTS 3.10.1 Action requires the reduction of THERMAL POWER or the placement of the unit in MODE 3 within 6 hours. The proposed Required Action requires the unit to suspend the PHYSICS TEST exception within 1 hour. Suspension of PHYSICS TESTS exceptions

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DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

requires restoration of each of the applicable LCOs to within specification. The Completion Time to accomplish this has been reduced from "6 hours" to "1 hour," therefore the change is more restrictive. The change is acceptable and necessary because the initial conditions for the safety analysis are not being met. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

M02 CTS 3.10.1 does not provide any Actions for when the requirements of LCO 3.10.1.a (the THERMAL POWER limitation) or LCO 3.10.1.b (the High Flux Trip Setpoint limitation) are not met. ITS 3.1.8 includes ACTION B that, in part, includes a Condition to cover THERMAL POWER > 85% RTP, High Flux trip setpoint > 10% higher than PHYSICS TESTS power level, and High Flux trip setpoint > 90% RTP. ITS 3.1.8 Required Action B.1 requires the suspension of PHYSICS TESTS exception within 1 hour. This changes the CTS by imposing an additional requirement on the application of the test exception LCO.

The purpose of the ITS 3.1.8 Conditions and Required Action B.1 is to place the plant in a safe condition when the limits are not met. Currently, the CTS 3.10.1 Action does not provide any compensatory actions if the requirements of LCO 3.10.1.a (the THERMAL POWER limitation) or LCO 3.10.1.b (the High Flux Trip Setpoint limitation) are not met. Therefore, testing would be suspended and the LCOs that have been suspended would have to be restored to within limit. The proposed Required Action requires the unit to suspend the PHYSICS TESTS exceptions within 1 hour. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification. The Completion Time to accomplish this is "1 hour," therefore the change is more restrictive. The change is acceptable and necessary because the initial conditions for the safety analysis are not being met. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

M03 CTS 3.10.1.a requires THERMAL POWER to be maintained ≤ 85% RTP, however there is no Surveillance Requirement associated with this requirement. CTS 3.1.1.1 requires SHTUDOWN MARGIN to be within limit, however the only Surveillance Requirement in MODE 1 is to verify the regulating rod groups are within the insertion limits. ITS SR 3.1.8.1 requires a verification that THERMAL POWER is < 85% RTP every hour and ITS SR 3.1.8.3 requires SDM to be with limits every 24 hours. This changes the CTS by adding two additional Surveillance Requirements.

This change is acceptable because the Surveillance Requirements are necessary to ensure the requirements of the LCO are being met. This change is designated as more restrictive because two new Surveillance Requirements are being added to the Technical Specifications.

M04 CTS 3.1.1.1 Action does not provide any specific requirements to suspend PHYSICS TESTS when SDM is not met. ITS 3.1.8 Required Action A.1 requires suspension of the PHYSICS TEST exception within 1 hour. This changes the CTS by imposing an additional requirement on the application of the test exception LCO.

DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

This change is acceptable because it imposes reasonable restrictions on the performance of PHYSICS TESTS when SDM is not met. The Bases for ITS 3.1.1, "SHUTDOWN MARGIN (SDM)," states that in MODE 1, the SDM is ensured by compliance with the rod insertion limit Specifications (LCO 3.1.5 and LCO 3.2.1). 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 1. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

M05 CTS 3.10.1 allows the requirements of Specification 3.1.3.6 (the regulating rod group insertion limits) to be suspended during PHYSICS TESTS. ITS LCO 3.1.8 only requires the regulating rod insertion limits associated with the restricted region to be suspended. This changes the CTS by imposing an additional requirement on the application of the test exception LCO.

The purpose of CTS 3.10.1 is to allow certain LCOs to not be met during the performance of PHYSICS TESTS. CTS 3.1.3.6 (ITS 3.2.1) specifies the physical insertion, sequence, and overlap limits for the regulating rod groups. This change will require the sequence and overlap limits to be met and will only allow the plant to enter the restricted operation region. The plant will not be able to enter the unacceptable region of the regulating group position operating limits curves. This change is acceptable because the PHYSICS TESTS do not require any test to violate the sequence and overlap limits and do not require entry into the unacceptable region of the regulating group position operating limits curves. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(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 require that the SDM be $\geq$ 1.0% $\Delta k/k$. ITS LCO 3.1.8.d states that the SDM shall be within the limits specified in the COLR, ITS 3.1.8 ACTION A provides actions for when the SDM is not within the limits, and ITS SR 3.1.8.4 requires verification that the SDM is within limits specified in the COLR. 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

DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

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 5.6.3, "CORE OPERATING LIMITS REPORT." ITS 5.6.3 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.

LESS RESTRICTIVE CHANGES

L01 *(Category 2 – Relaxation of Applicability)* CTS 3.10.1 requires the limits of Specification 3.2.2 (F_Q) and Specification 3.2.3 ($F^N_{\Delta H}$) to be maintained at all times during the PHYSICS TESTS in MODE 1. ITS 3.10.1.d only requires F_Q and $F^N_{\Delta H}$ to maintained at THERMAL POWER > 20% RTP. This changes the CTS by reducing the applicable conditions in which the Nuclear Heat Flux Hot Channel Factor (F_Q) and Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$) requirements must be met.

The purpose of CTS 3.10.1 is to establish limits that constrain the core power distribution within design limits during the PHYSICS TESTS such that accident initial condition protection criteria are preserved. This change is acceptable because the requirements continue to ensure that the core power distributions are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. This change revises the Applicability of F_Q and $F^N_{\Delta H}$ of CTS 3.10.1 from "MODE 1" to "MODE 1 with THERMAL POWER > 20% RTP." With THERMAL POWER less than or equal to 20% RTP, the reactor has insufficient stored energy in the fuel or energy being transferred to the coolant to require a limit on the distribution of core power. Along with this change the CTS 3.10.1 Action and Surveillance Requirement CTS 4.10.1.2 has been changed to only apply at THERMAL POWER > 20% RTP. This change is designated as less restrictive because the LCO requirements, Action, and Surveillance Requirement are applicable in fewer operating conditions than in the CTS.

L02 *(Category 3 – Relaxation of Completion Time)* When SDM is not within limit, the CTS 3.1.1.1 Action requires the plant to immediately initiate and continue boration at ≥ 25 gpm, of 7875 ppm boron or its equivalent, until the required SDM is restored. ITS 3.1.8 Required Action A.1 requires the boration to proceed within 15 minutes to reduce SDM to within limit. This changes the CTS by relaxing the Completion Time from "immediately" to 15 minutes.

The purpose of the CTS 3.1.1.1 Action is to restore the SDM to within its limit promptly. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the operability

DISCUSSION OF CHANGES
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

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 states 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.

L03 *(Category 4 – Relaxation of Required Action)* CTS 3.1.1.1 Action states that when the SDM is not within the applicable limits, boration must be initiated and continued at ≥ 25 gpm of 7875 ppm boron or equivalent until the required SDM is restored. ITS 3.1.8 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 Action 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 3.1.8 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.

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

CTS

3.1 REACTIVITY CONTROL SYSTEMS

3.1.8 PHYSICS TESTS Exceptions - MODE 1

3.10.1, 3.1.1.1

LCO 3.1.8 During the performance of PHYSICS TESTS, the requirements of:

Group

5

LCO 3.1.4, "CONTROL ROD Alignment Limits,"
LCO 3.1.5, "Safety Rod Insertion Limits,"
LCO 3.1.6, "AXIAL POWER SHAPING ROD Alignment Limits,"
LCO 3.2.1, "Regulating Rod Insertion Limits," for the restricted operation region only,
LCO 3.2.3, "AXIAL POWER IMBALANCE Operating Limits," and
LCO 3.2.4, "QUADRANT POWER TILT,"

; 1

(APSR) 3

; 4

LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits;"

(QPT) 3

may be suspended, provided:

a. THERMAL POWER is maintained ≤ 85% RTP, ; 1

High Flux

b. Nuclear overpower trip setpoint is ≤ 10% RTP higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP, ; 2 1

---NOTE---

c. Only required when THERMAL POWER is > 20% RTP.

$F_Q(Z)$ and $F^N_{\Delta H}$ are maintained within the limits specified in the COLR, and ; 2 1

d. SDM is within the limits specified in the COLR.

APPLICABILITY: MODE 1 during PHYSICS TESTS.

CTS

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.1.1.1 Action	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
3.10.1 Action	B. THERMAL POWER > 85% RTP. OR High Flux ~~Nuclear overpower~~ trip setpoint > 10% higher than PHYSICS TESTS power level. (2) OR High Flux ~~Nuclear overpower~~ trip setpoint > 90% RTP. (2) OR ------------NOTE------------ Only required when THERMAL POWER is > 20% RTP. ---------------------------- $F_Q(\boxed{Z})$ or $F^N_{\Delta H}$ not within limits. (2)	B.1 Suspend PHYSICS TESTS exceptions.	1 hour

CTS

SURVEILLANCE REQUIREMENTS

		SURVEILLANCE	FREQUENCY
DOC M03	SR 3.1.8.1	Verify THERMAL POWER is ≤ 85% RTP.	1 hour
4.10.1.2	SR 3.1.8.2	------------------------------NOTE------------------------------ Only required to be met when THERMAL POWER is > 20% RTP. --- Perform SR 3.2.5.1.	 2 hours
4.10.1.1	SR 3.1.8.3	Verify ~~nuclear overpower~~ High Flux trip setpoint is ≤ 10% RTP higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP.	8 hours 2
DOC M03	SR 3.1.8.4	Verify SDM is within the limits specified in the COLR.	24 hours

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

1. These punctuation corrections have been made consistent with the Writer's Guide *for the Improved Standard Technical Specifications*, TSTF-GG-05-01, *Section* 5.1.3.

2. Changes are made which reflect the plant specific nomenclature.

3. Changes are made to reflect another Specification.

4. The allowance to not meet the APSR insertion limits (ITS LCO 3.2.2) during a PHYSICS TEST has been added to be consistent with the allowances provided to not meet insertion limits for the safety rods (ITS LCO 3.1.5) and the regulating rods (ITS LCO 3.2.1). This is also consistent with the current licensing basis (CTS 3.10.1).

5. Correct LCO title has been provided.

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 Systems - MODE 1

BASES

BACKGROUND

The purpose of this MODE 1 LCO is to permit PHYSICS TESTS to be conducted by providing exemptions from the requirements of other LCOs. Establishment of a test program to verify that structures, systems, and components will perform satisfactorily in service is required by Section XI of 10 CFR 50, Appendix B (Ref. 1). Testing is required as an integral part of the design, fabrication, construction, and operation of the power plant. All functions necessary to ensure that specified design conditions are not violated during normal operation and anticipated operational occurrences must be tested. Requirements for notification of the NRC, for the purpose of conducting tests and experiments, are specified in 10 CFR 50.59 (Ref. 2).

The key objectives of a test program are to (Ref. 3): 1

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 1

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.

To accomplish these objectives, testing is performed prior to initial criticality; during startup, low power operations, and power ascension; at high powers; and after each fueling. 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 guidelines. The procedures include all information necessary to permit a detailed execution of testing required to ensure the design intent is met. PHYSICS TESTS are performed in accordance with

BASES

BACKGROUND (continued)

these procedures, and test results are approved prior to continued power escalation and long term power operation. Examples of PHYSICS TESTS include determination of critical boron concentration, CONTROL ROD group worths, reactivity coefficients, flux symmetry, and core power distribution.

APPLICABLE SAFETY ANALYSES

It is acceptable to suspend certain LCOs for PHYSICS TESTS because reactor protection criteria are preserved by the LCOs still in effect and by the SRs. Even if an accident occurs during PHYSICS TESTS with one or more LCOs suspended, fuel damage criteria are preserved because the limits on nuclear hot channel factors, ejected rod worth, and shutdown capability are maintained during the PHYSICS TESTS.

14.1-2 and 14.1-3 (2)

UFSAR

Reference 5 defines requirements for initial testing of the facility, including PHYSICS TESTS. Tables 13-3 and 13-4 (Ref. 6) summarize the zero, low power, and power tests. Requirements for reload fuel cycle PHYSICS TESTS are given in Table 1 ANSI/ANS-19.6.1-1985 (Ref. 4). Although these PHYSICS TESTS are generally accomplished within the limits of all LCOs, one or more LCOs must sometimes be suspended to make completion of PHYSICS TESTS possible or practical. (2)

post-initial fuel loading-precritical testing and post-criticality test, respectively

UFSAR, Appendix 4B (2)

A summary of the PHYSICS TESTS for each cycle are listed in Reference 7.

This is acceptable as long as the fuel design criteria are not violated. When one or more of the limits specified in:

LCO 3.1.4, "CONTROL ROD Group Alignment Limits,"
LCO 3.1.5, "Safety Rod Insertion Limits," (1)
LCO 3.1.6, "AXIAL POWER SHAPING ROD (APSR) Alignment Limits,"
LCO 3.2.1, "Regulating Rod Insertion Limits," for the restricted operation region only, (5)
LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits;"
LCO 3.2.3, "AXIAL POWER IMBALANCE Operating Limits," or
LCO 3.2.4, "QUADRANT POWER TILT (QPT)"

are suspended for PHYSICS TESTS, the fuel design criteria are preserved by maintaining the nuclear hot channel factors (in MODE 1 PHYSICS TESTS) within their limits, maintaining ejected rod worth within limits by restricting regulating rod insertion to within the acceptable operating region or the restricted operating region, by limiting maximum THERMAL POWER and by maintaining SDM within the limits specified in the COLR. Therefore, surveillance of the F_Q(Z), the $F^N_{\Delta H}$, and SDM is (2)

BASES

APPLICABLE SAFETY ANALYSES (continued)

required to verify that their limits are not exceeded. The limits for the nuclear hot channel factors are specified in the COLR. Refer to the Bases for LCO 3.2.5 for a complete discussion of $F_Q(Z)$ and $F^N_{\Delta H}$. During PHYSICS TESTS, one or more of the LCOs that normally preserve the $F_Q(Z)$ and $F^N_{\Delta H}$ limits may be suspended. However, the results of the safety analysis are not adversely impacted if verification that $F_Q(Z)$ and $F^N_{\Delta H}$ are within their limits is obtained, while one or more of the LCOs is suspended. Therefore, SRs are placed on $F_Q(Z)$ and $F^N_{\Delta H}$ during MODE 1 PHYSICS TESTS when THERMAL POWER exceeds 20% RTP to verify that these factors remain within their limits. Periodic verification of these factors allows PHYSICS TESTS to be conducted while continuing to maintain the design criteria. 2 2 2

PHYSICS TESTS include measurement of core nuclear parameters or exercise of control components that affect process variables. Among the process variables involved are AXIAL POWER IMBALANCE and QPT, which represent initial condition input (power peaking) for the accident analysis. Also involved are the movable control components, i.e., the regulating rods and the APSRs, which affect power peaking ~~and are~~ . The regulating rods are also required for shutdown of the reactor. The limits for these variables are specified for each fuel cycle in the COLR. 2

As described in LCO 3.0.7, compliance with Test Exceptions LCOs is optional, and therefore no criteria of 10 CFR 50.36(c)(2)(ii) apply. Test Exceptions 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.

LCO

This LCO permits individual CONTROL RODS to be positioned outside of their specified group alignment and withdrawal limits and to be assigned to other than specified CONTROL ROD groups, and permits AXIAL POWER IMBALANCE and QPT limits to be exceeded during the performance of PHYSICS TESTS. In addition, this LCO permits verification of the fundamental core characteristics and nuclear instrumentation operation. 4 4

The requirements of LCO 3.1.4, LCO 3.1.5, LCO 3.1.6, LCO 3.2.1 (for the ~~restricted operation region only),~~ LCO 3.2.2, LCO 3.2.3, and LCO 3.2.4 may be suspended during the performance of PHYSICS TESTS provided: 5

BASES

LCO (continued)

a. THERMAL POWER is maintained ≤ 85% RTP; 1

High Flux

b. ~~Nuclear overpower~~ trip setpoint is ≤ 10% RTP higher than the THERMAL POWER at which the test is performed, with a maximum setting of 90% RTP; 5 1

c. $F_Q(Z)$ and $F^N_{\Delta H}$ are maintained within limits specified in the COLR while operating at greater than 20% RTP; and 2 1

d. SDM is maintained within the limits specified in the COLR.

Operation with THERMAL POWER ≤ 85% RTP during PHYSICS TESTS provides an acceptable thermal margin when one or more of the applicable LCOs is out of specification. Eighty-five percent RTP is consistent with the maximum power level for conducting the intermediate core power distribution test specified in Reference 4. The High Flux ~~nuclear overpower~~ trip setpoint is reduced so that a similar margin exists between the steady state condition and trip setpoint as exists during normal operation at RTP. 5

LCO provision c is modified by a Note that requires the adherence to power peaking factor requirements only when THERMAL POWER is greater than 20% RTP. This establishes an LCO provision that is consistent with the Applicability of LCO 3.2.5, "Power Peaking Factors."

APPLICABILITY

This LCO is applicable in MODE 1, when the reactor has completed low power testing and is in power ascension, or during power operation with THERMAL POWER > 5% RTP but ≤ 85% RTP. This LCO is applicable for power ascension testing, as defined by Regulatory Guide 1.68 (Ref. 3). In MODE 2, Applicability of this LCO is not required because LCO 3.1.9, "PHYSICS TESTS Exceptions - MODE 2," addresses PHYSICS TESTS exceptions in MODE 2. In MODES 3, 4, 5, and 6, Applicability is not required because PHYSICS TESTS are not performed in these MODES.

BASES

ACTIONS

A.1 and A.2

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 addition tanks or the borated water storage tank.

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. The operator should begin boration with the best source available for the plant conditions. Boration will be continued until SDM is within limit. In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. 6

Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification.

B.1

If THERMAL POWER exceeds 85% RTP, then 1 hour is allowed for the operator to reduce THERMAL POWER to within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCO, addressed by PHYSICS TESTS exceptions.

High Flux

If the ~~nuclear overpower~~ trip setpoint is not within the specified limits, then 1 hour is allowed for the operator to restore the ~~nuclear overpower~~ trip setpoint within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCO, addressed by these PHYSICS TESTS exceptions. 5

High Flux

If the results of the incore flux map indicate that either $F_Q[(Z)]$ or $F^N_{\Delta H}$ has exceeded its limit when THERMAL POWER is greater than 20% RTP, then PHYSICS TESTS are suspended. This action is required because of direct indication that the core peaking factors, which are fundamental initial conditions for the safety analysis, are excessive. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification. 2

This Condition is modified by a Note that requires performance of the Required Action only when THERMAL POWER is greater than 20% RTP. This establishes an ACTIONS entry Condition that is consistent with LCO provision c and the Applicability of LCO 3.2.5, "Power Peaking Factors."

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

Verification that THERMAL POWER is ≤ 85% RTP ensures that the required additional thermal margin has been established prior to and during PHYSICS TESTS. The required Frequency of once per hour allows the operator adequate time to determine any degradation of the established thermal margin during PHYSICS TESTS.

SR 3.1.8.2

Verification that $F_Q\boxed{(Z)}$ and $F^N_{\Delta H}$ are within their limits ensures that core 2
local linear heat rate and departure from nucleate boiling ratio will remain within their limits, while one or more of the LCOs that normally control these design limits are out of specification. The required Frequency of 2 hours allows the operator adequate time for collecting a flux map and for performing the hot channel factor verifications, based on operating experience. If SR 3.2.5.1 is not met, PHYSICS TESTS are suspended and LCO 3.2.5 applies. This Frequency is more conservative than the Completion Time for restoration of the individual LCOs that preserve the 2
$F_Q\boxed{(Z)}$ and $F^N_{\Delta H}$ limits.

This SR is modified by a Note that requires performance only when THERMAL POWER is greater than 20% RTP. This establishes a performance requirement that is consistent with the Applicability of LCO 3.2.5, "Power Peaking Factors."

SR 3.1.8.3

High Flux

Verification that the ~~nuclear overpower~~ trip setpoint is within the limit 5
specified for each PHYSICS TEST ensures that core protection at the reduced power level is established and will remain in place during the PHYSICS TESTS. Performing the verification once every 8 hours allows the operator adequate time for determining any degradation of the established trip setpoint margin before and during PHYSICS TESTS and for adjusting the ~~nuclear overpower~~ trip setpoint. 5

High Flux

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.4

The SDM is verified by performing a reactivity balance calculation, considering, but not limited to, the following reactivity effects: 2

a. Reactor Coolant System (RCS) boron concentration;

b. ~~CONTROL ROD~~ position; 1 4

c. Doppler defect;

d. Fuel burnup based on gross thermal energy generation; 1

e. Samarium concentration;

f. Xenon concentration; and

g. Moderator defect.

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, December 13, 1985.~~ UFSAR, Appendix 4B. 2
5. U FSAR, Section ~~[13.4.8]~~ 14.1. 2 3
6. U FSAR, ~~Section [13.4.8],~~ Tables ~~13-3 and 13-4, Am. 49, September 30, 1976].~~ 14.1-2 and 14.1-3. 2 3
7. UFSAR, Appendix 4B, Section 9. 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.8 BASES, PHYSICS TESTS EXCEPTIONS – MODE 1

1. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

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. Typographical error corrected.

5. Changes are made to reflect changes made to the Specification.

6. Changes are made to be consistent with other places in the Bases (i.e., LCO 3.1.1 Required Action A.1).

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.8, PHYSICS TESTS EXCEPTIONS – MODE 1

There are no specific NSHC discussions for this Specification.

ATTACHMENT 9

ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

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

A01

ITS

SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

M04

A02

LCO 3.1.9 3.10.2 The limitations of Specifications 3.1.1.3, 3.1.3.1, 3.1.3.2, 3.1.3.5, ~~3.1.3.6~~, ~~3.1.3.7~~, and 3.1.3.9 may be suspended during the performance of PHYSICS TESTS provided: LCO 3.4.2 L03

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER, and

b. The reactor trip setpoints on the OPERABLE High Flux Channels are set at ≤ 25% of RATED THERMAL POWER.

c. The nuclear instrumentation ~~Source Range and Intermediate Range~~ high startup rate control rod withdrawal inhibit are OPERABLE. LA01

Add proposed LCO 3.1.9 part e L03

APPLICABILITY: MODE 2.

ACTION:

ACTION A With the THERMAL POWER > 5% of RATED THERMAL POWER, immediately open the control rod drive trip breakers.

Add proposed ACTION C L03

Add proposed ACTION D M01

SURVEILLANCE REQUIREMENTS

SR 3.1.9.3 4.10.2.1 The THERMAL POWER shall be determined to be ≤ 5% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

LA01

SR 3.1.9.1 4.10.2.2 Each ~~Source and Intermediate Range~~ and High Flux Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 24 hours prior to initiating PHYSICS TESTS.

Add proposed SR 3.1.9.4 M02

Add proposed SR 3.1.9.2 L03

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A01

ITS

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

LA02

LCO 3.1.9.d 3.1.1.1 The SHUTDOWN MARGIN shall be ~~≥ 1% Δk/k~~ not within limits specified in the COLR

See ITS 3.1.1, ITS 3.1.2, ITS 3.1.8, and ITS 3.2.1

APPLICABILITY: MODES 1, 2*, 3**, 4 and 5.

LA02

ACTION:

not within limits

within 15 minutes

L01

ACTION B With the SHUTDOWN MARGIN ~~< 1% Δk/k~~, ~~immediately~~ initiate ~~and continue~~ boration at ≥ 25 gpm ~~of 7875 ppm boron or its~~ equivalent, until the required SHUTDOWN MARGIN is restored.

L02

Add proposed Required Action B.2

M03

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be ≥ 1% Δk/k:

See ITS 3.1.1 and ITS 3.2.1

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 increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

See ITS 3.1.4

See ITS 1.0

b. When in MODES 1 or 2#, at least once per 12 hours, by verifying that regulating rod groups withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2## 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 3.2.1

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

See ITS 3.1.1

See ITS 3.1.1 and ITS 3.2.1

*See Special Test Exception 3.10.4

**See LCO 3.7.9, Steam Generator Level, for additional SHUTDOWN MARGIN requirements.

See ITS 3.1.1

#With $k_{eff} \geq 1.0$

##With $k_{eff} < 1.0$

See ITS 3.2.1

DISCUSSION OF CHANGES
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

ADMINISTRATIVE CHANGES

A01 In the conversion of the Davis-Besse 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-1430, Rev. 3.1, "Standard Technical Specifications-Babcock and Wilcox Plants" (ISTS).

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

A02 CTS 3.10.2 allows the limitation of Specification 3.1.3.7 to be suspended during the performance of the PHYSICS TEST. ITS 3.1.9 does not include this specific allowance to suspend Specification 3.1.3.7 during the performance of the PHYSICS test.

This change is acceptable because the requirements have not changed. CTS 3.1.3.7, Rod Program, requirements have been relocated to the TRM. The TRM will continue to allow the Rod Program requirements of CTS 3.1.3.7 to be suspended during the PHYSICS test. This change is considered administrative because the technical requirements have not changed.

MORE RESTRICTIVE CHANGES

M01 CTS 3.10.2 does not provide any Actions for when the requirements of LCO 3.10.2.b (the High Flux channel trip setpoint limitation) or LCO 3.10.2.c (the nuclear instrumentation high startup rate control rod withdrawal inhibit OPERABILITY requirement) are not met. ITS 3.1.9 ACTION D includes a Condition to cover the high flux trip setpoint not within limit and nuclear instrumentation high startup rate control rod withdrawal inhibit inoperable. ITS 3.1.9 Required Action D.1 requires the suspension of PHYSICS TESTS exception within 1 hour. This changes the CTS by imposing an additional requirement on the application of the test exception LCO.

The purpose of the ITS 3.1.9 Conditions and Required Action D.1 is to place the plant in a safe condition when the limits are not met. Currently, the CTS 3.10.2 Action does not provide any compensatory actions if the requirements of LCO 3.10.2.b (the High Flux channel trip setpoint limitation) or LCO 3.10.2.c (the nuclear instrumentation high startup rate control rod withdrawal inhibit OPERABILITY requirement) are not met. Therefore, testing would be suspended and the LCOs that have been suspended would have to be restored to within limit. The proposed Required Action requires the unit to suspend the PHYSICS TESTS exceptions within 1 hour. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification. The Completion Time to accomplish this is "1 hour," therefore the change is more restrictive. The change is acceptable and necessary because the initial conditions for the safety analysis are not being met. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

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DISCUSSION OF CHANGES
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

M02 CTS 3.1.1.1 requires SHTUDOWN MARGIN to be within limit, however the Surveillance Requirements in MODE 2 are to verify the regulating rod groups are within the insertion limits every 12 hours and to verify within 4 hours prior to achieving reactor criticality predicted control rod position is within limit of CTS 3.1.3.6. ITS SR 3.1.9.4 requires SDM to be with limits every 24 hours. This changes the CTS by adding an additional Surveillance Requirement.

This change is acceptable because the Surveillance Requirement is necessary to ensure the requirements of the LCO are being met. The SDM verification in ITS SR 3.1.9.4 requires a reactivity balance calculation to be performed. This ensures SDM is met because the regulating rod groups are not required to be within insertion limits. This change is designated as more restrictive because a new Surveillance Requirement is being added to the Technical Specifications.

M03 CTS 3.1.1.1 Action does not provide any specific requirements to suspend PHYSICS TESTS when SDM is not met. ITS 3.1.9 Required Action B.2 requires suspension of the PHYSICS TEST exception within 1 hour. 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 SDM is not met. The Bases for ITS 3.1.1, "SHUTDOWN MARGIN (SDM)," states that in MODE 2, the SDM is ensured by compliance with the rod insertion limit Specifications (LCO 3.1.5 and LCO 3.2.1). 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. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

M04 CTS 3.10.2 allows the requirements of CTS 3.1.3.6 (Regulating Rod Insertion Limits) to be suspended during performance of PHYSICS TESTS when in MODE 2. This includes the sequence and overlap limits as well as the insertion limits for both the restricted operation region and the unacceptable operation region. ITS 3.1.9 does not allow suspension of the LCO 3.2.1 insertion limits for the unacceptable operation region; only the insertion limits for the restricted operation region and the sequence and overlap limits are allowed to be suspended. This changes the CTS by deleting the allowance to suspend the regulating rod insertion limits for the unacceptable operation region during PHYSICS TESTS in MODE 2.

This change is acceptable because it imposes reasonable restrictions on the performance of PHYSICS TESTS. The unacceptable operation region should not be entered during a PHYSICS TEST, and is currently not entered. This will help ensure that SDM continues to be met during the MODE 2 PHYSICS TEST. This change is designated as more restrictive because it imposes additional restrictions not found in the CTS.

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DISCUSSION OF CHANGES
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 3.10.2.c requires the nuclear instrumentation "Source Range and Intermediate Range" high startup rate control rod withdrawal inhibit to be OPERABLE. CTS 4.10.2.2, in part, requires the nuclear instrumentation "Source Range and Intermediate Range" high startup rate control rod withdrawal inhibit to be subjected to a CHANNEL FUNCTIONAL TEST. ITS LCO 3.1.9.c requires the nuclear instrumentation high startup rate control rod withdrawal inhibit to be OPERABLE. ITS SR 3.1.9.1, in part, requires the performance of a CHANNEL FUNCTIONAL TEST on the nuclear instrumentation rod inhibit channels. This changes the CTS by removing details of the specific channels (i.e., Source Range and Intermediate Range) 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 nuclear instrumentation high startup rate control rod withdrawal inhibit be OPERABLE and also requires the performance of a CHANNEL FUNCTIONAL TEST. The details of the specific types of channels do 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.

LA02 *(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 require that the SDM be $\geq$ 1.0% $\Delta k/k$. ITS LCO 3.1.9.d states that the SDM shall be within the limits specified in the COLR, ITS 3.1.9 ACTION B provides actions for when the SDM is not within the limits, and ITS SR 3.1.9.4 requires verification that the SDM is within limits specified in the COLR. 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

DISCUSSION OF CHANGES
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

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 5.6.3, "CORE OPERATING LIMITS REPORT." ITS 5.6.3 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.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* When SDM is not within limit, CTS 3.1.1.1 Action requires the plant to immediately initiate and continue boration at ≥ 25 gpm, of 7875 ppm boron or its equivalent, until the required SDM is restored. ITS 3.1.9 Required Action B.1 requires the boration to proceed within 15 minutes to reduce SDM to within limit. This changes the CTS by relaxing the Completion Time from "immediately" to 15 minutes.

The purpose of CTS 3.1.1.1 Action is to restore the SDM to within its limit promptly. 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. 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 states 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.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.1.1.1 Action states that when the SDM is not within the applicable limits, boration must be initiated and continued at ≥ 25 gpm of 7875 ppm boron or equivalent until the required SDM is restored. ITS 3.1.9 ACTION B 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 Action 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

DISCUSSION OF CHANGES
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

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 B, "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 addition tanks or the borated water storage tank. The operator should borate with the best source available for the unit conditions." Boration at the 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.

L03 *(Category 1 – Relaxation of LCO Requirements)* CTS 3.10.2 state that limitations of certain Specifications may be suspended during the performance of PHYSICS TESTS. ITS 3.1.9 provides an additional exception to LCO 3.4.2, "RCS Minimum Temperature for Criticality," provided the RCS lowest loop average temperature is ≥ 520°F (ITS LCO 3.1.9 part e). A Surveillance to verify the RCS lowest loop average temperature is ≥ 520°F every 30 minutes (ITS SR 3.1.9.2) has been added. In addition, ITS 3.1.9 ACTION C has been added to cover the situation when RCS lowest loop average temperature is not within limit. The Required Action is to suspend PHYSICS TESTS exceptions within 30 minutes. This changes the CTS by allowing the suspension of the RCS minimum temperature for criticality limit during performance of a MODE 2 PHYSICS TEST. However, it places a limitation on the RCS lowest loop average temperature that is allowed during the test.

The purpose of CTS 3.10.2 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 due to the low probability of an accident occurring and on operating experience. 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 3.1.1.4 (ITS 3.4.2) requires the RCS lowest operating loop temperature to be ≥ 525°F. Therefore, this change reduces the temperature for criticality by 5°F during the performance of PHYSICS TESTS. This is necessary to help facilitate the performance of certain tests, such as the determination of the control rod group worth. The lower limit on RCS average temperature is provided in the test exception LCO to ensure that the RCS temperature stays close to the normally allowed limit. Furthermore, the RCS average temperature is required to be verified every 30 minutes to ensure it is maintained within the allowed limit. 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)

3.1.9 PHYSICS TESTS Exceptions - MODE 2

3.10.2, 3.1.1.1 LCO 3.1.9 During performance of PHYSICS TESTS, the requirements of: (7)

(MTC) (1)

LCO 3.1.3, "Moderator Temperature Coefficient," ; (7)
LCO 3.1.4, "CONTROL ROD Group Alignment Limits,"
LCO 3.1.5, "Safety Rod Insertion Limits," (APSR) ; (1)
LCO 3.1.6, "AXIAL POWER SHAPING ROD Alignment Limits,"
LCO 3.2.1, "Regulating Rod Insertion Limits," for the restricted operation region only, ~~and~~ ; (6) (1) (8)
LCO 3.4.2, "RCS Minimum Temperature for Criticality" (TSTF-467)

for the sequence and overlap limits, and the insertion limits

LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits;" and

may be suspended provided that:

a. THERMAL POWER is ≤ 5% RTP ; (1)

b. Reactor trip setpoints on the OPERABLE ~~nuclear overpower~~ High Flux channels are set to ≤ 25% RTP ; (5) (1)

c. Nuclear instrumentation high startup rate ~~CONTROL~~ ~~ROD~~ withdrawal inhibit is OPERABLE ~~and~~ ; (3) (1)

d. SDM is within the limits specified in the COLR ;

e. RCS lowest loop average temperature is ≥ 520 °F. (TSTF-467) (2)

APPLICABILITY: During PHYSICS TESTS initiated in MODE 2.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.10.2 Action	A. THERMAL POWER not within limit.	A.1 Open control rod drive trip breakers.	Immediately
3.1.1.1 Action	B. SDM not within limit.	B.1 Initiate boration to restore SDM to within limit. AND B.2 Suspend PHYSICS TESTS exceptions.	15 minutes 1 hour

CTS

ACTIONS (continued)

INSERT 1

CONDITION	REQUIRED ACTION	COMPLETION TIME
High Flux DOC M01 D. ~~Nuclear overpower~~ trip setpoint is not within limit. OR Nuclear instrumentation high startup rate ~~CONTROL ROD~~ withdrawal inhibit inoperable.	D.1 Suspend PHYSICS TESTS exceptions.	1 hour

TSTF-467 9 5 3

SURVEILLANCE REQUIREMENTS

INSERT 2

	SURVEILLANCE	FREQUENCY
4.10.2.1	SR 3.1.9.3 Verify THERMAL POWER is ≤ 5% RTP.	1 hour
	~~SR 3.1.9.3 Verify nuclear overpower trip setpoint is ≤ 25% RTP.~~	~~8 hours~~
DOC M02	SR 3.1.9.4 Verify SDM is within the limits specified in the COLR.	24 hours

INSERT 3

4 4 TSTF-467 4 TSTF-467 4 TSTF-467 9

CTS

9 TSTF-467 **INSERT 1**

DOC L03	D. C	RCS lowest loop average temperature not within limit.	D.1 C Suspend PHYSICS TESTS exceptions.	30 minutes

4 **INSERT 2**

4.10.2.2	SR 3.1.9.1	Perform a CHANNEL FUNCTIONAL TEST on each nuclear instrumentation high startup rate control rod withdrawal inhibit and High Flux channel.	Once within 24 hours prior to initiating PHYSICS TESTS

TSTF-467 **INSERT 3**

DOC L03	SR 3.1.9.2	Verify the RCS lowest loop average temperature is ≥ [520]°F.	30 minutes 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

1. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

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

3. Typographical error corrected.

4. ITS SR 3.1.9.1, a CHANNEL FUNCTIONAL TEST, has been added consistent with current licensing basis (CTS 4.10.2.2). This CHANNEL FUNCTIONAL TEST, in part, will verify the trip setpoint of the High Flux channels are $\leq$ 25% RTP. Therefore, ISTS SR 3.1.9.2, the requirement to check the nuclear overpower trip setpoint every 8 hours has been deleted. The 8 hour Frequency is not considered to be necessary based on the performance of the equipment. Subsequent SRs have been renumbered due to this change.

5. Changes are made which reflect the plant specific nomenclature.

6. ISTS LCO 3.1.9 includes an allowance to suspend the LCO 3.2.1 requirements associated with the restricted operation region only. It does not allow the plant to suspend the overlap and sequence limits of LCO 3.2.1. ITS LCO 3.1.9 allows the plant to also suspend the overlap and sequence limits. This addition is consistent with CTS 3.10.2, which allows the sequence and overlap limits to be suspended during physics tests.

7. Changes are made do reflect another Specification.

8. The allowance to not meet the APSR insertion limits (ITS LCO 3.2.2) during a PHYSICS TEST has been added to be consistent with the allowances provided to not meet insertion limits for the safety rods (ITS LCO 3.1.5) and the regulating rods (ITS LCO 3.2.1). This is also consistent with the current licensing basis (CTS 3.10.2).

9. ISTS 3.1.9 ACTION D was added after ISTS 3.1.9 ACTION C. However, since the ISTS 3.1.9 ACTION D Frequency is 30 minutes, it has been added before the ISTS 3.1.9. ACTION C. In addition, ISTS SR 3.1.9.2 was added after ISTS SR 3.1.9.1. However, since the ISTS SR 3.1.9.2 Frequency is 30 minutes, it has been added before the ISTS SR 3.1.9.1. These changes are consistent with the Improved Standard Technical Specifications, TSTF-GG-05-01, Sections 4.1.6.b and 4.1.7.a.

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

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.9 PHYSICS TESTS Exceptions - MODE 2

BASES

BACKGROUND

The purpose of this MODE 2 LCO is to permit PHYSICS TESTS to be conducted by providing exemptions from the requirements of other LCOs. Establishment of a test program to verify that structures, systems, and components will perform satisfactorily in service is required by 10 CFR 50, Appendix B (Ref. 1). Testing is required as an integral part of the design, fabrication, construction, and operation of the power plant. All functions necessary to ensure that specified design conditions are not violated during normal operation and anticipated operational occurrences must be tested. Requirements for notification of the NRC, for the purpose of conducting tests and experiments, are specified in 10 CFR 50.59 (Ref. 2).

The key objectives of a test program are to (Ref. 3):

a. Ensure that the facility has been adequately designed ; 1

b. Validate the analytical models used in the design and analysis

c. Verify the assumptions used to predict unit response ; 1

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.

To accomplish these objectives, testing is performed prior to initial criticality; during startup, low power operations, and power ascension; at high powers; 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 guidelines. The procedures include all information necessary to permit a detailed execution of 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)

Examples of MODE 2 PHYSICS TESTS include determination of critical boron concentration, CONTROL ROD group worth, and reactivity coefficients. 2

14.1-2 and 14.1-3 3

APPLICABLE SAFETY ANALYSES

UFSAR

post - initial fuel loading - precritical testing and post-criticality test, respectively

A summary of the PHYSICS TESTS for each cycle are listed in Reference 7.

Reference 5 defines requirements for initial testing of the facility, including PHYSICS TESTS. Tables 13-3 and 13-4 (Ref. 6) summarize the zero, low power, and power tests. Requirements for reload fuel cycle PHYSICS TESTS are given in Table 1 of ANSI/ANS-19.6.1-1985 (Ref. 4). Although these PHYSICS TESTS are generally accomplished within the limits of all LCOs, conditions may occur when one or more of the LCOs must be suspended to make completion of PHYSICS TESTS possible or practical.

UFSAR, Appendix 4B 3

3

It is acceptable to suspend the following LCOs for PHYSICS TESTS because reactor protection criteria are preserved by the LCOs still maintained and by the SRs:

for the sequence and overlap limits, and the insertion limits

LCO 3.2.2, "AXIAL POWER SHAPING ROD (APSR) Insertion Limits:" and

LCO 3.1.3, "Moderator Temperature Coefficient (MTC),"
LCO 3.1.4, "CONTROL ROD Group Alignment Limits,"
LCO 3.1.5, "Safety Rod Insertion Limits,"
LCO 3.1.6, "AXIAL POWER SHAPING ROD (APSR) Alignment Limits,"
LCO 3.2.1, "Regulating Rod Insertion Limits" for the restricted operation region only, and
LCO 3.4.2, "RCS Minimum Temperature for Criticality."

: 1
: 1 6
: 1

Even if an accident occurs during PHYSICS TESTS with one or more LCOs suspended, fuel damage criteria are preserved because the limits on THERMAL POWER and shutdown capability are maintained during the PHYSICS TESTS.

Shutdown capability is preserved by limiting maximum obtainable THERMAL POWER and maintaining adequate SDM, when in MODE 2 PHYSICS TESTS. In MODE 2, the Reactor Coolant System (RCS) temperature must be within the narrow range instrumentation for plant control. The narrow range temperature instrumentation goes on scale at 520°F. Therefore, it is considered safe to allow the minimum RCS temperature to decrease to 520°F during MODE 2 PHYSICS TESTS, based on the low probability of an accident occurring and on prior operating experience.

BASES

APPLICABLE SAFETY ANALYSES (continued)

PHYSICS TESTS include measurement of core nuclear parameters or exercise of control components that affect process variables.

As described in LCO 3.0.7, compliance with Test Exceptions LCOs is optional, and therefore no criteria of 10 CFR 50.36(c)(2)(ii) apply. Test Exceptions 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.

LCO

This LCO permits individual ~~CONTROL~~ ~~RODS~~ to be positioned outside of their specified group alignment and withdrawal limits and to be assigned to other than specified ~~CONTROL~~ ~~ROD~~ groups during the performance of PHYSICS TESTS. In addition, this LCO permits verification of the fundamental core characteristics. 2 2

(except for the insertion limits for the unacceptable operation region)

This LCO also allows suspension of LCO 3.1.3, LCO 3.1.4, LCO 3.1.5, LCO 3.1.6, LCO 3.2.~~1~~, and LCO 3.4.2, provided: 6

LCO 3.2.2.

a. THERMAL POWER is ≤ 5% RTP[] ; 1

High Flux

b. ~~Nuclear overpower~~ trip setpoints on the OPERABLE nuclear power range channels are set to ≤ 25% RTP[] ; 6

c. Nuclear instrumentation high startup rate ~~CONTROL~~ ~~ROD~~ withdrawal inhibit is OPERABLE[] ~~and~~ ; 2 TSTF -467 1

d. SDM is maintained within the limits specified in the COLR[] ; and TSTF -467 4

lowest 5

e. RCS loop average temperature is ≥ [] 520 [] °F.

The limits of LCO 3.2.3 and LCO 3.2.4 do not apply in MODE 2. Inhibiting ~~CONTROL~~ ~~ROD~~ withdrawal, based on startup rate, also limits local linear heat rate (LHR), departure from nucleate boiling ratio (DNBR), and peak RCS pressure during accidents initiated from low power. 2

APPLICABILITY

This LCO is applicable when the reactor is either subcritical or critical with THERMAL POWER ≤ 5% RTP. The Applicability is stated as "during PHYSICS TESTS initiated in MODE 2" to ensure that the 5% RTP maximum power level is not exceeded. Should the THERMAL POWER exceed 5% RTP, and consequently the unit enter MODE 1, this

BASES

APPLICABILITY (continued)

Applicability statement prevents exiting this Specification and its Required Actions. This LCO is applicable for initial criticality or low power testing, as defined by Regulatory Guide 1.68 (Ref. 3). In MODE 1, Applicability of this LCO is not required because LCO 3.1.8, "PHYSICS TESTS Exceptions - MODE 1," addresses PHYSICS TESTS exceptions in MODE 1. In MODES 3, 4, 5, and 6, Applicability is not required because physics testing is not performed in these MODES. 5

ACTIONS

A.1

If THERMAL POWER exceeds 5% RTP, a positive reactivity addition could be occurring, and a nuclear excursion could result. To ensure that local LHR, DNBR, and RCS pressure limits are not violated, the reactor is tripped. The necessary prompt action requires manual operator action to open the CONTROL ROD drive trip breakers without attempts to reduce THERMAL POWER by actuating the control system (i.e., CONTROL ROD insertion or RCS boration).

B.1 and B.2

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. ~~The operator should begin boration with the best source available for the plant conditions.~~ Boration will be continued until SDM is within limit. In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. 7

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 addition tanks or the borated water storage tank.

Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable LCOs to within specification.

INSERT 1 TSTF-467 6

D ~~C~~.1 6

If the ~~nuclear overpower~~ High Flux trip setpoint is > 25% RTP, then 1 hour is allowed for the operator to restore the ~~nuclear overpower~~ High Flux trip setpoint within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within 6

TSTF -467 **INSERT 1**

C → D.1 6

If the RCS lowest loop average temperature is < [520] °F, then 30 minutes is allowed for the operator to restore the RCS lowest loop average temperature to within limits or to complete an orderly suspension of PHYSICS TESTS exceptions. The required Completion Time is consistent with, or more conservative than, those specified in the individual LCOs addressed by the PHYSICS TESTS exceptions. 4

BASES

ACTIONS (continued)

specification, in order to ensure that continuity of reactor operation is within initial condition limits. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCOs addressed by PHYSICS TESTS exceptions.

If the nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit function is inoperable, then 1 hour is allowed for the operator to restore the function to OPERABLE status or to complete an orderly suspension of PHYSICS TESTS exceptions. Suspension of PHYSICS TESTS exceptions requires restoration of each of the applicable individual LCOs to within specification. This required Completion Time is consistent with, or more conservative than, those specified for the individual LCOs addressed by PHYSICS TESTS exceptions. 2

The nuclear instrumentation high startup rate CONTROL ROD withdrawal inhibit function is not required when the reactor power level is above the operating range of the instrumentation channel. For example, if the reactor power level is above the source range channel operating range, then only the intermediate range high startup rate CONTROL ROD withdrawal inhibit is required to be functional. 2 2

SURVEILLANCE REQUIREMENTS

SR 3.1.9.1

Performing a CHANNEL FUNCTIONAL TEST on each nuclear instrumentation source and intermediate range high startup rate CONTROL ROD withdrawal inhibit and nuclear overpower channel, ensures that the instrumentation required to detect a deviation from THERMAL POWER or to detect a high startup rate is OPERABLE. Performing the test once within 24 hours, prior to initiating PHYSICS TESTS, ensures that the instrumentation is OPERABLE shortly before PHYSICS TESTS begin and allows the operator to correct any instrumentation problems. High Flux 2 6

INSERT 2

TSTF -467 8

SR 3.1.9.2 1 3

Verification that THERMAL POWER is ≤ 5% RTP ensures that an adequate margin is maintained between the THERMAL POWER level and the nuclear overpower trip setpoint. Hourly verification is adequate for the operator to determine any change in core conditions, such as xenon redistribution occurring after a THERMAL POWER reduction, that could cause THERMAL POWER to exceed the specified limit. High Flux 6

TSTF -467

INSERT 2

SR 3.1.9.2 8

Verification that the RCS lowest loop average temperature is ≥ [520]°F will ensure that the unit is ~~not~~ operating in a condition ~~that could invalidate the safety analyses~~ consistent with the LCO requirements. 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~~ LCO are ~~not violated~~ met. 4 5 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.9.3

Verification that the nuclear overpower trip setpoint is within the limit specified for PHYSICS TESTS ensures that core protection at the reduced power level is established and will remain in place during PHYSICS TESTS. Performing the verification once per 8 hours allows the operator adequate time for determining any degradation of the established trip setpoint margin before and during PHYSICS TESTS and for adjusting the nuclear overpower trip setpoint. 6

SR 3.1.9.4

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration;
b. CONTROL ROD position; 1
c. RCS average temperature;
d. Fuel burnup based on gross thermal energy generation; 1
e. Samarium concentration;
f. Xenon concentration;
g. Isothermal temperature coefficient (ITC), when below the point of adding heat (POAH); 1
h. Moderator defect, when above the POAH; and
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.

BASES

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, December 13, 1985.~~ UFSAR, Appendix 4B. 3

5. U FSAR, Section ~~[13.4.8]~~ 14.1. 3 4

6. U FSAR, ~~Section [13.4.8], [~~Table s ~~13-3 and Table 13-4]~~ 14.1-2 and 14.1-3. 3 4

7. UFSAR, Appendix 4B, Section 9. 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.1.9 BASES, PHYSICS TESTS EXCEPTIONS – MODE 2

1. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

2. Typographical error corrected.

3. 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.

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

5. Changes are made to reflect the Specification.

6. Changes are made to reflect changes made to the Specification.

7. Changes are made to be consistent with other places in the Bases (i.e., LCO 3.1.1 Required Action A.1).

8. The Bases for ISTS SR 3.1.9.1 have not been deleted as required by TSTF-467, since the Surveillance discussed in the Bases has been retained in the Davis-Besse ITS. Furthermore, the SRs have been renumbered, consistent with their order in ITS.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.1.9, PHYSICS TESTS EXCEPTIONS – MODE 2

There are no specific NSHC discussions for this Specification.

ATTACHMENT 10

Relocated/Deleted Current Technical Specifications (CTS)

CTS 3/4.1.1.2, BORON DILUTION

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

CTS 3/4.1.1.2

REACTIVITY CONTROL SYSTEMS

BORON DILUTION

LIMITING CONDITION FOR OPERATION

3.1.1.2 The flow rate of reactor coolant through the Reactor Coolant System shall be ≥ 2800 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 < 2800 gpm, immediately suspend all operations involving a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The flow rate of reactor coolant through the Reactor Coolant System shall be determined to be ≥ 2800 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 DHR pump is in operation and supplying ≥ 2800 gpm to the Reactor Coolant System.

L01

* In MODE 5 or MODE 6 the Reactor Coolant System (RCS) boron concentration may be greater than the boron concentration of water available for addition. If the flowrate of reactor coolant through the RCS is less than 2800 gpm, water of lower boron concentration than the existing RCS concentration may be added to the RCS provided that in MODE 5 the boron concentration of the water to be added is equal to or greater than the boron concentration associated with the SHUTDOWN MARGIN requirement of Specification 3.1.1.1, or in MODE 6 the boron concentration of the water to be added is equal to or greater than the boron concentration corresponding to the more restrictive reactivity condition specified in Specification 3.9.1.

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DISCUSSION OF CHANGES
CTS 3/4.1.1.2, BORON DILUTION

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L01 *(Category 1 – Relaxation of LCO Requirements)* CTS 3.1.1.2 requires the flow rate of reactor coolant through the Reactor Coolant System to be greater than or equal to 2800 gpm whenever a reduction in Reactor Coolant System boron concentration is being made. With the flow rate not within limit, immediate suspension of all operations involving a reduction in boron concentration of the Reactor Coolant System is required. CTS 4.1.1.2 requires the flow rate of reactor coolant through the Reactor Coolant System to be monitored within one hour prior to the start and at least once per hour during a reduction in the Reactor Coolant System boron concentration. The ITS does not include this Specification. This changes the CTS by eliminating this Specification.

The purpose of CTS 3.1.1.2 is to ensure there is enough flow to support adequate mixing, prevent stratification, and ensure that reactivity changes will be gradual during boron concentration reductions in the Reactor Coolant System. This flow rate will circulate a volume of 12,110 cubic feet of Reactor Coolant System 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 Reactor Coolant System and/or decay heat removal loops to be OPERABLE and in operation regardless of whether or not a reduction in Reactor Coolant System 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 Reactor Coolant System pumps is significantly greater than 2800 gpm and because operation of the Decay Heat Removal System is controlled by plant operating procedures to ensure adequate flow.

DISCUSSION OF CHANGES
CTS 3/4.1.1.2, BORON DILUTION

In MODES 1 and 2, if any Reactor Coolant System loop is not OPERABLE and in operation, ITS LCO 3.4.4 ACTION B requires the unit to be in MODE 3 within 6 hours. If the unit is operating in MODES 3, 4, and 5 (with the Reactor Coolant System 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. In MODE 5 with the Reactor Coolant loops not filled, ITS LCO 3.4.8 requires two decay heat removal loops to be OPERABLE and one loop is required to be in operation. ITS LCO 3.4.8 also 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 Reactor Coolant System water volume. If the unit is operating in MODE 6 with high reactor water level, ITS LCO 3.9.4 requires one decay heat removal loop to be OPERABLE and in operation. ITS LCO 3.9.4 also 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, ITS LCO 3.9.5 requires two decay heat removal loops to be OPERABLE and one loop is required to be in operation. ITS LCO 3.9.5 also 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 Reactor Coolant System 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 3/4.1.1.2, 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)

REACTIVITY CONTROL SYSTEMS

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 At least one of the following boron injection flow paths shall be OPERABLE.

a. A flow path from the concentrated boric acid storage system via a boric acid pump and a makeup or decay heat removal (DHR) pump to the Reactor Coolant System, if only the boric acid storage system is OPERABLE, or

b. A flow path from the borated water storage tank via a makeup or DHR pump to the Reactor Coolant System if only the borated water storage tank 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 until at least one injection path is restored to OPERABLE status.

R01

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[1] by verifying that the pipe temperature of the heat traced portion of the flow path is ≥ 105°F when a flow path from the concentrated boric acid storage system is used, and

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.

[1]If the 7 day verification falls during transfers of makeup water or dilute boron solutions (fluid source concentration of less than 5000 ppmB), the verification period may be extended up to 8 hours after the addition of dilute boron solution has been stopped for a period of at least 8 hours.

DISCUSSION OF CHANGES
CTS 3/4.1.2.1, FLOW PATHS - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.1.2.1 provides requirements on the Boration System flow paths during shutdown. CTS 3.1.2.1 requires a flow path from the concentrated boric acid storage system via a boric acid pump and a makeup or decay heat removal (DHR) pump to the Reactor Coolant System if only the boric acid storage is OPERABLE or a flow path from the borated water storage tank via a makeup or DHR pump to the Reactor Coolant System if only the borated water storage tank is OPERABLE. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

DISCUSSION OF CHANGES
CTS 3/4.1.2.1, FLOW PATHS - SHUTDOWN

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. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. 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)

CTS 3/4.1.2.2

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. A flow path from the concentrated boric acid storage system via a boric acid pump and makeup or decay heat removal (DHR) pump to the Reactor Coolant System, and

b. A flow path from the borated water storage tank via makeup or DHR pump to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the flow path from the concentrated boric acid storage system 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 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. R01

b. With the flow path from the borated 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(1) by verifying that the pipe temperature of the heat traced portion of the flow path from the concentrated boric acid storage system is ≥ 105°F.

(1) If the 7 day verification falls during transfers of makeup water or dilute boron solutions (fluid source concentration of less than 5000 ppmB), the verification period may be extended up to 8 hours after the addition of dilute boron solution has been stopped for a period of at least 8 hours.

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CTS 3/4.1.2.2

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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.

R01

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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

R01 CTS 3/4.1.2.2 provides requirements on the flow paths during operation. CTS 3.1.2.2 requires the a flow path from the concentrated boric acid storage system via a boric acid pump and a makeup or decay heat removal (DHR) pump to the Reactor Coolant System, and a flow path from the borated water storage tank via a makeup or DHR pump to the Reactor Coolant System to be OPERABLE. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

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

DISCUSSION OF CHANGES
CTS 3/4.1.2.2, FLOW PATHS - OPERATING

Paths - Operating Specification will be relocated to the TRM. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. 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.

CTS 3/4.1.2.3, MAKEUP PUMP - SHUTDOWN

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

CTS 3/4.1.2.3

REACTIVITY CONTROL SYSTEMS

MAKEUP PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 At least one makeup 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 essential bus.

APPLICABILITY: MODE 5*.

ACTION:

With no makeup pump OPERABLE, suspend all operations involving positive reactivity changes until at least one makeup pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.3 No additional Surveillance Requirements other than those required by Specification 4.0.5 are applicable.

R01

*With RCS pressure ≥ 150 psig.

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DISCUSSION OF CHANGES
CTS 3/4.1.2.3, MAKEUP PUMP - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.1.2.3 provides requirements on the Boration System makeup pump during shutdown. CTS 3.1.2.3 requires at least one makeup pump in the boron injection flow path required by Specification 3.1.2.1 to be OPERABLE and capable of being powered from an OPERABLE essential bus. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Makeup Pump - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Makeup Pump - Shutdown Specification will be relocated to the TRM. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are

DISCUSSION OF CHANGES
CTS 3/4.1.2.3, MAKEUP PUMP - SHUTDOWN

made under 10 CFR 50.59, which ensures changes are properly evaluated. 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 3/4.1.2.3, MAKEUP PUMP - SHUTDOWN

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.4, MAKEUP PUMPS - OPERATING

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

REACTIVITY CONTROL SYSTEMS

MAKEUP PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 Two makeup pumps shall be OPERABLE.

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

ACTION:

With only one makeup pump OPERABLE, restore the inoperable pump to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 6 hours; restore two 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 No additional Surveillance Requirements other than those required by Specification 4.0.5 are applicable. R01

*With RCS pressure ≥ 150 psig.

DISCUSSION OF CHANGES
CTS 3/4.1.2.4, MAKEUP PUMPS - OPERATING

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.1.2.4 provides requirements on the flow paths during operation. CTS 3.1.2.4 requires two makeup pumps to be OPERABLE. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Makeup Pumps - Operating LCO and Surveillances may be relocated out of the Technical Specifications. The Makeup Pumps - Operating Specification will be relocated to the TRM. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. This

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DISCUSSION OF CHANGES
CTS 3/4.1.2.4, MAKEUP PUMPS - OPERATING

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.

<u>REMOVED DETAIL CHANGES</u>

None

<u>LESS RESTRICTIVE CHANGES</u>

None

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.2.4, MAKEUP PUMPS - OPERATING

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.5, DECAY HEAT REMOVAL PUMP - SHUTDOWN

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

REACTIVITY CONTROL SYSTEMS

DECAY HEAT REMOVAL PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.5 At least one decay heat removal (DHR) pump in the boron injection flow path required by Specification 3.1.2.1 or 3.1.2.2 shall be OPERABLE and capable of being powered from an OPERABLE essential bus.

APPLICABILITY: MODES 4*, 5* and 6.

ACTION:

With no DHR pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one DHR pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

R01

4.1.2.5 No additional Surveillance Requirements other than those required by Specification 4.0.5.

*RCS Pressure < 150 psig.

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DISCUSSION OF CHANGES
CTS 3/4.1.2.5, DECAY HEAT REMOVAL PUMP - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.1.2.5 provides requirements on the boration system decay heat removal pump during shutdown. CTS 3.1.2.5 requires at least one decay heat removal (DHR) pump in the boron injection flow path required by Specification 3.1.2.1 or 3.1.2.2 to be OPERABLE and capable of being powered from an OPERABLE essential bus. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Decay Heat Removal Pump - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Decay Heat Removal Pump - Shutdown Specification will be

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DISCUSSION OF CHANGES
CTS 3/4.1.2.5, DECAY HEAT REMOVAL PUMP - SHUTDOWN

relocated to the TRM. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. 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, DECAY HEAT REMOVAL PUMP - SHUTDOWN

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.6, BORIC ACID PUMP - SHUTDOWN

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

CTS 3/4.1.2.6

REACTIVITY CONTROL SYSTEMS

BORIC ACID PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.6 At least one boric acid pump shall be OPERABLE and capable of being powered from an OPERABLE essential bus if only the flow path through the boric acid pump in Specification 3.1.2.1a is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no boric acid 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 until at least one boric acid pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.6 No additional Surveillance Requirements other than those required by Specification 4.0.5 are applicable.

R01

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DISCUSSION OF CHANGES
CTS 3/4.1.2.6, BORIC ACID PUMP - SHUTDOWN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.1.2.6 provides requirements on the Boration System boric acid pump during shutdown. CTS 3.1.2.6 requires at least one boric acid pump to be OPERABLE and capable of being powered from an OPERABLE essential bus if only the flow path through the boric acid pump in Specification 3.1.2.1a is OPERABLE. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Boric Acid Pump - Shutdown LCO and Surveillances may be relocated out of the Technical Specifications. The Boric Acid Pump - Shutdown Specification will be relocated to the TRM. The TRM

DISCUSSION OF CHANGES
CTS 3/4.1.2.6, BORIC ACID PUMP - SHUTDOWN

is currently incorporated by reference into the UFSAR, thus any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. 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 PUMP - SHUTDOWN

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.2.7, BORIC ACID PUMPS - OPERATING

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

CTS 3/4.1.2.7

REACTIVITY CONTROL SYSTEMS

BORIC ACID PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.7 At least one boric acid 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 essential bus.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With no boric acid pump OPERABLE, restore at least one boric acid pump to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 6 hours; restore at least one boric acid pump to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.7 No additional Surveillance Requirements other than those required by Specification 4.0.5 are applicable. R01

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DISCUSSION OF CHANGES
CTS 3/4.1.2.7, BORIC ACID PUMPS - OPERATING

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.1.2.7 provides requirements on the boric acid pumps during operation. At least one boric acid 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 essential bus. The boration subsystems of the Makeup and Purification System and Chemical Addition System provide the means to control the chemical neutron absorber (boron) concentration in the RCS and to help maintain the SHUTDOWN MARGIN. The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

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 boration subsystems are not used for, nor are capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

2. The boration subsystems are 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.

3. The boration subsystems are not part of a primary success path in the mitigation of a DBA or transient. The Emergency Core Cooling System required boration capability for mitigation of DBAs is covered in LCO 3.5.4, "Borated Water Storage Tank (BWST)."

4. As discussed in B&W Owners Group Technical Report 47-1170689-00 (Appendix A pages A-3 through A-6), the loss of the boration subsystems was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Boric Acid Pumps - Operating LCO and Surveillances may be relocated out of the Technical Specifications. The Boric Acid Pumps - Operating Specification will be relocated to the TRM. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are

DISCUSSION OF CHANGES
CTS 3/4.1.2.7, BORIC ACID PUMPS - OPERATING

made under 10 CFR 50.59, which ensures changes are properly evaluated. 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 3/4.1.2.7, BORIC ACID PUMPS - OPERATING

There are no specific NSHC discussions for this Specification.

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CTS 3/4.1.3.7, ROD PROGRAM

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

REACTIVITY CONTROL SYSTEMS

ROD PROGRAM

LIMITING CONDITION FOR OPERATION

3.1.3.7 Each control rod assembly (safety, regulating and APSR) shall be programmed to operate in the core location and rod group specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*.

ACTION:

With any control rod assembly not programmed to operate as specified above, be in HOT STANDBY within 1 hour.

SURVEILLANCE REQUIREMENTS

4.1.3.7

a. Each control rod assembly shall be demonstrated to be programmed to operate in the specified core location and rod group by:

1. Selection and actuation from the control room and verification of movement of the proper rod as indicated by both the absolute and relative position indicators:

a) For all control rod assemblies after the control rod drive patches are locked subsequent to test, reprogramming or maintenance within the panels.

b) For specifically affected individual rod assemblies following maintenance, test, reconnection or modification of power or instrumentation cables from the control rod drive control system to the control rod drive.

2. Verifying that each cable that has been disconnected has been properly matched and reconnected to the specified control rod drive.

b. At least once each 7 days, verify that the control rod drive patch panels are locked.

R01

*See Special Test Exceptions 3.10.1 and 3.10.2.

DISCUSSION OF CHANGES
CTS 3/4.1.3.7, ROD PROGRAM

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3.1.3.7 requires each control rod assembly (safety, regulating, and APSR) to be programmed to operate in the core location and rod group specified in the COLR. CTS 4.1.3.7.a requires each control rod assembly to be demonstrated to be programmed to operate in the specified core location and rod group. CTS 4.1.3.7.b requires verification that the control rod drive patch panels are locked every 7 days. If any control rod assembly is not programmed to operate as specified the plant must be in HOT STANDBY within 1 hour. The location of control rod assemblies is provided in the reload report for each fuel cycle, and are reflected as core location and rod group assignments in the COLR. These constraints on control rod assembly core locations and rod group assignments function to optimize core burnup and minimize local power peaking during operation. Programming (or "patching") of control rod assemblies is also determined by the reload report for each fuel cycle to ensure that adequate shutdown margin can be achieved when the control rods are tripped. Incorrect programming of control rod assemblies in regulating groups would be revealed during measurement of group rod worths performed during startup testing, and verification that control rod assemblies in safety groups are fully withdrawn is performed using the control rod position indication system. Unlatched control rod assemblies would be detected via core power tilt measurements during power escalation. When test, reprogramming, or maintenance of the control rod drive patch panel and associated cables and instrumentation is performed, control rod control "programming" is also validated. If rod assemblies are not programmed correctly at some point the applicable insertion, overlap, and alignment limit may not be met. The Technical Specifications still include appropriate compensatory actions for insertion, overlap, and alignment limits not met. This will ensure the safety analysis is met or the plant will be required to be shut down within the specified time frame. Therefore, 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 3/4.1.3.7 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. Rod Program is not used for, nor capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA.

DISCUSSION OF CHANGES
CTS 3/4.1.3.7, ROD PROGRAM

2. Rod Program is not a process variable that is an initial condition in a DBA or transient analyses.

3. Rod Program does not act as a part of a primary success path in the mitigation of a DBA or transient.

4. As discussed in Reference 3 (Appendix A pages A-13 through A-14), the loss of this Specification was found to be non-significant risk contributor to core damage frequency and offsite releases. Davis-Besse has reviewed this evaluation, considers it applicable to Davis-Besse Nuclear Power Station, and concurs with the assessment.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Rod Program LCO and Surveillances may be relocated out of the Technical Specifications. The Rod Program Specification will be relocated to the TRM. The TRM is currently incorporated by reference into the UFSAR, thus any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. 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)

CTS 3/4.1.3.8, XENON REACTIVITY

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

REACTIVITY CONTROL SYSTEMS

XENON REACTIVITY

LIMITING CONDITION FOR OPERATION

3.1.3.8 THERMAL POWER shall not be increased above the power level cutoff specified in the acceptable operating limits for regulating rod position provided in the CORE OPERATING LIMITS REPORT unless one of the following conditions is satisfied:

a. Xenon reactivity is within 10 percent of the equilibrium value for RATED THERMAL POWER and is approaching stability, or

b. THERMAL POWER has been within a range of 87 to 92 percent of RATED THERMAL POWER for a period exceeding 2 hours in the soluble poison control mode, excluding xenon free start-ups.

APPLICABILITY: MODE 1.

ACTION:

With the requirements of the above specification not satisfied, reduce THERMAL POWER to less than or equal to the power level cutoff within 15 minutes.

L01

SURVEILLANCE REQUIREMENTS

4.1.3.8 Xenon reactivity shall be determined to be within 10% of the equilibrium value for RATED THERMAL POWER and to be approaching stability or it shall be determined that the THERMAL POWER has been in the range of 87 to 92% of RATED THERMAL POWER for $\geq$ 2 hours, prior to increasing THERMAL POWER above the power level cutoff.

DISCUSSION OF CHANGES
CTS 3/4.1.3.8, XENON REACTIVITY

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L01 *(Category 1 – Relaxation of LCO Requirements)* CTS 3.1.3.8 does not allow THERMAL POWER to be increased above the power level cutoff specified in the acceptable operating limits for regulating rod position provided in the COLR unless xenon reactivity is within 10% of the equilibrium value for RATED THERMAL POWER and is approaching stability or THERMAL POWER has been within a range of 87 to 92% RTP for a period exceeding 2 hours in the soluble poison control mode, excluding xenon free start-ups. The ITS does not include this Specification. This changes the CTS by eliminating this Specification.

CTS 3.1.3.8 provides the ability to prevent excessive power peaking by transient xenon at RATED THERMAL POWER. Originally, operating restrictions were imposed on all the Babcock and Wilcox units due to power peaking resulting from transient xenon. The restrictions, known as the "power level cutoff," represented a tradeoff between wider operational envelopes and achievable power level during xenon transients. The power level cutoff temporarily reduced the maximum power level for operation as power was increased during a xenon transient. The peaking considerations from transient xenon are now implicitly included in the Davis-Besse reload safety evaluation analysis, so that the power level cutoff has been raised to 100% RTP. This effectively eliminates the operational restrictions due to transient xenon. CTS 3.1.3.8 contains the power level cutoff requirements; however, the regulating rod insertion figures (required by CTS 3.1.3.6 and ITS 3.2.1) show the value has been increased to 100% RTP. Therefore, this change is acceptable since improvements in core maneuvering analysis techniques have resulted in the restrictions of this Specification no longer being necessary to support core power peaking and rod insertion limits. 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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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.1.3.8, XENON REACTIVITY

There are no specific NSHC discussions for this Specification.

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CTS 3/4.10.3, REACTOR COOLANT LOOPS

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

SPECIAL TEST EXCEPTION

REACTOR COOLANT LOOPS

LIMITING CONDITION FOR OPERATION

3.10.3 The limitations of Specification 3.4.1 may be suspended during the performance of STARTUP and PHYSICS TESTS provided:

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER, and

b. The reactor trip setpoints on the OPERABLE High Flux channels are set ≤ 25% of RATED THERMAL POWER.

APPLICABILITY: MODE 2.

ACTION:

With the THERMAL POWER greater than 5% of RATED THERMAL POWER, immediately open the control rod drive trip breakers.

M01

SURVEILLANCE REQUIREMENTS

4.10.3.1 The THERMAL POWER shall be determined to be ≤ 5% of RATED THERMAL POWER at least once per hour during STARTUP and PHYSICS TESTS.

4.10.3.2. Each High Flux Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating startup or PHYSICS TESTS.

DISCUSSION OF CHANGES
CTS 3/4.10.3, REACTOR COOLANT LOOPS

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

M01 CTS 3/4.10.3 provides an exception to the reactor coolant loop requirements in CTS 3.4.1 in MODE 2 for the purpose of the performance of STARTUP and PHYSICS TEST provided the THERMAL POWER does not exceed 5% RTP and the reactor trip setpoints on the OPERABLE High Flux channels are set <25% RTP. According to the Bases, this special test exception permits reactor criticality under various flow conditions and is required in order to perform certain startup and PHYSICS TESTS while at low THERMAL POWER levels. 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. 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 3/4.10.3, REACTOR COOLANT LOOPS

There are no specific NSHC discussions for this Specification.

CTS 3/4.10.4, SHUTDOWN MARGIN

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

SPECIAL TEST EXCEPTIONS

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.10.4 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of control rod worth and shutdown margin provided:

a. Reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s), and

b. All axial power shaping rods are withdrawn to at least 35% (indicated position) and OPERABLE.

APPLICABILITY: MODE 2.

ACTION:

a. With any safety or regulating control rod not fully inserted and with less than the above reactivity equivalent available for trip insertion or the axial power shaping rods not within their withdrawal limits, immediately initiate and continue boration at ≥ 25 gpm of 7875 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all safety or regulating control rods fully inserted and the reactor subcritical by less than the above reactivity equivalent, immediately initiate and continue boration at ≥ 25 gpm of 7875 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

M01

SURVEILLANCE REQUIREMENTS

4.10.4.1 The position of each safety, regulating, and axial power shaping rod either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.4.2 Each safety or regulating control 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.

SPECIAL TEST EXCEPTIONS

SHUTDOWN MARGIN

SURVEILLANCE REQUIREMENTS (Continued)

4.10.4.3 The axial power shaping rods shall be demonstrated OPERABLE by moving each axial power shaping rod $\geq$ 6.5% (indicated position) within 4 hours prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

M01

DISCUSSION OF CHANGES
CTS 3/4.10.4, SHUTDOWN MARGIN

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

M01 CTS 3/4.10.4 provides an exception to the SHUTDOWN MARGIN requirements in CTS 3.1.1.1 in MODE 2 for the purpose of 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). 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

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.10.4, SHUTDOWN MARGIN

There are no specific NSHC discussions for this Specification.

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