# Description of Changes - NUREG-1431 Section 3.01.05

*13-Nov-99*

| DOC Number | DOC Text |
|---|---|
| A.01 | In the conversion of Point Beach current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the Standard Technical Specifications, Westinghouse Plants, NUREG-1431, Revision 1 (i.e., Improved Standard Technical Specifications (ISTS)). |

| CTS: | ITS: |
|---|---|
| 15.03.10 | LCO 3.01.04 |
| 15.03.10.B.01 | LCO 3.01.04 |
| | SR 3.01.04.01 |
| 15.03.10.B.01.A.03 | LCO 3.01.04 COND A |
| 15.03.10.B.01.A.03.A | LCO 3.01.04 COND A RA A.1.1 |
| | LCO 3.01.04 COND A RA A.1.2 |
| 15.03.10.B.01.A.03.B | LCO 3.01.04 COND A RA A.2 |
| 15.03.10.B.01.B.01 | LCO 3.01.04 COND B RA B.1 |
| 15.03.10.B.01.B.01.A | LCO 3.01.04 COND B RA B.2.1.1 |
| 15.03.10.B.01.B.01.C | LCO 3.01.04 COND B RA B.2.3 |
| 15.03.10.B.01.B.01.F | LCO 3.01.04 COND C |
| | LCO 3.01.04 COND C RA C.1 |
| 15.03.10.B.01.B.02 | LCO 3.01.04 COND D |
| 15.03.10.B.01.B.02.A | LCO 3.01.04 COND D RA D.1.1 |
| | LCO 3.01.04 COND D RA D.1.2 |
| 15.03.10.H | SR 3.01.04.03 |
| 15.03.10.H.01 | SR 3.01.04.03 |
| 15.04.01 T 15.04.01-02 09 (A) | SR 3.01.04.03 |
| | SR 3.01.04.03 |
| 15.04.01 T 15.04.01-02 10 | SR 3.01.04.02 |

| DOC Number | DOC Text |
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| A.02 | The CTS provides an introductory statement (Applicability) which simply states which systems/components are addressed within a given section. This same information, while worded differently, is contained within the title of each ITS LCO. Accordingly, this change is a change in format with no change in technical requirement. |

| CTS: | ITS: |
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| 15.03.10 APPL | LCO 3.01.04 |

| DOC Number | DOC Text |
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| A.03 | The CTS provides an introductory statement (Objective) at the beginning of this Section of the Technical Specifications which provides a brief summary of the purpose for this Section. This information is contained in the Bases Section of the ITS. This information does not establish any regulatory requirements for the systems and components addressed within this Section. Accordingly, deletion of this information does not alter any requirement set forth in the Technical Specifications. This change is administrative and consistent with the format and presentation for the ITS as provided in NUREG 1431.<br><br>**CTS:** 15.03.10 OBJ<br>**ITS:** B 3.01.04 |
| A.04 | The CTS requires all shutdown and control rods to be operable during power and low power operation. All indicated rod positions are required to be within an alignment limit based upon demanded rod position. ITS LCO 3.1.4 will require all shutdown and control rods to be operable and within their alignment limits. The rod alignment limits themselves have been moved to ITS SR 3.1.4.1. ITS SR 3.0.1 establishes the requirement that surveillances must be met when the LCO is applicable. Moving this limit to a surveillance makes the presentation of this LCO more concise, while retaining the same regulatory requirement through application of SR 3.0.1. Accordingly, these changes do not represent a change in intent or usage and are therefore administrative.<br><br>**CTS:** 15.03.10.B.01<br>**ITS:** LCO 3.01.04 |
| A.05 | The CTS Actions for untrippable and misaligned control rods contain an Action which requires verification that Shut Down Margin (SDM) exceeds its required value which is specified in CTS Table 15.3.10-2. CTS Table 15.3.10-2 has been proposed for relocation to the Core Operating Limits Report (COLR) as discussed in Description of Change LA.1 of LCO 3.1.1. Therefore, the Actions for untrippable and misaligned control rods have been changed to reference the SDM limits provided in the COLR. This change has been classified as an administrative change relative to this LCO, as the basis for relocation of the SDM limit itself has been addressed in LCOs 3.1.1. |

| CTS: | ITS: |
|---|---|
| 15.03.10.B.01.A.01.A | COLR |
| 15.03.10.B.01.A.03.A | COLR |
| 15.03.10.B.01.B.01.A | COLR |
| 15.03.10.B.01.B.01.C | COLR |
| 15.03.10.B.01.B.02.A | COLR |

| DOC Number | DOC Text | |
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| A.06 | The CTS *requires all shutdown and control rods to be operable (trippable and aligned) during* power and low power operation which is equivalent to proposed ITS Modes 1 and 2 with Keff greater than or equal to 1.0. The CTS requires that the unit be placed into Hot Shut Down if the LCO Actions are not met. The CTS definition of Hot Shut Down requires the reactor to be greater than or equal to 540 degrees and subcritical by greater than or equal to the required Shut Down Margin (changes to this definition are addressed in Description of Change M.2 of Section 1.0 of this conversion package). This condition is equivalent to ITS Mode 2 with Keff less than 1.0 (reactor subcritical).<br><br>The proposed ITS Mode of Applicability for this LCO is Mode 1 and Mode 2 with Keff greater than or equal to 1.0, with the Actions placing the unit into Mode 2 with Keff less than 1.0. Therefore, this change is administrative. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.B.01 | LCO 3.01.04 |
| | | LCO 3.01.04 |
| | 15.03.10.B.01.A.01.C | LCO 3.01.04 COND A RA A.2 |
| | 15.03.10.B.01.A.03.B | LCO 3.01.04 COND A RA A.2 |
| | 15.03.10.B.01.B.02.B | LCO 3.01.04 COND D RA D.2 |
| A.07 | The CTS specifies control rod alignment limits are to be fulfilled using the demand and individual rod position indicators. CTS 15.3.10.B.1.b.1 and 2 provides an exception to the use of the demand and individual rod indicators for determining alignment when the reason for the misalignment is caused by a malfunctioning position indicator. The proposed ITS LCO 3.1.4 will continue to require control rod alignment, while ITS LCO 3.1.7 establishes the preferential means of determining rod position. Based on the restructuring of the ITS with its associated usage rules, it is no longer necessary to specifically state "except for misalignments caused by *malfunctioning rod position indicators*". This change is administrative. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.B.01.B.01 | DELETED |
| | | LCO 3.01.04 |
| | | LCO 3.01.04 |
| | | LCO 3.01.04 COND B |
| | 15.03.10.B.01.B.02 | DELETED |
| | | LCO 3.01.04 |

13-Nov-99

| DOC Number | DOC Text | |
|---|---|---|
| A.08 | The CTS specifies that FQ(Z) and FN Delta H are to be verified to be within limits within 72 hours of determining that a control rod is misaligned. The ITS has substituted reference to the Surveillance Requirements (SR 3.2.1.1, SR 3.2.1.2, and SR 3.2.2.1) which are used to verify that these limits are met in place of reference to the limitation itself. The specific surveillance referenced to verify that FQ(Z) and FN Delta H are met have been previously addressed in DOC L.04 of LCO 3.2.1. Reference to the specific Surveillances which verify that the thermal limits are met is consistent with the format and presentation of NUREG 1431 and is administrative. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.B.01.B.01.D | LCO 3.01.04 COND B RA B.2.4 |
| | 15.03.10.B.01.B.01.E | LCO 3.01.04 COND B RA B.2.5 |
| A.09 | The CTS specifies Actions for control rods which do not meet their rod drop time which state that; if the reactor is critical the control rod must be declared untrippable, and if the reactor is subcritical the reactor must be maintained in a subcritical condition. The proposed ITS, while not presented in the same fashion, establishes the same Actions. If a control rod is determined to be outside of its required drop time when the reactor is subcritical, LCO 3.0.4 prohibits entry into Mode 1 or 2 (reactor critical) because the Actions for an inoperable control rod do not allow indefinite operation in Modes 1 or 2. If a control rod is determined to be outside of its required rod drop time with the reactor critical (ITS Modes 1 and 2), The ITS requires that the control rod be declared inoperable, which ultimately requires the unit to be placed into Mode 2 with Keff less than 1.0 within six hours, which as discussed in Description of Change A.06 of this LCO is equivalent to the CTS Action. Accordingly, this change is administrative. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.H.01 | DELETED |
| | 15.03.10.H.01.A | DELETED |
| | 15.03.10.H.01.B | DELETED |
| A.10 | The CTS states that rod drop timing will be performed for all full length control rods while the ITS specifies that rod drop timing will be performed for all control rods. The Point Beach design no longer incorporates partial length control rods; therefore, deletion of this nomenclature does not alter the testing performed. All control rods will continue to be drop timed. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-02 09 (A) | DELETED |

| DOC Number | DOC Text |
|---|---|
| A.11 | The CTS requires control rod drop timing to be performed at rated reactor coolant flow. The ITS will continue this practice, but has changed the phrasing of this prerequisite condition to "all reactor coolant pumps running". The reactor coolant pumps are verified to provide a minimum of 100% of the required forced circulation through the reactor core by proposed SR 3.4.1.3. Accordingly, running all reactor coolant pumps is equivalent to the CTS requirement to establish rated reactor coolant flow. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-02 09 (A)(3) | SR 3.01.04.03 |

| DOC Number | DOC Text |
|---|---|
| A.12 | CTS 15.3.10.B.1 states that control rod must be operable during power and low power operation which has previously been established to be equivalent to ITS Modes 1 and 2 with Keff greater than or equal to 1.0, as addressed in Description of Change A.6 of this Section. Line item 10 of CTS Table 15.4.1-2, requires performance of partial control rod movement tests with Note 18 stating that the partial movement testing is not required to be performed if the reactor is subcritical (ITS Mode 3). ITS SR 3.0.1 establishes the requirement that surveillances must be met when the LCO is applicable (ITS Modes 1 and 2 with Keff greater than or equal to 1.0) which is equivalent to power and low power operation, making Note 18 unnecessary in the ITS. Accordingly, the deletion of Note 18 as applied to line item 10 of Table 15.4.1-2 is administrative. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-02 10 (18) | DELETED |

| DOC Number | DOC Text |
|---|---|
| A.13 | Note 22 to line item 19 of CTS Table 15.4.1-2, states that shiftly control rod alignment channel checks are not required during periods of cold shutdown and refueling, but must be performed prior to reactor criticality if it had not been performed within its previous surveillance interval. This frequency notation is ambiguous in that it does not provide any specific guidance between cold shutdown and reactor critical operations. The CTS Mode of Applicability for control rod operability and alignment has been determined to be equivalent to ITS Mode 1 and 2 with Keff greater than or equal to 1.0 as stated in Description of Change A.6 of this Section. CTS 15.4.0.1 states that surveillance requirements shall be met when the system or component is required to be operable. By applying Specification 15.4.0.1 to the "Plant Conditions When Required" as modified by Note 22, the CTS required mode of performance for this surveillance has been determined to be equivalent to ITS Modes 1 and 2 with Keff greater than or equal to 1.0. ITS SR 3.0.1 establishes the requirement that surveillances must be met when the LCO is applicable. As such, the ITS mode of performance for this surveillance is equivalent to the CTS, making this change administrative. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 | LCO 3.01.04 |
| 15.04.01 T 15.04.01-01 19 (22) | DELETED |
| 15.04.01 T 15.04.01-01 19.A | LCO 3.01.04 |
| 15.04.01 T 15.04.01-01 19.A (22) | DELETED |
| 15.04.01 T 15.04.01-01 ALL | LCO 3.01.04 |

| DOC Number | DOC Text |
|---|---|
| A.14 | CTS Table 15.4.1-1 line item 19 requires the performance of a channel check for control rods on a shiftly basis, which has been concluded to be equivalent to the ITS Surveillance Requirements which verify that the control rods are within their alignment limits. The control rod analog and demand position indicators do not provide any protective functions. These channels are used solely for the purpose of verifying that the control rod alignment limits are maintained. A channel check as discussed in CTS Section 15.4.1 is intended to be a simple observation of instrument function, which is fulfilled through verification of control rod alignment limits. Performance of the proposed ITS surveillances while stated to verify operational limits still encompasses an observation of required channel function while clarifying the intended control rod alignment check. This change is administrative. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 | SR 3.01.04.01 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.04.01 |

| DOC Number | DOC Text |
|---|---|
| A.15 | The Bases of the current Technical Specifications for this section have been completely replaced by revised Bases that reflect the format and applicable content of PBNP ITS, consistent with the Standard Technical Specifications for Westinghouse Plants, NUREG-1431. The revised Bases are as shown in the PBNP ITS Bases. |

| CTS: | ITS: |
|---|---|
| BASES | B 3.01.04 |

| DOC Number | DOC Text | |
|---|---|---|
| L.01 | CTS Action 15.3.10.B.1.a.1.a and b require Shutdown Margin (SDM) to either be; verified to exceed the applicable value, or to be restored by boration within one hour when a control rod is found to be untrippable. Similarly, CTS Action 15.3.10.B.1.b.1.a requires SDM to either be; verified to exceed the applicable value, or to be restored by boration within one hour when a control rod is found to be misaligned. In the unlikely event of an untrippable or misaligned control rod with SDM not within limits, the CTS Action to restore SDM via boration within one hour is not considered to be a viable action. Restoration of SDM would require determination of the SDM deficit, quantification of the amount of boration required, initiation and completion of the boration, and a confirmatory sample to conclude that the required RCS boron concentration was achieved. The proposed ITS will require initiation of boration to restore SDM within one hour. Relaxing the Required Actions from restoring SDM by boration to the initiation of boration will require prompt action to be initiated to restore SDM (boration) without requiring entry into the default Condition and Required Action if restoration of SDM takes in excess of one hour. Entry into the default Conditions and Required Actions will require the unit to be placed into Mode 3 within six hours. The initiation of a unit shutdown will not restore SDM to within limits; continued boration is the only appropriate Action for restoration of SDM. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.B.01.A.01.B | LCO 3.01.04 COND A RA A.1.2 |
| | 15.03.10.B.01.A.03.A | LCO 3.01.04 COND A RA A.1.2 |
| | 15.03.10.B.01.B.01.A | LCO 3.01.04 COND B RA B.2.1.2 |
| | 15.03.10.B.01.B.02.A | LCO 3.01.04 COND D RA D.1.2 |
| L.02 | The CTS requires rod drop testing to be performed in the hot condition for rods which have had maintenance performed. The CTS defines the hot shutdown condition as being subcritical by at least the required Shutdown Margin, with Tavg being greater than 540 degrees. The ITS will require rod drop testing to be performed prior to reactor criticality with RCS temperature greater than or equal to 500 degrees. The 40 degree decrease in testing condition will not significantly alter control rod drop time, in fact rod drop times at reduced temperatures have been shown to be slightly longer due to increased RCS density. Allowing testing at this slightly reduced temperature is still representative of operating conditions, while allowing added scheduling flexibility which was the intent of the CTS. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-02 09 (A)(4) | SR 3.01.04.03 |

| DOC Number | DOC Text | |
|---|---|---|
| L.03 | The CTS requires rod drop testing to be performed under both hot and cold conditions, with only the hot drop tests requiring to be timed. Cold drop testing is considered to be a good practice for verification of control rod trippability prior to plant heat up where rod drop timing is performed; but is not required by the NUREG. Performance of rod drops in a cold condition could prevent having to return the plant to a cold condition to enact repairs if a problem were disclosed at a higher temperature. There are no credible failure mechanisms that would exist solely under cold conditions nor has there been an occurrence of a control rod failing to trip under cold condition alone. Satisfactory demonstration of control rod trippability in a hot condition, as proposed, is sufficient to provide adequate assurance of function prior to entry into the Mode of Applicability for control rods. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-02 09 (A)(3) | DELETED |
| L.04 | The CTS requires the control rods to be partially moved every two weeks to confirm that the control rods are not impaired in any fashion that could impact the control rods capability to trip upon demand. The frequency for performing this test in the ITS is 92 days. Industry experience, as documented in NUREG 1366, "Improvements to Technical Specification Surveillance Requirements," has shown the 92 day frequency is sufficient to detect control rod failures which could impact control rod trippability. Furthermore, the proposed Frequency takes into consideration other information available to the operator such as individual rod position which is determined every 12 hours. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-02 10 | SR 3.01.04.02 |

| DOC Number | DOC Text |
|---|---|
| L.05 | CTS Table 15.4.1-1 footnote 18 requires rod positions to be logged once per hour, after load changes in excess of 10% power, and after rod motion in excess of 30 steps when the on-line computer is inoperable. This verification is required in addition to routine verification of analog rod position and demand position indication which is required once per shift. Actual and demanded control rod positions are monitored by the on-line computer, which will initiate an alarm if rod alignment exceeds predetermined limits. However, the on-line computer alarm function does not provide any safety function nor does it input to any protection circuits. This alarm merely provides a non-safety means of alerting personnel to a condition which does not comply with an LCO requirement. Inoperability of the alarm in and of itself does not lead to a control rod misalignment. Alarm inoperability represents a reduction in monitoring capability for a condition (control rod misalignment) which rarely occurs. Control rod positions are required to be routinely verified once every 12 hours by the proposed ITS. Deletion of the increased surveillance and conditional frequencies (logged once per hour, after load changes in excess of 10% power, and after rod motion in excess of 30 steps with an inoperable alarm) does not alleviate the responsibility of the licensee to be vigilant of plant conditions and LCO compliance. Typically, the unit is operated with the control rods well within their associated alignment limits with significant rod motion made only due to planned evolutions. However, significant rod motion could be the result of an unplanned evolution such as a large generator load rejection. Unplanned evolutions of this nature are readily apparent and result in increased monitoring of affected parameters and significant plant conditions. Rod position and demand position indicators in combination with routine surveillance verification (every 12 hours) provides adequate assurance that non-compliance is readily detectable without the need for increased monitoring. Accordingly, this requirement may be deleted form the Technical Specifications as it is not required to provide adequate protection of public health and safety. |

| **CTS:** | **ITS:** |
|---|---|
| 15.04.01 T 15.04.01-01 19.B | DELETED |
| 15.04.01 T 15.04.01-01 NOTE (18) | DELETED |

| DOC Number | DOC Text |
|---|---|
| L.06 | The CTS states that control rod drop timing must be performed on rods which had maintenance performed on them. This provision is no longer necessary in the ITS. ITS SR 3.1.4.3 requires rod drop testing to be performed to verify control rod operability. Post maintenance testing is captured through application of SR 3.0.1 and SR 3.0.2. SR 3.0.1 establishes the requirement that surveillances must be met when the LCO is applicable. Implicit in the application of SR 3.0.1, is the need to ensure that all Surveillance Requirements remain valid upon completion of maintenance. Following any maintenance, a review of applicable Surveillance Requirements must be conducted to determine the appropriate post maintenance testing that must be completed in order to declare the affected equipment operable. This includes ensuring applicable surveillances are not invalidated by the maintenance performed and their most recent performance is within its required frequency of performance in accordance with SR 3.0.2. If the review determines that the maintenance performed could not invalidate the surveillances and the last performed surveillance was within the required periodicity, then the surveillance would not be required post maintenance. This is less restrictive than the CTS requirement to perform rod drop testing following maintenance with no exceptions. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-02 09 (A)(4) | DELETED |

| DOC Number | DOC Text |
|---|---|
| L.07 | The CTS required frequency for performance of rod alignment verifications is "once per shift", while the proposed frequency of performance for the ITS is every 12 hours. The nominal Point Beach shift duration is 8 hours. Therefore this change extends the nominal time between performances of this surveillance by 4 hours, resulting in a relaxation of the current requirement. This relaxation is acceptable, because the 12 hour 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. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 | SR 3.01.04.01 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.04.01 |
| 15.04.01 T 15.04.01-01 S - EACH SHIFT | SR 3.01.04.01 |

| DOC Number | DOC Text |
|---|---|
| LA.01 | The CTS requires performance of rod worth measurements following each refueling shutdown prior to power operation. This surveillance has been moved to licensee control. The ITS will continue to require performance of a reactivity balance prior to entry into Mode 1 (greater than or equal to 5% power). The reactivity balance is a measure of the predicted versus measured core reactivity which will provide an indirect qualitative verification of control rod worth. The positive reactivity inherent in the core design must be balanced by the negative reactivity of the control components, thermal feedback, neutron leakage, and neutron absorbers. Meeting the acceptance limits of the reactivity balance provides assurance that Design Basis Accident and transient analyses remain valid. Large reactivity differences would be indicative of unanticipated changes in fuel and neutron absorbers. Changes in excess of 1% delta K/k must be evaluated in accordance with the reactivity balance LCO (ITS LCO 3.1.2) to determine that the core is acceptable for continued operation. The Bases of ITS LCO 3.1.8 list control rod worth as a core physics test for which the Mode 2 physics testing exception LCO is intended to be used. In addition, control rod worth is a physics test which is specified in ANSI/ANS 19.6.1-1985, "Reload Startup Physics Tests for Pressurized Water Reactors," which is used as a basis document for physics testing at Point Beach. The CTS does not specify a specific acceptance criteria nor does it specify the number of control rods which must be verified during the performance of the control rod worth test, leaving these variables currently to licensee control. A ten percent margin has been assumed between the calculated control rod worths and the worth assumed in the safety analysis. Previous performances of this test have found that the analysis assumptions relative to predicted ejected rod worth and power peaking factors are consistently overpredicted. Based on the above, it has been concluded that performance of a reactivity balance provides sufficient confidence that the assumptions of the safety analysis are maintained and relocation of the control rod worth tests to licensee control is acceptable based on the absence of acceptance criteria and the margins that exist. Control of the rod worth measurement test, will like other core physics tests continue to be controlled in accordance with 10CFR 50.59. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-02 09 (B) | FSAR |
| | FSAR |

| DOC Number | DOC Text |
|---|---|
| M.01 | The CTS defines control rod operability as trippability. When a control rod fails to step on demand, the CTS allows up to six hours to determine whether the problem is due to an electrical problem in the rod control system (control rod still operable-trippable), or a problem exists which could inhibit the control rods ability to trip in upon demand. The ITS will continue to define control rod operability based upon its ability to trip upon demand, but delete the CTS provision allowing up to six hours to determine operability. |

| CTS: | ITS: |
|---|---|
| 15.03.10.B.01 | DELETED |

*13-Nov-99*

| DOC Number | DOC Text |
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| M.02 | CTS 15.3.10.B.1.a.1 and 15.3.10.B.1.a.2 will allow continuous operations with a single untrippable control rod provided shutdown margin is maintained and the rod insertion limits are adjusted to account for the reactivity worth of the stuck rod. The proposed ITS will require the unit to be shutdown whenever one or more control rods are determined to be untrippable. Deletion of the provision to allow continued operation with a single control rod stuck is more restrictive than the CTS, consistent with the provisions of NUREG 1431. The proposed definition of shutdown margin will continue to require the worth of any stuck rod to be considered. In addition, CTS Actions 15.3.10.B.1.a and 15.3.10.B.1.c have been combined into one Condition (ITS Condition A) based on the Actions for one or more inoperable control rods being the same. |

| CTS: | ITS: |
|---|---|
| 15.03.10.B.01.A.01.A | LCO 3.01.04 COND A |
| 15.03.10.B.01.A.01.C | LCO 3.01.04 COND A RA A.2 |
| 15.03.10.B.01.A.02 | DELETED |
| 15.03.10.B.01.A.02.A | DELETED |
| 15.03.10.B.01.A.02.B | DELETED |
| 15.03.10.B.01.A.02.C | DELETED |

| DOC Number | DOC Text |
|---|---|
| M.03 | The CTS allows continuous operation with a misaligned control rod at power levels not to exceed 75%, with analysis of hot channel factors and allowable power level required only if operation above 75% power with a misaligned control rod is desired. The proposed ITS will restrict operation with a misaligned control rod to less than or equal to 75% power with a misaligned control rod indefinitely. For continued operation at any power level less than or equal to 75% power, ITS will require a reevaluation and confirmation of safety analysis results within 5 days of a control rod becoming misaligned. This change is an added restriction on plant operation being proposed consistent with NUREG 1431. |

| CTS: | ITS: |
|---|---|
| 15.03.10.B.01.B.01.G | LCO 3.01.04 COND B RA B.2.6 |

| DOC Number | DOC Text |
|---|---|
| M.04 | The CTS 15.3.10.H requires control rod drop time to be verified with RCS temperature greater than the minimum temperature for criticality. CTS 15.3.1.F establishes the minimum temperature for criticality as being to the left of the criticality curve presented on the plant heatup limitations curve (Figure 15.3.1-1). The plant heat up curve criticality limit is based on achieving a minimum vessel temperature of no lower than 40 degrees above the minimum permissible temperatures calculated in Appendix G of the ASME Code (360 to approximately 445 degrees dependent upon RCS pressure). The proposed ITS will require control rod drop time to be verified with RCS Tavg greater than or equal to 500 degrees. The testing condition proposed is to simulate a reactor trip under actual conditions from an operating condition. This change is a more restrictive change, because the CTS would allow testing to be performed as low as 360 degrees in fulfilling this CTS requirement.<br>**CTS:** 15.03.10.H.01<br>**ITS:** SR 3.01.04.03 |
| M.05 | The CTS requires power to be reduced to less than or equal to 75% power within eight hours if a control rod is not within its alignment limit. The ITS reduces this time frame to two hours. Two hours is a reasonable time to either restore a control rod to within its alignment limit or to reduce reactor power to less than or equal to 75% power. This time frame is consistent with that contained in NUREG 1431 and is a more restrictive requirement.<br>**CTS:** 15.03.10.B.01.B.01.B<br>**ITS:** LCO 3.01.04 COND B RA B.2.2 |
| M.06 | The CTS requires control rods to be periodically tested by "partial movement of all rods". This test is intended to confirm that the control rods are capable of tripping upon demand. The proposed ITS will verify freedom of movement by requiring the control rods to be moved a minimum of at least ten steps in either direction. This imposes an additional acceptance criteria for control rod freedom of movement which does not exist in the CTS. This change is a more restrictive change being made consistent with NUREG 1431.<br>**CTS:** 15.04.01 T 15.04.01-02 10<br>**ITS:** SR 3.01.04.02 |

# 15.3.10 CONTROL ROD AND POWER DISTRIBUTION LIMITS

## Applicability

Applies to the operation of the control rods and to core power distribution limits. A.02

## Objective

A.03

To insure (1) core subcriticality after a ~~reactor trip~~, (2) a limit on potential reactivity ~~insertions~~ from a hypothetical rod cluster control ~~assembly~~ (RCCA) ejection, and (3) ~~an acceptable~~ core power distribution during ~~power~~ operation.

## Specification

A. SHUTDOWN MARGIN

1. The shutdown margin shall exceed the applicable value as shown in Figure 15.3.10-2 under all steady-state operating conditions from 350°F to full power. If the shutdown margin is less than the applicable value of Figure 15.3.10-2, within 15 minutes initiate boration to restore the shutdown margin. < See LCO 3.1.1 >

2. A shutdown margin of at least 1% Δk/k shall be maintained when the reactor coolant temperature is less than 350°F. If the shutdown margin is less than this limit, within 15 minutes initiate boration to restore the shutdown margin.

A.4

B. ROD OPERABILITY AND BANK ALIGNMENT LIMITS LCO 3.1.4

limits

Mode 1 and 2

A.6

1. During power and low power operation, all shutdown and control rods shall be operable, with all individual indicated rod positions within twelve steps of their bank demand position, except when the bank demand position is ≤30 steps or ≥215 steps. In this case, all individual indicated rod positions shall be within 24 steps of their bank demand position. SR 3.1.4.1

M.1

~~If an RCCA does not step in upon demand, up to six hours is allowed to determine whether the problem with stepping is an electrical problem. If the problem cannot be resolved within six hours, the RCCA shall be declared inoperable until it has been verified that it will step in or would drop upon demand.~~

M.2

LCO 3.1.4 Cond A

a. Rod Operability Requirements

or more rods are

(1) If one ~~rod is~~ determined to be untrippable, perform the following actions:

A.1

LCO 3.1.4 RA A.1.1 and A.1.2

M.2

AND

A.5

L.1

initiate action to

(a) Within one hour verify that the shutdown margin exceeds the applicable value ~~as shown in Figure 15.3.10-2;~~ provided in the COLR,
OR
(b) Within one hour restore the shutdown margin by boration,
~~OR~~
(c) Within six hours be in hot shutdown. Mode 2 with Keff < 1.0

LCO 3.1.4 RA A.2

A.6

~~(2) If sustained power operation with an untrippable rod is desired, perform the following actions:~~

~~(a) Within one hour verify that the shutdown margin exceeds the applicable value as shown in Figure 15.3.10-2; OR within one hour restore the shutdown margin by boration;~~
~~AND~~
~~(b) Within six hours, adjust the insertion limits to reflect the worth of the untrippable rod.~~

~~(c) If the above actions and associated completion times are not met, be in hot shutdown within six hours.~~

A.1

Consolidated with Cond A, RA A.1.1, A.1.2, and A.2

(3) If more than one rod is determined to be untrippable, perform the following actions:

(a) Within one hour verify that the shutdown margin exceeds the applicable value ~~as shown in Figure 15.3.10-2;~~ provided in the COLR, OR within one hour initiate action to restore the shutdown margin by boration;
AND
(b) Within six hours be in hot shutdown. Mode 3

L.1

A.6

A.5

A.7

LCO Statement/ Cond B

b. Rod Bank Alignment Limits

(1) If it has been determined that one rod is not within alignment limits, ~~and the indicated misalignment is not being caused by malfunctioning rod position indication,~~ within one hour restore the rod to within alignment limits; OR perform the following actions:

RA B.1

L.1

initiate action to

(a) Within one hour verify that the shutdown margin exceeds the applicable value ~~as shown in Figure 15.3.10-2~~ provided in the COLR, OR within one hour restore the shutdown margin by boration;
AND
(b) Within ~~eight~~ two hours reduce thermal power to ≤75 percent of rated thermal power;
AND

A.5

RA B 2.2

M.5

RA B.2.1.1/ B.2.1.2

A.1

RA B 2.3 — (c) Verify that the shutdown margin exceeds the applicable value ~~as shown in Figure 15.3.10-2~~ provided in the COLR, once per twelve hours; (A.5)
AND

RA B 2.4 — (d) Within 72 hours ~~verify that measured values of $F_Q(Z)$ are within limits;~~ perform SR 3.2.1.1 and SR 3.2.1.2
AND

RA B 2.5 — (e) Within 72 hours ~~verify that $F^N_{\Delta H}$ is within limits;~~ perform SR 3.2.2.1 (A.8)

Cond C and RA C.1 — (f) If the above actions and associated completion times are not met, be in hot shutdown within the following six hours.

RA B 2.6 - Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions within 5 days — ~~(g) In order to subsequently increase thermal power above 75 percent of rated thermal power with the existing rod misalignment, perform an analysis to determine the hot channel factors and the resulting allowable power level in accordance with TS 15.3.10.E.~~

M.3

(2) If it has been determined that more than one rod is not within alignment limits ~~and the misalignments are not being caused by malfunctioning rod position indication,~~ perform the following actions: (A.7)

(a) Within one hour verify that the shutdown margin exceeds the applicable value ~~as shown in Figure 15.3.10-2~~ provided in the COLR, (A.5) OR within one hour initiate action to (L.1) restore the shutdown margin by boration;
AND

(b) Be in hot shutdown within six hours.

Cond D and RA D.1.1, D.1.2, and D.2 (A.6)

C. ROD POSITION INDICATION

NOTE: Separate entry into TS 15.3.10.C.1.a, b, or c is allowed for each inoperable rod position indicator and each bank of demand position indication.

1. During power operation ≥10 percent of rated thermal power, the rod position indication system and the bank demand position indication system shall be operable.

a. If one or more rod position indicators (RPI) are determined to be inoperable, perform the following actions:

(1) Within eight hours verify the position of the rods with inoperable RPIs by using movable incore detectors;
AND

< See LCO 3.1.8

M.4 A.1

Tavg greater than or equal to 500 degrees

H. RCCA DROP TIMES

A.1

SR 3.1.4.3

1. With RCS temperature greater than the minimum temperature for criticality and with both reactor coolant pumps running, the drop time of each RCCA shall be no greater than 2.2 seconds from the loss of stationary gripper coil voltage to dashpot entry. ~~If this condition is not met, perform the following actions:~~

A.9

~~a. If the reactor is critical, declare the rod untrippable;~~
~~OR~~
~~b. If the reactor is subcritical, maintain the reactor subcritical.~~

Basis

< See LCOs 3.1.1, 3.1.6, and 3.1.7 >

Insertion Limits and Shutdown Margin

During power operation, the shutdown banks are fully withdrawn. Fully withdrawn is defined as a bank demand position equal to or greater than 225 steps. Evaluation has shown that positioning control rods at 225 steps, or greater, has a negligible effect on core power distributions and peaking factors. Due to the low reactivity worth in this region of the core and the fact that, at 225 steps, control rods are only inserted one step into the active fuel region of the core, positioning rods at this position or higher has minimal effect. This position is varied, based on a predetermined schedule, in order to minimize wear of the RCCA's from the guide cards.

The control rod insertion limits provide for achieving hot shutdown by reactor trip at any time and assume the highest worth control rod remains fully withdrawn. A 10% margin in reactivity worth of the control rods is included to assure meeting the assumptions used in the accident analysis. A reactor trip occurring during power operation places the reactor into hot shutdown. In addition, the insertion limits provide a limit on the maximum inserted rod worth in the unlikely event of a hypothetical rod ejection and provide for acceptable nuclear peaking factors. The specified control rod insertion limits take into account the effects of fuel densification. The rods are withdrawn in the sequence of A, B, C, D with overlap between banks. The overlap between successive control banks is provided to compensate for the low differential rod worth near the top and bottom of the core.

When the insertion limits are observed and the control rod banks are above the solid lines shown on Figure 15.3.10-1, the shutdown requirement is met. The maximum shutdown margin requirement occurs at end of core life and is based on the value used in analysis of the hypothetical steam break accident. Figure 15.3.10-2 shows the shutdown margin equivalent to 2.77% reactivity at end-of-life with respect to an uncontrolled cooldown. All other accident analyses assume 1% or greater reactivity shutdown margin. Shutdown margin calculations include the effects of axial power distribution. The accident analyses assume no change in core poisoning due to xenon, samarium or soluble boron.

< See LCOs 3.1.1 and 3.1.7 >



If the shutdown margin requirements are not met, boration must be initiated promptly. Fifteen minutes is an adequate period of time for an operator to correctly align and start the required systems and components. It is assumed that boration will be continued until shutdown margin requirements are met.

Rod Operability Requirements and Bank Alignment Limits

A.15

The operability (e.g. trippability) of the shutdown and control rods is an initial assumption in all safety analyses that take credit for rod insertion upon reactor trip. Maximum rod misalignment is also an initial assumption in the safety analyses that directly affect core power distributions and assumptions of available shutdown margin. A rod cluster control assembly (RCCA) shall be considered operable if the RCCA drops upon removal of stationary gripper coil voltage.

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. This will also cause a reduction in the total available rod worth for reactor shutdown. Therefore, control rod alignment and operability are related to core operation in design power peaking limits and the core design requirement of a minimum shutdown margin.

From operating experience to date, an RCCA which steps in properly will drop when a trip signal occurs because the only force acting to drive the rod in is gravity. When it has been determined that a rod does not drop, the shutdown margin calculation will need to include the worth of the inoperable control rod. Further experience indicates that control rods which do not step are usually affected by electrical problems. That is, normally the problem is in the rod control cabinets.

Rod cluster control assemblies (RCCAs), or rods, are moved by their control rod drive mechanisms (CRDMs). Each CRDM moves its RCCA one step (approximately 5/8 inch) at a time, but at varying rates (steps per minute) depending on the signal output from the Rod Control System.

The RCCAs are divided among control banks and shutdown banks. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. A bank of RCCAs consists of one or two groups that are moved in staggered fashion, but always within one step of each other. Each unit has four control banks and two shutdown banks.

When one or more rods are determined to be untrippable, there is a possibility that the required shutdown margin may be adversely affected. Under these conditions, it is important to determine the shutdown margin, and if it is less than the required value, initiate boration until the required shutdown margin is restored. The one-hour time limit is adequate for determining the shutdown margin and, if necessary, for restoring the shutdown margin by boration. In this situation, shutdown margin verification must include the worth of the untrippable rod, as well as a rod of maximum worth.

If the untrippable rods cannot be restored to an operable condition, the plant must be placed in a condition where the LCO requirements are not applicable. To achieve this status, the unit must be placed in hot shutdown within six hours. This allows this plant condition to be reached in an orderly manner, without challenging any plant systems.

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

If the misalignment condition cannot be readily corrected, thermal power will be adjusted so that hot channel factors are maintained, and so that the requirements on shutdown margin and ejected rod worth are preserved. Continued operation of the reactor with a misaligned control rod is allowed if $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits. When a control rod is misaligned, the assumptions that are used to determine the rod insertion limits, axial flux difference limits, and quadrant power tilt limits are not preserved. Therefore, the limits may not preserve the design peaking factors and $F_Q(Z)$ and $F^N_{\Delta H}$ must be verified directly by incore mapping.

Upon detection of a potential problem concerning one or more rods, a maximum of six hours is provided for troubleshooting activities. Immediately upon determining that one or more rods is inoperable, the applicable actions in TS 15.3.10.B shall be performed. If after six hours, an operability determination has not yet been made, the rod(s) shall be declared inoperable and the applicable actions in TS 15.3.10.B shall be performed.

Rod Position Indication

< See LCO 3.1.8 >

During power operation at greater than ten percent of rated thermal power, the rod position indication system and the bank demand position indication system are required to be operable. These systems are required to be operable because the position of rods must be determined in order to ensure that rod alignment and insertion limits are being satisfied. Rod position accuracy is essential during power operations. Power peaking, ejected rod worth, or shutdown margin limits may be violated in the event of a design basis accident with rods operating, undetected, outside of their required limits.

The various control rod banks (shutdown banks and control banks, A, B, C, and D) are each to be moved as a bank; that is, with all rods in the bank within one step (5/8 inch) of the bank position. Direct information on rod position indication is provided by two methods: A digital count of actuating pulses which shows the demand position of the banks and a linear position indicator (LVDT) which indicates the actual rod position. The rod position indicator channel has a demonstrated accuracy of 5% of span (±11.5 steps). Therefore, an analysis has been performed to show that a misalignment of 24 steps cannot cause design hot channel factors to be exceeded. A single fully misaligned RCCA, that is, an RCCA 230 steps out of alignment with its bank, does not result in exceeding core limits in steady-state operation at power levels less than or equal to rated power. In other words, a single dropped RCCA is allowable from a core power

TABLE 15.4.1-2 (Continued)

< See LCOs 3.7.15 and 3.7.16 >

| | | Test | Frequency |
|---|---|---|---|
| 7. | Spent Fuel Pit | a) Boron Concentration | Monthly |
| | | b) Water Level Verification | Weekly |
| 8. | Secondary Coolant | Gross Beta-gamma Activity or gamma isotopic analysis | Weekly(6) |
| | | Iodine concentration | Weekly when gross Beta-gamma activity equals or exceeds 1.0 μCi/g (6) |
| 9. | Control Rods | a) Rod drop times of all ~~full length~~ rods ~~(4)~~ | Each refueling or after maintenance that could affect proper functioning ~~(4)~~ |
| | | b) Rodworth measurement | Following ~~each refueling shutdown~~ prior to commencing power operation |
| 10. | Control Rod | ~~Partial movement of all rods~~ | ~~Every 2 weeks~~ ~~(10)~~ 92 days |
| 11. | Pressurizer Safety Valves | Set point < See LCO 3.4.10 > | Every five years (11) |
| 12. | Main Steam Safety Valves | Set Point < See LCO 3.7.1 > | Every five years (11) |
| 13. | Containment Isolation Trip | Functioning < See LCO 3.6.3 and 3.6.2 > | Each refueling shutdown |
| 14. | Refueling System Interlocks | Functioning < See LCO 3.9.1 > | Each refueling shutdown |
| 15. | Service Water System | Functioning < See LCO 3.7.8 > | Each refueling shutdown |
| 16. | Primary System Leakage | Evaluate < See LCO 3.4.13 > | Monthly (6) |
| 17. | Diesel Fuel Supply | Fuel inventory < See LCO 3.8.3 > | Daily |
| 18. | Deleted | | |
| 19. | Deleted | | |
| 20. | Boric Acid System | Storage Tank and piping temperatures ≥ temperature required by Table 15.3.2-1 | Daily(19) |

< See LCO 3.7.18 >

SR 3.1.4.3

A.11/L.3

A.10

A.1

Prior to reactor criticality after each removal of

L.6/
L.2

LA.1

Verify rod freedom of movement (trippability) by moving each control rod not fully inserted in the core ≥ 10 steps in either direction

SR 3.1.4.2

M.6

A.12

L.4

< See LCO 3.5.2 >

A.1

TABLE 15.4.1-2 (Continued)

| | | | |
|---|---|---|---|
| 30. | Pressurizer Heaters | Verify that 100 KW of heaters are available | Quarterly |
| 31. | CVCS Charging Pumps | Verify operability pumps.(17) | Quarterly |
| 32. | Potential Dilution in Progress Alarm | Verify operability of alarm. | Prior to placing plant in cold shutdown. |
| 33. | Core Power Distribution | Perform power distribution maps using movable incore detector system to confirm hot channel factors | Monthly (20) |
| 34. | Shutdown Margin | Perform shutdown margin calculation | Daily (21) |

< See LCO 3.4.9 >

< See LCO 3.5.2 >

< See LCO 3.3.9 >

< See LCOs 3.2.1 and LCO 3.2.2>

< See LCOs: 3.4.16, 3.5.4, 3.7.18, and 3.4.13 >

< See LCO 3.1.1 and 3.1.10 >

< See LCO 3.4.16 >

< See LCOs 3.7.1, 3.4.10 >

(1) Required only during periods of power operation.

(2) Q determination will be started when the gross activity analysis of a filtered sample indicates ≥10μCi/cc and will be redetermined if [will all reactor coolant pumps running] req A.11 increase by SR 3.1.4.3 Ci/cc.

L.3

(3) Drop test shall be conducted [at rated reactor coolant flow]. Rods shall ~~be dropped under~~ both cold and hot condition, but ~~cold drop tests need not~~ be timed.

(4) Drop tests will be conducted [in the hot condition] [greater than or equal to 500 degrees] for rods on which ~~maintenance was performed~~.

L.6

L.2

(5) As accessible without disassembly of rotor.

(6) Not required during periods of refueling shutdown.

(7) At least once per week during periods of refueling shutdown.

< See LCO 3.4.16 >

(8) At least three times per week (with maximum time of 72 hours between samples) during periods of refueling shutdown.

(9) Not required during periods of cold or refueling shutdown, but must be performed prior to exceeding 200°F if it has not been performed during the previous surveillance period.

< See LCOs 3.3.1, 3.6.3 >

(10) Sample to be taken after a minimum of 2 EFPD and 20 days power operation since the reactor was last subcritical for 48 hours or longer.

< See LCO 3.4.16 >

(11) An approximately equal number of valves shall be tested each refueling outage such that all valves will be tested within a five year period. If any valve fails its tests, an additional number of valves equal to the number originally tested shall be tested. If any of the additional tested valves fail, all remaining valves shall be tested.

(12) The specified buses shall be determined energized in the required manner at least once per shift by verifying correct static transfer switch alignment and indicated voltage on the buses.

< See Section 3.8 >

(13) Not required if the block valve is shut to isolate a PORV that is inoperable for reasons other than excessive seat leakage.

< See LCO 3.4.11 >

(14) Only applicable when the overpressure mitigation system is in service.

(15) Required to be performed only if conditions will be established, as defined in Specification 15.3.15, where the PORVs are used for low temperature overpressure protection. The test must be performed prior to establishing these conditions.

< See LCO 3.4.12 >

Associated Specification removed with Unit 1 Amendment 176 and Unit 2 Amendment 180

A.1

TABLE 15.4.1-2 (Continued)

< See LCOs 3.4.11 and 3.4.12>

(16) Test valve operation in accordance with the inservice test requirements of the ASME Boiler and Pressure Vessel Code, Section XI.

(17) ~~Operability of charging pumps is verified by ensuring that the pumps develop the required flowrate, as~~ specified by the In-Service Test Program.

< See LCO 3.5.2 >

(18) ~~Not required to be performed if the reactor is subcritical.~~

(19) ~~Required only when the BAST(s) are relied upon as a source of borated water.~~

(20) Perform during power operation at effective full power monthly invervals. Following a refueling shutdown, a powre distribution map shall be performed prior to exceeding 90% of rated thermal power.

(21) ~~Only applicable during low-power physics testing.~~

< See LCOs 3.2.1 and 3.2.2 >

A.12

< See LCO 3.1.1 and 3.1.10 >

Spec 3.1.5
Page 10 of 13

A.1

TABLE 15.4.1-1 (continued)

| NO. | CHANNEL DESCRIPTION | CHECK | CALIBRATE | TEST | PLANT CONDITIONS WHEN REQUIRED |
|---|---|---|---|---|---|
| 9. | Steam Generator Flow Mismatch | S(22) | R | Q(1) | ALL |
| 10. | Steam Generator Pressure | S(16) | R | Q(1) | ALL |
| 11. | 4KV Bus Undervoltage (A01 & A02) | | | | |
| | -AFW pump actuation | - | R | M(1) | ALL |
| | -Reactor Protection actuation | - | R | M(1,2) | ALL |
| 12. | 4KV Bus Underfrequency (A01 & A02) | | | | |
| | -to Reactor Coolant Pump trip | - | R | - | ALL |
| 13. | Safeguards Bus Voltage | | | | |
| | -Loss of 4KV | S | R | M | ALL |
| | -Degraded 4KV | S | R | M | ALL |
| | -Loss of 480V | S | R | M | ALL |
| 14. | 120 Vac Instrument Buses | W(6) | - | - | ALL |
| 15. | Reactor Trip Signal From Turbine | | | | |
| | -Turbine Autostop | - | - | M(1) | ALL |
| | -Turbine Stop Valve | - | - | M(1) | ALL |
| 16. | Reactor Trip Signal From SI | - | - | M(1) | ALL |
| 17. | Feedwater Isolation on SI | | | | |
| | -MFP Trip on Safety Injection | - | - | R | ALL |
| | -MFRV Shutting on Safety Injection | - | - | R | ALL |
| 18. | Accumulator Level and Pressure | S | R | - | ALL |
| 19. | Analog Rod Position | S(8)~~(22)~~ | R | - | ~~ALL~~ |
| | -with step counters | ~~S(22)~~ | - | - | ~~ALL~~ |
| | -Monitoring by On-Line Computer | (18) | - | - | PWR,HOT S/D |

< See LCOs: 3.3.1, 3.3.2, and 3.3.5 >

< See LCOs; 3.8.9 and 3.8.10 >

< See LCOs 3.1.6 and 3.1.7>

< See LCO 3.5.1 >

A.13

< See LCO 3.1.8 >

Mode 1 and 2

A.13

L.5

Replace with Insert 3.1.5-1

A.14/L.7

NOTATION USED IN TABLE 15.4.1-1

A – Annually (12 months)
S- Each shift ← L.7
D- Daily
W- Weekly
Q- Quarterly
M- Monthly
P- Prior to reactor criticality if not performed during the previous week.
R- Each refueling interval (18 months)
PWR- Power and Low Power Operation, as defined in Specifications 15.1.h. and 15.1.m.
HOT S/D- Hot Shutdown, as defined in Specification 15.1.g.1.
COLD S/D- Cold Shutdown, as defined in Specification 15.1.g.2.
REF S/D- Refueling Shutdown, as defined in Specification 15.1.g.3.
ALL- All conditions of operation, as defined in Specifications 15.1.g, h and m. ← A.13

**Discussed in LCOs which notation is applicable to**

NOTES USED IN TABLE 15.4.1-1

**< See LCOs; 3.3.1, 3.3.3, and 3.3.2>**

| | |
|---|---|
| (1) | Not required during periods of refueling shutdown, but must be performed prior to reactor criticality if it has not been performed during the previous surveillance period. |
| (2) | Tests of the low power trip bistable setpoints which cannot be done during power operations shall be conducted prior to reactor criticality if not done in the previous surveillance interval. **< See LCO 3.3.1>** |
| (3) | Perform test of the isolation valve signal. **< See LCO 3.3.2 >** |
| (4) | Perform by means of the moveable incore detector system. **< See LCO 3.3.1 >** |
| (5) | Recalibrate if the absolute difference is ≥3 percent. |
| (6) | Verification of proper breaker alignment and that the 120 Vac instrument buses are energized. **< See Section 3.8 >** |
| (7) | Source check is required prior to initiation of a release. Source check is an assessment of channel response by exposing the detector to a source of increased radiation. Channel check is required shiftly during a release. If monitor or isolation function is discovered inoperable, discontinue release immediately. **< See Section 3.3 >** |
| (8) | Verify that the associated rod insertion limit is not being violated at least once per 4 hours whenever the rod insertion limit alarm for a control bank is inoperable. **< See LCOs 3.1.6 and 3.1.7>** |
| (9) | Test of Narrow Range Pressure, 3.0 psig, -3.0 psig excluded. **< See LCO 3.3.2 >** |

A.1

< See LCO 3.4.12 >



NOTES USED IN TABLE 15.4.1-1 (continued)

(10) When used for the Low Temperature Overpressure System, each PORV shall be demonstrated operable by:
a. Performance of a channel functional test on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required operable and at least once per 31 days thereafter when the PORV is required operable.

(11) Performance of a channel functional test is required, excluding valve operation. < See LCO 3.4.11 >

(12) Shiftly check is required when the reactor coolant system is not open to the atmosphere and the reactor coolant system temperature is less than the minimum temperature for the in-service pressure test as specified in TS Figure 15.3.1-1. < See LCO 3.4.12 >

(13) An AFW flow path to each steam generator shall be demonstrated operable, following each cold shutdown of greater than 30 days, prior to entering power operation by verifying AFW flow to each steam generator. < See LCO 3.7.5 >

(14) Calibration is to be a verification of response to a source. < See LCO 3.3.3 >

(15) Sample gas for calibration at 2% and 6%.

< See LCO 3.4.3 >

(16) A check of one pressure channel per steam generator is required whenever the steam generator could be pressurized.

< See LCOs 3.3.1 and 3.3.2>

(17) Includes test of logic for reactor trip on low-low level, automatic actuation logic for auxiliary feedwater pumps, and test of logic for feedwater isolation on high steam generator level.

(18) Rod positions must be logged at least once per hour, after a load change >10% or after >30 ~~inches of control rod motion if the on-line computer is inoperable.~~ L.5

(19) The daily heat balance is a gain adjustment performed to match Nuclear Instrumentation System indicated power level with reactor thermal output.

(20) To confirm that hot channel factor limits are being satisfied, the requirements of TS 15.3.10.B must be met. < See LCO 3.3.1 >

(21) Check required only when the low temperature overpressure protection system is in operation. < See LCO 3.4.11 >

(22) Not required during period of cold and refueling ~~shutdowns, but must be performed prior to reactor criticality if it~~ has not been performed during the previous surveillance period. A.13

(23) Each train tested at least every 62 days on a staggered basis. < See LCOs 3.3.1 and 3.3.2 >

(24) Neutron detectors excluded from calibration. < See LCO 3.3.1 >

LCO 3.1.5 CTS INSERT 3.1.5-1

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.4.1 | Verify individual indicated rod positions are within the following alignment limits:<br><br>± 12 steps of their group step demand when demand position indication is > 30 steps and < 215 steps; and<br><br>± 24 steps of their group step demand when demand position indication is ≤ 30 steps and ≥ 215 steps. | 12 hours |

L.7

A.14

# Justification For Deviations - NUREG-1431 Section 3.01.05

*13-Nov-99*

| JFD Number | JFD Text |
|---|---|
| 01 | The CTS requires all shutdown and control rods to be within an alignment limit which is based on demanded control rod position. Between 30 and 215 step of demand, the limit is 12 steps with the limit becoming 24 steps at less than or equal to 30 and greater than or equal to 215 steps of demand. NUREG 1431 presents the control rod alignment limit as a fixed value of 12 steps for the entire range of demand position. The proposed ITS LCO has been rephrased to require the control rod alignment to be maintained within limits, with the variable limit specified in SR 3.1.5.1. Complementary changes have been proposed to the Bases and examples of rod misalignment within consistent with the requirements. This change is necessary to retain the variable alignment limit contained in the CTS while maintaining a concise LCO statement.<br><br>Variable rod alignment limits are required based on non-linearities that exist in the analog rod position indication system at Point Beach. The expanded limits for rod alignment at the extreme ends of control rod demanded position are acceptable based on the relatively low rod worth and peaking factors in this range. |

| ITS: | NUREG: |
|---|---|
| B 3.01.04 | B 3.01.05 |
| LCO 3.01.04 | LCO 3.01.05 |
| SR 3.01.04.01 | SR 3.01.05.01 |

*13-Nov-99*

| JFD Number | JFD Text |
|---|---|
| 02 | The NUREG LCO 3.1.5 specifies the instrumentation necessary for LCO compliance within the LCO statement, requiring "indicated rod positions". By stating that the LCO requires "indicated rod position", an inoperable rod position indicator would result in non-compliance with this LCO statement, even though the Actions contined in ITS LCO 3.1.7 provide appropriate compensitory Action for the loss of an indicator. This change simplifies the LCO presentation while retaining the CLB variable rod alignment limits as addressed in Justification for Deviation 1 of this Section. LCO 3.1.5 ensures control rod alignment is maintained within the limit. The prefered means of determining indicated rod position is through the use of the rod position indicator system, however alternate means are addressed in ITS LCO 3.1.7 if a position indicator is inoperable.<br><br>The CTS contains this concept in CTS 15.3.10.B.1.b.1 which establishes the Action for a control rod which has been determined not to be within its alignment limits based on the inoperability of the position indicator itself. Although the specific instrumentation required for LCO compliance (i.e. the individual indicated rod position) is deleted from the LCO statement, the ITS will continue to require that control rods be maintained within their alignment limits in ITS LCO 3.1.4 while establishing the means of determining rod position in ITS LCO 3.1.7. This change is consistent with the CTS. Changes to the LCO made by TSTF 107, Revision 4, are not applicable with these proposed changes.<br><br>**ITS:** B 3.01.04; LCO 3.01.04<br>**NUREG:** B 3.01.05; LCO 3.01.05 |
| 03 | NUREG 1431 requires verification of steady state FQ (SR 3.2.1.1) within 72 hours of one control rod being found to be outside its alignment limits. The ITS will require verification of the steady state FQ limit (FQC(Z)), and the transient FQ limit (FQW(Z)) within 72 hours of one control rod being found to be outside its alignment limits. As discussed in Description of Change L.04 of LCO 3.2.1, the surveillance methodology at Point Beach, by which FQ is determined uses Relaxed Axial Offset Control. Under this methodology, FQ is approximated using two independent limits FQC(Z) and FQW(Z), which are verified in Surveillance Requirements SR 3.2.1.1 and 3.2.1.2 in the proposed ITS. FQC(Z) is the actual measured heat flux at equilibrium conditions, corrected for measurement and manufacturing tolerances, and FQW(Z) is FQC(Z) corrected for projected worst case heat flux redistributions. Verification of the steady state limit alone does not ensure that the transient limit is met. Therefore, adding a requirement to verify that the transient limit (FQW(Z) - SR 3.2.1.2) is met as well as the steady state limit (FQC(Z) - SR 3.2.1.1) is consistent with verification that the overall FQ limit is maintained as required by the CTS. This implements approved TSTF 314, Revision 0.<br><br>**ITS:** B 3.01.04; LCO 3.01.04 COND B RA B.2.4<br>**NUREG:** B 3.01.05; LCO 3.01.05 COND B RA B.2.4 |

| JFD Number | JFD Text | |
|---|---|---|
| 04 | Brackets have been removed and the appropriate plant specific information has be input. Appropriate changes made within the Bases text as appropriate. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.04 | B 3.01.05 |
| | SR 3.01.04.03 | SR 3.01.05.03 |
| 05 | Reference to the General Design Criteria (GDC) of 10 CFR 50 Appendix A has been deleted from the Bases of the Technical Specifications, substituting reference to the appropriate section of the FSAR which specifies the Point Beach design criteria. Point Beach was constructed and licensed prior to the GDC being issued. The Point Beach construction permit was issued prior to the GDCs being issued in 1971. Point Beach was designed and constructed utilizing the 1967 proposed GDCs. Accordingly, reference has been provided to the appropriate criteria and section of the Point Beach FSAR which provides explanation of Point Beach's design basis. In addition, References 5 through 7 of the NUREG Bases References Section are not necessary, as the information which is tied to these references is contained in the same Section of the FSAR previously stated as Reference 4. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.04 | B 3.01.05 |
| 06 | The Bases for NUREG 1431 contains a generic description of the number of control rod groups per bank. This description has been replaced with information reflective of the Point Beach design. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.04 | B 3.01.05 |
| 07 | NUREG 1431 refers to the equipment used to provide individual rod position indication as being digital, while the equipment installed and used at Point Beach is analog. Accordingly, the description of the equipment and terminology used in the proposed ITS has been alter to reflect Point Beach's design. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.04 | B 3.01.05 |

| JFD Number | JFD Text | |
|---|---|---|
| 08 | NUREG LCO 3.1.5 requires all control rods to be operable and within their alignment limits. Control rod alignment is verified by SR 3.1.5.1, while operability is defined by SR 3.1.5.2 and SR 3.1.5.3 which verify control rod freedom of movement (trippability) and control rod drop time. NUREG 1431 contains Conditions and Required Actions to address control rod untrippability and misalignment, but does not contain a Condition to address rod drop times that are out of limits. While rod drop timing is required to be performed prior to the reactor being made critical, it is not inconceivable that a control rod could be found to be outside of its rod drop time with the reactor critical, for which there is no Condition specified. Condition A has been rewritten to be applied to inoperable control rods so that it will encompass both untrippable control rods and control rods with excessive drop times. This change has been made to assure that shutdown margin is verified in addition to requiring a timely plant shutdown, as application of ITS LCO 3.0.3 alone would not require verification of shutdown margin and correction of shutdown margin if required. Complementary Bases changes have been made to reflect this change. These changes are consistent with approved TSTF 107, Revision 4. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.04 | B 3.01.05 |
| 09 | The Mode of Applicability for the Rod Group Alignment Limits in NUREG 1431 is Modes 1 and 2, and the associated Required Actions place the unit in Mode 3. The Mode of Applicability for the Rod Group Alignment Limits has been revised to be applicable in Modes 1 and 2 when Keff is greater than or equal to 1.0. Rod Group Alignment limits are established to maintain acceptable power distribution and to add negative reactivity to shutdown the reactor upon receipt of a reactor trip signal. Power distribution is only of concern when the reactor is at power (Keff greater than or equal to 1.0) which is consistent with the Mode of Applicability specified for the proposed Shutdown Bank Insertion Limits. Prior to reactor criticality, Shutdown margin is addressed in ITS LCO 3.1.1, which is applicable in Mode 2 with Keff less than 1.0 and Modes 3, 4, and 5. Accordingly, the safety basis for Rod Group Alignment limits is Modes 1 and 2 with Keff greater than or equal to 1.0, which is consistent with the current Technical Specification Mode of Applicability contained in Specification 15.3.10.B.1. Specification 15.3.10.B.1 is applicable during power and low power operation, which by the CTS would be anytime the reactor is critical. ITS Modes 1 and 2 with Keff greater than or equal to 1.0 is therefore equivalent to the CTS requirement. The associated Required Actions has been revised based upon the proposed Applicability to place the unit into Mode 2 with Keff less than 1.0. Corresponding changes to the Bases have been proposed to support these revised changes. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.04 | B 3.01.05 |
| | LCO 3.01.04 COND A | LCO 3.01.05 COND A |

| JFD Number | JFD Text |
|---|---|
| 10 | Point Beach uses the related axial offset methodology for determining compliance with the FQ heat flux hot channel factor. As such, reference to FQ has been revised to reflect FQW(Z) and FQC(Z) as stipulated in ITS LCO 3.2.1. This change is consistent with approved TSTF 314, Revision 0. |

| ITS: | NUREG: |
|---|---|
| B 3.01.04 | B 3.01.05 |

## 3.1 REACTIVITY CONTROL SYSTEMS

### 3.1.~~5~~ 4 Rod Group Alignment Limits

Approved TSTF 136

2

Approved TSTF 11

LCO 3.1.~~5~~ 4 All shutdown and control rods shall be OPERABLE, with ~~all~~ individual ~~indicated~~ rod positions within ~~12 steps of their group step counter demand position~~ limits.

1

APPLICABILITY: ~~MODES 1 and 2.~~
MODE 1.
MODE 2 with $K_{eff} \geq 1.0$.

09

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more rod(s) ~~untrippable~~ inoperable (8) | A.1.1 Verify SDM ~~is ≥ [1.6]% Δk/k~~ to be within the limits provided in the COLR. | 1 hour |
| | OR | |
| | A.1.2 Initiate boration to restore SDM to within limit. | 1 hour |
| | AND | |
| | A.2 Be in ~~MODE 3.~~ MODE 2 with $K_{eff}$ < 1.0. (9) | 6 hours |
| B. One rod not within alignment limits. | B.1 Restore rod to within alignment limits. | 1 hour |
| | OR | |
| | B.2.1.1 Verify SDM ~~is ≥ [1.6]% Δk/k~~ to be within the limits provided in the COLR. | 1 hour |
| | OR | |

(continued)

to be within the limits provided in the COLR

Approved TSTF 9

Approved TSTF 136

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. (continued) | B.2.1.2 Initiate boration to restore SDM to within limit. | 1 hour |
| | AND | |
| | B.2.2 Reduce THERMAL POWER to ≤ 75% RTP. | 2 hours |
| | AND | |
| | B.2.3 Verify SDM ~~is ≥ [1.6]% Δk/k~~. to be within the limits provided in the COLR<br>Approved TSTF 9 | Once per 12 hours |
| | AND | |
| | B.2.4 Perform SR 3.2.1.1. and SR 3.2.1.2<br>3 | 72 hours |
| | AND | |
| | B.2.5 Perform SR 3.2.2.1. | 72 hours |
| | AND | |
| | B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions. | 5 days |
| C. Required Action and associated Completion Time of Condition B not met. | C.1 Be in ~~MODE 3.~~ MODE 2 with $K_{eff}$ < 1.0.<br>9 | 6 hours |

(continued)

Approved TSTF 136

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. More than one rod not within alignment limit. | D.1.1 Verify SDM ~~is ≥ [1.6]% Δk/k~~ to be within the limits provided in the COLR. | 1 hour |
| | OR | |
| | D.1.2 Initiate boration to restore required SDM to within limit. | 1 hour |
| | AND | |
| | D.2 Be in ~~MODE 3.~~ MODE 2 with $K_{eff}$ < 1.0. | 6 hours |

Approved TSTF 9

9

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.1.~~5~~4.1 ~~Verify individual rod positions within alignment limit.~~ Replace with Insert 3.1.5-01 | 12 hours ~~AND Once within 4 hours and every 4 hours thereafter when the rod position deviation monitor is inoperable~~ |

Approved TSTF 136

1

Approved TSTF 110

(continued)

Approved TSTF 136 4

SURVEILLANCE REQUIREMENTS (continued)

| | | |
|---|---|---|
| SR 3.1.5.2 | Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction. | 92 days |
| SR 3.1.5.3 | Verify rod drop time of each rod, fr om the fully withdrawn position, is ≤ 2.2 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with:<br>a. $T_{avg}$ ≥ 500°F; and<br>b. All reactor coolant pumps operating. | Prior to reactor criticality after each removal of the reactor head |

4 4

Approved TSTF 136

Insert 3.1.5-01

Verify individual rod positions are within the following alignment limits:

a. ± 12 steps of demanded position when demand position indication is > 30 steps and < 215 steps; and

b. ± 24 steps of demanded position when demand position indication is ≤ 30 steps and ≥ 215 steps.

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.5 Rod Group Alignment Limits

8

BASES

---

BACKGROUND

i.e.

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

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

FSAR Section 3.2, Reactor Design, FSAR Section 1.3.5, Reactivity Control (Ref. 1 and 2)

5

3

or shutdown

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

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

Rod cluster control assemblies (RCCAs), or rods, are moved by their control rod drive mechanisms (CRDMs). Each CRDM moves its RCCA one step (approximately 5/8 inch) at a time, but at varying rates (steps per minute) depending on the signal output from the Rod Control System.

The RCCAs are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists

BASES

BACKGROUND (Continued)

6

A bank of RCCAs may consist of one or two groups. When a bank consists of two groups, the groups are moved in a staggered fashion, but always within one step of each other. Control banks A and C and shutdown bank A consist of two groups each while control banks B and D and shutdown bank B consist of a single group.

of two or more RCCAs that are electrically paralleled to step simultaneously. ~~A bank of RCCAs consists of two groups that are moved in a staggered fashion, but always within one step of each other. All units have four control banks and at least two shutdown banks.~~

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

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

7

The Bank Demand Position Indication System counts the pulses from the rod control system that moves the rods. There is one step counter for each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The Bank Demand Position Indication System is considered highly precise (± 1 step or ± 5/8 inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod.

7

Replace with Insert B 3.1.5-1

The ~~D~~RPI System provides a highly accurate indication of actual ~~control~~ rod position, but at a lower precision than the step counters. ~~This system is based on inductive analog signals from a series of coils spaced along a hollow tube~~

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BASES

BACKGROUND (Continued)

7

Replace with Insert B 3.1.5-1

~~with a center to center distance of 3.75 inches, which is six steps. To increase the reliability of the system, the inductive coils are connected alternately to data system A or B. Thus, if one system fails, the DRPI will go on half accuracy with an effective coil spacing of 7.5 inches, which is 12 steps. Therefore, the normal indication accuracy of the DRPI System is ± 6 steps (± 3.75 inches), and the maximum uncertainty is ± 12 steps (± 7.5 inches). With an indicated deviation of 12 steps between the group step counter and DRPI, the maximum deviation between actual rod position and the demand position could be 24 steps, or 15 inches.~~

4 5

APPLICABLE SAFETY ANALYSES

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

a. There be no violations of:

1. specified acceptable fuel design limits, or
2. Reactor Coolant System (RCS) pressure boundary integrity; and

b. The core remains subcritical after accident transients.

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

Two types of analysis are performed in regard to static rod misalignment (Ref. 4). With control banks at their insertion limits, one type of analysis considers the case when any one rod is completely inserted into the core. The second type of analysis considers the case of a completely

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APPLICABLE SAFETY ANALYSES (continued)

withdrawn single rod from a bank inserted to its insertion limit. Satisfying limits on departure from nucleate boiling ratio in both of these cases bounds the situation when a rod is misaligned from its group by 12 steps.

Another type of misalignment occurs if one RCCA fails to insert upon a reactor trip and remains stuck fully withdrawn. This condition is assumed in the evaluation to determine that the required SDM is met with the maximum worth RCCA also fully withdrawn (Ref. ~~5~~ 4). 5

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

10

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

10

Shutdown and control rod OPERABILITY and alignment are directly related to power distributions and SDM, which are initial conditions assumed in safety analyses. Therefore they satisfy Criterion 2 of the NRC Policy Statement.

LCO

The limits on shutdown or control rod alignments ensure that ~~the assumptions in~~ control rod the safety analysis will remain valid. The requirements on OPERABILITY ensure that upon reactor ~~trip, the assumed reactivity~~ LCO will be available and will be ~~inserted~~ Insert B 3.1.5-2. The ~~OPERABILITY~~ requirements also ensure that the

8



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LCO (continued)

RCCAs and banks maintain the correct power distribution and rod alignment.

The requirement to maintain the rod alignment to within plus or minus 12 steps is conservative. The minimum misalignment assumed in safety analysis is 24 steps (15 inches), and in some cases a total misalignment from fully withdrawn to fully inserted is assumed. Failure to meet the requirements of this LCO may produce unacceptable power peaking factors and LHRs, or unacceptable SDMs, all of which may constitute initial conditions inconsistent with the safety analysis.

APPLICABILITY

MODE 2 with Keff ≥ 1.0,

9

MODE 2 with Keff < 1.0, and

The requirements on RCCA OPERABILITY and alignment are applicable in MODES 1 and ~~2~~ because these are the only MODES in which neutron (or fission) power is generated, and the OPERABILITY (i.e., trippability) and alignment of rods have the potential to affect the safety of the plant. In MODES 3, 4, 5, and 6, the alignment limits do not apply because the ~~control rods are bottomed and the~~ reactor is shut down and not producing fission power. In the shutdown MODES, the OPERABILITY of the shutdown and control rods has the potential to affect the required SDM, but this effect can be compensated for by an increase in the boron concentration of the RCS. See LCO 3.1.1, "SHUTDOWN MARGIN (SDM) ~~- $T_{avg}$ > 200°F,~~" for SDM in MODES 3, 4, and 5 and LCO 3.9.1, "Boron Concentration," for boron concentration requirements during refueling.

9

MODE 2 with Keff < 1.0, and

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ACTIONS

A.1.1 and A.1.2

inoperable

8

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

In this situation, SDM verification must include the worth

ACTIONS (continued)

of the untrippable rod, as well as a rod of maximum worth.

A.2

inoperable 8

If the ~~untrippable~~ 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 unit must be brought to at least ~~MODE 3~~ within 6 hours. 9 MODE 2 with Keff < 1.0

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.

B.1

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

An alternative to realigning a single misaligned RCCA to the group average position is to align the remainder of the group to the position of the misaligned RCCA. However, this must be done without violating the bank sequence, overlap, and insertion limits specified in LCO 3.1.~~6~~ "Shutdown Bank Insertion Limits," and LCO 3.1.~~7~~ "Control Bank Insertion Limits." The Completion Time of 1 hour gives the operator sufficient time to adjust the rod positions in an orderly manner.

5 6 Approved TSTF 136

B.2.1.1 and B.2.1.2

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

In many cases, realigning the remainder of the group to the misaligned rod may not be desirable. For example, realigning control bank B to a rod that is misaligned

BASES

ACTIONS (continued)

25 1 ~~15~~ steps from the top of the core would require a significant power reduction, since control bank D must be moved fully in and control bank C must be moved in to approximately 100 to 115 steps.

Power operation may continue with one RCCA ~~trippable but~~ 8 misaligned, provided that SDM is verified within 1 hour. The Completion Time of 1 hour represents the time necessary for determining the actual unit SDM and, if necessary, aligning and starting the necessary systems and components to initiate boration.

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

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

Reduction of power to 75% RTP ensures that local LHR increases due to a misaligned RCCA will not cause the core design criteria to be exceeded (Ref. ~~7~~ 4 5). The Completion Time of 2 hours gives the operator sufficient time to accomplish an orderly power reduction without challenging the Reactor Protection System.

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

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

$F^C_Q(Z)$,
$F^W_Q(Z)$,
10

Once current conditions have been verified acceptable, time

BASES

ACTIONS (continued)

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Insert 3.1.5-3

is available to perform evaluations of accident analysis to determine that core limits will not be exceed ed during a Design Basis Event for the duration of operation under these conditions. A Completion Time of 5 days is sufficient time to obtain the required input data and to perform the analysis.

Approved TSTF 15

~~C~~ D.1.1 and ~~C~~ D.1.2

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

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~~C~~ D.2

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

9

The allowed Completion Time is reasonable, based on operating experience, for reaching ~~MODE 3~~ MODE 2 with Keff < 1.0 from full power conditions in an orderly manner and without challenging plant systems.

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C.1 ~~D.1~~

When Required Actions cannot be completed within their Completion Time, the unit must be brought to a MODE or

9 → MODE 2 with Keff < 1.0

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BASES

ACTIONS (continued)

Condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to a t least ~~MODE 3~~ within 6 hours, which obviates concerns about the development of undesirable xenon or power distributions. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching ~~MODE 3~~ from full power conditions in an orderly manner and without challenging the plant systems.

Approved TSTF 136 → 4

SURVEILLANCE REQUIREMENTS

SR 3.1.~~5~~.1

Verification that individual rod positions are within alignment limits at a Frequency of 12 hours provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. ~~If the rod position deviation monitor is inoperable, a Frequency of 4 hours accomplishes the same goal.~~ 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.

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9 → with Keff ≥ 1.0

SR 3.1.~~5~~.2

Verifying each control rod is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each control rod would result in radial or axial power tilts, or oscillations. Exercising each individual control rod every 92 days provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each control rod by 10 steps will not cause radial or axial power tilts, or oscillations, to occur. The 92 day Frequency takes into consideration other information available to the operator in the control room and SR 3.1.~~5~~.1, which is performed more frequently and adds to the determination of OPERABILITY of the rods. Between required performances of SR 3.1.~~5~~.2 (determination of control rod OPERABILITY by movement), if a control rod(s) is discovered to be immovable, but remains trippable ~~and aligned~~, the control rod(s) is considered to be OPERABLE. At any time, if a

8



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BASES

SURVEILLANCE REQUIREMENTS (continued)

control rod(s) is immovable, a determination of the trippability (OPERABILITY) of the control r od(s) must be made, and appropriate action taken.

Approved TSTF 136 → 4

SR 3.1.~~5~~ 4.3

Verification of rod drop times allows the operator to determine that the maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analysis. Measuring rod drop times prior to reactor criticality, after reactor vessel head removal, ensures that the reactor internals and rod drive mechanism will not interfere with rod motion or rod drop time, and that no degradation in these systems has occurred that would adversely affect control rod motion or drop time. This testing is performed with all RCPs operating and the average moderator temperature ≥ 500°F to simulate a reactor trip under actual conditions.

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.

REFERENCES

1. ~~10 CFR, Appendix A, GDC 10 and GDC 26.~~
2. ~~10 CFR 50.46.~~

1. FSAR, Section 3.2.
2. FSAR, Sections 1.3.5.

3. ~~FSAR, Chapter [15].~~ 10 CFR 50.46.
4. FSAR, Chapter ~~[15]~~ 14
5. ~~FSAR, Chapter [15].~~
6. ~~FSAR, Chapter [15].~~
7. ~~FSAR, Chapter [15].~~

5

4

**Insert 3.1.5-1:**

The RPI is a linear variable differential transformer (LVDT) consisting of primary and secondary coils stacked alternately on a support tube with the control rod drive shaft acting as the core of the transformer. The primary and secondary coils are series connected with the primary coil supplied with AC power from a constant current source. The position of the control rod drive shaft changes the primary to secondary coil magnetic coupling resulting in a variable secondary voltage which is proportional to the position of the drive shaft (control rod). The RPI channel has an indication accuracy of 5% of span (11.5 steps) therefore, the maximum deviation between actual and demanded indication could be 24 steps or approximately 15 inches. Because the rod position indicator system may have a 12 step error when a misalignment of 24 steps is occurring, the Specification allows only an indicated misalignment of 12 steps between 30 and 215 steps. When the bank demand position is greater than or equal to 215 steps, or, less than or equal to 30 steps, the consequences of a misalignment are much less severe. The differential worth of an individual RCCA is less, and the resultant perturbation on power distributions is less than when the bank is in its high differential worth region. At the top and bottom of the core, an indicated 24 step misalignment may be representing an actual misalignment of 36 steps.

**Insert 3.1.5-2:**

The control rod OPERABILITY requirement is satisfied provided the control rod will fully insert within the required rod drop time assumed in the safety analysis. Control rod malfunctions that result in the inability to move a control rod (e.g. lift coil and rod control system logic failures), but do not impact the control rod trippability, do not result in control rod inoperability.

**Insert 3.1.5-3:** 4 14

4 The accident analyses presented in the FSAR Chapter ~~15~~ (Ref. ~~5~~) that may be adversely affected will be evaluated to ensure that the analyses results remain valid for the duration of continued operation under these conditions.

| NSHC Number | NSHC Text |
|---|---|
| A | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change involves reformatting and rewording of the current Technical Specifications. The reformatting and rewording process involves no technical changes to existing requirements. As such, this change is administrative in nature and does not impact initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not increase the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any new or eliminate any old requirements. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The proposed change will not significantly reduce the margin of safety because it has no impact on any safety analysis assumptions. This change is administrative. As such, there is no technical change to the requirements and, therefore, there is no reduction in the margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.01 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change will relax the Technical Specification Required Actions requiring initiation of boration versus restoration of SDM. While SDM is assumed in various analyses, failing to meet the SDM limit is not an accident precursor. The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. Accordingly, there will be no significant change in the probability of accidents previously evaluated. The additional time allowed for this change to enact restoration actions does not represent an increase in the consequences of accidents previously evaluated, as the plant condition during this extended period is the same as those which are currently allowed for a finite period before requiring a unit shutdown, and a unit shutdown in itself will not directly restore SDM. Accordingly, the consequences are not increased as a result of this change.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>Relative to an untrippable control rod, the ITS requires the unit to be placed into Mode 3 within six hours, where as the CTS could have allowed continued operation with a single untrippable control rod. Multiple misaligned control rods, will also require the unit to be placed into Mode 3 within six hours. By requiring a unit shutdown, in parallel with the initiation of boration to restore SDM, all the appropriate actions necessary to place the unit into a safe condition continue to be required. Relative to single control rod misalignment, all analyses are performed assuming maximum control rod misalignment. Allowing more realistic action for restoration of SDM will continue to be enveloped by the accident analyses. Accordingly, the proposed change does not involve a significant reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.02 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change relaxes the specified testing conditions for the performance of rod drop timing tests from 540 degrees to 500 degrees. The purpose of specifying a minimum temperature for rod drop timing is to establish test conditions representative of an operating reactor. The probability of an accident is not increased by this change as the testing conditions are independent of event probabilities. The test conditions specified are still representative operating conditions. The establishment of this condition will continue to provide adequate assurance of component operability. In providing this assurance, the consequences of analyzed events have not been significantly increased.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed). Testing parameters specified are still representative of plant conditions expected during operation. The proposed conditions will still provide adequate assurance of continued operability, while not establishing any new or unique failure modes. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The control rods will continue to be tested under conditions representative of operating conditions. The minimum temperature for testing, while lower than currently allowed, will result in more conservative measured times, as rod drop times are longer at reduced temperatures due to increased coolant density. Therefore, while establishing increased testing flexibility, the proposed change will not result in a significant reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.03 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The Technical Specifications will continue to require testing to verify control rod operability. The performance of control rod drop timing with the reactor coolant temperature greater than 500 degrees has been demonstrated to be sufficient to verify control rod operability. There are no credible failure mechanisms that would exist solely under cold conditions during rod drop testing nor has there been an occurrence of a control rod failing to trip under cold conditions alone. Accordingly, the proposed change does not significantly increase the probability or consequences of accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still provide for testing under conditions representative of reactor operation, and will continue to provide assurance of control rod operability. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The testing conditions retained in the Technical Specifications for rod drop testing are adequate to provide sufficient assurance of rod operability. Cold drop testing is a good practice for verification of control rod trippability prior to plant heat up where rod drop timing is performed. There are no credible failure mechanisms that would exist solely under cold conditions nor has there been an occurrence of a control rod failing to trip under cold conditions alone. Satisfactory demonstration of control rod trippability in a hot condition is sufficient to provide adequate assurance of function prior to entry into the Mode of Applicability for control rods. Based on the above, this change does not represent a significant reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.04 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>Relaxing the frequency of performance for a surveillance does not result in any hardware changes, nor does it significantly increase the probability of occurrence for initiation of any analyzed events since the function of the equipment has remained unchanged. The proposed frequency has been determined to be adequate based on industry operating data as supported by the conclusions reached in NUREG 1366. Surveillance tests are intended to provide assurance of continued component operability. The frequency of performance of a surveillance does not significantly increase the consequences of an accident as a change in frequency does not change the response of the equipment in performing its specified function.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure compliance with the limiting condition for operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The increased surveillance interval is acceptable based on the industry data that has concluded that the likelihood of active equipment failure is low. The most probable failure mechanisms occur during refueling operations, for which testing is required by the Technical Specifications prior to entry into the Mode of Applicability. The likelihood of an undetectable failure is not significant based on data obtained during routine and non-routine evolutions. This information includes control rod position which is required to be verified every 12 hours by the Technical Specifications and monitoring of rod position changes in response to power changes. Based on the above, it has been concluded that this change does not represent a significant reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.05 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change involves deletion of a non-routine surveillance from the Technical Specifications which is based on the inoperability of a non-safety related alarm. The rod alignment limit alarm (initiated by the on-line computer) does not provide any safety function nor does it input to any protection circuits. Inoperability of the alarm in and of itself does not lead to a control rod misalignment. Alarm inoperability represents a reduction in monitoring capability for a condition (actual control rod misalignment) which rarely occurs. The on-line computer alarm merely provides a non-safety means of alerting personnel to a condition which does not comply with an LCO requirement. Control rod alignment limits are required to be routinely verified once every 12 hours by the proposed ITS. Deletion of the increased surveillance and conditional frequencies (logged once per hour, after load changes in excess of 10% power, and after rod motion in excess of 30 steps with an inoperable alarm) does not alleviate the responsibility of the license to be vigilant of plant conditions and LCO compliance. The inoperability and increased surveillance frequency are not linked to any accident precursors, and accordingly have no impact on the probability of events. The on-line computer (rod alignment limit alarm) is not assumed to function in the mitigation of any event, nor is the increased surveillance interval assumed. Accordingly the consequences of previously evaluated accidents are also unaffected. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. LCO compliance is still required. This change deletes non-routine surveillances based on other means which readily alert personnel to the potential of an LCO non-compliance. The proposed change will not impose any different operational configurations. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The proposed changes do not alter any assumed conditions or limitation in any previously evaluated accidents. Therefore the margin of safety is unaffected by this change. |

| NSHC Number | NSHC Text |
|---|---|
| L.06 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined that it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of a accident previously evaluated?<br><br>The proposed change continues to ensure that rod drop times remain within limits. The capability of control rods to drop in response to a trip signal is not a factor in determining the probability of an accident. The capability of the control rods to drop in response to a valid trip signal is a factor in determining the consequences of the accident. The proposed Specifications require that all applicable surveillances be met in order to consider the control rods operable. One of the surveillances verifies the control rods ability to drop into the core within required time limits. As the Specifications continue to provide assurance that the control rods will drop within time limits as required by the analyses, the consequences of an accident previously evaluated are not increased.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change, in conjunction the Technical Specification requirement that all applicable Surveillances be met in order to consider the control rods operable, ensures operation within the bounds of the existing analyses. No new systems or equipment are being installed, nor is the operation of existing equipment or systems altered by this change. Therefore, this change cannot create a new or different kind of accident form any accident previously evaluated.<br><br>3. Does the change involve a significant reduction in a margin of safety?<br><br>The proposed change does not alter the acceptance limits for rod drop testing. Technical Specifications continue to require operability of the control rods and ensure that the applicable Surveillance is adequate and performed at a periodicity necessary to provide assurance of operability. Rod drop testing will still be required following all maintenance that could affect rod drop times. Therefore, operation in accordance with the proposed change does not result in a reduction of a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.07 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. The proposed change extends the surveillance frequency for rod alignment verifications from "each shift" (nominally 8 hours) to 12 hours. This relaxation is acceptable, because the 12 hour 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. Therefore, this change does not increase the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation or alter the method of normal plant operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>There are no margins of safety related to safety analyses that are dependent upon the proposed change. The requirements will continue to assure that limiting conditions for the rod alignment verifications are properly maintained. Therefore, this change does not involve a reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| LA | *In accordance with the criteria set forth in 10 CFR 50.92,* PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change relocates requirements from the Technical Specifications to the Bases, FSAR, or other plant controlled documents. The Bases and FSAR will be maintained using the provisions of 10 CFR 50.59. In addition to 10 CFR 50.59 provisions, the Technical Specifications Bases are subject to the change process in the Administrative Controls Chapter of the ITS. Plant procedures and other plant controlled documents are subject to controls imposed by plant administrative procedures, which endorse applicable regulations and standards. Changes to the Bases, FSAR, or other plant controlled documents will be evaluated in accordance with the requirements of the Bases Control Program in Chapter 5.0 of the ITS, 10 CFR 50.59, or plant administrative processes. Therefore, no increase in the *probability or consequences of an accident previously evaluated will be allowed.*<br><br>2. Does the change create the possibility of a new or different kind of accident from any *accident previously evaluated?*<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any different requirements and adequate control of the information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the requirements to be moved from the Technical Specifications to the Bases, FSAR, or other plant controlled documents are as they currently exist. Future changes to the requirements in the Bases, FSAR, or other plant controlled documents will be evaluated in accordance with the requirements of 10 CFR 50.59, the Bases Control Program in Chapter 5.0 of the ITS, or the applicable plant process and no reduction in a margin of safety will be allowed. |

| NSHC Number | NSHC Text |
|---|---|
| M | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change provides more restrictive requirements for operation of the facility. These more stringent requirements do not result in operation that will increase the probability of initiating an analyzed event and do not alter the assumptions relative to the mitigation of an accident or transient event. These more restrictive requirements continue to ensure process variables, structures, systems and components are maintained consistent with the safety analyses. Therefore, this change does not increase the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change does impose different requirements. However, these changes are consistent with assumptions made in the safety analysis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The imposition of more restrictive requirements either has no affect on or increases the margin of safety. Each change is providing additional restrictions to enhance plant safety. These changes are consistent with the safety analysis. Therefore, this change does not involve a reduction in a margin of safety. |

## 3.1 REACTIVITY CONTROL SYSTEMS

### 3.1.4 Rod Group Alignment Limits

LCO 3.1.4 All shutdown and control rods shall be OPERABLE. with individual rod positions within limits.

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

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more rod(s) inoperable. | A.1.1 Verify SDM to be within the limits provided in the COLR.<br><br>OR<br><br>A.1.2 Initiate boration to restore SDM to within limit.<br><br>AND<br><br>A.2 Be in MODE 2 with $k_{eff}$ < 1.0. | 1 hour<br><br><br><br>1 hour<br><br><br><br>6 hours |
| B. One rod not within alignment limits. | B.1 Restore rod to within alignment limits.<br><br>OR<br><br>B.2.1.1 Verify SDM to be within the limits provided in the COLR.<br><br>OR | 1 hour<br><br><br><br>1 hour<br><br>(continued) |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. (continued) | B.2.1.2 Initiate boration to restore SDM to within limit. | 1 hour |
| | AND | |
| | B.2.2 Reduce THERMAL POWER to ≤ 75% RTP. | 2 hours |
| | AND | |
| | B.2.3 Verify SDM to be within the limits provided in the COLR. | Once per 12 hours |
| | AND | |
| | B.2.4 Perform SR 3.2.1.1 and SR 3.2.1.2. | 72 hours |
| | AND | |
| | B.2.5 Perform SR 3.2.2.1. | 72 hours |
| | AND | |
| | B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions. | 5 days |
| C. Required Action and associated Completion Time of Condition B not met. | C.1 Be in MODE 2 with $k_{eff}$ < 1.0. | 6 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. More than one rod not within alignment limit. | D.1.1 Verify SDM to be within the limits provided in the COLR. | 1 hour |
| | <u>OR</u> | |
| | D.1.2 Initiate boration to restore required SDM to within limit. | 1 hour |
| | <u>AND</u> | |
| | D.2 Be in MODE 2 with $k_{eff}$ < 1.0. | 6 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.1.4.1 Verify individual rod positions are within the following alignment limits:<br>a. ± 12 steps of demanded position when demand position indication is > 30 steps and < 215 steps; and<br>b. ± 24 steps of demanded position when demand position indication is ≤ 30 steps and ≥ 215 steps. | 12 hours |
| SR 3.1.4.2 Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction. | 92 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.4.3 | Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.2 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with:<br>a. $T_{avg}$ ≥ 500°F; and<br>b. All reactor coolant pumps operating. | Prior to reactor criticality after each removal of the reactor head |

B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.4 Rod Group Alignment Limits

BASES

BACKGROUND

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

The applicable criteria for these reactivity and power distribution design requirements are FSAR Section 3.2, Reactor Design, FSAR Section 1.3.5, Reactivity Control (Ref. 1 and 2), and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Plants" (Ref. 3).

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

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

Rod cluster control assemblies (RCCAs), or rods, are moved by their control rod drive mechanisms (CRDMs). Each CRDM moves its RCCA one step (approximately 5/8 inch) at a time, but at varying rates (steps per minute) depending on the signal output from the Rod Control System.

The RCCAs are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. A

BASES

BACKGROUND (Continued)

bank of RCCAs may consist of one or two groups. When a bank consists of two groups, the groups are moved in a staggered fashion, but always within one step of each other. Control banks A and C and shutdown bank A consist of two groups each while control banks B and D and shutdown bank B consist of a single group.

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

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

The Bank Demand Position Indication System counts the pulses from the rod control system that moves the rods. There is one step counter for each group of rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. The Bank Demand Position Indication System is considered highly precise (± 1 step or ± 5/8 inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod.

The RPI System provides a highly accurate indication of actual rod position, but at a lower precision than the step

BASES

BACKGROUND (Continued)

counters. The RPI is a linear variable differential transformer (LVDT) consisting of primary and secondary coils stacked alternately on a support tube with the control rod drive shaft acting as the core of the transformer. The primary and secondary coils are series connected with the primary coil supplied with AC power from a constant current source. The position of the control rod drive shaft changes the primary to secondary coil magnetic coupling resulting in a variable secondary voltage which is proportional to the position of the drive shaft (control rod). The RPI channel has an indication accuracy of 5% of span (11.5 steps) therefore, the maximum deviation between actual and demanded indication could be 24 steps or approximately 15 inches. Because the rod position indicator system may have a 12 step error when a misalignment of 24 steps is occurring, the Specification allows only an indicated misalignment of 12 steps between 30 and 215 steps. When the bank demand position is greater than or equal to 215 steps, or, less than or equal to 30 steps, the consequences of a misalignment are much less severe. The differential worth of an individual RCCA is less, and the resultant perturbation on power distributions is less than when the bank is in its high differential worth region. At the top and bottom of the core, an indicated 24 step misalignment may be representing an actual misalignment of 36 steps.

APPLICABLE SAFETY ANALYSES

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

a. There be no violations of:

   1. specified acceptable fuel design limits, or
   2. Reactor Coolant System (RCS) pressure boundary integrity; and

b. The core remains subcritical after accident transients.

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

BASES

APPLICABLE SAFETY ANALYSES (continued)

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.

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

Another type of misalignment occurs if one RCCA fails to insert upon a reactor trip and remains stuck fully withdrawn. This condition is assumed in the evaluation to determine that the required SDM is met with the maximum worth RCCA also fully withdrawn (Ref. 4).

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

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

BASES

APPLICABLE SAFETY ANALYSES (continued)

Shutdown and control rod OPERABILITY and alignment are directly related to power distributions and SDM, which are initial conditions assumed in safety analyses. Therefore they satisfy Criterion 2 of the NRC Policy Statement.

LCO

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

The requirement to maintain the rod alignment to within plus or minus 12 steps is conservative. The minimum misalignment assumed in safety analysis is 24 steps (15 inches), and in some cases a total misalignment from fully withdrawn to fully inserted is assumed. Failure to meet the requirements of this LCO may produce unacceptable power peaking factors and LHRs, or unacceptable SDMs, all of which may constitute initial conditions inconsistent with the safety analysis.

APPLICABILITY

The requirements on RCCA OPERABILITY and alignment are applicable in MODES 1 and 2 with $k_{eff} \geq 1.0$ 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 MODE 2 with $k_{eff} < 1.0$ and MODES 3, 4, 5, and 6, the alignment limits do not apply because the reactor is shut down and not producing fission power. In the shutdown MODES, the OPERABILITY of the shutdown and control rods has the potential to affect the required SDM, but this

BASES

APPLICABILITY (continued)

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 MODE 2 with $k_{eff}$ < 1.0, and MODES 3, 4, and 5 and LCO 3.9.1, "Boron Concentration," for boron concentration requirements during refueling.

ACTIONS

A.1.1 and A.1.2

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

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

A.2

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 unit must be brought to at least MODE 2 with $k_{eff}$ < 1.0 within 6 hours.

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

B.1

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

An alternative to realigning a single misaligned RCCA to the group average position is to align the remainder of the

BASES

ACTIONS (continued)

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

B.2.1.1 and B.2.1.2

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

In many cases, realigning the remainder of the group to the misaligned rod may not be desirable. For example, realigning control bank B to a rod that is misaligned 25 steps from the top of the core would require a significant power reduction, since control bank D must be moved fully in and control bank C must be moved in to approximately 100 to 115 steps.

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

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

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

Reduction of power to 75% RTP ensures that local LHR increases due to a misaligned RCCA will not cause the core design criteria to be exceeded (Ref. 4). The Completion Time of 2 hours gives the operator sufficient time to accomplish an orderly power reduction without challenging the Reactor Protection System.

BASES

ACTIONS (continued)

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

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

Once current conditions have been verified acceptable, time is available to perform evaluations of accident analysis to determine that core limits will not be exceeded during a Design Basis Event for the duration of operation under these conditions. The accident analyses presented in the FSAR Chapter 14 (Ref. 4) that may be adversely affected will be evaluated to ensure that the analysis results remain valid for the duration of continued operation under these conditions. A Completion Time of 5 days is sufficient time to obtain the required input data and to perform the analysis.

C.1

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

D.1.1 and D.1.2

More than one control rod becoming misaligned from its group average position is not expected, and has the potential to

BASES

ACTIONS (continued)

reduce SDM. Therefore, SDM must be evaluated. One hour allows the operator adequate time to determine SDM. Restoration of the required SDM, if necessary, requires increasing the RCS boron concentration to provide negative reactivity, as described in the Bases of LCO 3.1.1. The required Completion Time of 1 hour for initiating boration is reasonable, based on the time required for potential xenon redistribution, the low probability of an accident occurring, and the steps required to complete the action. This allows the operator sufficient time to align the required valves and start the boric acid pumps. Boration will continue until the required SDM is restored.

D.2

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

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

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

SR 3.1.4.2

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

SR 3.1.4.3

Verification of rod drop times allows the oper ator to determine that the maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analysis. Measuring rod drop times prior to reactor criticality, after reactor vessel head removal, ensures that the reactor internals and rod drive mechanism will not

BASES

SURVEILLANCE REQUIREMENTS (continued)

interfere with rod motion or rod drop time, and that no degradation in these systems has occurred that would adversely affect control rod motion or drop time. This testing is performed with all RCPs operating and the average moderator temperature ≥ 500°F to simulate a reactor trip under actual conditions.

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.

REFERENCES

1. FSAR, Section 3.2.
2. FSAR, Sections 1.3.5.
3. 10 CFR 50.46.
4. FSAR, Chapter 14.

# Cross-Reference Report - NUREG-1431 Section 3.01.06
## ITS to CTS

13-Nov-99

| ITS | CTS | DOC |
|---|---|---|
| B 3.01.05 | 15.03.10 OBJ | A.07 |
| | BASES | A.03 |
| COLR | 15.03.10 F 15.03.10-01 | LA.01 |
| | 15.03.10.A.01 | LA.01 |
| LCO 3.01.05 | 15.03.10 | A.01 |
| | 15.03.10 APPL | A.06 |
| | 15.03.10.A.01 | A.08 |
| | 15.03.10.D.01 | A.01 |
| | 15.03.10.D.01 | A.02 |
| LCO 3.01.05 COND A | 15.03.10.D.01.a | A.01 |
| LCO 3.01.05 COND A RA A.1.1 | 15.03.10.D.01.a | LA.01 |
| LCO 3.01.05 COND A RA A.1.2 | 15.03.10.A.01 | L.01 |
| | 15.03.10.D.01.a | L.01 |
| LCO 3.01.05 COND A RA A.2 | 15.03.10.D.01.b | A.01 |
| LCO 3.01.05 COND B | 15.03.10.D.01.c | A.01 |
| LCO 3.01.05 COND B RA B.1 | 15.03.10.D.01.c | A.01 |
| LCO 3.01.05 NOTE | NEW | L.02 |
| SR 3.01.05.01 | 15.04.01 T 15.04.01-01 19 | A.01 |
| | 15.04.01 T 15.04.01-01 19 | A.02 |
| | 15.04.01 T 15.04.01-01 19 | A.05 |
| | 15.04.01 T 15.04.01-01 19 | L.03 |
| | 15.04.01 T 15.04.01-01 19 (22) | A.04 |
| | 15.04.01 T 15.04.01-01 19.A | A.01 |
| | 15.04.01 T 15.04.01-01 19.A | A.02 |
| | 15.04.01 T 15.04.01-01 19.A | A.05 |
| | 15.04.01 T 15.04.01-01 19.A | L.03 |
| | 15.04.01 T 15.04.01-01 19.A (22) | A.04 |
| | 15.04.01 T 15.04.01-01 ALL | A.02 |
| | 15.04.01 T 15.04.01-01 S - EACH SHIFT | L.03 |

# Cross-Reference Report - NUREG-1431 Section 3.01.06
## CTS to ITS

13-Nov-99

| CTS | ITS | DOC |
|---|---|---|
| 15.03.10 | LCO 3.01.05 | A.01 |
| 15.03.10 APPL | LCO 3.01.05 | A.06 |
| 15.03.10 OBJ | B 3.01.05 | A.07 |
| 15.03.10 F 15.03.10-01 | COLR | LA.01 |
| 15.03.10.A.01 | COLR | LA.01 |
| | LCO 3.01.05 | A.08 |
| | LCO 3.01.05 COND A RA A.1.2 | L.01 |
| 15.03.10.D.01 | LCO 3.01.05 | A.01 |
| | LCO 3.01.05 | A.02 |
| 15.03.10.D.01.a | LCO 3.01.05 COND A | A.01 |
| | LCO 3.01.05 COND A RA A.1.1 | LA.01 |
| | LCO 3.01.05 COND A RA A.1.2 | L.01 |
| 15.03.10.D.01.b | LCO 3.01.05 COND A RA A.2 | A.01 |
| 15.03.10.D.01.c | LCO 3.01.05 COND B | A.01 |
| | LCO 3.01.05 COND B RA B.1 | A.01 |
| 15.04.01 T 15.04.01-01 19 | SR 3.01.05.01 | A.01 |
| | SR 3.01.05.01 | A.02 |
| | SR 3.01.05.01 | A.05 |
| | SR 3.01.05.01 | L.03 |
| 15.04.01 T 15.04.01-01 19 (22) | SR 3.01.05.01 | A.04 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.05.01 | A.01 |
| | SR 3.01.05.01 | A.02 |
| | SR 3.01.05.01 | A.05 |
| | SR 3.01.05.01 | L.03 |
| 15.04.01 T 15.04.01-01 19.A (22) | SR 3.01.05.01 | A.04 |
| 15.04.01 T 15.04.01-01 ALL | SR 3.01.05.01 | A.02 |
| 15.04.01 T 15.04.01-01 S - EACH SHIFT | SR 3.01.05.01 | L.03 |
| BASES | B 3.01.05 | A.03 |

# Description of Changes - NUREG-1431 Section 3.01.06

*13-Nov-99*

| DOC Number | DOC Text |
|---|---|
| A.01 | In the conversion of Point Beach current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the Standard Technical Specifications, Westinghouse Plants, NUREG-1431, Revision 1 (i.e., Improved Standard Technical Specifications (ISTS)). |

| CTS: | ITS: |
|---|---|
| 15.03.10 | LCO 3.01.05 |
| 15.03.10.D.01 | LCO 3.01.05 |
| 15.03.10.D.01.a | LCO 3.01.05 COND A |
| 15.03.10.D.01.b | LCO 3.01.05 COND A RA A.2 |
| 15.03.10.D.01.c | LCO 3.01.05 COND B |
| | LCO 3.01.05 COND B RA B.1 |
| 15.04.01 T 15.04.01-01 19 | SR 3.01.05.01 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.05.01 |

| DOC Number | DOC Text |
|---|---|
| A.02 | CTS 15.3.10.D.1 states that whenever the reactor is critical that the shutdown banks must be fully withdrawn. This establishes an applicability of reactor critical for this requirement. The proposed ITS for Point Beach specifies an applicability of Modes 1 and 2 when Keff is greater than or equal to 1.0. Accordingly, the applicability for this requirement has remainded the same.<br><br>Line item 19 of table 15.4.1-1, requires a channel check to be performed for the rod position indicators on a shiftly frequency in "all" plant conditions. Table 15.4.1-1 defines "all" plant conditions through reference to Specification 15.1.g, h, and m, which are; 1] Shutdown ( Hot, Cold, Refueling, and Shutdown Margin), 2] Power Operations (greater than 2% power), and 3] Low Power Operation (less than or equal to 2% power). As such, defining the applicability of this surveillance in the terms specified in Specification 15.1.g, h, and m are vague and non-prescriptive. Specification 15.4.0.1 states that surveillance requirements shall be met during all times that the system or component is required to be operable. Through applying Specification 15.4.0.1, the applicability of CTS line item 19 of Table 15.4.1-1 would be when the reactor is critical, which is consistent with the safety basis for the Specification. As such, the applicability of the proposed ITS Surveillance Requirement is equivalent to the CTS, making this change administrative. |

| CTS: | ITS: |
|---|---|
| 15.03.10.D.01 | LCO 3.01.05 |
| 15.04.01 T 15.04.01-01 19 | SR 3.01.05.01 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.05.01 |
| 15.04.01 T 15.04.01-01 ALL | SR 3.01.05.01 |

# Description of Changes - NUREG-1431 Section 3.01.06

*13-Nov-99*

| DOC Number | DOC Text | |
|---|---|---|
| A.03 | The Bases of the current Technical Specifications for this section have been completely replaced by revised Bases that reflect the format and applicable content of PBNP ITS, consistent with the Standard Technical Specifications for Westinghouse Plants, NUREG-1431. The revised Bases are as shown in the PBNP ITS Bases. | |
| | **CTS:** | **ITS:** |
| | BASES | B 3.01.05 |
| A.04 | Note 22 to line item 19 of CTS Table 15.4.1-2 states that shiftly control rod insertion limit channel checks are not required during periods of cold shutdown and refueling, but must be performed prior to reactor criticality if it had not been performed within its previous surveillance interval. This frequency notation is ambiguous in that it does not provide any specific guidance between cold shutdown and reactor critical operations. CTS Specification 15.4.0.1 states that surveillance requirements shall be met when the system or component is required to be operable. The CTS Mode of Applicability for control rod insertion limits has been determined to be equivalent to ITS Mode 1 and 2 with Keff greater than or equal to 1.0 which has been established as the ITS Mode of Applicability as stated in Description of Change A.2 of this LCO. By applying Specification 15.4.0.1, the CTS required mode of performance for this surveillance has been determined to be equivalent to ITS Modes 1 and 2 with Keff greater than or equal to 1.0. ITS SR 3.0.1 establishes the requirement that surveillances must be met when the LCO is applicable. As such, the ITS mode of performance for this surveillance is equivalent to the CTS, making this change administrative. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-01 19 (22) | SR 3.01.05.01 |
| | 15.04.01 T 15.04.01-01 19.A (22) | SR 3.01.05.01 |
| A.05 | CTS Table 15.4.1-1 line item 19 requires the performance of a channel check for control rods on a shiftly basis, which has been concluded to be equivalent to the ITS Surveillance Requirements which verify that the shutdown banks are within their insertion limits. The control rod analog and demand position indicators do not provide any protective functions. These channels are used solely for the purpose of verifying that the shutdown bank insertion limits are maintained. A channel check as discussed in CTS Section 15.4.1 is intended to be a simple observation of instrument function, which is fulfilled through verification of these operational parameters. Performance of the proposed ITS surveillances while stated to verify operational limits still encompasses an observation of required channel function and clarifies the intended check. This change is administrative. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-01 19 | SR 3.01.05.01 |
| | 15.04.01 T 15.04.01-01 19.A | SR 3.01.05.01 |

| DOC Number | DOC Text | |
|---|---|---|
| A.06 | The CTS provides an introductory statement (Applicability) which simply states which systems/components are addressed within a given section. This same information while worded differently is contained within the title of each ITS LCO. Accordingly, this change is a change in format with no change in technical requirement. | |
| | **CTS:** | **ITS:** |
| | 15.03.10 APPL | LCO 3.01.05 |
| A.07 | The CTS provides an introductory statement (Objective) at the beginning of this Section of the Technical Specifications which provide a brief summary of the purpose for this Section. This information is contained in the Bases Section of the ITS. This information does not establish any regulatory requirements for the systems and components addressed within this Section. Accordingly, deletion of this information does not alter any requirement set forth in the Technical Specifications. This change is administrative and consistent with the format and presentation for the ITS as provided in NUREG 1431. | |
| | **CTS:** | **ITS:** |
| | 15.03.10 OBJ | B 3.01.05 |
| A.08 | CTS 15.3.10.A.1 and 2 requires Shutdown Margin (SDM) to be maintained whenever the reactor coolant temperature is less than 350 degrees (15.3.10.A.2) and from 350 degrees to full power (15.3.10.A.1). The requirement to maintain SDM within limits has been moved to several LCOs within the ITS. During critical operation (Mode 1 and Mode 2 with Keff greater than or equal to 1.0) , SDM is assured through the maintenance of rod insertion limits in ITS LCO 3.1.5 and 3.1.6, while in Mode 2 with Keff less than 1.0, and Modes 3, 4, and 5, SDM is assured through the application of ITS LCO 3.1.1. Accordingly, while presented in a different fashion than CTS, the requirement to maintain SDM has been retained in the ITS, making this change administrative. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.A.01 | LCO 3.01.05 |

| DOC Number | DOC Text |
|---|---|
| L.01 | CTS 15.3.10.A.1 requires Shutdown Margin (SDM) to be maintained within limits, with an Action of initiation of boration to restore SDM within 15 minutes, if this limitation is not met. In addition, CTS Action 15.3.10.D.1.a requires Shutdown Margin (SDM) to either be verified to exceed its required value or to be restored by boration within one hour when one or more shutdown bank(s) are found to not be fully withdrawn. Shutdown banks are withdrawn and left in position during reactor critical operation, except during performance of the periodic freedom of movement tests. During performance of this test, the shutdown bank can be readily returned to its required position within the one hour time limit. However, in the unlikely event of a shutdown bank being found outside of its rod insertion limit with SDM not met, the CTS Action to initiate boration within 15 minutes and restore SDM via boration within one hour is not considered to be a viable action. Restoration of SDM would require determination of the SDM deficit, quantification of the amount of boration required, initiation and completion of the boration, and a confirmatory sample to conclude that the required RCS boron concentration was achieved.<br><br>The proposed ITS will require either verification that SDM is within limits or initiation of boration to restore SDM within one hour. Relaxing the Required Actions to the initiation of boration will allow actions to be initiated to restore SDM (boration if necessary) while increasing available focus to restoring the shutdown bank to its required position, restoring compliance with the LCO and SDM. The CTS and the ITS both require restoration of shutdown bank insertion limits within two hours, which establishes a bounding limit for operation with an insertion limit not met. As such, the maximum time that SDM could be not met is an additional one hour before the initiation of a plant shutdown. The additional one hour allowance is considered acceptable based on the increased focus that will be available to the most appropriate action, which is restoration of the shutdown bank insertion limit. |

| CTS: | ITS: |
|---|---|
| 15.03.10.A.01 | LCO 3.01.05 COND A RA A.1.2 |
| 15.03.10.D.01.a | LCO 3.01.05 COND A RA A.1.2 |

| DOC Number | DOC Text | |
|---|---|---|
| L.02 | CTS 15.3.10.D.1 requires the shutdown banks to be fully withdrawn whenever the reactor is critical. Line item 10 of CTS Table 15.4.1-2 requires the control rods to be tested for freedom of movement once every two weeks. The control rod freedom of movement test involves moving several control rods slightly below their rod insertion limits, resulting in entry into the CTS Action which requires the control rods to be returned to their required positions within two hours. The duration that rods are below their insertion limits during the performance of this test is minimal (less than approximately 15 minutes) in comparison to the current two hour restoration time.<br><br>ITS LCO 3.1.5 is modified by a note which allows the Shutdown Bank Insertion Limit LCO to not be considered applicable during performance of the periodic control rod freedom of movement test. This change is not intended to change the method of surveillance testing but rather reduce the administrative burden associated with tracking entry into and closure of Technical Specification Required Actions when performing routine required Technical Specification Surveillance tests. Elimination of the above referenced administrative burden is a relaxation of current requirements, which is acceptable based on the fact that control rods are typically exercised over a range of travel where the integral rod/bank worth is low, thereby having minimal affect on power distribution and required shutdown margin. Reducing the administrative burden associated with routine testing will allow increased focus on issues of higher safety significance. | |
| | **CTS:** | **ITS:** |
| | NEW | LCO 3.01.05 NOTE |
| L.03 | CTS Table 15.4.1-1, surveillance frequency S, "each shift", is proposed to become "every 12 hours", in ITS. The nominal Point Beach shift duration is 8 hours. Therefore this change extends the nominal time between performances of these surveillances by 4 hours, resulting in a relaxation of the current requirement. This is acceptable based on other less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels, and the low probability of equipment malfunction during the additional (nominal 4 hour) time interval. Proposed ITS SR 3.1.5.1 establishes an acceptable periodicity for verification of that all rods are meet the rod insertion limits. The shutdown banks are manually repositioned by the operator, thus there is no credible means for the shutdown banks to inadvertently violate the insertion limit absent a readily detectable system failure. The operators will be knowledgeable of any change in rod insertion; thus the increased frequency of verification failure of a rod insertion limit alarm is not necessary to ensure the limits are met. | |
| | **CTS:** | **ITS:** |
| | 15.04.01 T 15.04.01-01 19 | SR 3.01.05.01 |
| | 15.04.01 T 15.04.01-01 19.A | SR 3.01.05.01 |
| | 15.04.01 T 15.04.01-01 S - EACH SHIFT | SR 3.01.05.01 |

| DOC Number | DOC Text |
|---|---|
| LA.01 | CTS 15.3.10.D contains a requirement to maintain Shutdown Margin within limits (defined in Figure 15.3.10-1) and a requirement to maintain the shutdown banks fully withdrawn (defined as being greater than 225 steps) in addition to referencing the specific Shutdown Margin Limit (SDM) which must be restored if the insertion limits are violated. Rod insertion limits are established primarily to maintain the required SDM which is a cycle specific variable. The SDM limits have been moved to the Core Operating Limits Report. SDM, and control and shutdown rod insertion limits, can be adequately controlled outside of the Technical Specifications since these limitations are calculated using an approved methodology which is ultimately controlled via the methodology's inclusion in the Administrative Control Section of the ITS. Specific Reporting Requirements to notify the NRC when changes are made to the COLR have been proposed consistent with NUREG 1431 and NRC Generic Letter 88-16. This change represents a relaxation of existing requirements. The limits associated with this specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS will still retain a requirement to maintain compliance with the limitation. Changes to the limits will be controlled in accordance with the 10 CFR 50.59 process. Therefore, the level of safety is unaffected by the change. |

| CTS: | ITS: |
|---|---|
| 15.03.10 F 15.03.10-01 | COLR |
| 15.03.10.A.01 | COLR |
| 15.03.10.D.01.a | LCO 3.01.05 COND A RA A.1.1 |

15.3.10 CONTROL ROD AND POWER DISTRIBUTION LIMITS

Applicability

Applies to the operation of the control rods and to core power distribution limits.

A.06

A.07

Objective

To insure (1) core subcriticality after a reactor trip, (2) a limit on potential reactivity insertions from a hypothetical rod cluster control assembly (RCCA) ejection, and (3) an acceptable core power distribution during power operation.

L.01

A.08

Specification

COLR LA.01 Cond A RA A.1.2

A. SHUTDOWN MARGIN

ITS LCO 3.1.5

1. The shutdown margin shall exceed the applicable value ~~as shown in Figure 15.3.10-2~~ under all steady-state operating conditions from 350°F to full power. If the shutdown margin is less than the applicable value ~~of Figure 15.3.10-2, within~~ 15 minutes initiate boration to restore the shutdown margin.

2. A shutdown margin of at least 1% Δk/k shall be maintained when the reactor coolant temperature is less than 350°F. If the shutdown margin is less than this limit, within 15 minutes initiate boration to restore the shutdown margin.

B. ROD OPERABILITY AND BANK ALIGNMENT LIMITS

1. During power and low power operation, a < See LCO 3.1.1 > all be operable, with all individual indicated rod positions within twelve steps of their bank demand position, except when the bank demand position is ≤30 steps or ≥215 steps. In this case, all individual indicated rod positions shall be within 24 steps of their bank demand position.

<See LCO 3.1.5>

If an RCCA does not step in upon demand, up to six hours is allowed to determine whether the problem with stepping is an electrical problem. If the problem cannot be resolved within six hours, the RCCA shall be declared inoperable until it has been verified that it will step in or would drop upon demand.

a. Rod Operability Requirements

(1) If one rod is determined to be untrippable, perform the following actions:

(2) Once per shift check the position of the rods with inoperable RPIs by using excore detectors, or thermocouples, or movable incore detectors;

(3) If the above actions and associated completion times are not met, perform the actions in accordance with TS 15.3.10.B.1.b.

b. If one or more rods with inoperable RPIs have been moved in excess of 24 steps in one direction since the last determination of the rod's position, perform the following actions:

< See LCO 3.1.8 >

L.2

Add Note for control rod testing (Insert 3.1.6-02)

(1) Within four hours check the position of the rods with inoperable RPIs by using excore detectors, or thermocouples, or movable incore detectors;

(2) If the above action and associated completion time is not met, perform the actions in accordance with TS 15.3.10.B.1.b.

c. If bank demand position indication, for one or more banks, is determined to be inoperable, perform the following actions:

(1) Once per shift verify that all RPIs for the affected banks are operable;
AND
(2) Once per shift verify that the most withdrawn rod and the least withdrawn rod of the affected banks are ≤12 steps apart, except when the bank demand position is ≤30 steps or ≥215 steps. In this case, once per shift verify that the most withdrawn rod and the least withdrawn rod of the affected banks are ≤24 steps apart;

LCO 3.1.5

(3) If the above actions and associated completion times are not met, perform the actions in accordance with TS 15.3.10.B.1.b.

D. BANK INSERTION LIMITS

Mode 1, Mode 2 with Keff ≥ 1.0 — A.2

LA.1

1. ~~When the reactor is critical~~, ~~the shutdown banks shall be fully withdrawn. Fully withdrawn is defined as a bank position equal to or greater than 225 steps. This definition is applicable to shutdown and control banks.~~

Replace with Insert 3.1.6-01

If this condition is not met, perform the following actions;

the COLR

L.1

a. Within one hour verify that the shutdown margin exceeds the applicable value as shown in ~~Figure 15.3.10-2;~~ OR ~~within one hour restore the shutdown margin by boration;~~

LCO 3.1.5 Cond A RA A.1.1 and A.1.2

initiate boration to restore SDM to within limits.

AND

b. Within two hours fully withdraw the shutdown banks.

LCO 3.1.5
Cond B RA B.1

c. If the above actions and associated completion times are not met, be in hot shutdown within the following six hours.

2. When the reactor is critical, the control banks shall be inserted no further than the limits shown by the lines on Figure 15.3.10-1. If this condition is not met, perform the following actions:

a. Within one hour verify that the shutdown margin exceeds the applicable value as shown in Figure 15.3.10-2; OR within one hour restore the shutdown margin by boration;

< See LCO 3.1.7 >

AND

b. Within two hours restore the control banks to within limits.

c. If the above actions and associated completion times are not met, be in hot shutdown within the following six hours.

E. POWER DISTRIBUTION LIMITS

1. Hot Channel Factors

a. The hot channel factors defined in the basis shall meet the following limits:

$$F_Q(Z) \leq \frac{(2.50)}{P} \times K(Z) \qquad \textit{for } P > 0.5$$

$$F_Q(Z) \leq 5.00 \times K(Z) \qquad \textit{for } P \leq 0.5$$

$$F^N_{\Delta H} < 1.70 \times [1 + 0.3\,(1-P)]$$

Where P is the fraction of full power at which the core is operating, K(Z) is the function in Figure 15.3.10-3 and Z is the core height location of $F_Q$.

b. If $F_Q(Z)$ exceeds the limit of Specification 15.3.10.E.1.a, within fifteen minutes reduce thermal power until $F_Q(Z)$ limits are satisfied;

(1) After thermal power has been reduced in accordance with Specification 15.3.10.E.1.b, perform the following actions:

< See LCO 3.2.1/3.2.2 >

H. RCCA DROP TIMES

1. With RCS temperature greater than the minimum temperature for criticality and with both reactor coolant pumps running, the drop time of each RCCA shall be no greater than 2.2 seconds from the loss of stationary gripper coil voltage to dashpot entry. If this condition is not met, perform the following actions:

   a. If the reactor is critical, declare the rod untrippable;
   OR
   b. If the reactor is subcritical, maintain the reactor subcritical.

Basis

Insertion Limits and Shutdown Margin A.3

During power operation, the shutdown banks are fully withdrawn. Fully withdrawn is defined as a bank demand position equal to or greater than 225 steps. Evaluation has shown that positioning control rods at 225 steps, or greater, has a negligible effect on core power distributions and peaking factors. Due to the low reactivity worth in this region of the core and the fact that, at 225 steps, control rods are only inserted one step into the active fuel region of the core, positioning rods at this position or higher has minimal effect. This position is varied, based on a predetermined schedule, in order to minimize wear of the RCCA's from the guide cards.

The control rod insertion limits provide for achieving hot shutdown by reactor trip at any time and assume the highest worth control rod remains fully withdrawn. A 10% margin in reactivity worth of the control rods is included to assure meeting the assumptions used in the accident analysis. A reactor trip occurring during power operation places the reactor into hot shutdown. In addition, the insertion limits provide a limit on the maximum inserted rod worth in the unlikely event of a hypothetical rod ejection and provide for acceptable nuclear peaking factors. The specified control rod insertion limits take into account the effects of fuel densification. The rods are withdrawn in the sequence of A, B, C, D with overlap between banks. The overlap between successive control banks is provided to compensate for the low differential rod worth near the top and bottom of the core.

When the insertion limits are observed and the control rod banks are above the solid lines shown on Figure 15.3.10-1, the shutdown requirement is met. The maximum shutdown margin requirement occurs at end of core life and is based on the value used in analysis of the hypothetical steam break accident. Figure 15.3.10-2 shows the shutdown margin equivalent to 2.77% reactivity at end-of-life with respect to an uncontrolled cooldown. All other accident analyses assume 1% or greater reactivity shutdown margin. Shutdown margin calculations include the effects of axial power distribution. The accident analyses assume no change in core poisoning due to xenon, samarium or soluble boron.

< See LCO 3.1.7 >

LA.01

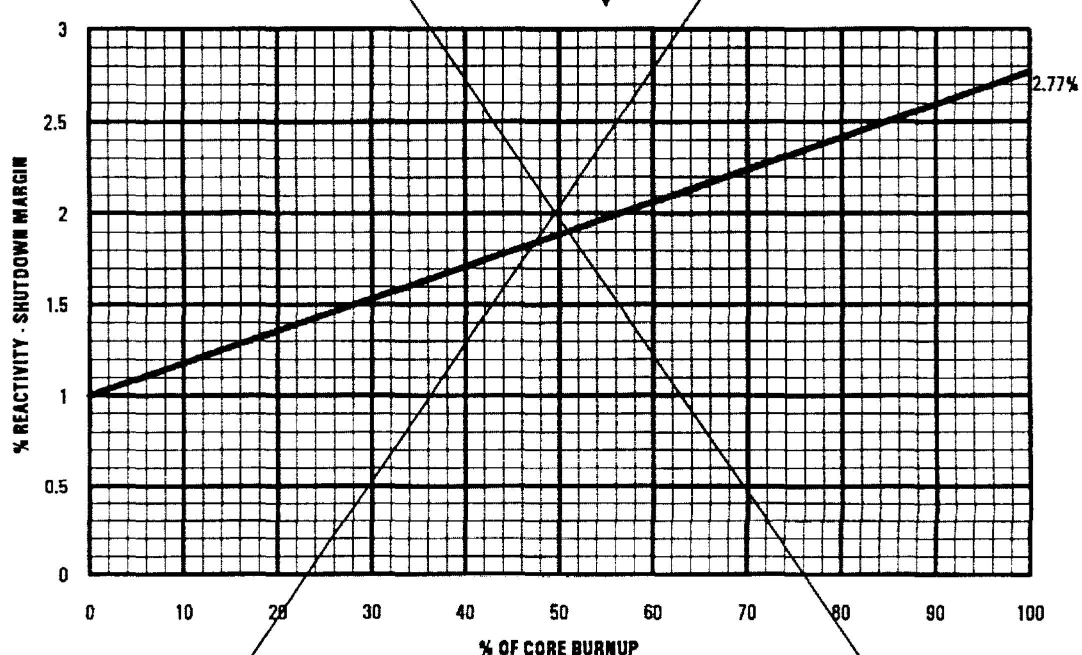


FIGURE 15.3.10-2
REQUIRED SHUTDOWN MARGIN

A.1



TABLE 15.4.1-1 (continued)

| NO. | CHANNEL DESCRIPTION | CHECK | CALIBRATE | TEST | PLANT CONDITIONS WHEN REQUIRED |
|---|---|---|---|---|---|
| 9. | Steam Generator Flow Mismatch | S(22) | R | Q(1) | ALL |
| 10. | Steam Generator Pressure | S(16) | R | Q(1) | ALL |
| 11. | 4KV Bus Undervoltage (A01 & A02) | | | | |
| | -AFW pump actuation | - | R | M(1) | ALL |
| | -Reactor Protection actuation | - | R | M(1,2) | ALL |
| 12. | 4KV Bus Underfrequency (A01 & A02) | | | | |
| | -to Reactor Coolant Pump trip | - | R | - | ALL |
| 13. | Safeguards Bus Voltage | | | | |
| | -Loss of 4KV | S | R | M | ALL |
| | -Degraded 4KV | S | R | M | ALL |
| | -Loss of 480V | S | R | M | ALL |
| 14. | 120 Vac Instrument Buses | W(6) | - | - | ALL |
| 15. | Reactor Trip Signal From Turbine | | | | |
| | -Turbine Autostop | - | - | M(1) | ALL |
| | -Turbine Stop Valve | - | - | M(1) | ALL |
| 16. | Reactor Trip Signal From SI | - | - | M(1) | ALL |
| 17. | Feedwater Isolation on SI | | | | |
| | -MFP Trip on Safety Injection | - | - | R | ALL |
| | -MFRV Shutting on Safety Injection | - | - | R | ALL |
| 18. | Accumulator Level and Pressure | S | R | - | ALL |
| 19. | Analog Rod Position | S(8,22) | R | - | ALL |
| | -with step counters | S(22) | - | - | ALL |
| | -Monitoring by On-Line Computer | (18) | - | - | |

< See LCO 3.3.1 and 3.3.2 >

< See 3.3.5 >

< See LCO 3.8.9 and 3.8.10 >

< See LCO 3.3.1 >

< See LCO 3.3.2 and 3.7.3 >

< See LCO 3.5.1 >

Replace with Insert 3.1.6-03

A.5/L.3

A.2

Mode 1 and 2 with Keff ≥ 1.0

PWR,HOT S/D

< See LCO 3.1.5>

SR 3.1.5.1

L.3

A.1



NOTATION USED IN TABLE 15.4.1-1

A - Annually
S- Each shift ← L.3
D- Daily
W- Weekly
Q- Quarterly
M- Monthly
P- Prior to reactor criticality if not performed during the previous week.
R- Each refueling interval (18 months)
PWR- Power and Low Power Operation, as defined in Specifications 15.1.h. and 15.1.m.
HOT S/D- Hot Shutdown, as defined in Specification 15.1.g.1.
COLD S/D- Cold Shutdown, as defined in Specification 15.1.g.2.
REF S/D- Refueling Shutdown, as defined in Specification 15.1.g.3.
ALL- All conditions of operation, as defined in Specifications 15.1.g, h and m.

**Discussed in LCOs which notation is applicable to**

Mode 1 and 2 with Keff ≥ 1.0 ← A.2

**< See LCOs; 3.3.1, 3.3.3, and 3.3.2 >**

NOTES USED IN TABLE 15.4.1-1

(1) Not required during periods of refueling shutdown, but must be performed prior to reactor criticality if it has not been performed during the previous surveillance period.

(2) Tests of the low power trip bistable setpoints which cannot be done during power operations shall be conducted prior to reactor criticality if not done in the previous surveillance interval. **< See LCO 3.3.1 >**

(3) Perform test of the isolation valve signal. **< See LCO 3.3.2 >**

(4) Perform by means of the moveable incore detector system. **< See LCO 3.3.1 >**

(5) Recalibrate if the absolute difference is ≥3 percent. **< See Section 3.8 >**

(6) Verification of proper breaker alignment and that the 120 Vac instrument buses are energized. **< See Section 3.3 >**

(7) Source check is required prior to initiation of a release. Source check is an assessment of channel response by exposing the detector to a source of increased radiation. Channel check is required shiftly during a release. If monitor or isolation function is discovered inoperable, discontinue release immediately.

(8) Verify that the associated rod insertion limit is not being violated at least once per 4 hours whenever the rod insertion limit alarm for a control bank is inoperable.

(9) Test of Narrow Range Pressure, 3.0 psig, -3.0 psig excluded. **< See LCO 3.3.2 >**

L.3

< See LCO 3.4.12 >

NOTES USED IN TABLE 15.4.1-1 (continued)

(10) When used for the Low TemperatureOverpressure Protection System, each PORV shall be demonstrated operable by:
a. Performance of a channel functional test on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required operable and at least once per 31 days thereafter when the PORV is required operable.

(11) Performance of a channel functional test is required, excluding valve operation. < See LCO 3.4.11 >

(12) Shiftly check is required when the reactor coolant system is not open to the atmosphere and the reactor coolant system temperature is less than the minimum temperature for the in-service pressure test as specified in TS Figure 15.3.1-1.

(13) An AFW flow path to each steam generator shall be demonstrated operable, following each cold shutdown of greater than 30 days, prior to entering power operation by verifying AFW flow to each steam generator. < See LCO 3.7.5 >

(14) Calibration is to be a verification of response to a source. < See LCO 3.3.3 >

(15) Sample gas for calibration at 2% and 6%.

(16) A check of one pressure channel per steam generator is required whenever the steam generator could be pressurized. < See LCO 3.4.3 >

(17) Includes test of logic for reactor trip on low-low level, automatic actuation logic for auxiliary feedwater pumps, and test of logic for feedwater isolation on high steam generator level. < See LCO 3.3.1 and 3.3.2 >

(18) Rod positions must be logged at least once per hour, after a load change >10% or after >30 inches of control rod motion if the on-line computer is inoperable. < See LCO 3.1.5 >

(19) The daily heat balance is a gain adjustment performed to match Nuclear Instrumentation System indicated power level with reactor thermal output. < See LCO 3.3.1 >

(20) To confirm that hot channel factor limits are being satisfied, the requirements of TS 15.3.10.B must be met.

(21) Check required only when the low temperature overpressure protection system is in operation. < See LCO 3.4.11 >

(22) ~~Not required during period of cold and refueling shutdowns, but must be performed prior to reactor criticality if it has not been performed during the previous surveillance period~~.

Deleted - Addressed by ITS SR 3.0.4

A.4

(23) Each train tested at least every 62 days on a staggered basis. < See LCO 3.3.1 and 3.3.2>

(24) Neutron detectors excluded from calibration. < See LCO 3.3.1 >

# Spec 3.1.6 Inserts

**Insert 3.1.6-01:**

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

**Insert 3.1.6-02:**

This LCO is not applicable while performing SR 3.1.4.2.

**Insert 3.1.6-03:**

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

A.5

L.3

# Justification For Deviations - NUREG-1431 Section 3.01.06

*13-Nov-99*

| JFD Number | JFD Text | |
|---|---|---|
| 01 | Reference to the General Design Criteria (GDC) of 10 CFR 50 Appendix A has been deleted from the Bases of the Technical Specifications, substituting reference to the appropriate section of the FSAR which specifies the Point Beach design criteria. Point Beach was constructed and licensed prior to the GDC being issued. The Point Beach construction permit was issued prior to the GDCs being issued in 1971. Point Beach was designed and constructed utilizing the 1967 proposed GDCs. Accordingly, reference has been provided to the appropriate criteria and section of the Point Beach FSAR which provides explanation of Point Beach's design basis. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.05 | B 3.01.06 |
| 02 | The brackets have been removed and the proper plant specific information has been provided for reference 3 of the References Section for the Bases of LCO 3.1.6. In addition, the Applicable Safety Analyses Section of the Bases for LCO 3.1.6 has been changed to reference 4 and Reference 4 has been added to the References Section of the Bases to allow the appropriate Section of the FSAR to be listed and referenced. Reference 3 contains the control rod design requirements, while reference 4 contains a broad reference to the Accident Analyses Section of the FSAR which contains the accidents analysis assumption for analyzed events which credit a specific SDM. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.05 | B 3.01.06 |
| 03 | The Bases for Required Action A.1.1 references the Bases for SR 3.1.1.1 to obtain a listing of effects for calculation of SDM when one or more shutdown banks are not within limits. This LCO Action is applicable in Modes 1 and 2 with Keff greater than or equal to 1.0. SR 3.1.1.1 calculates SDM in Mode 2 with Keff < 1.0, and Modes 3, 4, and 5, addressing subcritical conditions. Therefore, the Bases of SR 3.1.1.1 contains effects which are not applicable to an operating reactor. Proposed ITS LCO 3.1.5 Required Action A.1.1 has been modified to list the effects listed from the Bases of SR 3.1.1.1 which are applicable to reactor critical operation. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.05 | B 3.01.06 |

# Justification For Deviations - NUREG-1431 Section 3.01.06

*13-Nov-99*

| JFD Number | JFD Text |
|---|---|
| 04 | The Mode of Applicability for the Shutdown Bank Insertion Limits in NUREG 1431 is Mode 1 and 2 with any control bank not fully inserted, and the associated Required Actions place the unit in Mode 3. The Mode of Applicability for the Shutdown Bank Insertion Limits has been revised to be applicable in Mode 1 and 2 when Keff is greater than or equal to 1.0. Shutdown Bank insertion limits are established to maintain acceptable power distribution and to add negative reactivity to shutdown the reactor upon receipt of a reactor trip signal. Power distribution is only of concern when the reactor is at power (Keff greater than or equal to 1.0) which is consistent with the Mode of Applicability specified for the proposed Control Bank Alignment Limits. Prior to reactor criticality, Shutdown margin is addressed in ITS LCO 3.1.1, which is applicable in Mode 2 with Keff less than 1.0 and Modes 3, 4, and 5. Accordingly, the safety basis for shutdown bank position should appropriately be maintained at Modes 1 and 2 with Keff greater than or equal to 1.0, which is consistent with the current Technical Specification Mode of Applicability. Application of proposed ITS LCO SR 3.0.4 will ensure that the shutdown bank insertion limits are met prior to the reactor becoming critical.<br><br>The associated Required Action has been revised based upon the above to place the unit into Mode 2 with Keff less than 1.0 consistent with the LCO Applicability. Corresponding changes to the Bases have been proposed to support these revised changes.<br><br>**ITS:** B 3.01.05; LCO 3.01.05; LCO 3.01.05 COND B RA B.1<br>**NUREG:** B 3.01.06; LCO 3.01.06; LCO 3.01.06 COND B RA B.1 |
| 05 | The Bases for proposed ITS SR 3.1.5.1 has been expanded to include reference to the preferred indication for verifying that shutdown banks are within their insertion limits.<br><br>**ITS:** B 3.01.05<br>**NUREG:** B 3.01.06 |
| 06 | The proposed Bases has been modified to reflect the Point Beach design. Not all control rod banks consist of two groups of rods as stated in the Bases of NUREG 1431 LCO 3.1.6. Control banks may consist of a single group dependent upon the number of control rods assigned to the bank. Typically control rod banks with four or fewer rods consist of a single group. Any bank that consists of two groups will step the banks within one step of each other.<br><br>**ITS:** B 3.01.05<br>**NUREG:** B 3.01.06 |

Approved TSTF 136 5

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Shutdown Bank Insertion Limits

LCO 3.1.6 Each shutdown bank shall be within insertion limits specified in the COLR.

5 Approved TSTF 136

Approved TSTF 239

Keff ≥1.0 4

APPLICABILITY: MODE 1,
MODE 2 with ~~any control bank not fully inserted~~.

----------------------------NOTE----------------------------
This LCO is not applicable while performing SR 3.1.5.2.
------------------------------------------------------------

Approved TSTF 136 4

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more shutdown banks not within limits. | A.1.1 Verify SDM ~~is ≥ [1.6]% Δk/k~~ to be within the limits provided in the COLR.<br><br>OR<br><br>A.1.2 Initiate boration to restore SDM to within limit.<br><br>AND<br><br>A.2 Restore shutdown banks to within limits. | 1 hour<br><br><br>1 hour<br>Approved TSTF 9<br><br><br>2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE ~~3~~ 2 with Keff <1.0.<br>4 | 6 hours |

Approved TSTF 136 5

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.~~6~~.1 5 | Verify each shutdown bank is within the limits specified in the COLR. | 12 hours |

Approved TSTF 136

Approved TSTF 136 5

## B 3.1 REACTIVITY CONTROL SYSTEMS

## B 3.1.6 Shutdown Bank Insertion Limits

5

BASES

BACKGROUND

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

1 Replace with Insert B 3.1.6-01

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

6 one or

A bank of RCCAs may consist of one or two groups. When a bank consists of two groups, the groups are moved in a staggered fashion, but always within one step of each other. Control banks A and C and shutdown bank A consist of two groups each while control banks B and D and shutdown bank B consist of a single group.

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

Approved TSTF 136 4 7

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



Approved TSTF 136 5

BACKGROUND (continued)

Hence, they are not capable of adding a large amount of positive reactivity. Boration or dilution of the Reactor Coolant System (RCS) compensates for the reactivity changes associated with large changes in RCS temperature. The design calculations are performed with the assumption that the shutdown banks are withdrawn first. The shutdown banks can be fully withdrawn without the core going critical. This provides available negative reactivity in the event of boration errors. The shutdown banks are controlled manually by the control room operator. During normal unit operation, the shutdown banks are either fully withdrawn or fully inserted. The shutdown banks must be completely withdrawn from the core, prior to withdrawing any control banks ~~during an approach~~ prior to criticality. The shutdown banks are then left in this position until the reactor is shut down. They affect core power and burnup distribution, and add negative reactivity to shut down the reactor upon receipt of a reactor trip signal.

4

APPLICABLE SAFETY ANALYSES

On a reactor trip, all RCCAs (shutdown banks and control banks), except the most reactive RCCA, are assumed to insert into the core. The shutdown banks shall be at or above their insertion limits and available to insert the maximum amount of negative reactivity on a reactor trip signal. The control banks may be partially inserted in the core, as ~~allowed by LCO 3.1.7~~ 6 "Control Bank Insertion Limits." The shutdown bank and control bank insertion limits are established to ensure that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM (see LCO 3.1.1, "SHUTDOWN MARGIN (SDM)~~) — $T_{avg}$ > 200°F," and LCO 3.1.2, "SHUTDOWN MARGIN (SDM) — $T_{avg}$ ≤ 200°F"~~) following a reactor trip from full power. The combination of control banks and shutdown banks (less the most reactive RCCA, which is assumed to be fully withdrawn) is sufficient to take the reactor from full power conditions at rated temperature to zero power, and to maintain the required SDM at rated no load temperature (Ref. 3). The shutdown bank insertion limit also limits the reactivity worth of an ejected shutdown rod.

Approved TSTF 136

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

APPLICABLE SAFETY ANALYSIS (continued)

a. There be no violations of:

1. specified acceptable fuel design limits, or

2. RCS pressure boundary integrity; and

b. The core remains subcritical after accident transients.

As such, the shutdown bank insertion limits affect safety analysis involving core reactivity and SDM (Ref. ~~3~~ 4).

The shutdown bank insertion limits preserve an initial condition assumed in the safety analyses and, as such, satisfy Criterion 2 of the NRC Policy Statement. 2

LCO

The shutdown banks must be within their insertion limits any time the reactor is critical ~~or approaching criticality.~~ 4 This ensures that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM following a reactor trip.

The shutdown bank insertion limits are defined in the COLR.

APPLICABILITY

4

The shutdown banks must be within ~~their insertion limits,~~ with Keff > 1.0 with the reactor in MODES 1 and 2. ~~The applicability in MODE 2 begins prior to initial control bank withdrawal, during an approach to criticality, and continues throughout MODE 2, until all control bank rods are again fully inserted by reactor trip or by shutdown.~~ Approved TSTF 239 This ensures that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM following a reactor trip. ~~The shutdown banks do not have to be within their insertion limits in MODE 3, unless an approach to criticality is being made. In MODE 3, 4, 5, or 6, the shutdown banks are fully inserted in the core and contribute to the SDM.~~ Approved TSTF 136 Refer to LCO 3.1.1 ~~and LCO 3.1.2~~ for Mode 2 with Keff < 1.0 and SDM requirements in MODES 3, 4, and 5. LCO 3.9.1, "Boron Concentration," ensures adequate SDM in MODE 6.

The Applicability requirements have been modified by a Note indicating the LCO requirement is suspended during

Approved TSTF 136

BASES

APPLICABILITY (continued)

4

~~SR 3.1.5.2~~. This SR verifies the freedom of the rods to move, and requires the shutdown bank to move below the LCO limits, which would normally violate t he LCO.

ACTIONS

A.1.1, A.1.2 and A.2

4

with Keff ≥ 1.0

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

3

Replace with Insert 3.1.6-02

The allowed Completion Time of 2 hours 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

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

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5

SURVEILLANCE REQUIREMENTS

SR 3.1.~~6~~5.1

4

Verification that the shutdown banks are within their insertion limits ~~prior to an approach to criticality~~ ensures that when the reactor is critical, or being taken critical, the shutdown banks will be available to shut down the reactor, and the required SDM will be maintained following a



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5

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SURVEILLANCE REQUIREMENTS (continued)

within limits

reactor trip. This SR and Frequency ensure that the shutdown banks are ~~withdrawn before the control banks are withdrawn~~ during a unit startup and subsequent operation.

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

Typically, the individual rod position indicators are used to confirm shutdown bank insertion limits.

4 5

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 10, GDC 26, and GDC 28.~~ FSAR, Section 3.1.
2. 10 CFR 50.46.
3. FSAR, Chapter ~~[15]~~ Section 3.2
4. FSAR, Chapter 14.

1 2



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# LCO 3.1.6 Bases Inserts

Insert B 3.1.6-01:

The design criteria for reactivity and power distribution are found in FSAR Section 3.1.

Insert B 3.1.6-02:

the following listed reactivity effects:

a. RCS boron concentration;

b. Control bank position;

c. Power defect;

d. Fuel burnup;

e. Xenon concentration; and

f. Samarium concentration.

| NSHC Number | NSHC Text |
|---|---|
| A | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change involves reformatting and rewording of the current Technical Specifications. The reformatting and rewording process involves no technical changes to existing requirements. As such, this change is administrative in nature and does not impact initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not increase the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any new or eliminate any old requirements. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The proposed change will not significantly reduce the margin of safety because it has no impact on any safety analysis assumptions. This change is administrative. As such, there is no technical change to the requirements and, therefore, there is no reduction in the margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.01 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change will relax the Technical Specification Required Actions requiring initiation of boration versus restoration of SDM. The CTS and the ITS both require restoration of control bank insertion limits within two hours, which establishes a bounding limit for operation with an insertion limit not met. As such, the maximum time that SDM could conceivably not be met is an additional one hour before the initiation of a plant shutdown is required. While SDM and rod position (available worth) are variables assumed in various analyses, the state of not meeting a rod insertion limit is not an accident precursor. The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. Accordingly, there will be no significant change in the probability of accidents previously evaluated. The additional one hour period allowed to be in this condition does not represent an increase in the consequences of accidents previously evaluated, as the plant condition during this extended period is the same as those currently allowed for up to one hour. Accordingly, the consequences are the same during this increased period. Accordingly, this change does not present a significant increase in the consequences of accidents previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>In the unlikely event of a shutdown bank being found outside of its rod insertion limit with SDM not met, the CTS Action to restore SDM via boration within one hour is not a viable action, which would then result in the initiation of a plant shutdown which is a diversion of resources which should be more appropriately focused on restoration of the shutdown banks insertion limit. The additional one hour allowance is acceptable based on the increased focus that will be available to the most appropriate action which is restoration of the shutdown bank insertion limit. Accordingly, increasing the time allowed before shutdown actions are required to be initiated by an additional hour does not involve a significant reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.02 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The Technical Specification control rod freedom of movement test involves moving several control rods slightly below their rod insertion limits, resulting in entry into the CTS Action which requires the control rods to be returned to their required positions within two hours. This change eliminates the need to enter the Technical Specification Required Actions during performance of the test. This change is not intended to alter the method of surveillance testing but rather reduce the administrative burden associated with tracking entry into and closure of Technical Specification Required Actions when performing routine required Technical Specification Surveillance tests. Elimination of administrative burden is not an accident precursor. The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. Accordingly, there will be no significant change in the probability of accidents previously evaluated. Control rods are typically exercised over a range of travel where the integral rod/bank worth is low, thereby having minimal affect on power distribution and required shutdown margin. Therefore, this change does not involve a significant increase in the consequences of accidents previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation or alter the method of normal plant operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The control rod freedom of movement test involves moving several of the control rods slightly below their rod insertion limits. The duration that rods are below their insertion limits during the performance of this test is minimal (less than approximately 15 minutes). Control rods are typically exercised over a range of travel where the integral rod/bank worth is low, thereby having minimal affect on power distribution and required shutdown margin. This change is not intended to change the method of surveillance testing but rather reduce the administrative burden associated with tracking entry into and closure of Technical Specification Required Actions when performing routine required Technical Specification Surveillance tests. Reducing the administrative burden associated with routine testing will |

| NSHC Number | NSHC Text |
|---|---|
| | allow increased focus on issues of higher safety significance. Accordingly, this change does not involve a significant reduction in a margin of safety. |
| L.03 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. The proposed change extends the surveillance frequency for CHANNEL CHECKS from "each shift" (nominally 8 hours) to 12 hours. This is acceptable because the CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels and because of the unlikelihood of a channel failure during this interval. Therefore, this change does not involve an increase in the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation or alter the method of normal plant operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>There are no margins of safety related to safety analyses that are dependent upon the proposed change. The requirements will continue to assure that limiting conditions for the Control Bank Insertion Limits are properly maintained. Therefore, this change does not involve a reduction in a margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| LA | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change relocates requirements from the Technical Specifications to the Bases, FSAR, or other plant controlled documents. The Bases and FSAR will be maintained using the provisions of 10 CFR 50.59. In addition to 10 CFR 50.59 provisions, the Technical Specifications Bases are subject to the change process in the Administrative Controls Chapter of the ITS. Plant procedures and other plant controlled documents are subject to controls imposed by plant administrative procedures, which endorse applicable regulations and standards. Changes to the Bases, FSAR, or other plant controlled documents will be evaluated in accordance with the requirements of the Bases Control Program in Chapter 5.0 of the ITS, 10 CFR 50.59, or plant administrative processes. Therefore, no increase in the probability or consequences of an accident previously evaluated will be allowed.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any different requirements and adequate control of the information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the requirements to be moved from the Technical Specifications to the Bases, FSAR, or other plant controlled documents are as they currently exist. Future changes to the requirements in the Bases, FSAR, or other plant controlled documents will be evaluated in accordance with the requirements of 10 CFR 50.59, the Bases Control Program in Chapter 5.0 of the ITS, or the applicable plant process and no reduction in a margin of safety will be allowed. |

## 3.1 REACTIVITY CONTROL SYSTEMS

### 3.1.5 Shutdown Bank Insertion Limits

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

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

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

---

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more shutdown banks not within limits. | A.1.1 Verify SDM to be within the limits provided in the COLR. | 1 hour |
| | <u>OR</u> | |
| | A.1.2 Initiate boration to restore SDM to within limit. | 1 hour |
| | <u>AND</u> | |
| | A.2 Restore shutdown banks to within limits. | 2 hours |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 2 with $K_{eff} < 1.0$. | 6 hours |

SURVEILLANCE REQUIREMENTS

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

## B 3.1 REACTIVITY CONTROL SYSTEMS

## B 3.1.5 Shutdown Bank Insertion Limits

BASES

---

BACKGROUND

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

The design criteria for reactivity and power distribution are found in FSAR Section 3.1. (Ref. 1). and 10 CFR 50.46. "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors" (Ref. 2). Limits on control rod insertion have been established. and all rod positions are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved.

The rod cluster control assemblies (RCCAs) are divided among control banks and shutdown banks. Each bank may be further subdivided into one or two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. A bank of RCCAs may consist of one or two groups. When a bank consists of two groups. the groups are moved in a staggered fashion. but always within one step of each other. Control banks A and C and shutdown bank A consist of two groups each while control banks B and D and shutdown bank B consist of a single group. See LCO 3.1.4. "Rod Group Alignment Limits." for control and shutdown rod OPERABILITY and alignment requirements. and LCO 3.1.7. "Rod Position Indication." for position indication requirements.

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

BASES

BACKGROUND (continued)

Hence, they are not capable of adding a large amount of positive reactivity. Boration or dilution of the Reactor Coolant System (RCS) compensates for the reactivity changes associated with large changes in RCS temperature. The design calculations are performed with the assumption that the shutdown banks are withdrawn first. The shutdown banks can be fully withdrawn without the core going critical. This provides available negative reactivity in the event of boration errors. The shutdown banks are controlled manually by the control room operator. During normal unit operation, the shutdown banks are either fully withdrawn or fully inserted. The shutdown banks must be completely withdrawn from the core, prior to withdrawing any control banks prior to criticality. The shutdown banks are then left in this position until the reactor is shut down. They affect core power and burnup distribution, and add negative reactivity to shut down the reactor upon receipt of a reactor trip signal.

APPLICABLE SAFETY ANALYSES

On a reactor trip, all RCCAs (shutdown banks and control banks), except the most reactive RCCA, are assumed to insert into the core. The shutdown banks shall be at or above their insertion limits and available to insert the maximum amount of negative reactivity on a reactor trip signal. The control banks may be partially inserted in the core, as allowed by LCO 3.1.6, "Control Bank Insertion Limits." The shutdown bank and control bank insertion limits are established to ensure that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required SDM (see LCO 3.1.1, "SHUTDOWN MARGIN (SDM)") following a reactor trip from full power. The combination of control banks and shutdown banks (less the most reactive RCCA, which is assumed to be fully withdrawn) is sufficient to take the reactor from full power conditions at rated temperature to zero power, and to maintain the required SDM at rated no load temperature (Ref. 3). The shutdown bank insertion limit also limits the reactivity worth of an ejected shutdown rod.

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

a. There be no violations of:

BASES

APPLICABLE SAFETY ANALYSIS (continued)

1. specified acceptable fuel design limits, or
2. RCS pressure boundary integrity: and

b. The core remains subcritical after accident transients.

As such, the shutdown bank insertion limits affect safety analysis involving core reactivity and SDM (Ref. 4).

The shutdown bank insertion limits preserve an initial condition assumed in the safety analyses and, as such, satisfy Criterion 2 of the NRC Policy Statement.

LCO

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

The shutdown bank insertion limits are defined in the COLR.

APPLICABILITY

The shutdown banks must be within their insertion limits, with the reactor in MODES 1 and 2 with Keff ≥ 1.0. 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 MODE 2 with Keff < 1.0 and MODES 3, 4, and 5. LCO 3.9.1, "Boron Concentration," ensures adequate SDM in MODE 6.

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

ACTIONS

A.1.1, A.1.2 and A.2

When one or more shutdown banks is not within insertion limits, 2 hours is allowed to restore the shutdown banks to

BASES

ACTIONS (continued)

within the insertion limits. This is necessary because the available SDM may be significantly reduced, with one or more of the shutdown banks not within their insertion limits. Also, verification of SDM or initiation of boration within 1 hour is required, since the SDM in MODES 1 and 2 with Keff ≥ 1.0 is ensured by adhering to the control and shutdown bank insertion limits (see LCO 3.1.1). If shutdown banks are not within their insertion limits, then SDM will be verified by performing a reactivity balance calculation, considering the following listed reactivity effects:

a. RCS boron concentration;

b. Control bank position;

c. Power defect;

d. Fuel burnup;

e. Xenon concentration; and

f. Samarium concentration.

The allowed Completion Time of 2 hours 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

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

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that the shutdown banks are within their insertion limits ensures that when the reactor is critical, or being taken critical, the shutdown banks will be available to shut down the reactor, and the required SDM

BASES

SURVEILLANCE REQUIREMENTS (continued)

will be maintained following a reactor trip. This SR and Frequency ensure that the shutdown banks are within limits during a unit startup and subsequent operation. Typically, the individual rod position indicators are used to confirm shutdown bank insertion limits.

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

REFERENCES

1. FSAR, Section 3.1.
2. 10 CFR 50.46.
3. FSAR, Section 3.2.
4. FSAR, Chapter 14.

# Cross-Reference Report - NUREG-1431 Section 3.01.07

## ITS to CTS

13-Nov-99

| ITS | CTS | DOC |
|---|---|---|
| B 3.01.06 | 15.03.10 OBJ | A.07 |
| | BASES | A.01 |
| | BASES | A.03 |
| COLR | 15.03.10 F 15.03.10-02 | LA.01 |
| | 15.03.10.A.01 | LA.01 |
| | 15.03.10.D.01 | LA.01 |
| | 15.03.10.D.02 | LA.01 |
| LCO 3.01.06 | 15.03.10 APPL | A.06 |
| | 15.03.10.A.01 | A.08 |
| | 15.03.10.D.02 | A.01 |
| | 15.03.10.D.02 | A.02 |
| | 15.03.10.D.02 | LA.01 |
| LCO 3.01.06 NOTE | NEW | L.02 |
| LCO 3.01.06 COND A | 15.03.10.A.01 | A.08 |
| | 15.03.10.D.02.a | A.01 |
| LCO 3.01.06 COND A RA A.1.1 | 15.03.10.D.02.a | LA.01 |
| LCO 3.01.06 COND A RA A.1.2 | 15.03.10.A.01 | L.01 |
| | 15.03.10.D.02.a | L.01 |
| LCO 3.01.06 COND A RA A.2 | 15.03.10.D.02.b | A.01 |
| LCO 3.01.06 COND B | 15.03.10.A.01 | A.08 |
| | NEW | M.01 |
| LCO 3.01.06 COND B RA B.1.1 | NEW | M.01 |
| LCO 3.01.06 COND B RA B.1.2 | NEW | M.01 |
| LCO 3.01.06 COND B RA B.2 | NEW | M.01 |
| LCO 3.01.06 COND C | 15.03.10.D.02.c | A.01 |
| | NEW | M.01 |
| LCO 3.01.06 COND C RA C.1 | 15.03.10.D.02.c | L.05 |
| SR 3.01.06.01 | NEW | M.02 |

| ITS | CTS | DOC |
|---|---|---|
| SR 3.01.06.02 | 15.04.01 T 15.04.01-01 19 | L.04 |
| | 15.04.01 T 15.04.01-01 19 | A.02 |
| | 15.04.01 T 15.04.01-01 19 | A.05 |
| | 15.04.01 T 15.04.01-01 19 (22) | A.04 |
| | 15.04.01 T 15.04.01-01 19.A | A.05 |
| | 15.04.01 T 15.04.01-01 19.A | L.04 |
| | 15.04.01 T 15.04.01-01 19.A | A.02 |
| | 15.04.01 T 15.04.01-01 19.A (22) | A.04 |
| | 15.04.01 T 15.04.01-01 ALL | A.02 |
| | 15.04.01 T 15.04.01-01 S - EACH SHIFT | L.04 |
| SR 3.01.06.03 | 15.03.10 F 15.03.10-02 | LA.02 |
| | 15.03.10.D.01 | LA.02 |
| | 15.04.01 T 15.04.01-01 19 | A.05 |
| | NEW | M.01 |

# Cross-Reference Report - NUREG-1431 Section 3.01.07
## CTS to ITS

13-Nov-99

| CTS | ITS | DOC |
|---|---|---|
| 15.03.10 APPL | LCO 3.01.06 | A.06 |
| 15.03.10 OBJ | B 3.01.06 | A.07 |
| 15.03.10 F 15.03.10-02 | COLR | LA.01 |
| | SR 3.01.06.03 | LA.02 |
| 15.03.10.A.01 | COLR | LA.01 |
| | LCO 3.01.06 | A.08 |
| | LCO 3.01.06 COND A | A.08 |
| | LCO 3.01.06 COND A RA A.1.2 | L.01 |
| | LCO 3.01.06 COND B | A.08 |
| 15.03.10.D.01 | COLR | LA.01 |
| | SR 3.01.06.03 | LA.02 |
| 15.03.10.D.02 | COLR | LA.01 |
| | LCO 3.01.06 | A.01 |
| | LCO 3.01.06 | A.02 |
| | LCO 3.01.06 | LA.01 |
| 15.03.10.D.02.a | LCO 3.01.06 COND A | A.01 |
| | LCO 3.01.06 COND A RA A.1.1 | LA.01 |
| | LCO 3.01.06 COND A RA A.1.2 | L.01 |
| 15.03.10.D.02.b | LCO 3.01.06 COND A RA A.2 | A.01 |
| 15.03.10.D.02.c | LCO 3.01.06 COND C | A.01 |
| | LCO 3.01.06 COND C RA C.1 | L.05 |
| 15.04.01 T 15.04.01-01 19 | SR 3.01.06.02 | A.02 |
| | SR 3.01.06.02 | A.05 |
| | SR 3.01.06.02 | L.04 |
| | SR 3.01.06.03 | A.05 |
| 15.04.01 T 15.04.01-01 19 (22) | SR 3.01.06.02 | A.04 |
| 15.04.01 T 15.04.01-01 19 (8) | DELETED | L.03 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.06.02 | A.05 |
| | SR 3.01.06.02 | L.04 |
| | SR 3.01.06.02 | A.02 |
| 15.04.01 T 15.04.01-01 19.A (22) | SR 3.01.06.02 | A.04 |
| 15.04.01 T 15.04.01-01 ALL | SR 3.01.06.02 | A.02 |
| 15.04.01 T 15.04.01-01 S - EACH SHIFT | SR 3.01.06.02 | L.04 |
| BASES | B 3.01.06 | A.03 |
| | B 3.01.06 | A.01 |

# Description of Changes - NUREG-1431 Section 3.01.07

*15-Nov-99*

| DOC Number | DOC Text |
|---|---|
| A.01 | In the conversion of Point Beach current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the Standard Technical Specifications, Westinghouse Plants, NUREG-1431, Revision 1 (i.e., Improved Standard Technical Specifications (ISTS)). |

| CTS: | ITS: |
|---|---|
| 15.03.10.D.02 | LCO 3.01.06 |
| 15.03.10.D.02.a | LCO 3.01.06 COND A |
| 15.03.10.D.02.b | LCO 3.01.06 COND A RA A.2 |
| 15.03.10.D.02.c | LCO 3.01.06 COND C |
| BASES | B 3.01.06 |

A.02

CTS 15.3.10.D.2 states that whenever the reactor is critical that the control banks will be inserted no further than the limits provided in Figure 15.3.10-1. This establishes an applicability of reactor critical for this requirement. The proposed ITS for Point Beach specifies an applicability of Modes 1 and 2 when Keff is greater than or equal to 1.0. Accordingly, the applicability for this requirement has remained the same.

Line item 19 of table 15.4.1-1, requires a channel check to be performed for the rod position indicators on a shiftly frequency in "all" plant conditions. Table 15.4.1-1 defines "all" plant conditions through reference to Specification 15.1.g, h, and m, which are; 1] Shutdown ( Hot, Cold, Refueling, and Shutdown Margin), 2] Power Operations (greater than 2% power), and 3] Low Power Operation (less than or equal to 2% power). As such, defining the applicability of this surveillance in the terms specified in Specification 15.1.g, h, and m are vague and non prescriptive. Specification 15.4.0.1 states that surveillance requirements shall be met during all times that the system or component is required to be operable. Through applying Specification 15.4.0.1, the applicability of CTS line item 19 of Table 15.4.1-1 would be when the reactor is critical, which is consistent with the safety basis for the Specification. As such, the applicability of the proposed ITS Surveillance Requirement is equivalent to the CTS, making this change administrative.

| CTS: | ITS: |
|---|---|
| 15.03.10.D.02 | LCO 3.01.06 |
| 15.04.01 T 15.04.01-01 19 | SR 3.01.06.02 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.06.02 |
| 15.04.01 T 15.04.01-01 ALL | SR 3.01.06.02 |

*15-Nov-99*

| DOC Number | DOC Text |
|---|---|
| A.03 | The Bases of the current Technical Specifications for this section have been completely replaced by revised Bases that reflect the format and applicable content of PBNP ITS, consistent with the Standard Technical Specifications for Westinghouse Plants, NUREG-1431. The revised Bases are as shown in the PBNP ITS Bases. |

| CTS: | ITS: |
|---|---|
| BASES | B 3.01.06 |

| DOC Number | DOC Text |
|---|---|
| A.04 | Note 22 to line item 19 of CTS Table 15.4.1-2, states that shiftly control rod insertion limit channel checks are not required during periods of cold shutdown and refueling, but must be performed prior to reactor criticality if it had not been performed within its previous surveillance interval. This frequency notation is ambiguous in that it does not provide any specific guidance between cold shutdown and reactor critical operations. CTS Specification 15.4.0.1 states that surveillance requirements shall be met when the system or component is required to be operable. The CTS Mode of Applicability for control rod insertion limits has been determined to be equivalent to ITS Mode 1 and 2 with Keff greater than or equal to 1.0 which has been established as the ITS Mode of Applicability as stated in Description of Change A.2 of this LCO. By applying Specification 15.4.0.1, the CTS required mode of performance for this surveillance has been determined to be equivalent to ITS Modes 1 and 2 with Keff greater than or equal to 1.0. ITS SR 3.0.1 establishes the requirement that surveillances must be met when the LCO is applicable. As such, the ITS mode of performance for this surveillance is equivalent to the CTS, making this change administrative. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 (22) | SR 3.01.06.02 |
| 15.04.01 T 15.04.01-01 19.A (22) | SR 3.01.06.02 |

| DOC Number | DOC Text |
|---|---|
| A.05 | CTS Table 15.4.1-1 line item 19 requires the performance of a channel check for control rods on a shiftly basis, which has been concluded to be equivalent to the ITS Surveillance Requirements which verify that the all control rods are within their insertion, alignment, and overlap limits. The control rod analog and demand position indicators do not provide any protective functions. These channels are used solely for the purpose of verifying that the control rod alignment, insertion, and sequence limits are maintained. A channel check as discussed in CTS Section 15.4.1 is intended to be a simple observation of instrument function, which is fulfilled through verification of these operational parameters. Performance of the proposed ITS surveillances while stated to verify operational limits still encompasses an observation of required channel function while clarifying the intent of this surveillance. This change is administrative. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 | SR 3.01.06.02<br>SR 3.01.06.03 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.06.02 |

| DOC Number | DOC Text | |
|---|---|---|
| A.06 | The CTS provides an introductory statement (Applicability) which simply states which systems/components are addressed within a given section. This same information while worded differently is contained within the title of each ITS LCO. Accordingly, this change is a change in format with no change in technical requirement. | |
| | **CTS:** | **ITS:** |
| | 15.03.10 APPL | LCO 3.01.06 |
| A.07 | The CTS provides an introductory statement (Objective) at the beginning of this Section of the Technical Specifications which provide a brief summary of the purpose for this Section. This information is contained in the Bases Section of the ITS. This information does not establish any regulatory requirements for the systems and components addressed within this Section. Accordingly, deletion of this information does not alter any requirement set forth in the Technical Specifications. This change is administrative and consistent with the format and presentation for the ITS as provided in NUREG 1431. | |
| | **CTS:** | **ITS:** |
| | 15.03.10 OBJ | B 3.01.06 |
| A.08 | CTS 15.3.10.A.1 and 2 requires Shutdown Margin (SDM) to be maintained whenever the reactor coolant temperature is less than 350 degrees (15.3.10.A.2) and from 350 degrees to full power (15.3.10.A.1). The requirement to maintain SDM within limits has been moved to several LCOs within the ITS. During critical operation (Mode 1 and Mode 2 with Keff greater than or equal to 1.0) , SDM is assured through the maintenance of rod insertion limits in ITS LCO 3.1.5 and 3.1.6, while in Mode 2 with Keff less than 1.0, and Modes 3, 4, and 5, SDM is assured through the application of ITS LCO 3.1.1. Accordingly, while presented in a different fashion than CTS, the requirement to maintain SDM has been retained in the ITS, making this change administrative. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.A.01 | LCO 3.01.06 |
| | | LCO 3.01.06 COND A |
| | | LCO 3.01.06 COND B |

| DOC Number | DOC Text |
|---|---|
| L.01 | CTS 15.3.10.A.1 requires Shutdown Margin (SDM) to be maintained within limits, with an Action of initiation of boration to restore within 15 minutes, if this limitation is not met. In addition, CTS Action 15.3.10.D.2.a, requires SDM to either be verified to exceed its required value or to be restored by boration within one hour when one or more control bank(s) are found to not be within their insertion limits. In the unlikely event of a control bank found to be in violation of its rod insertion limit with SDM not met, the CTS Actions to initiate boration within 15 minutes and to restore SDM via boration within one hour are not considered viable actions. Restoration of SDM would require determination of the SDM deficit, quantification of the amount of boration required, initiation and completion of the boration, and a confirmatory sample to conclude that the required RCS boron concentration was achieved.<br><br>The proposed ITS will require either verification that SDM is within limits or initiation of boration to restore SDM within one hour. Relaxing the Required Actions to the initiation of boration will allow actions to be initiated to restore SDM (boration if necessary) while increasing available focus to restoring the control bank to its required position, restoring compliance with the LCO and SDM. The CTS and the ITS both require restoration of control bank insertion limits within two hours, which establishes a bounding limit for operation with an insertion limit not met. As such, the maximum time that SDM could conceivably not be met is an additional one hour before the initiation of a plant shutdown. The additional one hour allowance is considered acceptable based on the increased focus that will be available to the most appropriate action, which is restoration of the control bank insertion limit. |

| CTS: | ITS: |
|---|---|
| 15.03.10.A.01 | LCO 3.01.06 COND A RA A.1.2 |
| 15.03.10.D.02.a | LCO 3.01.06 COND A RA A.1.2 |

| DOC Number | DOC Text |
|---|---|
| L.02 | CTS 15.3.10.D.2 requires the control banks to be withdrawn in excess of their rod insertion limits whenever the reactor is critical. Line item 10 of CTS Table 15.4.1-2 requires the control rods to tested for freedom of movement once every two weeks. The control rod freedom of movement test involves moving several of the control rods slightly below their rod insertion limits, resulting in entry into the CTS Action which requires the control rods to be returned to their required positions within two hours. The duration that rods are below their insertion limits during the performance of this test is minimal (less than approximately 15 minutes) in comparison to the current two hour restoration time.<br><br>ITS LCO 3.1.6 is modified by a note which allows the Control Bank Insertion Limit LCO to not be considered applicable during performance of the periodic control rod freedom of movement test. This change is not intended to change the method of surveillance testing but rather reduce the administrative burden associated with tracking entry into and closure of Technical Specification Required Actions when performing routine required Technical Specification Surveillance tests. Elimination of the above referenced administrative burden is a relaxation of current requirements, which is acceptable based on the fact that control rods are typically exercised over a range of travel where the integral rod/bank worth is low, thereby having minimal affect on power distribution and required shutdown margin. Reducing the administrative burden associated with routine testing will allow increased focus on issues of higher safety significance.<br><br>**CTS:** NEW<br>**ITS:** LCO 3.01.06 NOTE |

| DOC Number | DOC Text |
|---|---|
| L.03 | CTS Table 15.4.1-1 footnote 8 requires verification that the rod insertion limits are not being violated at least once per 4 hours whenever the rod insertion limit alarm for a control bank is inoperable. This verification is required to be performed per the proposed Technical Specifications on a 12 hour frequency regardless of the alarm operability.<br><br>The rod insertion limit alarm does not provide any safety function nor does it input to any protection circuits. This alarm merely provides a non-safety means of alerting personnel to a condition which does not comply with an LCO requirement. Rod insertion limits are required to be routinely verified once every 12 hours by the proposed ITS, deletion of the increased surveillance frequency (every 4 hours with an inoperable alarm) does not alleviate the responsibility of the license to be vigilant of plant conditions and LCO compliance. Typically, the unit is operated with the control banks significantly above their rod insertion limits with significant rod motion made only due to planned evaluations. However, significant rod motion could be the result of an unplanned evolution such as a large generator load rejection. Unplanned evaluations of this nature are readily apparent and result in increased monitoring of affected parameters and significant plant conditions. The above discussed indicators in combination with routine surveillance verification (every 12 hours) provides adequate assurance that non-compliance is readily detectable without the need for increased monitoring. Accordingly, this requirement may be deleted from the Technical Specifications as it is not required to provide adequate protection of public health and safety. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 (8) | DELETED |

| DOC Number | DOC Text |
|---|---|
| L.04 | CTS Table 15.4.1-1, surveillance frequency S, "each shift", is proposed to become "every 12 hours", in ITS. The nominal Point Beach shift duration is 8 hours. Therefore this change extends the nominal time between performances of these surveillances by 4 hours, resulting in a relaxation of the current requirement. This is acceptable based on other less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels, and the low probability of equipment malfunction during the additional (nominal 4 hour) time interval. |

| CTS: | ITS: |
|---|---|
| 15.04.01 T 15.04.01-01 19 | SR 3.01.06.02 |
| 15.04.01 T 15.04.01-01 19.A | SR 3.01.06.02 |
| 15.04.01 T 15.04.01-01 S - EACH SHIFT | SR 3.01.06.02 |

| DOC Number | DOC Text | |
|---|---|---|
| L.05 | The CTS required action to be in hot shutdown within 6 hours is being changed to "Be in MODE 2 with keff < 1.0." This is the appropriate required action for the proposed Technical Specifications based on the applicablility of the LCO. Proposed Technical Specification 3.1.6 LCO Applicability states, "MODE 1, MODE 2 with keff >/= 1.0." Therefore, the proposed required action is appropriate and consistent with the proposed Technical Specifications requirements for control bank insertion limits. The proposed required action provides for safety of the reactor and reactor coolant system because the reactor is required to be placed in a condition that the LCO requirements are not applicable. | |
| | **CTS:** | **ITS:** |
| | 15.03.10.D.02.c | LCO 3.01.06 COND C RA C.1 |
| LA.01 | CTS 15.3.10.D contains a requirement to maintain Shutdown Margin within limits and the control banks no further inserted than specified in CTS figure 15.3.10-1 as modified by the fully withdrawn limits (greater than or equal to 225 steps) specified in CTS 15.3.10.d.1. Additionally, this specification references the specific Shutdown Margin Limit (Figure 15.3.10-2) which must be maintained/restored if the rod insertion limits are violated. Rod insertion limits are established to maintain the required SDM which is a cycle specific variable. The SDM limits have been moved to the Core Operating Limits Report. SDM control and shutdown rod insertion limits can be adequately controlled outside of the Technical Specifications because these limitations are calculated using an approved methodology which is ultimately controlled via the methodology's inclusion in the Administrative Control Section of the ITS. Specific Reporting Requirements to notify the NRC when changes are made to the COLR have been proposed consistent with NUREG 1431 and NRC Generic Letter 88-16. This change represents a relaxation of existing requirements. The limits associated with this specification are not required to be in the ITS to provide adequate protection of the public health and safety, because the ITS will still retain a requirement to maintain compliance with the limitation. Changes to the limits will be controlled in accordance with the 10 CFR 50.59 process. Therefore, the level of safety is unaffected by the change. | |
| | **CTS:** | **ITS:** |
| | 15.03.10 F 15.03.10-02 | COLR |
| | | COLR |
| | | COLR |
| | 15.03.10.A.01 | COLR |
| | 15.03.10.D.01 | COLR |
| | 15.03.10.D.02 | COLR |
| | | LCO 3.01.06 |
| | 15.03.10.D.02.a | LCO 3.01.06 COND A RA A.1.1 |

13-Nov-99

| DOC Number | DOC Text |
|---|---|
| LA.02 | The CTS defines fully withdrawn for the control rods as being greater than or equal to 225 steps. This is to allow the control rods to be "parked" at this position or higher while meeting the definition of fully withdrawn. Allowing the rod to be defined as being fully withdrawn above this level minimizes control rod cladding wear caused by vibration at the guide card area, extending control rod life cycle. The concept of defining what constitutes "fully withdrawn" is contained in ITS SR 3.1.6.3. This SR contains an exception to verifying control bank sequence and overlap for control rods which are "withdrawn" from the core in accordance with the limits specified in the COLR. Fully withdrawn is subjective and should be defined and maintained consistent with the limits established for control bank positioning. Therefore, the definition of "fully withdrawn" is proposed for inclusion into the COLR.<br><br>Control rod insertion limits (inclusive of the definition of fully withdrawn) can be adequately controlled outside of the Technical Specifications since this limitation is calculated utilizing an approved methodology which is ultimately controlled via the methodology's inclusion in the Administrative Control Section of the ITS. Specific Reporting Requirements to notify the NRC when changes are made to the COLR have been proposed consistent with NUREG 1431 and NRC Generic Letter 88-16. This change represents a relaxation of existing requirements. The limits associated with this specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS will continue to retain a requirement to maintain compliance with the limit. Changes to the limit will be controlled in accordance with the 10 CFR 50.59 process. Therefore, the level of safety is unaffected by the change. |

| CTS: | ITS: |
|---|---|
| 15.03.10 F 15.03.10-02 | SR 3.01.06.03 |
| 15.03.10.D.01 | SR 3.01.06.03 |

| DOC Number | DOC Text |
|---|---|
| M.01 | Control bank sequence and overlap are assumptions which are integrally linked to process variables which are used in analyses which assume rod worth and power distribution. While these variables are assumed, the CTS does not contain any limitations on control bank sequence or overlap.<br><br>The proposed ITS has included control bank sequence and overlap limits as part of the Control Bank Insertion Limits LCO. A specific Surveillance Requirement to verify these limitations, and appropriate Conditions and Required Actions have been proposed as well. The actual sequence and overlap limit will be contained in the COLR, consistent with other core parameters which are cycle specific. The proposed surveillance will require verification that the sequence and overlap limits are met once every 12 hours. The proposed Condition and Required Actions will require verification that SDM is met or the initiation of boration within one hour, and restoration of the sequence and overlap limits within 2 hours. The proposed LCO, Surveillance Requirement, and Condition and Required Actions are consistent with the safety basis for these parameters and NUREG 1431. |

| CTS: | ITS: |
|---|---|
| NEW | LCO 3.01.06 COND B |
| | LCO 3.01.06 COND B RA B.1.1 |
| | LCO 3.01.06 COND B RA B.1.2 |
| | LCO 3.01.06 COND B RA B.2 |
| | LCO 3.01.06 COND C |
| | SR 3.01.06.03 |

| DOC Number | DOC Text |
|---|---|
| M.02 | The CTS does not contain any surveillance which would verify that the control bank positions calculated as part of the estimated critical condition (ECC) are within limits prior to criticality. This surveillance is required to provide assurance that the reactor will not achieve criticality below the rod insertion limits. The proposed ITS contains a Surveillance Requirement (SR 3.1.6.1) which requires verification that the ECC control bank positions are within the limits specified in the COLR. This is an additional restriction proposed for inclusion into the Technical Specifications consistent with NUREG 1431. |

| CTS: | ITS: |
|---|---|
| NEW | SR 3.01.06.01 |

15.3.10 CONTROL ROD AND POWER DISTRIBUTION LIMITS

Applicability

Applies to the operation of the control rods and to core power distribution limits.

A.06

Objective

A.07

To insure (1) core subcriticality after a reactor trip, (2) a limit on potential reactivity insertions from a hypothetical rod cluster control assembly (RCCA) ejection, and (3) an acceptable core power distribution during power operation.

L.01

Specification

A.08

COLR

LA.01

Cond A RA A.1.2

A. SHUTDOWN MARGIN

ITS LCO 3.1.6, COND A AND COND B

1. The shutdown margin shall exceed the applicable value ~~as shown in Figure 15.3.10-2~~ under all steady-state operating conditions from 350°F to full power. If the shutdown margin is less than the applicable value ~~of Figure 15.3.10-2, within~~ 15 minutes initiate boration to restore the shutdown margin.

2. A shutdown margin of at least 1% Δk/k shall be maintained when the reactor coolant temperature is less than 350°F. If the shutdown margin is less than this limit, within 15 minutes initiate boration to restore the shutdown margin.

B. ROD OPERABILITY AND BANK ALIGNMENT LIMITS

1. During power and low power operation, a < See LCO 3.1.1 > all be operable, with all individual indicated rod positions within twelve steps of their bank demand position, except when the bank demand position is ≤30 steps or ≥215 steps. In this case, all individual indicated rod positions shall be within 24 steps of their bank demand position.

<See LCO: 3.1.5>

If an RCCA does not step in upon demand, up to six hours is allowed to determine whether the problem with stepping is an electrical problem. If the problem cannot be resolved within six hours, the RCCA shall be declared inoperable until it has been verified that it will step in or would drop upon demand.

a. Rod Operability Requirements

(1) If one rod is determined to be untrippable, perform the following actions:

(2) Once per shift check the position of the rods with inoperable RPIs by using excore detectors, or thermocouples, or movable incore detectors;

(3) If the above actions and associated completion times are not met, perform the actions in accordance with TS 15.3.10.B.1.b.

b. If one or more rods with inoperable RPIs have been moved in excess of 24 steps in one direction since the last determination of the rod's position, perform the following actions:

(1) Within four hours check the position of the rods with inoperable RPIs by using excore detectors, or thermocouples, or movable incore detectors;

< See LCO 3.1.8 >

L.2

Add Note for control rod testing (Insert 3.1.7-02)

(2) If the above action and associated completion time is not met, perform the actions in accordance with TS 15.3.10.B.1.b.

c. If bank demand position indication, for one or more banks, is determined to be inoperable, perform the following actions:

(1) Once per shift verify that all RPIs for the affected banks are operable;
<u>AND</u>

(2) Once per shift verify that the most withdrawn rod and the least withdrawn rod of the affected banks are ≤12 steps apart, except when the bank demand position is ≤30 steps or ≥215 steps. In this case, once per shift verify that the most withdrawn rod and the least withdrawn rod of the affected banks are ≤24 steps apart;

(3) If the above actions and associated completion times are not met, perform the actions in accordance with TS 15.3.10.B.1.b.

D. <u>BANK INSERTION LIMITS</u>

LA.2 SR 3.1.6.3

1. <u>When the reactor is critical, the shutdown banks shall be fully withdrawn.</u> Fully withdrawn is defined <u>as a bank position equal to or greater than 225 steps.</u> This definition is applicable to shutdown and control banks.

as specified in the COLR

< See LCO 3.1.6 >

If this condition is not met, perform the following actions:

a. Within one hour verify that the shutdown margin exceeds the applicable value as shown in Figure 15.3.10-2; <u>OR</u> within one hour restore the shutdown margin by boration;

< See LCO 3.1.6 >

A.1

AND

b. Within two hours fully withdraw the shutdown banks.

c. If the above actions and associated completion times are not met, be in hot shutdown within the following six hours.

Mode 1, Mode 2 with Keff $\geq$ 1.0 A.2

2. ~~When the reactor is critical~~, ~~the control banks shall be inserted no further than the limits shown by the lines on Figure 15.3.10-1. If this condition is not met, perform the following actions:~~ M.1 LA.1

Replace with Insert 3.1.7-01

M.1

the COLR

L.1

LCO 3.1.6
Cond B RA B.1.1
Cond B RA B.1.2

a. Within one hour verify that the shutdown margin exceeds the applicable value as shown in ~~Figure 15.3.10-2;~~ OR ~~within one hour restore the shutdown margin by boration;~~

initiate boration to restore SDM to within limits.

AND

LCO 3.1.6
Cond B RA B.2

b. Within two hours restore the control banks to within limits.

LCO 3.1.6
Cond C RA C.1

c. If the above actions and associated completion times are not met, be in hot shutdown within the following six hours.

L.5

E. POWER DISTRIBUTION LIMITS

1. Hot Channel Factors

a. The hot channel factors defined in the basis shall meet the following limits:

$$F_Q(Z) \leq \frac{(2.50)}{P} \times K(Z) \qquad \textit{for } P > 0.5$$

$$F_Q(Z) \leq 5.00 \times K(Z) \qquad \textit{for } P \leq 0.5$$

$$F^N_{\Delta H} < 1.70 \times [1 + 0.3\,(1\text{-}P)]$$

Where P is the fraction of full power at which the core is operating, K(Z) is the function in Figure 15.3.10-3 and Z is the core height location of $F_Q$.

b. If $F_Q(Z)$ exceeds the limit of Specification 15.3.10.E.1.a, within fifteen minutes reduce thermal power until $F_Q(Z)$ limits are satisfied;

(1) After thermal power has been reduced in accordance with Specification 15.3.10.E.1.b, perform the following actions:

< See LCO 3.2.1/3.2.2 >

H. RCCA DROP TIMES

1. With RCS temperature greater than the minimum temperature for criticality and with both reactor coolant pumps running, the drop time of each RCCA shall be no greater than 2.2 seconds from the loss of stationary gripper coil voltage to dashpot entry. If this condition is not met, perform the following actions:

   a. If the reactor is critical, declare the rod untrippable;
   OR
   b. If the reactor is subcritical, maintain the reactor subcritical.

Basis

Insertion Limits and Shutdown Margin

< See LCO 3.1.6 >

During power operation, the shutdown banks are fully withdrawn. Fully withdrawn is defined as a bank demand position equal to or greater than 225 steps. Evaluation has shown that positioning control rods at 225 steps, or greater, has a negligible effect on core power distributions and peaking factors. Due to the low reactivity worth in this region of the core and the fact that, at 225 steps, control rods are only inserted one step into the active fuel region of the core, positioning rods at this position or higher has minimal effect. This position is varied, based on a predetermined schedule, in order to minimize wear of the RCCA's from the guide cards.

A.3

The control rod insertion limits provide for achieving hot shutdown by reactor trip at any time and assume the highest worth control rod remains fully withdrawn. A 10% margin in reactivity worth of the control rods is included to assure meeting the assumptions used in the accident analysis. A reactor trip occurring during power operation places the reactor into hot shutdown. In addition, the insertion limits provide a limit on the maximum inserted rod worth in the unlikely event of a hypothetical rod ejection and provide for acceptable nuclear peaking factors. The specified control rod insertion limits take into account the effects of fuel densification. The rods are withdrawn in the sequence of A, B, C, D with overlap between banks. The overlap between successive control banks is provided to compensate for the low differential rod worth near the top and bottom of the core.

When the insertion limits are observed and the control rod banks are above the solid lines shown on Figure 15.3.10-1, the shutdown requirement is met. The maximum shutdown margin requirement occurs at end of core life and is based on the value used in analysis of the hypothetical steam break accident. Figure 15.3.10-2 shows the shutdown margin equivalent to 2.77% reactivity at end-of-life with respect to an uncontrolled cooldown. All other accident analyses assume 1% or greater reactivity shutdown margin. Shutdown margin calculations include the effects of axial power distribution. The accident analyses assume no change in core poisoning due to xenon, samarium or soluble boron.

If the shutdown margin requirements are not met, boration must be initiated promptly. Fifteen minutes is an adequate period of time for an operator to correctly align and start the required systems and components. It is assumed that boration will be continued until shutdown margin requirements are met.

A.3

< See LCO 3.1.5 >

Rod Operability Requirements and Bank Alignment Limits

The operability (e.g. trippability) of the shutdown and control rods is an initial assumption in all safety analyses that take credit for rod insertion upon reactor trip. Maximum rod misalignment is also an initial assumption in the safety analyses that directly affect core power distributions and assumptions of available shutdown margin. A rod cluster control assembly (RCCA) shall be considered operable if the RCCA drops upon removal of stationary gripper coil voltage.

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. This will also cause a reduction in the total available rod worth for reactor shutdown. Therefore, control rod alignment and operability are related to core operation in design power peaking limits and the core design requirement of a minimum shutdown margin.

From operating experience to date, an RCCA which steps in properly will drop when a trip signal occurs because the only force acting to drive the rod in is gravity. When it has been determined that a rod does not drop, the shutdown margin calculation will need to include the worth of the inoperable control rod. Further experience indicates that control rods which do not step are usually affected by electrical problems. That is, normally the problem is in the rod control cabinets.

Rod cluster control assemblies (RCCAs), or rods, are moved by their control rod drive mechanisms (CRDMs). Each CRDM moves its RCCA one step (approximately 5/8 inch) at a time, but at varying rates (steps per minute) depending on the signal output from the Rod Control System.

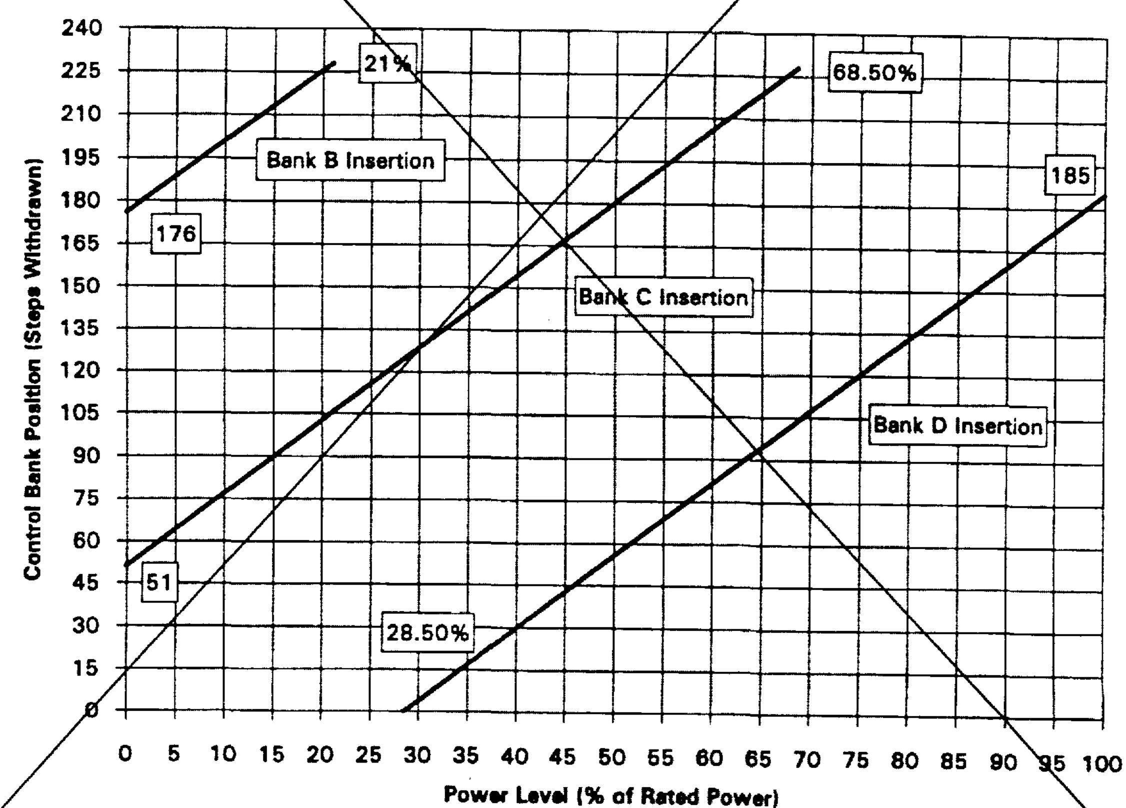
The RCCAs are divided among control banks and shutdown banks. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. A bank of RCCAs consists of one or two groups that are moved in staggered fashion, but always within one step of each other. Each unit has four control banks and two shutdown banks.

When one or more rods are determined to be untrippable, there is a possibility that the required shutdown margin may be adversely affected. Under these conditions, it is important to determine the shutdown margin, and if it is less than the required value, initiate boration until the required shutdown margin is restored. The one-hour time limit is adequate for determining the shutdown margin and, if necessary, for restoring the shutdown margin by boration. In this situation, shutdown margin verification must include the worth of the untrippable rod, as well as a rod of maximum worth.

LA.01

# FIGURE 15.3.10-1

## CONTROL BANK INSERTION LIMITS
## POINT BEACH UNITS 1 AND 2




SR 3.1.6.3

LA.2

(specified in the COLR)

Note: The "fully withdrawn" parking position range can be used without violating this Figure.

LA.01

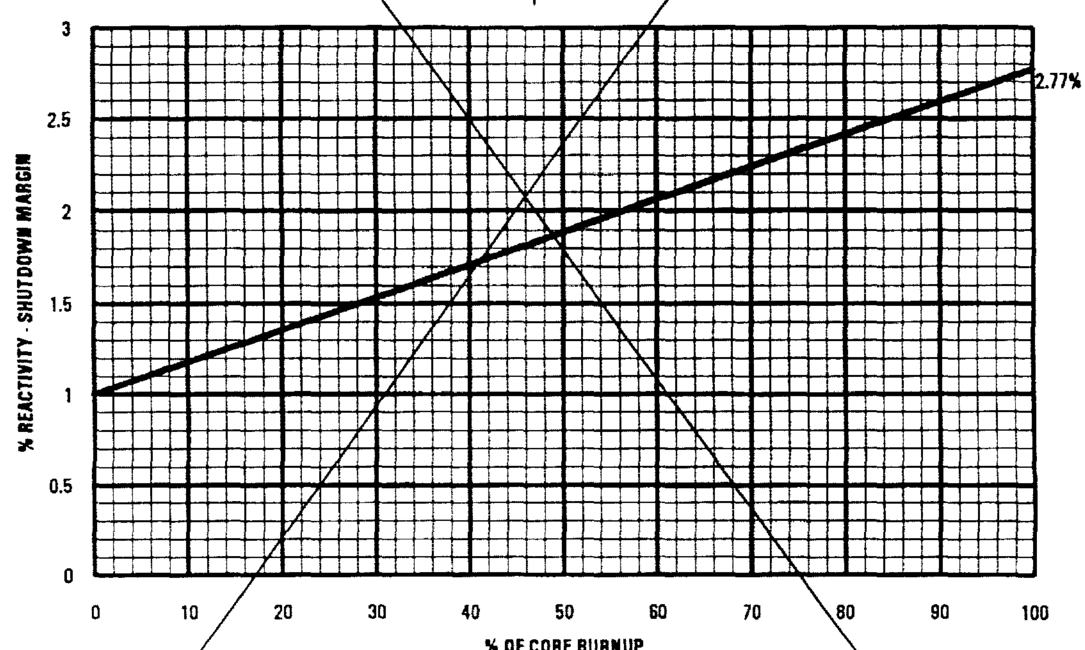



FIGURE 15.3.10-2
REQUIRED SHUTDOWN MARGIN

TABLE 15.4.1-1 (continued)

| NO. | CHANNEL DESCRIPTION | CHECK | CALIBRATE | TEST | PLANT CONDITIONS WHEN REQUIRED | |
|---|---|---|---|---|---|---|
| 9. | Steam Generator Flow Mismatch | S(22) | R | Q(1) | ALL | |
| 10. | Steam Generator Pressure | S(16) | R | Q(1) | ALL | |
| 11. | 4KV Bus Undervoltage (A01 & A02) | | | | | < See LCO 3.3.1 and 3.3.2 > |
| | -AFW pump actuation | - | R | M(1) | ALL | |
| | -Reactor Protection actuation | - | R | M(1,2) | ALL | |
| 12. | 4KV Bus Underfrequency (A01 & A02) | | | | | |
| | -to Reactor Coolant Pump trip | - | R | - | ALL | |
| 13. | Safeguards Bus Voltage | | | | | < See LCO 3.3.2 and 3.3.5 > |
| | -Loss of 4KV | S | R | M | ALL | |
| | -Degraded 4KV | S | R | M | ALL | |
| | -Loss of 480V | S | R | M | ALL | |
| 14. | 120 Vac Instrument Buses | W(6) | - | - | ALL | < See LCO 3.8.9 and 3.8.10 > |
| 15. | Reactor Trip Signal From Turbine | | | | | |
| | -Turbine Autostop | - | - | M(1) | ALL | |
| | -Turbine Stop Valve | - | - | M(1) | ALL | < See LCO 3.3.1 > |
| 16. | Reactor Trip Signal From SI | - | - | M(1) | ALL | |
| 17. | Feedwater Isolation on SI | | | | | < See LCO 3.3.2 and 3.7.3> |
| | -MFP Trip on Safety Injection | - | - | R | ALL | |
| | -MFRV Shutting on Safety Injection | - | - | R | ALL | |
| 18. | Accumulator Level and Pressure | S | R | - | ALL | < See LCO 3.5.1 > |
| 19. | Analog Rod Position | S(R ~~22~~) | R | - | ALL | < See LCO 3.1.8 > |
| | -with step counters | S(~~22~~) | - | - | ALL | Mode 1 and 2 with Keff ≥ 1.0 |
| | -Monitoring by On-Line Computer | (18) | - | - | PWR,HOT S/D | < See LCO 3.1.8 > |

Replace with Insert 3.1.7-03 (SR 3.1.6.2 and SR 3.1.6.3)

L.3

A.4

A.2

A.5

L.4

M.1

Insert New SR 3.1.6.1. See Insert 3.1.7-4.

M.2

NOTATION USED IN TABLE 15.4.1-1

A – Annually (12 months)
~~S- Each shift~~ L.4
D- Daily
W- Weekly
Q- Quarterly
M- Monthly
P- Prior to reactor criticality if not performed during the previous week.
R- Each refueling interval (18 months)
PWR- Power and Low Power Operation, as defined in Specifications 15.1.h. and 15.1.m.
HOT S/D- Hot Shutdown, as defined in Specification 15.1.g.1.
COLD S/D- Cold Shutdown, as defined in Specification 15.1.g.2.
REF S/D- Refueling Shutdown, as defined in Specification 15.1.g.3.
~~ALL- All conditions of operation, as defined in Specifications 15.1.g, h and m.~~

**Discussed in LCOs which notation is applicable to**

Mode 1 and 2 with Keff ≥ 1.0 A.2

**< See LCOs; 3.3.1, 3.3.3, and 3.3.2 >**

NOTES USED IN TABLE 15.4.1-1

(1) Not required during periods of refueling shutdown, but must be performed prior to reactor criticality if it has not been performed during the previous surveillance period.

(2) Tests of the low power trip bistable setpoints which cannot be done during power operations shall be conducted prior to reactor criticality if not done in the previous surveillance interval. **< See LCO 3.3.1 >**

~~(3) Perform test of the isolation valve signal.~~ **< See LCO 3.3.2 >**

(4) Perform by means of the moveable incore detector system. **< See LCO 3.3.1 >**

(5) Recalibrate if the absolute difference is ≥3 percent. **< See Section 3.8 >**

(6) Verification of proper breaker alignment and that the 120 Vac instrument buses are energized. **< See Section 3.3 >**

(7) Source check is required prior to initiation of a release. Source check is an assessment of channel response by exposing the detector to a source of increased radiation. Channel check is required shiftly during a release. If monitor or isolation function is discovered inoperable, discontinue release immediately.

(8) Verify that the associated rod insertion limit is not being violated ~~at least once per 4 hours whenever the rod insertion limit alarm for a control bank~~ is inoperable.

(9) Test of Narrow Range Pressure, 3.0 psig, -3.0 psig excluded. **< See LCO 3.3.2 >**

L.3

< See LCO 3.4.12 >

NOTES USED IN TABLE 15.4.1-1 (continued)

(10) When used for the Low TemperatureOverpressure Protection System, each PORV shall be demonstrated operable by:

a. Performance of a channel functional test on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required operable and at least once per 31 days thereafter when the PORV is required operable.

(11) Performance of a channel functional test is required, excluding valve operation. < See LCO 3.4.11 >

(12) Shiftly check is required when the reactor coolant system is not open to the atmosphere and the reactor coolant system temperature is less than the minimum temperature for the in-service pressure test as specified in TS Figure 15.3.1-1.

(13) An AFW flow path to each steam generator shall be demonstrated operable, following each cold shutdown of greater than 30 days, prior to entering power operation by verifying AFW flow to each steam generator. < See LCO 3.7.5 >

(14) Calibration is to be a verification of response to a source. < See LCO 3.3.3 >

(15) Sample gas for calibration at 2% and 6%.

< See LCO 3.3.1, 3.3.2, and 3.3.3 >

(16) A check of one pressure channel per steam generator is required whenever the steam generator could be pressurized.

< See LCO 3.3.2 >

(17) Includes test of logic for reactor trip on low-low level, automatic actuation logic for auxiliary feedwater pumps, and test of logic for feedwater isolation on high steam generator level.

(18) Rod positions must be logged at least once per hour, after a load change >10% or after >30 inches of control rod motion if the on-line computer is inoperable. < See LCO 3.1.5 >

(19) The daily heat balance is a gain adjustment performed to match Nuclear Instrumentation System indicated power level with reactor thermal output.

< See LCO 3.3.1 >

(20) To confirm that hot channel factor limits are being satisfied, the requirements of TS 15.3.10.B must be met.

(21) Check required only when the low temperature overpressure protection system is in operation. < See LCO 3.4.11 >

(22) ~~Not required during period of cold and refueling shutdowns, but must be performed prior to reactor criticality if it has not been performed during the previous surveillance period~~.

Deleted - Addressed by ITS SR 3.0.4

A.4

(23) Each train tested at least every 62 days on a staggered basis. < See LCO 3.3.1 and 3.3.2>

(24) Neutron detectors excluded from calibration. < See LCO 3.3.1 >

# Spec 3.1.7 Inserts

Insert 3.1.7-01:

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

Insert 3.1.7-02:

This LCO is not applicable while performing SR 3.1.4.2.

Insert 3.1.7-03:

A.5 L.4

| | | |
|---|---|---|
| SR 3.1.6.2 | Verify each control bank insertion is within the limits specified in the COLR. | 12 hours |
| SR 3.1.6.3 | Verify sequence and overlap limits specified in the COLR are met for control banks not withdrawn from the core as specified in the COLR. | 12 hours |

M.1

Insert 3.1.7-04:

| | | |
|---|---|---|
| SR 3.1.6.1 | Verify estimated critical control bank position is within the limits specified in the COLR. | Within 4 hours prior to achieving criticality |

M.2

# Justification For Deviations - NUREG-1431 Section 3.01.07

*13-Nov-99*

| JFD Number | JFD Text | |
|---|---|---|
| 01 | Reference to the General Design Criteria (GDC) of 10 CFR 50 Appendix A has been deleted from the Bases of the Technical Specifications, substituting reference to the appropriate section of the FSAR which specifies the Point Beach design criteria. Point Beach was constructed and licensed prior to the GDC being issued. The Point Beach construction permit was issued prior to the GDCs being issued in 1971. Point Beach was designed and constructed utilizing the 1967 proposed GDCs. Accordingly, reference has been provided to the appropriate criteria and section of the Point Beach FSAR which provides explanation of Point Beach's design basis. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| 02 | The Bases for LCO 3.1.7 provides a description of control bank overlap, which includes specific reference to the position of Control Bank C when Control Bank D begins to move in addition to the fully withdrawn position for the control rods. The C Bank position at which Control Bank D begins to move at Point Beach is 125 steps and the fully withdrawn position for the control rods is 225 steps. These site specific numbers have been substituted for the numbers used in NUREG 1431. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| 03 | The Bases for LCO 3.1.7 provides three FSAR Section references (3, 4, and 5) for various analyses and parameters. Reference 3 contains contains a broad reference to the Accident Analyses Section of the FSAR which contains the accident analyses assumptions for analyzed events. Therefore, Reference 4 and 5 are unnecessary. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| 04 | The brackets have been removed and the proper plant specific information has been provided. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| 05 | The Bases for Required Action A.1.1 references the Bases for SR 3.1.1.1 to obtain a listing of effects for calculation of SDM when one or more shutdown banks are not within limits. This LCO Action is applicable in Modes 1 and 2 with Keff greater than or equal to 1.0. SR 3.1.1.1 calculates SDM in Mode 2 with Keff < 1.0, and Modes 3, 4, and 5, addressing subcritical conditions. Therefore, the Bases for SR 3.1.1.1 contains effects which are not applicable to an operating reactor. Proposed ITS LCO 3.1.5 Required Action A.1.1 has been modified to list the effects listed from the Bases for SR 3.1.1.1 which are applicable to reactor critical operation. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |

*13-Nov-99*

| JFD Number | JFD Text | |
|---|---|---|
| 06 | Figure B 3.1.7-1, "Control Bank Insertion Limits" is provided in the Bases of the ITS as an example of the rod insertion limits in addition to a reference in explaining the concept of bank overlap. This figure has been retained, but as a generic figure for information only to eliminate any possible confusion as to the figure's use. Plant specific information is contained in the COLR. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| 07 | The Mode of Applicability for NUREG LCO 3.1.7 is Mode 1 and 2 with Keff greater than or equal to 1.0, while the default Required Action (C.1) requires the unit to be placed into Mode 3 within 6 hours. LCO 3.0.2 states that an LCOs Required Actions are no longer applicable if an LCO is met or no longer applicable. Accordingly, the Required Actions are no longer applicable after the unit reaches Mode 2 with Keff less than 1.0. Therefore, the default action has been revised to require the unit to be placed into Mode 2 with Keff less than 1.0 within 6 hours to establish continuity between the General Usage LCOs and the Required Actions for NUREG 1431 LCO 3.1.7. This implements approved TSTF 238, Revision 0. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| | LCO 3.01.06 COND C RA C.1 | LCO 3.01.07 COND C RA C.1 |
| 08 | NUREG 1431 allows control bank insertion, sequence, and overlap limits to be specified in the COLR. NUREG 1431 SR 3.1.7.3 states that control banks which are fully withdrawn from the core are not required to be checked for proper sequence and overlap, as in the fully withdrawn position, overlap and sequence are no longer observable parameters. The CTS defines fully withdrawn for the control rods as being greater than or equal to 225 steps. This is to allow the control rods to be "parked" at this position or higher while meeting the definition of fully withdrawn. Defining fully withdrawn at greater than or equal to 225 steps minimizes control rod cladding wear caused by vibration in the guide card area. Fully withdrawn is not adequately defined in the NUREG. Fully withdrawn is subjective and should be defined and maintained consistent with the control bank insertion limits. Therefore, the definition of "fully withdrawn" is proposed for inclusion into the COLR. | |
| | **ITS:** | **NUREG:** |
| | B 3.01.06 | B 3.01.07 |
| | COLR | N/A |
| | | N/A |
| | SR 3.01.06.03 | N/A |
| | | N/A |
| | | SR 3.01.07.03 |

# Justification For Deviations - NUREG-1431 Section 3.01.07

*13-Nov-99*

| JFD Number | JFD Text |
|---|---|
| 09 | The porposed Bases has been modified to reflect the Point Beach design. Not all control rod banks consist of two groups of rods as stated in the Bases of NUREG 1431 LCO 3.1.6. Control banks may consist of a single group dependent upon the number of control rods assigned to the bank. Typically control rod banks with four or fewer rods consist of a single group. Any bank that consists of two groups will step the banks within one step of each other.<br>**ITS:** B 3.01.06 **NUREG:** B 3.01.07 |
| 10 | The Mode of Applicability for NUREG 1431 LCO 3.1.7 is Mode 1 and Mode 2 when Keff is greater than or equal to 1.0, however, the Applicability and Actions Sections of the NUREG Bases do not reflect this completely. As such, the proposed ITS Bases has been changed to correspond to the actual Applicability of the LCO.<br>**ITS:** B 3.01.06 **NUREG:** B 3.01.07 |

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3.1 REACTIVITY CONTROL SYSTEMS

3.1.~~7~~ 6 Control Bank Insertion Limits

LCO 3.1.~~7~~ 6 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

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

---------------------------NOTE---------------------------
This LCO is not applicable while performing SR 3.1.~~5~~ 4.2.
----------------------------------------------------------

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Control bank insertion limits not met. | A.1.1 Verify SDM ~~is ≥ [1.6]% Δk/k~~ to be within the limits provided in the COLR | 1 hour |
| | OR | |
| | A.1.2 Initiate boration to restore SDM to within limit. | 1 hour |
| | AND | |
| | A.2 Restore control bank(s) to within limits. | 2 hours |

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(continued)

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ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Control bank sequence or overlap limits not met.<br><br>to be within the limits provided in the COLR<br><br>Approved TSTF 09 | B.1.1 Verify SDM ~~is ≥ [1.6]% Δk/k~~.<br><br><u>OR</u><br><br>B.1.2 Initiate boration to restore SDM to within limit.<br><br><u>AND</u><br><br>B.2 Restore control bank sequence and overlap to within limits. | 1 hour<br><br><br><br>1 hour<br><br><br><br>2 hours |
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE ~~3~~.<br>2 with Keff <1.0 | 6 hours |

7

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.7.1<br>6<br>Approved TSTF 136 | Verify estimated critical control bank position is within the limits specified in the COLR. | Within 4 hours prior to achieving criticality |

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.~~7~~ 6.2 | Verify each control bank insertion is within the limits specified in the COLR. | 12 hours<br><br>~~AND~~<br><br>~~Once within 4 hours and every 4 hours thereafter when the rod insertion limit monitor is inoperable~~ |
| SR 3.1.~~7~~ 6.3 | Verify sequence and overlap limits specified in the COLR are met for control banks not ~~fully~~ withdrawn from the core as specified in the COLR. | 12 hours |

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8

6

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B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.7 Control Bank Insertion Limits

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BASES

BACKGROUND

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

1

Replace with Insert B 3.1.7-01

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

9

Replace with Insert B 3.1.7-04

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The rod cluster control assemblies (RCCAs) are divided among control banks and shutdown banks. Each bank may be further subdivided into two groups to provide for precise reactivity control. A group consists of two or more RCCAs that are electrically paralleled to step simultaneously. ~~A bank of RCCAs consists of two groups that are moved in a staggered fashion, but always within one step of each other. All plants have four control banks and at least two shutdown banks.~~ See LCO 3.1.5 "Rod Group Alignment Limits," for control and shutdown rod OPERABILITY and alignment requirements, and LCO 3.1.8 "Rod Position Indication," for position indication requirements.

4

7

The control bank insertion limits are specified in the COLR. An example is provided for information only in Figure B 3.1.7-1. The control banks are required to be at or above the insertion limit lines.

6

Figure B 3.1.7-1 also indicates how the control banks are moved in an overlap pattern. Overlap is the distance traveled together by two control banks. The predetermined



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BASES

125 2

BACKGROUND (continued)

position of control bank C, at which control bank D will begin to move with bank C on a withdrawal, will be at ~~118~~ steps for a fully withdrawn position of ~~231~~ steps. The fully withdrawn position is defined in the COLR.

225 2

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5

4

6

The control banks are used for precise reactivity control of the reactor. The positions of the control banks are normally controlled automatically by the Rod Control System, but can also be manually controlled. They are capable of adding reactivity very quickly (compared to borating or diluting).

The power density at any point in the core must be limited, so that the fuel design criteria are maintained. Together, LCO 3.1.5, LCO 3.1.6 "Shutdown Bank Insertion Limits," LCO 3.1.7, LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," provide limits on control component operation and on monitored process variables, which ensure that the core operates within the fuel design criteria.

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

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

APPLICABLE SAFETY ANALYSES

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

APPLICABLE SAFETY ANALYSIS (continued)

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

a. There be no violations of:

   1. specified acceptable fuel design limits, or
   2. Reactor Coolant System pressure boundary integrity; and

b. The core remains subcritical after accident transients.

As such, the shutdown and control bank insertion limits affect safety analysis involving core reactivity and power distributions (Ref. 3).

The SDM requirement is ensured by limiting the control and shutdown bank insertion limits so that allowable inserted worth of the RCCAs is such that sufficient reactivity is available in the rods to shut down the reactor to hot zero power with a reactivity margin that assumes the maximum worth RCCA remains fully withdrawn upon trip (Ref. 4). 3 3

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

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

The insertion limits satisfy Criterion 2 of the NRC Policy Statement, in that they are initial conditions assumed in the safety analysis.

LCO

The limits on control banks sequence, overlap, and physical insertion, as defined in the COLR, must be maintained because they serve the function of preserving power

LCO (continued)

distribution, ensuring that the SDM is maintain ed, ensuring that ejected rod worth is maintained, and ensuring adequate negative reactivity insertion is available on trip. The overlap between control banks provides more uniform rates of reactivity insertion and withdrawal and is imposed to maintain acceptable power peaking during control bank motion.

---

APPLICABILITY

10

Mode 2 with Keff < 1.0 and

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4

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

The applicability requirements have been modified by a Note ~~indicating the LCO requ~~irements are suspended during the performance of SR 3.1.5λ2. This SR verifies the freedom of the rods to move, and requires the control bank to move below the LCO limits, which would violate the LCO.

---

ACTIONS

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

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

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

b. Moving rods to be consistent with power.

Also, verification of SDM or initiation of boration to regain SDM is required within 1 hour, since the SDM in MODES 1 and 2 normally ensured by adhering to the control and shutdown bank insertion limits (see LCO 3.1.1, "SHUTDOWN MARGIN (SDM) ~~- $T_{avg}$ > 200°F~~") has been upset. If control banks are not within their insertion limits, then SDM will

with Keff ≥1.0 is

10

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BASES 5

ACTIONS (continued)

Replace with Insert 3.1.7-02

be verified by performing a reactivity balance calculation, considering ~~the effects listed in the BASES for SR 3.1.1.1~~.

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

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

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

C.1

If Required Actions A.1 and A.2, or B.1 and B.2 cannot be completed within the associated Completion Times, the plant must be brought to MODE 3 where the LCO is not applicable.

2 with Keff < 1.0

7

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.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

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

The estimated critical position (ECP) depends upon a number of factors, one of which is xenon concentration. If the ECP was calculated long before criticality, xenon concentration could change to make the ECP substantially in error. Conversely, determining the ECP immediately before



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BASES

SURVEILLANCE REQUIREMENTS (continued)

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criticality could be an unnecessary burden. There are a number of unit parameters requiring operator attention at that point. Performing the ECP calculation within 4 hours prior to criticality avoids a large error from changes in xenon concentration, but allows the operator some flexibility to schedule the ECP calculation with other startup activities.

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SR 3.1.6.2

~~With an OPERABLE bank insertion limit monitor, v~~ V erification of the control bank insertion limits at a Frequency of 12 hours is sufficient to ~~ensure OPERABILITY of the bank insertion limit monitor and to~~ detect control banks that may be approaching the insertion limits since, normally, very little rod motion occurs in 12 hours. ~~If the insertion limit monitor becomes inoperable, verification of the control bank position at a Frequency of 4 hours is sufficient to detect control banks that may be approaching the insertion limits.~~

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SR 3.1.6.3

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

Insert B 3.1.7-03

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 10, GDC 26, GDC 28.~~ FSAR, Section 3.1.

2. 10 CFR 50.46.

3. FSAR, Chapter [15].

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

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



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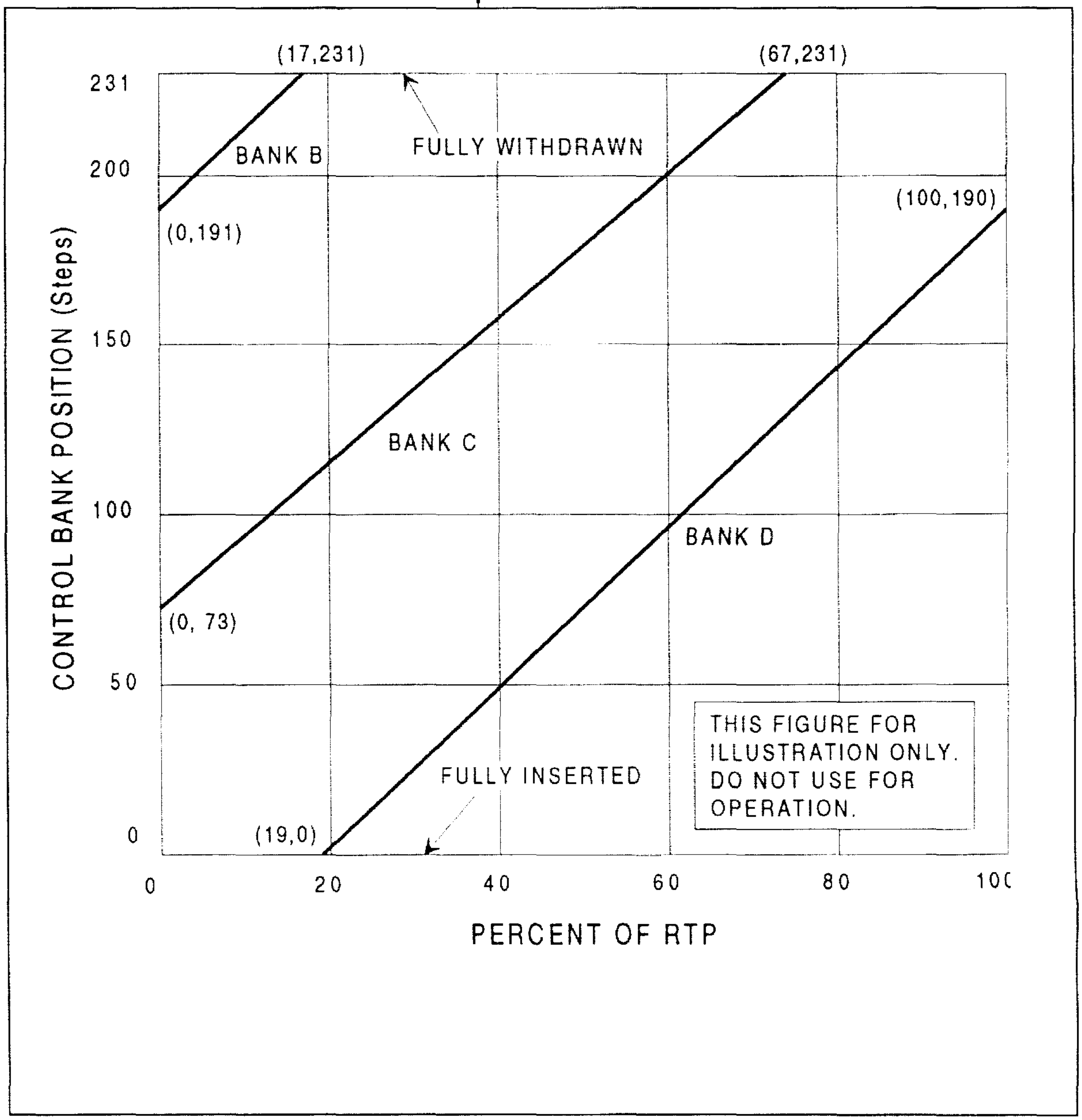
6

Replace with generic Figure

6

Approved TSTF 136

BASES

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6

Figure B 3.1.7-1 (page 1 of 1)
Control Bank Insertion vs. Percent RTP



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# LCO 3.1.7 BASES INSERTS

**Insert B 3.1.7-01:**

The design criteria for reactivity and power distribution are found in FSAR Section 3.1.

**Insert B 3.1.7-02:**

the following listed reactivity effects:

a. RCS boron concentration;

b. Control bank position;

c. Power defect;

d. Fuel burnup;

e. Xenon concentration; and

f. Samarium concentration.

**Insert B 3.1.7-03:**

Control banks which are fully withdrawn from the core as specified in the COLR do not have to be verified. In the fully withdrawn position, sequence and overlap can no longer be verified.

**Insert B 3.1.7-04:**

A bank of RCCAs may consist of one or two groups. When a bank consists of two groups, the groups are moved in a staggered fashion, but always within one step of each other. Control banks A and C and shutdown bank A consist of two groups each while control banks B and D and shutdown bank B consist of a single group.

13-Nov-99

| NSHC Number | NSHC Text |
|---|---|
| A | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change involves reformatting and rewording of the current Technical Specifications. The reformatting and rewording process involves no technical changes to existing requirements. As such, this change is administrative in nature and does not impact initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not increase the probability or consequences of an accident previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not require a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any new or eliminate any old requirements. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>The proposed change will not significantly reduce the margin of safety because it has no impact on any safety analysis assumptions. This change is administrative. As such, there is no technical change to the requirements and, therefore, there is no reduction in the margin of safety. |

| NSHC Number | NSHC Text |
|---|---|
| L.01 | In accordance with the criteria set forth in 10 CFR 50.92, PBNP has evaluated this proposed Technical Specifications change and determined it does not represent a significant hazards consideration. The following is provided in support of this conclusion.<br><br>1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?<br><br>The proposed change will relax the Technical Specification Required Actions requiring initiation of boration versus restoration of SDM. The CTS and the ITS both require restoration of control bank insertion limits within two hours, which establishes a bounding limit for operation with an insertion limit not met. As such, the maximum time that SDM could conceivably not be met is an additional one hour before the initiation of a plant shutdown is required. While SDM and rod position (available worth) are variables assumed in various analyses, the state of not meeting a rod insertion limit is not an accident precursor. The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. Accordingly, there will be no significant change in the probability of accidents previously evaluated. The additional one hour period allowed to be in this condition does not represent an increase in the consequences of accidents previously evaluated, as the plant condition during this extended period is the same as those currently allowed for up to one hour. Accordingly, the consequences are the same during this increased period. This change does not present a significant increase in the consequences of accidents previously evaluated.<br><br>2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?<br><br>The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.<br><br>3. Does this change involve a significant reduction in a margin of safety?<br><br>In the unlikely event of a control bank being found outside of its rod insertion limit with SDM not met, the CTS Action to restore SDM via boration within one hour is not a viable action, which would then result in the initiation of a plant shutdown which is a diversion of resources which should be more appropriately focused on restoration of the shutdown banks insertion limit. The additional one hour allowance is acceptable based on the increased focus that will be available to the most appropriate action which is restoration of the control bank insertion limit. Accordingly, increasing the time allowed before shutdown actions are required to be initiated by an additional hour does not involve a significant reduction in a margin of safety. |