ATTACHMENT 1

VOLUME 5

SAN ONOFRE NUCLEAR GENERATING STATION

IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.2 POWER DISTRIBUTION LIMITS

LIST OF ATTACHMENTS

ATTACHMENT 1

ITS 3.2.1, LINEAR HEAT RATE

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

ITS

LHR
3.2.1

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.1 — 3.2.1 Linear Heat Rate (LHR)

LCO 3.2.1 — LCO 3.2.1 LHR shall not exceed the limits specified in the COLR.

Applicability — APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A	A. Core operating limit supervisory system (COLSS) calculated core power exceeds the COLSS calculated core power operating limit based on LHR.	A.1 Restore LHR to within limits.	1 hour
ACTION B	B. ~~With COLSS not in service and any OPERABLE CPC local power density channel exceeding the LHR limit~~. [inserted: LHR not within region of acceptable operation when COLSS is out of service]	[inserted: B.1 Determine trend in LHR. AND B.2.1 With an adverse trend, restore LHR to within limits. OR] ~~B.1 Initiate SR 3.2.1.2~~ ~~AND~~ B.2 [.2] [inserted: With no adverse trend,] Restore LHR to within limits.	[Once per] 15 minutes [1 hour] 4 hours (A02, M01, M01, A03)
ACTION C	C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

Attachment 1, Volume 5, Rev. 0, Page 5 of 144

ITS

A01

LHR
3.2.1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.1.1	SR 3.2.1.1	-----------------NOTE-------------------- 1. Only ~~applicable~~ required to be met when COLSS is out of service. With COLSS in service, LHR is continuously monitored. ~~2. SR 3.0.4 is not applicable.~~ --- Verify LHR, as indicated on all OPERABLE CPC local power density channels, is within COLR limits.	A04 A05 ~~2 hours~~ In accordance with the Surveillance Frequency Control Program
ACTION B	SR 3.2.1.2 Not used.	~~-----------------NOTE-------------------- Only applicable with LHR outside limit, as indicated by any OPERABLE CPC local power density channel exceeding the LHR limit. --- Verify no adverse trend in LHR.~~	A02 ~~15 minutes~~
SR 3.2.1.3	SR 3.2.1.3	Verify the COLSS margin alarm actuates at a THERMAL POWER equal to or less than the core power operating limit based on LHR.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

LA01

ITS

LHR
3.2.1

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.1 | 3.2.1 Linear Heat Rate (LHR)

LCO 3.2.1 | LCO 3.2.1 LHR shall not exceed the limits specified in the COLR.

Applicability | APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION A	A. Core operating limit supervisory system (COLSS) calculated core power exceeds the COLSS calculated core power operating limit based on LHR.	A.1 Restore LHR to within limits. B.1 Determine trend in LHR. AND B.2.1 With an adverse trend, restore LHR to within limits. OR	1 hour	
ACTION B	B. ~~With COLSS not in service and any OPERABLE CPC local power density channel exceeding the LHR limit~~. LHR not within region of acceptable operation when COLSS is out of service	~~B.1 Initiate SR 3.2.1.2~~ ~~AND~~ B.2 .2 With no adverse trend, Restore LHR to within limits.	Once per 15 minutes 1 hour 4 hours	A02 M01 M01 A03
ACTION C	C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours	

ITS

A01

LHR
3.2.1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.1.1	SR 3.2.1.1 -------------------NOTE------------------- 1. Only ~~applicable~~ [required to be met] when COLSS is out of service. With COLSS in service, LHR is continuously monitored. ~~2. SR 3.0.4 is not applicable.~~ -- Verify LHR, as indicated on all OPERABLE CPC local power density channels, is within COLR limits.	A04 A05 ~~2 hours~~
ACTION B	SR 3.2.1.2 [Not used.] ~~-------------------NOTE-------------------~~ ~~Only applicable with LHR outside limit, as indicated by any OPERABLE CPC local power density channel exceeding the LHR limit.~~ ~~--~~ ~~Verify no adverse trend in LHR.~~	A02 ~~15 minutes~~
SR 3.2.1.3	SR 3.2.1.3 Verify the COLSS margin alarm actuates at a THERMAL POWER equal to or less than the core power operating limit based on LHR.	~~31 days~~

In accordance with the Surveillance Frequency Control Program — LA01

Attachment 1, Volume 5, Rev. 0, Page 8 of 144

DISCUSSION OF CHANGES
ITS 3.2.1, LINEAR HEAT RATE

ADMINISTRATIVE CHANGES

A01 In the conversion of the San Onofre Nuclear Generating Station (SONGS) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 3.0, "Standard Technical Specifications Combustion Engineering Plants" (ISTS) and additional approved Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.2.1 Required Action B.1 requires the initiation of SR 3.2.1.2 with COLSS not in service and the CPC local power density channel exceeding the LHR limit. CTS SR 3.2.1.2 requires verifying no adverse trend in LHR every 15 minutes. The SR contains a Note that modifies the SR to make it only applicable with LHR outside limits, as indicated by any OPERABLE CPC local power density channel exceeding the LHR limit. ITS Required Action B.1 requires the LHR trend to be determined every 15 minutes. This changes the CTS by deleting the SR and putting the requirements into the ACTIONS.

The application of this CTS SR 3.2.1.2 along with the Note that modified it is confusing and is more appropriately applied in the ACTIONS. The modified Completion Time is consistent with the current requirements. The proposed 15 minute Completion Time to determine the trend in LHR is consistent with the CTS Surveillance Frequency. This change appropriately incorporates a confusing SR that should be a Required Action into the ACTIONS. This change does not alter any of the requirements required by CTS 3.2.1 and is therefore administrative.

A03 CTS 3.2.1 Condition B states, "With COLSS not in service and any OPERABLE CPC local power density channel exceeding the LHR limit." ITS 3.2.1 Condition B states, "LHR not within region of acceptable operation when COLSS is out of service." This changes the CTS by stating that the LCO is not met (i.e., LHR is not within the region of acceptable operation) in the first part of the Condition.

The proposed change rewords the Condition to be consistent with NUREG-1432 without changing the intent. This is an administrative change which clarifies the wording of the Condition to align with the adverse condition that exists.

A04 CTS SR 3.2.1.1 contains a Note (Note 1) which modifies the SR by making it only "applicable" when COLSS is out of service. ITS SR 3.2.1.1 revises the Note to be only "required to be met" when COLSS is out of service. This changes the CTS by clarifying what applicable means (i.e., not required to be met) based on the changes to Section 1.4, and deleting the SR 3.0.4 allowance.

TSTF-284 revised CTS Section 1.4 to add a discussion regarding the use of "met" and "perform" in SR Notes and adds examples to facilitate the use and application of SR Notes that utilize "met" and "perform." The TSTF also revises SR Notes, as necessary, to appropriately clarify the use of "met" and "perform"

Attachment 1, Volume 5, Rev. 0, Page 9 of 144

DISCUSSION OF CHANGES
ITS 3.2.1, LINEAR HEAT RATE

exceptions. The SONGS CTS do not contain this detail; however, various locations throughout the TS provide Notes with "met" and "performed" distinctions. This change does not change the intent of any SR Note. This proposed change will provide for better use, application, and understanding of this Note along with the changes to Section 1.4. This is an administrative change which clarifies and corrects exceptions that are unclear or have incorrect usage of "met" and "perform."

A05 CTS SR 3.2.1.1 contains the Note (Note 2) that SR 3.0.4 is not applicable. ITS SR 3.2.1.1 does not contain this Note. This changes the CTS by deleting this specific Note.

The purpose of the Note is to allow the plant to enter the MODE of Applicability without performing the required Surveillances. This change is acceptable because the CTS as well as ITS SR 3.2.1.1 remaining Note (first sentence), which states, "Only required to be met when COLSS is out of service," is written to allow entry into MODE 1 following a reactor startup. This serves the same purpose as the existing CTS Note 2 and is described in CTS and ITS SR 3.0.4. Thus the Note is redundant and has been deleted. This change is designated as administrative because it eliminates a CTS provision which is not required because it is already allowed by the SR.

MORE RESTRICTIVE CHANGES

M01 CTS 3.2.1 Required Action B.1 requires the initiation of SR 3.2.1.2 if the COLSS is out of service and any OPERABLE CPC local power density channel exceeds the LHR limit. CTS SR 3.2.1.2 requires verification of no adverse trend in LHR every 15 minutes. However, this is done to monitor LHR, and no specific actions are required except to restore the LHR to within limits in 4 hours, as stated in CTS 3.2.1 Required Action B.2. Under similar conditions, if an adverse trend is detected, ITS 3.2.1 Required Action B.2.1 requires restoration of the LHR to within limits in 1 hour. If no adverse trend is detected, ITS 3.2.1 Required Action B.2.2 continues to require the LHR to be restored to within limits within 4 hours. This changes the CTS by requiring restoration of LHR to within the limits in 1 hour if an adverse trend is detected, in lieu of the current 4 hours.

The purpose of ITS 3.2.1 Required Action B.2.1 is to require restoration of the LHR to within limits in a time consistent with ITS 3.2.1 Required Action A.1, when an adverse trend in LHR is detected. This change is acceptable because the unit will be allowed to operate for a shorter period of time (1 hour) if an adverse trend is detected. This ensures that reductions in reactor power occur sooner when an adverse trend is detected. This change is designated as more restrictive because less time is allowed to restore LHR to within limits when an adverse trend is detected with the COLSS not in service.

RELOCATED SPECIFICATIONS

None

Attachment 1, Volume 5, Rev. 0, Page 10 of 144

DISCUSSION OF CHANGES
ITS 3.2.1, LINEAR HEAT RATE

REMOVED DETAIL CHANGES

LA01 *(Type 4 – Removal of LCO, SR, or other TS requirement to the LCS, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program)* CTS SR 3.2.1.1 requires verification that LHR, as indicated on all OPERABLE CPC local power density channels, is within COLR limits every 2 hours. CTS SR 3.2.1.3 requires verification the COLSS margin alarm actuates at a THERMAL POWER equal to or less than the core power operating limit based on LHR every 31 days. ITS SR 3.2.1.1 and ITS SR 3.2.1.3 require similar Surveillances, respectively, but specify the periodic Frequency as "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for the SRs and the Bases for the Frequencies to the Surveillance Frequency Control Program.

The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. In addition:

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program;

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1; and

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

The referenced document, NEI 04-10, Rev. 1, provides a detailed description of the process to be followed when considering changes to a Surveillance Frequency. NEI 04-10, Rev. 1, has been reviewed and approved by the NRC. Therefore, the process will not be discussed further here.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 and 1.177. Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF). Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies.

Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

DISCUSSION OF CHANGES
ITS 3.2.1, LINEAR HEAT RATE

1. **The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.**

   10 CFR 50.36(c) provides that TS will include items in the following categories:

   "(3) *Surveillance requirements*. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

   This change proposes to relocate various Frequencies for the performance of the Surveillance Requirements to a licensee-controlled program using an NRC approved methodology for control of the Surveillance Frequencies. The Surveillance Requirements themselves will remain in TS. This is consistent with other NRC approved TS changes in which the Surveillance Frequencies are not under NRC control, such as Surveillances that are performed in accordance with the Inservice Testing Program or the Containment Leakage Rate Testing Program, where the Frequencies vary based on the past performance of the subject components. Thus, this proposed change meets criterion 1 above.

2. **The proposed change is consistent with the defense-in-depth philosophy.**

   As described in Position 2.2.1.1 of Regulatory Guide 1.174, consistency with the defense-in-depth philosophy is maintained if:

   - A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation;
   - Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided;
   - System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers);
   - Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed;
   - Independence of barriers is not degraded;
   - Defenses against human errors are preserved; and
   - The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

Attachment 1, Volume 5, Rev. 0, Page 12 of 144

DISCUSSION OF CHANGES
ITS 3.2.1, LINEAR HEAT RATE

These defense-in-depth objectives apply to all risk-informed applications, and for some of the issues involved (e.g., no over-reliance on programmatic activities and defense against human errors), it is fairly straightforward to apply them to this proposed change. The use of the multiple risk metrics of CDF and LERF and controlling the change resulting from the implementation of this initiative would maintain a balance between prevention of core damage, prevention of containment failure, and consequence mitigation. Redundancy, diversity, and independence of safety systems are considered as part of the risk categorization to ensure that these qualities are not adversely affected. Independence of barriers and defense against common cause failures are also considered in the categorization. The improved understanding of the relative importance of plant components to risk resulting from the development of this program promotes an improved overall understanding of how the SSCs contribute to the plant's defense-in-depth.

3. **The proposed change maintains sufficient safety margins.**

   Conformance with this principle is assured since SSC design, operation, testing methods and acceptance criteria specified in the Codes and Standards or alternatives approved for use by the NRC, will continue to be met as described in the plant licensing basis (e.g., UFSAR, or Technical Specifications Bases). Also, the safety analysis acceptance criteria in the licensing basis (e.g., UFSAR, supporting analyses, etc.) are met with the proposed change.

4. **When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.**

   NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," will require that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

5. **The impact of the proposed change should be monitored using performance measurement strategies.**

   NEI 04-10 will require that changes in Surveillance Frequencies be monitored using performance management strategies.

Therefore, the proposed change is consistent with the guidance in Regulatory Guide 1.174.

This change is designated as a less restrictive removal of detail change because Surveillance Frequencies are being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

None

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

U2/U3 CTS

LHR (Digital) 2
3.2.1

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Linear Heat Rate (LHR) (Digital) 2

LCO 3.2.1

LCO 3.2.1 LHR shall not exceed the limits specified in the COLR.

Applicability

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A	A. Core Operating Limit Supervisory System (COLSS) calculated core power exceeds the COLSS calculated core power operating limit based on LHR.	A.1 Restore LHR to within limits.	1 hour
ACTION B, SR 3.2.1.2	B. LHR not within region of acceptable operation when the COLSS is out of service.	B.1 Determine trend in LHR. AND B.2.1 With an adverse trend, restore LHR to within limit. [s] OR B.2.2 With no adverse trend, restore LHR to within limits.	Once per 15 minutes 1 hour 4 hours
ACTION C, SR 3.2.1.2	C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

4

Attachment 1, Volume 5, Rev. 0, Page 15 of 144

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
SR 3.2.1.1	SR 3.2.1.1	------------------------------NOTE------------------------------ Only required to be met when COLSS is out of service. With COLSS in service, LHR is continuously monitored. --- Verify LHR, as indicated on each OPERABLE local power density channel, is within its limit.	2 hours	TSTF-425-A
SR 3.2.1.3	SR 3.2.1.2 3	Verify the COLSS margin alarm actuates at a THERMAL POWER equal to or less than the core power operating limit based on LHR.	31 days	3 TSTF-425-A

In accordance with the Surveillance Frequency Control Program

SR 3.2.1.2

Not used.

3

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.1, LINEAR HEAT RATE

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

2. The headings for ISTS 3.2.1 include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

3. The SR number has been changed to be consistent with the SR number in the SONGS CTS. SCE has decided not to renumber the CTS to be consistent with the ISTS because by doing so would result in the unnecessary administrative burden of changing SR numbers in plant procedures. For this reason, "Not used" SR numbers are also maintained in the ITS.

4. An "s" was added to "limit" in ISTS 3.2.1 Required Action B.2.1 to correct a typographical error because both Required Actions A.1 and B.2.2 use the term "limits."

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

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.1 Linear Heat Rate (LHR) (Digital) 3

BASES

BACKGROUND

The purpose of this LCO is to limit the core power distribution to the initial values assumed in the accident analyses. Operation within the limits imposed by this LCO limits or prevents potential fuel cladding failures that could 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 accident, ejected control element assembly (CEA) accident, or other postulated accident requiring termination by a Reactor Protective Protection System (RPS) trip function. This LCO limits the damage to the fuel cladding during an accident by ensuring that the plant is operating within acceptable bounding conditions at the onset of a transient. 1

Methods of controlling the power distribution include:

a. Using full or part length CEAs to alter the axial power distribution,

b. Decreasing CEA insertion by boration, thereby improving the radial power distribution, and

c. Correcting off optimum conditions (e.g., a CEA drop or misoperation of the unit) that cause margin degradations.

The core power distribution is controlled so that, in conjunction with other core operating parameters (e.g., CEA insertion and alignment limits), the power distribution does not result in violation of this LCO. The limiting safety system settings and this LCO are based on the accident analyses (Refs. 1 and 2), so that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences (AOOs), and the limits of acceptable consequences are not exceeded for other postulated accidents.

Limiting power distribution skewing over time also minimizes xenon distribution skewing, which is a significant factor in controlling the axial power distribution.

Power distribution is a product of multiple parameters, various combinations of which may produce acceptable power distributions. Operation within the design limits of power distribution is accomplished by generating operating limits on the LHR and departure from nucleate boiling (DNB).

BASES

BACKGROUND (continued)

Proximity to the DNB condition is expressed by the departure from nucleate boiling ratio (DNBR), defined as the ratio of the cladding surface heat flux required to cause DNB to the actual cladding surface heat flux. The minimum DNBR value during both normal operation and AOOs is calculated by the CE-1 Correlation (Ref. 3) and corrected for such factors as rod bow and grid spacers. It is accepted as an appropriate margin to DNB for all operating conditions.

There are two systems that monitor core power distribution online: the Core Operating Limit Supervisory System (COLSS) and the core protection calculators (CPCs). The COLSS and CPCs that monitor the core power distribution are capable of verifying that the LHR and the DNBR do not exceed their limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating core power operating limits corresponding to the allowable peak LHR and DNBR. The CPCs perform this function by continuously calculating an actual value of DNBR and local power density (LPD) for comparison with the respective trip setpoints.

A DNBR penalty factor is included in both the COLSS and CPC DNBR calculations to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by that assembly. Fuel assemblies that incur higher than average burnup experience a greater magnitude of rod bow. Conversely, fuel assemblies that receive lower than average burnup experience less rod bow. In design calculations for a reload core, each batch of fuel is assigned a penalty applied to the maximum integrated planar radial power peak of the batch. This penalty is correlated with the amount of rod bow determined from the maximum average assembly burnup of the batch. A single net penalty for the COLSS and CPCs is then determined from the penalties associated with each batch that comprises a core reload, accounting for the offsetting margins due to the lower radial power peaks in the higher burnup batches.

The COLSS indicates continuously to the operator how far the core is from the operating limits and provides an audible alarm if an operating limit is exceeded. Such a condition signifies a reduction in the capability of the plant to withstand an anticipated transient, but does not necessarily imply an immediate violation of fuel design limits. If the margin to fuel design limits continues to decrease, the RPS ensures that the specified acceptable fuel design limits are not exceeded during AOOs by initiating reactor trips.

BASES

BACKGROUND (continued)

The COLSS continually generates an assessment of the calculated margin for specified LHR and DNBR limits. The data required for these assessments include measured incore neutron flux, CEA positions, and Reactor Coolant System (RCS) inlet temperature, pressure, and flow.

In addition to the monitoring performed by the COLSS, the RPS (via the CPCs) continually infers the core power distribution and thermal margins by processing reactor coolant data, signals from excore neutron flux detectors, and input from redundant reed switch assemblies that indicate CEA positions. In this case, the CPCs assume a minimum core power of 20% RTP because the power range excore neutron flux detecting system is inaccurate below this power level. If power distribution or other parameters are perturbed as a result of an AOO, the high LPD or low DNBR trips in the RPS initiate a reactor trip prior to the exceeding of fuel design limits.

The LHR and DNBR algorithms are valid within the limits on ASI, F_{xy} and T_q T_Q. These limits are obtained directly from initial core or reload analysis. 5

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of normal operation or AOOs (Ref. 4).

The power distribution and CEA insertion and alignment LCOs prevent core power distributions from reaching levels that violate the following fuel design criteria:

a. During a LOCA, peak cladding temperature must not exceed 2200°F (Ref. 5),

b. During a loss of flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a DNB condition (Refs. 6 and 7 Ref. 4), 1

c. During an ejected CEA accident, the fission energy input to the fuel must not exceed 280 cal/gm (Refs. 8 and 9 Ref. [ ]), and 4

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (GDC 26, Ref. 10 [ ]). 4

BASES

APPLICABLE SAFETY ANALYSES (continued)

1, ,

The power density at any point in the core must be limited to maintain the fuel design criteria (Refs. 4 and 5). This is accomplished by maintaining the power distribution and reactor coolant conditions so that the peak LHR and DNB parameters are within operating limits supported by the accident analyses (Ref. 1) with due regard for the correlations between measured quantities, the power distribution, and uncertainties in determining the power distribution. 1

Fuel cladding failure during a LOCA is limited by restricting the maximum linear heat generation rate so that the peak cladding temperature does not exceed 2200°F (Ref. 5). Peak cladding temperatures exceeding 2200°F cause severe cladding failure by oxidation due to a Zircaloy water reaction.

The LCOs governing the LHR, ASI, and RCS ensure that these criteria are met as long as the core is operated within the ASI and F_{xy} limits specified in the COLR, and within the T_Q limits. The latter are process variables that characterize the three dimensional power distribution of the reactor core. 5

T_q

Operation within the limits for these variables ensures that their actual values are within the ranges used in the accident analyses.

Fuel cladding damage does not normally occur from conditions outside the limits of these LCOs during normal operation. However, fuel cladding damage could result if an accident or AOO occurs from initial conditions outside the limits of these LCOs. This potential for fuel cladding damage exists because changes in the power distribution can cause increased power peaking and can correspondingly increase local LHR.

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

LCO

The power distribution LCO limits are based on correlations between power peaking and certain measured variables used as inputs to the LHR and DNBR operating limits. The power distribution LCO limits are provided in the COLR. The limitation on LHR ensures that in the event of a LOCA the peak temperature of the fuel cladding does not exceed 2200°F.

BASES

APPLICABILITY

Power distribution is a concern any time the reactor is critical. The power distribution LCOs, however, are only applicable in MODE 1 above 20% RTP. The reasons these LCOs are not applicable below 20% RTP are:

a. The incore neutron detectors that provide input to the COLSS, which then calculates the operating limits, are inaccurate due to the poor signal to noise ratios at relatively low core power levels and

b. As a result of this inaccuracy, the CPCs assume minimum core power of 20% RTP when generating LPD and DNBR trip signals. When core power is below 20% RTP, the core is operating well below its thermal limits and the resultant CPC calculated LPD and DNBR trips are highly conservative.

ACTIONS

A.1

Operation at or below the COLSS calculated power limit based on the LHR ensures that the LHR limit is not exceeded. If the COLSS calculated core power limit based on the LHR exceeds the operating limit, restoring the LHR to within limit in 1 hour ensures that prompt action is taken to reduce LHR to below the specified limit. One hour is a reasonable time to return LHR to within limits when the limit is exceeded without a trip due to events such as a dropped CEA or an axial xenon oscillation.

B.1, B.2.1, and B.2.2

If the COLSS is not available the OPERABLE LPD channels are monitored to ensure that the LHR limit is not exceeded. Operation within this limit ensures that in the event of a LOCA the fuel cladding temperature does not exceed 2200°F. Four hours is allowed for restoring the LHR limit to within the region of acceptable operation. This duration is reasonable because the COLSS allows the plant to operate with less LHR margin (closer to the LHR limit than when monitoring the CPCs).

When operating with the COLSS out of service there is a possibility of a slow undetectable transient that degrades the LHR slowly over the 4 hour period and is then followed by an AOO or an accident. To remedy this, the CPC calculated values of LHR are monitored every 15 minutes when the COLSS is out of service. The 15 minute Frequency is adequate to allow the operator to identify an adverse trend in conditions that could result in an approach to the LHR limit. Also, a maximum allowable

Attachment 1, Volume 5, Rev. 0, Page 23 of 144

BASES

ACTIONS (continued)

change in the CPC calculated LHR ensures that further degradation requires the operators to take immediate action to restore LHR to within limits or reduce reactor power to comply with the Technical Specifications (TS). With an adverse trend, 1 hour is allowed for restoring LHR to within limits if the COLSS is not restored to OPERABLE status. Implementation of this requirement ensures that reductions in core thermal margin are quickly detected, and if necessary, results in a decrease in reactor power and subsequent compliance with the existing COLSS out of service TS limits.

With no adverse trend, 4 hours is allowed to restore the LHR to within limits if the COLSS is not restored to OPERABLE status. This duration is reasonable because the Frequency of the CPC determination of LHR is increased and if operation is maintained steady, the likelihood of exceeding the LHR limit during this period is not increased. The likelihood of induced reactor transients from an early power reduction is also decreased.

C.1

If the LHR cannot be returned to within its limit or the LHR cannot be determined because of the COLSS and CPC inoperability, core power must be reduced. Reduction of core power to < 20% RTP ensures that the core is operating within its thermal limits and places the core in a conservative condition based on the trip setpoints generated by the CPCs, which assume a minimum core power of 20% RTP. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach 20% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

With the COLSS out of service, the operator must monitor the LHR with each OPERABLE local power density channel. A 2 hour Frequency is sufficient to allow the operator to identify trends that would result in an approach to the LHR limits. INSERT 1 TSTF-425-A

This SR is modified by a Note that states that the SR is only required to be met when the COLSS is out of service. Continuous monitoring of the LHR is provided by the COLSS, which calculates core power and core power operating limits based on the LHR and continuously displays these limits to the operator. A COLSS margin alarm is annunciated in the event that the THERMAL POWER exceeds the core power operating limit based on LHR.

TSTF-425-A

INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 7

---Reviewer's Note---
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 6

 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.2

Not used. 8

SR 3.2.1.2 3

Verification that the COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on the LHR in units of kilowatts per foot ensures the operator is alerted when conditions approach the LHR operating limit.

INSERT 1

The 31 day Frequency for performance of this SR is consistent with the historical testing frequency of reactor protection and monitoring systems. The Surveillance Frequency for testing protection systems was extended to 92 days by CEN 327. Monitoring systems were not addressed in CEN 327; therefore, this Frequency remains at 31 days. TSTF-425-A

REFERENCES

U

1. FSAR, Section [15]. Chapter

2. FSAR, Section [6]. 1 4

3. CE-1 Correlation for DNBR.

4. 10 CFR 50.46, Appendix A, GDC 10. 2

5. 10 CFR 50.46. 1

6. UFSAR, Section 4.4.1.1.

7. UFSAR, Table 15.0-8.

8. UFSAR, Section 15.4.3.2.

9. UFSAR, Section 15.10. 4.3.2.

10. 10 CFR 50, Appendix A, GDC 26.

TSTF-425-A

INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 7

---Reviewer's Note---
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 6

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.1 BASES, LINEAR HEAT RATE

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

2. The reference to 10 CFR 50.46 Appendix A, GDC 10 is being corrected to 10 CFR 50 Appendix A, GDC 10. The GDC's are located in 10 CFR 50 Appendix A and 10 CFR 50.46 does not contain an Appendix A.

3. The headings for ISTS 3.2.1 Bases include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

4. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

5. Changes are made to use correct punctuation, correct typographical errors or to make corrections consistent with the Writers Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01.

6. This "Reviewers Note" is being deleted. The Reviewers Note is for the NRC reviewer during the NRC review and will not be part of the plant specific SONGS ITS.

7. The Bases words changed by TSTF-425 have been modified to state "The Frequency is controlled under the Surveillance Frequency Control Program." The Surveillance Frequency Control Program provides the details for how to change the Frequencies, thus the TSTF-425 words concerning operating experience, equipment reliability, and plant risk are not always true for each of the Frequencies.

8. Changes are made to the Bases to be consistent with changes made to the actual Specifications.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.1, LINEAR HEAT RATE

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 2

ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

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

ITS

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.2 3.2.2 Planar Radial Peaking Factors (F_{xy})

LCO 3.2.2 LCO 3.2.2 The measured Planar Radial Peaking Factors (F^M_{xy}) shall be less than or equal to the Planar Radial Peaking Factors (F^C_{xy}) used in the Core Operating Limit Supervisory System (COLSS) and in the Core Protection Calculators (CPCs).

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A A. $F^M_{xy} > F^C_{xy}$.	A.1 (.1) Adjust the CPC addressable constants to increase the multiplier applied to planar radial peaking by a factor ≥ F^M_{xy}/F^C_{xy}.	6 hours
	AND	
	A. ~~1.1~~ (2) Adjust the affected F^C_{xy} used in the COLSS (and CPCs) to a value greater than or equal to the measured F^M_{xy}.	6 hours (L01)
	OR	
	A.1.2 Maintain a margin to the COLSS operating limits of [(F^M_{xy}/F^C_{xy})-1.0] x 100%.	6 hours (L01)
	OR	
	A. ~~2~~ (.3) Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

F_{xy}
3.2.2

ITS

A01

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
	-----NOTE----- SR 3.0.4 is not applicable. ----------	A02
SR 3.2.2.1	SR 3.2.2.1 Verify measured F^M_{xy} obtained using the Incore Detector System is less than or equal to the value of F^C_{xy} used in the COLSS and CPCs.	Once after each fuel loading with THERMAL POWER > 40% RTP but prior to Thermal POWER operations above >85% RTP A01 AND 31 EFPD thereafter In accordance with the Surveillance Frequency Control Program

LA01

Attachment 1, Volume 5, Rev. 0, Page 34 of 144

ITS

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.2 — 3.2.2 Planar Radial Peaking Factors (F_{xy})

LCO 3.2.2 — LCO 3.2.2 The measured Planar Radial Peaking Factors (F^M_{xy}) shall be less than or equal to the Planar Radial Peaking Factors (F^C_{xy}) used in the Core Operating Limit Supervisory System (COLSS) and in the Core Protection Calculators (CPCs).

Applicability — APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
ACTION A — A. $F^M_{xy} > F^C_{xy}$.	A.1 [.1]	Adjust the CPC addressable constants to increase the multiplier applied to planar radial peaking by a factor ≥ F^M_{xy}/F^C_{xy}.	6 hours
		AND	
	A.~~1.1~~ [2]	Adjust the affected F^C_{xy} used in the COLSS [and CPCs] to a value greater than or equal to the measured F^M_{xy}.	6 hours (L01)
		OR	
	A.1.2	Maintain a margin to the COLSS operating limits of $[(F^M_{xy}/F^C_{xy})-1.0] \times 100\%$.	6 hours (L01)
	OR		
	A.~~2~~ [.3]	Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

Attachment 1, Volume 5, Rev. 0, Page 35 of 144

ITS

A01

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
	~~NOTE~~ ~~SR 3.0.4 is not applicable.~~	A02
SR 3.2.2.1 — SR 3.2.2.1	Verify measured F^M_{xy} obtained using the Incore Detector System is less than or equal to the value of F^C_{xy} used in the COLSS and CPCs.	Once after each fuel loading with THERMAL POWER > 40% RTP but prior to ~~Thermal POWER~~ [operations above] ~~>~~85% RTP (A01) AND ~~31 EFPD thereafter~~ [In accordance with the Surveillance Frequency Control Program] (LA01)

Attachment 1, Volume 5, Rev. 0, Page 36 of 144

DISCUSSION OF CHANGES
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

ADMINISTRATIVE CHANGES

A01 In the conversion of the San Onofre Nuclear Generating Station (SONGS) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 3.0, "Standard Technical Specifications Combustion Engineering Plants" (ISTS) and additional approved Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS SR 3.2.2.1 contains the Note that SR 3.0.4 is not applicable. ITS SR 3.2.2.1 does not contain this Note. This changes the CTS by deleting this specific note.

The purpose of the Note is to allow the plant to enter the MODE of Applicability without performing the required Surveillances. This change is acceptable because the CTS as well as ITS SR 3.2.2.1 Frequency is written to allow entry into MODE 1 following a reactor startup. This serves the same purpose as the Note and is described in CTS and ITS SR 3.0.4. Thus the Note is redundant and has been deleted. This change is designated as administrative because it eliminates a CTS provision which is not required because it is already allowed by the SR Frequency.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – Removal of LCO, SR, or other TS requirement to the LCS, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program)* CTS SR 3.2.2.1 requires the measured F_{xy} to be less than the calculated F_{xy} to be performed every 31 EFPD after the initial startup performance. ITS SR 3.2.2.1 requires a similar Surveillance, but specifies the periodic Frequency as "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the 31 EFPD Frequency and the Bases for the Frequencies to the Surveillance Frequency Control Program.

The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that

DISCUSSION OF CHANGES
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. In addition:

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program;

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1; and

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

The referenced document, NEI 04-10, Rev. 1, provides a detailed description of the process to be followed when considering changes to a Surveillance Frequency. NEI 04-10, Rev. 1, has been reviewed and approved by the NRC. Therefore, the process will not be discussed further here.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 and 1.177 Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF). Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies.

Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

1. **The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.**

   10 CFR 50.36(c) provides that TS will include items in the following categories:

   "(3) *Surveillance requirements*. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

   This change proposes to relocate various Frequencies for the performance of the Surveillance Requirements to a licensee-controlled program using an NRC approved methodology for control of the Surveillance Frequencies. The Surveillance Requirements themselves will remain in TS. This is consistent with other NRC approved TS changes in which the Surveillance Frequencies

Attachment 1, Volume 5, Rev. 0, Page 38 of 144

DISCUSSION OF CHANGES
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

are not under NRC control, such as Surveillances that are performed in accordance with the Inservice Testing Program or the Containment Leakage Rate Testing Program, where the Frequencies vary based on the past performance of the subject components. Thus, this proposed change meets criterion 1 above.

2. **The proposed change is consistent with the defense-in-depth philosophy.**

As described in Position 2.2.1.1 of Regulatory Guide 1.174, consistency with the defense-in-depth philosophy is maintained if:

- A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation;
- Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided;
- System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers);
- Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed;
- Independence of barriers is not degraded;
- Defenses against human errors are preserved; and
- The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

These defense-in-depth objectives apply to all risk-informed applications, and for some of the issues involved (e.g., no over-reliance on programmatic activities and defense against human errors), it is fairly straightforward to apply them to this proposed change. The use of the multiple risk metrics of CDF and LERF and controlling the change resulting from the implementation of this initiative would maintain a balance between prevention of core damage, prevention of containment failure, and consequence mitigation. Redundancy, diversity, and independence of safety systems are considered as part of the risk categorization to ensure that these qualities are not adversely affected. Independence of barriers and defense against common cause failures are also considered in the categorization. The improved understanding of the relative importance of plant components to risk resulting from the development of this program promotes an improved overall understanding of how the SSCs contribute to the plant's defense-in-depth.

Attachment 1, Volume 5, Rev. 0, Page 39 of 144

DISCUSSION OF CHANGES
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

3. **The proposed change maintains sufficient safety margins.**

   Conformance with this principle is assured since SSC design, operation, testing methods and acceptance criteria specified in the Codes and Standards or alternatives approved for use by the NRC, will continue to be met as described in the plant licensing basis (e.g., UFSAR, or Technical Specifications Bases). Also, the safety analysis acceptance criteria in the licensing basis (e.g., UFSAR, supporting analyses, etc.) are met with the proposed change.

4. **When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.**

   NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," will require that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

5. **The impact of the proposed change should be monitored using performance measurement strategies.**

   NEI 04-10 will require that changes in Surveillance Frequencies be monitored using performance management strategies.

Therefore, the proposed change is consistent with the guidance in Regulatory Guide 1.174.

This change is designated as a less restrictive removal of detail change because a Surveillance Frequency is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.2.2 Required Actions A.1, A.1.1, and A.1.2, when the measured planar radial peaking factors (F_{xy}) are greater than the calculated, require an adjustment of the CPC addressable constants to adjust the multiplier applied to the F_{xy}; and an adjustment of the calculated F_{xy} used in the COLSS or a requirement to maintain a margin to the COLSS operating limit. ITS 3.2.2 ACTION A will require an adjustment of the CPC addressable constants and a requirement to maintain a margin to the COLSS operating limit; or a requirement to adjust the calculated F_{xy} used in the COLSS and CPCs. This changes the CTS by not requiring an adjustment of the CPC addressable constants when an adjustment to the calculated F_{xy} used in the COLSS and CPCs is performed.

The purpose of ACTION A is to compensate for the potential of nonconservative operating limits and trip setpoints when the measured F_{xy} > calculated F_{xy}. This change allows the adjustment of the CPC addressable constants to increase the multiplier applied to planar radial to not be performed in all cases. Specifically, it allows only an adjustment of the calculated F_{xy}, used in the COLSS and CPCs to values ≥ measured F_{xy}. This adjustment adequately compensates for the

Attachment 1, Volume 5, Rev. 0, Page 40 of 144

DISCUSSION OF CHANGES
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

measured F_{xy} values exceeding the calculated F_{xy} values, and performs a similar function as the adjustment of addressable constants. This change will continue to ensure appropriate steps are taken to reduce the calculated F_{xy} to less than the measured F_{xy} to ensure COLSS operating limits and CPC trip setpoints remain valid with respect to the accident analysis. Therefore, this change is considered acceptable. This change is designated a less restrictive change because a Required Action has been deleted from the CTS.

Attachment 1, Volume 5, Rev. 0, Page 41 of 144

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

U2/U3 CTS

F_{xy} (Digital) 2
3.2.2

3.2 POWER DISTRIBUTION LIMITS

3.2.2 Planar Radial Peaking Factors (F_{xy}) (Digital) 2

LCO 3.2.2

LCO 3.2.2 The measured Planar Radial Peaking Factors (F_{xy}^{M}) shall be equal to or less than the Planar Radial Peaking Factors (F_{xy}^{C}). (These factors are used in the Core Operating Limit Supervisory System (COLSS) and in the Core Protection Calculators (CPCs)).

Applicability

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

ACTION A

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. $F_{xy}^{M} > F_{xy}^{C}$.	A.1.1 Adjust addressable CPC constants to increase the multiplier applied to planar radial peaking by a factor $\geq F_{xy}^{M} / F_{xy}^{C}$.	6 hours
	<u>AND</u>	
	A.1.2 Maintain a margin to the COLSS operating limits of $[(F_{xy}^{M} / F_{xy}^{C})-1.0] \times 100\%$	6 hours
	<u>OR</u>	
	A.2 Adjust the affected F_{xy}^{C} used in the COLSS and CPCs to a value greater than or equal to the measured F_{xy}^{M}.	6 hours
	<u>OR</u>	
	A.3 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

U2/U3 CTS

F_{xy} (Digital) 2
3.2.2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.2.1 — SR 3.2.2.1	Verify measured F_{xy}^{M} obtained using the Incore Detector System is equal to or less than the value of F_{xy}^{C} used in the COLSS and CPCs.	Once after each fuel loading with THERMAL POWER > 40% RTP but prior to operations above 70% RTP (85) 3 AND 31 EFPD thereafter (In accordance with the Surveillance Frequency Control Program) TSTF-425-A

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

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

2. The headings for ISTS 3.2.2 include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

3. ISTS SR 3.2.2.1 is required to be performed prior to exceeding 70% RTP after each fuel loading. This upper limit has been changed to 85% RTP, consistent with the current allowance in SONGS CTS SR 3.2.2.1. This allows testing the shape annealing matrixes. Furthermore, conservative values are inserted for the CPC uncertainty prior to initial startup, and these conservative values ensure protection capability of the CPCs and allow operation up to 85% RTP. This allowance was approved by the NRC as part of the original conversion to the ISTS format. The 85% RTP value is also consistent with Surveillances in CTS 3.3.1 (SRs 3.3.1.3, 3.3.1.5, and 3.3.1.11) that verify the CPCs are OPERABLE (as approved by the NRC in the safety evaluation for Units 2 and 3 Amendments 127 and 116, respectively, dated February 9, 1996 (ADAMS Accession No. ML021990684)).

Attachment 1, Volume 5, Rev. 0, Page 45 of 144

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

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.2 Planar Radial Peaking Factors (F_{xy}) (Digital) 3

BASES

BACKGROUND

The purpose of this LCO is to limit the core power distribution to the initial values assumed in the accident analyses. Operation within the limits imposed by this LCO either limits or prevents potential fuel cladding failures that could 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 accident, ejected control element assembly (CEA) accident, or other postulated accident requiring termination by a Reactor Protection [Protective] System (RPS) trip function. This LCO limits damage to the fuel cladding during an accident by ensuring that the plant is operating within acceptable conditions at the onset of a transient. 1

Methods of controlling the power distribution include:

a. Using full or part length CEAs to alter the axial power distribution,

b. Decreasing CEA insertion by boration, thereby improving the radial power distribution, and

c. Correcting off optimum conditions (e.g., a CEA drop or misoperation of the unit) that cause margin degradations.

The core power distribution is controlled so that, in conjunction with other core operating parameters (CEA insertion and alignment limits), the power distribution does not result in violation of this LCO. Limiting safety system settings and this LCO are based on the accident analyses (Refs. 1 and 2), so that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences (AOOs), and the limits of acceptable consequences are not exceeded for other postulated accidents.

Limiting power distribution skewing over time also minimizes xenon distribution skewing, which is a significant factor in controlling axial power distribution. Power distribution is a product of multiple parameters, various combinations of which may produce acceptable power distributions. Operation within the design limits of power distribution is accomplished by generating operating limits on linear heat rate (LHR) and departure from nucleate boiling (DNB).

BASES

BACKGROUND (continued)

Proximity to the DNB condition is expressed by the departure from nucleate boiling ratio (DNBR), defined as the ratio of the cladding surface heat flux required to cause DNB to the actual cladding surface heat flux. The minimum DNBR value during both normal operation and AOOs is [ ] 1.31 4 as calculated by the CE-1 Correlation (Ref. 3) and corrected for such factors as rod bow and grid spacers, and it is accepted as an appropriate margin to DNB for all operating conditions.

There are two systems that monitor core power distribution online: the Core Operating Limit Supervisory System (COLSS) and the core protection calculators (CPCs). The COLSS and CPCs that monitor the core power distribution are capable of verifying that the LHR and the DNBR do not exceed their limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating core power operating limits corresponding to the allowable peak LHR and DNBR values. The CPCs perform this function by continuously calculating actual values of DNBR and local power density (LPD) for comparison with the respective trip setpoints.

DNBR penalty factors are included in both the COLSS and CPC DNBR calculations to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by that assembly. Fuel assemblies that incur higher than average burnup experience greater rod bow. Conversely, fuel assemblies that receive lower than average burnup experience less rod bow. In design calculations for a reload core, each batch of fuel is assigned a penalty applied to the maximum integrated planar radial power peak of the batch. This penalty is correlated with the amount of rod bow determined from the maximum average assembly burnup of the batch. A single net penalty for the COLSS and CPCs is then determined from the penalties associated with each batch that comprises a core reload, accounting for the offsetting margins due to the lower radial power peaks in the higher burnup batches.

The COLSS indicates continuously to the operator how near the core is to the operating limits and provides an audible alarm if an operating limit is exceeded. Such a condition signifies a reduction in the capability of the plant to withstand an anticipated transient, but does not necessarily imply an immediate violation of fuel design limits. If the margin to fuel design limits continues to decrease, the RPS ensures that the specified acceptable fuel design limits are not exceeded for AOOs by initiating a reactor trip.

BASES

BACKGROUND (continued)

The COLSS continually generates an assessment of the calculated margin for LHR and DNBR specified limits. The data required for these assessments include measured incore neutron flux, CEA positions, and Reactor Coolant System (RCS) inlet temperature, pressure, and flow.

In addition to monitoring performed by the COLSS, the RPS (via the CPCs) continually infers the core power distribution and thermal margins by processing reactor coolant data, signals from excore neutron flux detectors, and input from redundant reed switch assemblies that indicates CEA position. In this case, the CPCs assume a minimum core power of 20% RTP. This threshold is set at 20% RTP because the power range excore neutron flux detecting system is inaccurate below this power level. If power distribution or other parameters are perturbed as a result of an AOO, the high LPD or low DNBR trips in the RPS initiate a reactor trip before fuel design limits are exceeded.

T_q

The limits on ASI, F_{xy}, and T_Q represent limits within which the LHR and DNBR algorithms are valid. These limits are obtained directly from the initial core or reload analysis. 6

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of normal operation or AOOs (Ref. 4). The power distribution and CEA insertion and alignment LCOs prevent core power distributions from reaching levels that violate the following fuel design criteria:

a. During a LOCA, peak cladding temperature must not exceed 2200°F (Ref. 5),

b. During a loss of flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a DNB condition (Ref. 4), 1
Refs. 6 and 7

c. During an ejected CEA accident, the fission energy input to the fuel must not exceed 280 cal/gm (Ref. [ ]), and 4
Refs. 8 and 9

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (GDC 26, Ref. [ ]). 4

1, , 10

The power density at any point in the core must be limited to maintain the fuel design criteria (Refs. 4 and 5). This result is accomplished by maintaining the power distribution and reactor coolant conditions so that the peak LHR and DNB parameters are within operating limits supported by the accident analyses (Ref. 1) with due regard for the correlations between measured quantities, the power distribution, and the uncertainties in the determination of power distribution. 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

Fuel cladding failure during a LOCA is limited by restricting the maximum linear heat generation rate so that the peak cladding temperature does not exceed 2200°F (Ref. 5). Peak cladding temperatures exceeding 2200°F cause severe cladding failure by oxidation due to a Zircaloy water reaction.

The LCOs governing LHR, ASI, and RCS ensure that these criteria are met as long as the core is operated within the ASI and F_{xy} limits specified in the COLR, and within the T_q T_Q limits. The latter are process variables that characterize the three dimensional power distribution of the reactor core. Operation within the limits for these variables ensures that their actual values are within the ranges used in the accident analyses. 6

Fuel cladding damage does not normally occur because of conditions outside the limits of these LCOs for ASI, F_{xy}, and T_q T_Q during normal operation. However, fuel cladding damage results if an accident or AOO occurs from initial conditions outside the limits of these LCOs. This potential for fuel cladding damage exists because changes in the power distribution can cause increased power peaking and correspondingly increased LHR. 6

F_{xy} satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The power distribution LCO limits are based on correlations between power peaking and certain measured variables used as inputs to the LHR and DNBR operating limits. The power distribution LCO limits are provided in the COLR.

Limiting of the calculated Planar Radial Peaking Factors (F^C_{XY}) used in the COLSS and CPCs to values equal to or greater than the measured Planar Radial Peaking Factors (F^M_{XY}) ensures that the limits calculated by the COLSS and CPCs remain valid.

APPLICABILITY

Power distribution is a concern any time the reactor is critical. The power distribution LCOs, however, are only applicable in MODE 1 above 20% RTP. The reasons these LCOs are not applicable below 20% RTP are:

a. The incore neutron detectors that provide input to the COLSS, which then calculates the operating limits, are inaccurate because of the poor signal to noise ratio that they experience at relatively low core power levels and

Attachment 1, Volume 5, Rev. 0, Page 50 of 144

BASES

APPLICABILITY (continued)

b. As a result of this inaccuracy, the CPCs assume a minimum core power of 20% RTP when generating the LPD and DNBR trip signals. When the core power is below 20% RTP, the core is operating well below its thermal limits, and the resultant CPC calculated LPD and DNBR trips are highly conservative.

ACTIONS

A.1.1 and A.1.2

When the F_{XY}^{M} values exceed the F_{XY}^{C} values used in the COLSS and CPCs, nonconservative operating limits and trip setpoints may be calculated. In this case, action must be taken to ensure that the COLSS operating limits and CPC trip setpoints remain valid with respect to the accident analysis. The operator can do this by performing the Required Actions A.1.1 and A.1.2. The 6 hour Completion Time provides the time required to calculate the required multipliers and make the necessary adjustments to the CPC addressable constants. During this period the DNBR and LHR setpoints may be slightly nonconservative but DNBR and LHR are still within limits. Therefore, 6 hours is an acceptable Completion Time to perform these actions considering the low probability of an accident occurring during this time period.

A.2

As an alternative to Required Actions A.1.1 and A.1.2, the operator may adjust the affected values of F_{XY}^{C} used in the COLSS and CPCs to values $\geq F_{XY}^{M}$. The 6 hour Completion Time provides the time required to calculate the required multipliers and make the necessary adjustments to the CPC addressable constants. During this period the DNBR and LHR setpoints may be slightly nonconservative but DNBR and LHR are still within limits. Therefore, 6 hours is an acceptable Completion Time to perform these actions considering the low probability of an accident occurring during this time period.

F_{xy} (Digital) 3
B 3.2.2

BASES

ACTIONS (continued)

A.3

If Required Actions A.1.1 and A.1.2 or A.2 cannot be accomplished within 6 hours, the core power must be reduced. Reduction to 20% RTP or less ensures that the core is operating within the specified thermal limits and places the core in a conservative condition based on the trip setpoints generated by the COLSS and CPC operating limits; these limits are established assuming a minimum core power of 20% RTP. Six hours is a reasonable time to reach 20% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

This periodic Surveillance is for determining, using the Incore Detector System, that F_{XY}^{M} values are ≤ F_{XY}^{C} values used in the COLSS and CPCs. It ensures that the F_{XY}^{C} values used remain valid throughout the fuel cycle. INSERT 1 A Frequency of 31 EFPD is acceptable because the power distribution changes only slightly with the amount of fuel burnup. Determining the F_{XY}^{M} values after each fuel loading when THERMAL POWER is > 40% RTP, but prior to its exceeding 70 85% RTP, ensures that the core is properly loaded. TSTF-425-A

REFERENCES

U
1. FSAR, Section Chapter [15]. 1 4
2. FSAR, Section Chapter [6].
3. CE-1 Correlation for DNBR.
4. 10 CFR 50.46, Appendix A, GDC 10. 2
5. 10 CFR 50.46. 1

6. UFSAR, Section 4.4.1.1.
7. UFSAR, Table 15.0-8.
8. UFSAR, Section 15.4.3.2.
9. UFSAR, Section 15.10. 4.3.2.
10. 10 CFR 50, Appendix A, GDC 26.

TSTF-425-A

INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 7

---Reviewer's Note---
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 5

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.2 BASES, PLANAR RADIAL PEAKING FACTORS (F_{xy})

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

2. The reference to 10 CFR 50.46 Appendix A, GDC 10 is being corrected to 10 CFR 50 Appendix A, GDC 10. The GDC's are located in 10 CFR 50 Appendix A and 10 CFR 50.46 does not contain an Appendix A.

3. The headings for ISTS 3.2.2 Bases include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

4. The ISTS Bases contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

5. This "Reviewers Note" is being deleted. The Reviewers Note is for the NRC reviewer during the NRC review and will not be part of the plant specific SONGS ITS.

6. Changes are made to use correct punctuation, correct typographical errors or to make corrections consistent with the Writers Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01.

7. The Bases words changed by TSTF-425 have been modified to state "The Frequency is controlled under the Surveillance Frequency Control Program." The Surveillance Frequency Control Program provides the details for how to change the Frequencies, thus the TSTF-425 words concerning operating experience, equipment reliability, and plant risk are not always true for each of the Frequencies.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.2, PLANAR RADIAL PEAKING FACTORS (F_{xy})

There are no specific No Significant Hazards Considerations for this Specification.

Attachment 1, Volume 5, Rev. 0, Page 56 of 144

ATTACHMENT 3

ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

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

ITS

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.3

3.2.3 AZIMUTHAL POWER TILT (T_q)

LCO 3.2.3

LCO 3.2.3 The measured T_q shall be less than or equal to the T_q allowance used in the core protection calculators (CPCs).

Applicability

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

ACTION A

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Measured T_q greater than the allowance used in the CPCs. [and ≤ 0.10]	A.1 Restore measured T_q to less than or equal to the allowance used in the CPCs.	2 hours
	OR	
	A.2 Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q.	2 hours

A02

(continued)

Attachment 1, Volume 5, Rev. 0, Page 59 of 144

ITS

A01

T_q
3.2.3

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Measured T_q > 0.03 and ≤ 0.10.	B.1 Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q.	2 hours
	AND	
	B.2 Evaluate core design and safety analysis and determine that the core is acceptable for continued operation.	72 hours
	AND	
	B.3 Establish appropriate operating restrictions and SRs.	72 hours

A02

(continued)

Attachment 1, Volume 5, Rev. 0, Page 60 of 144

ITS

A01

T_q
3.2.3

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION B ~~C~~ B. Measured T_q > 0.10. If T_q is > 0.10 due to a reason other than a dropped CEA, all subsequent Required Actions must be completed if power reduction commences prior to restoring T_q to ≤ 0.10. If T_q is > 0.10 due to a dropped CEA, Required Action B.3 must be completed if power reduction commences prior to restoring T_q to ≤ 0.10.	------------NOTE------------ ~~Action C.5 must be completed if power reduction commences prior to restoring T_q to ≤ 0.10.~~ ----------------------------- ~~C.1 Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q.~~ ~~AND~~ ~~C.2~~ B.1 Reduce THERMAL POWER to ≤ 50% RTP. AND ~~C.3~~ B.2 Reduce Linear Power Level — High trip setpoints to ≤ 55% RTP. AND ~~C.4~~ B.3 Correct the cause ~~for measured T_q > 0.10~~ of the out of limit condition. B.3 Restore the measured Tq to less than the Tq allowance used in the CPCs. ~~AND~~ Completion Time NOTE ~~C.5~~ ~~Verify~~ verified may proceed provided that the measured T_q is ≤ 0.10 at least once per hour for 12 hours, or until verified at ≥ 95% RTP.	M01 ~~2 hours~~ L01 4 hours 16 hours B.3 Completion Time Prior to increasing THERMAL POWER. Prior to increasing THERMAL POWER ~~> 50%~~ Subsequent ~~to~~ power operation > 50% RTP A03
ACTION C ~~D.~~ C. Required Actions and associated Completion Times not met.	~~D.1~~ C.1 Reduce THERMAL POWER to ≤ 20%.	6 hours

Attachment 1, Volume 5, Rev. 0, Page 61 of 144

ITS

A01

T_q
3.2.3

SURVEILLANCE REQUIREMENTS

A04

LA01

	SURVEILLANCE		FREQUENCY
SR 3.2.3.1	SR 3.2.3.1	---------NOTES--------- Only ~~applicable~~ required to be met when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. ----------------------- Calculate T_q and verify it is less than or equal to the T_q allowance used in the CPCs.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.3.2	SR 3.2.3.2	Verify COLSS azimuthal tilt alarm is actuated at a T_q value less than or equal to the T_q value used in the CPCs.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.3.3	SR 3.2.3.3	Independently confirm the validity of the COLSS calculated T_q by use of the incore detectors.	~~31 EFPD~~ In accordance with the Surveillance Frequency Control Program

ITS

A01

T_q
3.2.3

3.2 POWER DISTRIBUTION LIMITS

3.2.3 3.2.3 AZIMUTHAL POWER TILT (T_q)

LCO 3.2.3 LCO 3.2.3 The measured T_q shall be less than or equal to the T_q allowance used in the core protection calculators (CPCs).

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A A. Measured T_q greater than the allowance used in the CPCs [and ≤ 0.10].	A.1 Restore measured T_q to less than or equal to the allowance used in the CPCs.	2 hours
	<u>OR</u>	
	A.2 Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q.	2 hours

A02

(continued)

ITS

A01

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
~~B. Measured T_q > 0.03 and ≤ 0.10.~~	~~B.1~~	~~Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q.~~	~~2 hours~~
	~~AND~~		
	~~B.2~~	~~Evaluate core design and safety analysis and determine that the core is acceptable for continued operation.~~	~~72 hours~~
	~~AND~~		
	~~B.3~~	~~Establish appropriate operating restrictions and SRs.~~	~~72 hours~~

A02

(continued)

ITS

A01

T_q
3.2.3

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION B: ~~C~~ B. Measured T_q > 0.10. If T_q is > 0.10 due to a reason other than a dropped CEA, all subsequent Required Actions must be completed if power reduction commences prior to restoring T_q to ≤ 0.10. If T_q is > 0.10 due to a dropped CEA, Required Action B.3 must be completed if power reduction commences prior to restoring T_q to ≤ 0.10. B.3 Restore the measured Tq to less than the Tq allowance used in the CPCs.	------------NOTE------------ ~~Action C.5 must be completed if power reduction commences prior to restoring T_q to ≤ 0.10.~~ ---------------------------- ~~C.1 Adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q.~~ ~~AND~~ ~~C.2~~ B.1 Reduce THERMAL POWER to ≤ 50% RTP. AND ~~C.3~~ B.2 Reduce Linear Power Level – High trip setpoints to ≤ 55% RTP. AND ~~C.4~~ Correct the cause ~~for measured T_q > 0.10~~ of the out of limit condition. ~~AND~~ ~~C.5~~ ~~Verify~~ may proceed provided that the verified measured T_q is ≤ 0.10 at least once per hour for 12 hours, or until verified at ≥ 95% RTP. Completion Time NOTE	~~2 hours~~ 4 hours 16 hours B.3 Completion Time: Prior to increasing THERMAL POWER. Prior to increasing THERMAL POWER ~~> 50%~~ Subsequent ~~to~~ power operation > 50% RTP
ACTION C: ~~D.~~ C. Required Actions and associated Completion Times not met.	~~D.1~~ C.1 Reduce THERMAL POWER to ≤ 20%.	6 hours

M01 L01 A03

ITS

A01

T_q
3.2.3

SURVEILLANCE REQUIREMENTS

A04

LA01

	SURVEILLANCE	FREQUENCY
SR 3.2.3.1	SR 3.2.3.1 ------NOTES------ Only ~~applicable~~ required to be met when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. ------------ Calculate T_q and verify it is less than or equal to the T_q allowance used in the CPCs.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.3.2	SR 3.2.3.2 Verify COLSS azimuthal tilt alarm is actuated at a T_q value less than or equal to the T_q value used in the CPCs.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.3.3	SR 3.2.3.3 Independently confirm the validity of the COLSS calculated T_q by use of the incore detectors.	~~31 EFPD~~ In accordance with the Surveillance Frequency Control Program

DISCUSSION OF CHANGES
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

ADMINISTRATIVE CHANGES

A01 In the conversion of the San Onofre Nuclear Generating Station (SONGS) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 3.0, "Standard Technical Specifications Combustion Engineering Plants" (ISTS) and additional approved Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.2.3 ACTION B is for the Condition when measured T_q is greater than 0.03 and less than or equal to 0.10. When in this Condition, CTS requires the adjustment of the T_q allowance (Required Action B.1), evaluation of the core design and safety analysis and a determination that the core is acceptable for continued operations (Required Action B.2), and establishment of appropriate operating restrictions and SRs (Required Action B.3). ITS 3.2.3 does not contain a similar ACTION as CTS 3.2.3 ACTION B, but consolidates the CTS 3.2.3 ACTIONS A and B into ITS 3.2.3 ACTION A. Furthermore, the ITS does not require an evaluation of core design and safety analysis and a determination that core design is acceptable for continued operation and an establishment of appropriate restrictions and SRs. This changes the CTS by consolidating the two CTS ACTIONS into a single ITS ACTION, and deletes the CTS Required Actions B.2 and B.3.

CTS 3.2.3 ACTION B is for the condition when the measured $T_q > 0.03$ and ≤ 0.10. ITS 3.2.3 incorporates this CTS ACTION into ITS 3.2.3 ACTION A. The deletion of Required Action B.2 and B.3 is acceptable because if the Required Actions (either ITS 3.2.3 Required Action A.1 or A.2) are accomplished within the Completion Times, both the Core Design and Safety Analysis are maintained within the Design Basis. If the Required Actions are not completed within the required Completion Times, ITS 3.2.3 ACTION C is required to be entered and the unit will be required to reduce power and exit the Applicability of the LCO. This will ensure the plant takes appropriate steps to ensuring an evaluation is performed before plant restart. This change is considered administrative because the TS was only reorganized to be more efficient. The intent and action taken when the LCO is not met or the Required Actions cannot be performed within the Completion Times have not been altered. This change is consistent with NUREG-1432.

A03 CTS 3.2.3 Required Actions C.4 and C.5 require the cause for the measured $T_q > 0.10$ to be corrected prior to increasing THERMAL POWER > 50% (Required Action C.4) and to verify, subsequent to power operation > 50% RTP, measured T_q is ≤ 0.10 at least once per hour for 12 hours, or until verified at $\geq$ 95% RTP (Required Action C.5). ITS 3.2.3 Required Action B.3 requires the restoration of the measured T_q to less than the T_q allowance used in the CPCs prior to increasing THERMAL POWER. The prior to increasing THERMAL POWER Completion Time is modified by a Note that states to correct the cause of the out of limit condition prior to increasing THERMAL POWER and that subsequent

DISCUSSION OF CHANGES
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

power operation > 50% RTP may proceed provided that the measured T_q is verified $\leq$ 0.10 at least once per hour for 12 hours, or until verified at $\geq$ 95% RTP. This changes the CTS by clearly stating in a Required Action to restore the T_q prior to increasing THERMAL POWER, and including all the amplifying information concerning the periodic verification of measured T_q to a Note for the Completion Time.

This change is only a clarification of the current requirement. This change does not affect the technical requirements, and is made to be consistent with the current wording of NUREG-1432. The proposed wording makes it clear that the requirement is to restore the T_q to within its limit. This change is designated administrative because it does not result in any technical changes to the CTS requirements.

A04 CTS SR 3.2.3.1 contains a Note which modifies the SR by making it only "applicable" when COLSS is out of service. ITS SR 3.2.3.1 revises the Note to be only "required to be met" when COLSS is out of service. This changes the CTS by clarifying what applicable means (i.e., not required to be met) based on the changes to Section 1.4.

TSTF-284 revised CTS Section 1.4 to add a discussion regarding the use of "met" and "perform" in SR Notes and adds examples to facilitate the use and application of SR Notes that utilize "met" and "perform." The TSTF also revises SR Notes, as necessary to appropriately clarify the use of "met" and "perform" exceptions. The SONGS CTS do not contain this detail; however, various locations throughout the TS provide Notes with "met" and "performed" distinctions. This change does not change the intent of any SR Note. This proposed change will provide for better use, application, and understanding of this Note along with the changes to Section 1.4. This is an administrative change which clarifies and corrects exceptions that are unclear or have incorrect usage of "met" and "perform"

MORE RESTRICTIVE CHANGES

M01 The CTS 3.2.3 ACTION C Required Actions are modified by a Note that states Required Action C.5 must be completed if power reduction commences prior to restoring T_q to $\leq$ 0.10. This CTS Required Action requires a verification, prior to exceeding 50% RTP, that measured T_q is $\leq$ 0.10 at least once per hour for 12 hours, or until verified at $\geq$ 95% RTP. ITS 3.2.3 ACTION B Required Actions are modified by a Note that states if T_q is > 0.10 due to a reason other than a dropped CEA, all subsequent Required Actions must be completed if power reduction commences prior to restoring T_q to $\leq$ 0.10. Furthermore, the Note states that if T_q is > 0.10 due to a dropped CEA, Required Action B.3 must be completed if power reduction commences prior to restoring T_q to $\leq$ 0.10. This changes the CTS by requiring all of the Required Actions to be completed, not just the T_q verification if T_q is > 0.10 due to a reason other than a dropped CEA.

The purpose of the ITS 3.2.3 Note is to ensure corrective action is taken before unrestricted power operation resumes. The Note will ensure that if T_q is > 0.10 due to reasons other than a dropped CEA, then in addition to the T_q verification,

Attachment 1, Volume 5, Rev. 0, Page 68 of 144

DISCUSSION OF CHANGES
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

THERMAL POWER is reduced to $\leq$ 50% RTP and the Linear Power Level - High trip setpoints are reduced to $\leq$ 55% RTP. This change is acceptable because it requires performance of all the Required Actions in lieu of only one of the Required Actions, prior to increasing power above 50% RTP, if T_q is > 0.10 due to a reason other than a dropped CEA. This change is designated as more restrictive because more Required Actions must be performed in the ITS than in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – Removal of LCO, SR, or other TS requirement to the LCS, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program)* CTS 3.2.3 contains three SRs. CTS SR 3.2.3.1 requires T_q to be calculated and verified it is less than or equal to the T_q allowance used in CPCs every 12 hours. CTS SR 3.2.3.2 requires the verification COLSS azimuthal tilt alarm is actuated at a T_q value less than or equal to the T_q value used in the CPCs every 31 days. CTS SR 3.2.3.3 requires the validity of the COLSS calculated T_q to be independently confirmed by use of incore detectors every 31 EFPD. ITS SR 3.2.3.1, SR 3.2.3.2, and SR 3.2.3.3 are similar Surveillances, but specify the periodic Frequency as "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for the SRs and the Bases for the Frequencies to the Surveillance Frequency Control Program.

The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. In addition:

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program;

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1; and

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

The referenced document, NEI 04-10, Rev. 1, provides a detailed description of the process to be followed when considering changes to a Surveillance

Attachment 1, Volume 5, Rev. 0, Page 69 of 144

DISCUSSION OF CHANGES
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

Frequency. NEI 04-10, Rev. 1, has been reviewed and approved by the NRC. Therefore, the process will not be discussed further here.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 and 1.177. Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF). Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies.

Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

1. **The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.**

   10 CFR 50.36(c) provides that TS will include items in the following categories:

   "(3) *Surveillance requirements*. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

   This change proposes to relocate various Frequencies for the performance of the Surveillance Requirements to a licensee-controlled program using an NRC approved methodology for control of the Surveillance Frequencies. The Surveillance Requirements themselves will remain in TS. This is consistent with other NRC approved TS changes in which the Surveillance Frequencies are not under NRC control, such as Surveillances that are performed in accordance with the Inservice Testing Program or the Containment Leakage Rate Testing Program, where the Frequencies vary based on the past performance of the subject components. Thus, this proposed change meets criterion 1 above.

2. **The proposed change is consistent with the defense-in-depth philosophy.**

   As described in Position 2.2.1.1 of Regulatory Guide 1.174, consistency with the defense-in-depth philosophy is maintained if:

   - A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation;

   - Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided;

DISCUSSION OF CHANGES
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

- System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers);

- Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed;

- Independence of barriers is not degraded;

- Defenses against human errors are preserved; and

- The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

These defense-in-depth objectives apply to all risk-informed applications, and for some of the issues involved (e.g., no over-reliance on programmatic activities and defense against human errors), it is fairly straightforward to apply them to this proposed change. The use of the multiple risk metrics of CDF and LERF and controlling the change resulting from the implementation of this initiative would maintain a balance between prevention of core damage, prevention of containment failure, and consequence mitigation. Redundancy, diversity, and independence of safety systems are considered as part of the risk categorization to ensure that these qualities are not adversely affected. Independence of barriers and defense against common cause failures are also considered in the categorization. The improved understanding of the relative importance of plant components to risk resulting from the development of this program promotes an improved overall understanding of how the SSCs contribute to the plant's defense-in-depth.

3. **The proposed change maintains sufficient safety margins.**

   Conformance with this principle is assured since SSC design, operation, testing methods and acceptance criteria specified in the Codes and Standards or alternatives approved for use by the NRC, will continue to be met as described in the plant licensing basis (e.g., UFSAR, or Technical Specifications Bases). Also, the safety analysis acceptance criteria in the licensing basis (e.g., UFSAR, supporting analyses, etc.) are met with the proposed change.

4. **When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.**

   NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," will require that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

DISCUSSION OF CHANGES
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

5. **The impact of the proposed change should be monitored using performance measurement strategies.**

   NEI 04-10 will require that changes in Surveillance Frequencies be monitored using performance management strategies.

Therefore, the proposed change is consistent with the guidance in Regulatory Guide 1.174.

This change is designated as a less restrictive removal of detail change because Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS 3.2.3 Required Action C.1 requires the T_q allowance in CPCs to be adjusted, when the measured T_q is > 0.10, to ≥ the measured T_q within 2 hours. ITS 3.2.3 does not require this Required Action under similar conditions. This changes the CTS by deleting the requirement to adjust the T_q allowance in the CPCs to greater than or equal to the measured T_q within 2 hours when the measured T_q is > 0.10.

The purpose of the CTS Required Action is to minimize the effect of T_q being > 0.10. However, the subsequent Required Actions in both the CTS and the ITS also result in minimizing the effect of the T_q being outside the limit. ITS 3.2.3 Required Action B.1 requires a reduction in power to less than or equal to 50% RTP within 4 hours and once power is reduced, ITS 3.2.3 Required Action B.3 ensures that power is not increased until the measured T_q is within the limits. The time allowed to reduce power limits the probability of operation with a power distribution out of limits. Additionally reducing THERMAL POWER to ≤ 50% RTP within 4 hours provides an acceptable level of protection from increased power peaking due to potential xenon redistribution while maintaining a power level sufficiently high enough to allow the tilt to be analyzed. Furthermore, ITS 3.2.3 Required Action B.2 requires the Linear Power Level - High trip setpoints to be reduced to ≤ 55% RTP to ensure that the assumptions of the accident analysis regarding power peaking are maintained. After power has been reduced to ≤ 50% RTP, the rate and magnitude of changes in the core flux are greatly reduced. Requiring the reduction of power and the adjustment of the trip setpoint provides adequate protection to ensure the plant remains within limits in the Safety Analysis. Adjustment of the T_q prior to the completion time allowed to complete the above actions facilitates an unnecessary adjustment to the CPC allowances. By requiring that the measured T_q is less than the T_q allowance in CPCs prior to an increase in power ensures the Safety Analysis requirements are being maintained. Therefore, this change is acceptable. This change is designated as less restrictive because a Required Action in the CTS is not being included in the ITS.

Attachment 1, Volume 5, Rev. 0, Page 72 of 144

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

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AZIMUTHAL POWER TILT (T_q) (Digital) (2)

LCO 3.2.1

LCO 3.2.3 The measured T_q shall be less than or equal to the T_q allowance used in the core protection calculators (CPCs).

Applicability

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
(ACTIONS A and B) A. Measured T_q greater than the allowance used in the CPCs and ≤ [0.10]. (3)	A.1 Restore measured T_q. OR A.2 Adjust the T_q allowance in the CPCs to greater than or equal to the measured value.	2 hours 2 hours
(ACTION C) B. Measured T_q > [0.10]. (3) If T_q is > 0.10 due to a reason other than a dropped CEA, all subsequent Required Actions must be completed if power reduction commences prior to restoring T_q to ≤ 0.10. If T_q is > 0.10 due to a dropped CEA, Required Action B.3 must be completed if power reduction commences prior to restoring T_q to ≤ 0.10.	--------------------NOTE-------------------- All subsequent Required Actions must be completed if power reduction commences prior to restoring T_q to ≤ [0.10]. (4) -- B.1 Reduce THERMAL POWER to ≤ 50% RTP. AND B.2 Reduce Linear Power Level - High trip setpoints to ≤ 55% RTP. AND	 4 hours 16 hours

Attachment 1, Volume 5, Rev. 0, Page 74 of 144

U2/U3 CTS

T_q (Digital) 2
3.2.3

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
ACTION C		B.3	Restore the measured T_q to less than the T_q allowance used in the CPCs.	Prior to increasing THERMAL POWER -----------NOTE---------- Correct the cause of the out of limit condition prior to increasing THERMAL POWER. Subsequent power operation > 50% RTP may proceed provided that the measured T_q is verified ≤ [0.10] at least once per hour for 12 hours, or until verified at ≥ 95% RTP ----------------------------- 3
ACTION D	C. Required Actions and associated Completion Times not met.	C.1	Reduce THERMAL POWER to ≤ 20%.	6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
SR 3.2.3.1	SR 3.2.3.1	-------------------------------NOTE------------------------------ Only required to be met when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. -- Calculate T_q and verify it is within the limit.	In accordance with the Surveillance Frequency Control Program 12 hours TSTF-425-A
SR 3.2.3.2	SR 3.2.3.2	Verify COLSS azimuthal tilt alarm is actuated at a T_q value less than [or equal to] the T_q value used in the CPCs.	31 days TSTF-425-A 5

U2/U3 CTS

T_q (Digital)
3.2.3

2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.3.3	Independently confirm the validity of the COLSS calculated T_q by use of the incore detectors.	31 EFPD In accordance with the Surveillance Frequency Control Program

SR 3.2.3.3

TSTF-425-A

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

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

2. The headings for ISTS 3.2.3 include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

3. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

4. The Required Actions for ISTS 3.2.3 ACTION B are modified by a Note that requires all Required Actions to be completed if power reduction is commenced prior to restoring T_q to $\leq$ 0.10. However, if the reason T_q is > 0.10 is due to a dropped CEA, then ISTS 3.1.4 (ITS 3.1.5) provides Required Actions to restore the CEA to within its alignment limits. These Required Actions include a power reduction within 1 hour. However, the ISTS 3.1.4 Required Actions also require the CEA to be restored within its limits within 2 hours. Thus, within 2 hours, the reason the T_q is > 0.10 may be corrected. However, ISTS 3.2.3 would continue to require a power reduction all the way to 50% RTP in accordance with ISTS 3.2.3 Required Action B.1 due to the ISTS 3.2.3 Required Action Note. This requirement is not appropriate when the reason for the T_q problem is due to a dropped CEA and the dropped CEA issue is resolved prior to reducing power to below 50% RTP. Furthermore, CTS 3.2.3 does not include this more restrictive requirement. It essentially only requires the ISTS 3.2.3 Required Action B.3 to be taken if power is actually reduced to < 50% RTP. Therefore, the Note has been modified in ITS 3.2.3 to state that if T_q is > 0.10 due to a reason other than a dropped CEA, all subsequent Required Actions must be completed if power reduction commences prior to restoring T_q to $\leq$ 0.10. Furthermore, the Note states that if T_q is > 0.10 due to a dropped CEA, Required Action B.3 must be completed if power reduction commences prior to restoring T_q to $\leq$ 0.10. Thus, if the problem is due to a dropped CEA, then all the Required Actions will only be taken if restoration of the dropped CEA does not restore T_q to $\leq$ 0.10 within the 2 hour allowance provided in ITS 3.1.5 (ISTS 3.1.4).

5. The words "or equal to" have been added to ISTS SR 3.2.3.2 to be consistent with both the LCO statement and SR 3.2.3.1, which is the SR to be performed if the COLSS is not in service (hence, the alarm is not functional). This is also consistent with the CTS and also with similar Surveillances in ISTS 3.2.1 and 3.2.4.

Attachment 1, Volume 5, Rev. 0, Page 77 of 144

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

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.3 AZIMUTHAL POWER TILT (T_Q) (Digital) 6 2

T_q

BASES

BACKGROUND

The purpose of this LCO is to limit the core power distribution to the initial values assumed in the accident analyses. Operation within the limits imposed by this LCO either limits or prevents potential fuel cladding failures that could 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 accident, ejected control element assembly (CEA) accident, or other postulated accident requiring termination by a Reactor Protection System (RPS) trip function. This LCO limits the amount of damage to the fuel cladding during an accident by ensuring that the plant is operating within acceptable conditions at the onset of a transient. 1

Protective

Methods of controlling the power distribution include:

a. Using full or part length CEAs to alter the axial power distribution,

b. Decreasing CEA insertion by boration, thereby improving the radial power distribution, and

c. Correcting off optimum conditions, (e.g., a CEA drop or misoperation of the unit) that cause margin degradations.

The core power distribution is controlled so that, in conjunction with other core operating parameters (e.g., CEA insertion and alignment limits), the power distribution does not result in violation of this LCO. The limiting safety system settings and this LCO are based on the accident analyses (Refs. 1 and 2), so that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences (AOOs) and the limits of acceptable consequences are not exceeded for other postulated accidents.

Limiting power distribution skewing over time also minimizes xenon distribution skewing, which is a significant factor in controlling axial power distribution.

Power distribution is a product of multiple parameters, various combinations of which may produce acceptable power distributions. Operation within the design limits of power distribution is accomplished by generating operating limits on the linear heat rate (LHR) and the departure from nucleate boiling (DNB).

BASES

BACKGROUND (continued)

Proximity to the DNB condition is expressed by the departure from nucleate boiling ratio (DNBR), defined as the ratio of the cladding surface heat flux required to cause DNB to the actual cladding surface heat flux. The minimum DNBR value during both normal operation and AOOs is calculated by the CE-1 Correlation (Ref. 3) and corrected for such factors as rod bow and grid spacers, and it is accepted as an appropriate margin to DNB for all operating conditions.

There are two systems that monitor core power distribution online: the Core Operating Limit Supervisory System (COLSS) and the core protection calculators (CPCs). The COLSS and CPCs that monitor the core power distribution are capable of verifying that the LHR and the DNBR do not exceed their limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating core power operating limits corresponding to the allowable peak LHR and DNBR. The CPCs perform this function by continuously calculating actual values of DNBR and local power density (LPD) for comparison with the respective trip setpoints.

A DNBR penalty factor is included in the COLSS and CPC DNBR calculation to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by the assembly. Fuel assemblies that incur higher than average burnup experience greater magnitude of rod bow. Conversely, fuel assemblies that receive lower than average burnup experience less rod bow. In design calculations for a reload core, each batch of fuel is assigned a penalty applied to the maximum integrated planar radial power peak of the batch. This penalty is correlated with the amount of rod bow that is determined from the maximum average assembly burnup of the batch. A single net penalty for the COLSS and CPCs is then determined from the penalties associated with each batch that comprises a core reload, accounting for the offsetting margins caused by the lower radial power peaks in the higher burnup batches.

The COLSS indicates continuously to the operator how far the core is from the operating limits and provides an audible alarm if an operating limit is exceeded. Such a condition signifies a reduction in the capability of the plant to withstand an anticipated transient, but does not necessarily imply an immediate violation of fuel design limits. If the margin to fuel design limits continues to decrease, the RPS ensures that the specified acceptable fuel design limits are not exceeded for AOOs by initiating a reactor trip.

 2

BASES

BACKGROUND (continued)

The COLSS continually generates an assessment of the calculated margin for LHR and DNBR specified limits. The data required for these assessments include measured incore neutron flux data, CEA positions, and Reactor Coolant System (RCS) inlet temperature, pressure, and flow.

In addition to the monitoring performed by the COLSS, the RPS (via the CPCs) continually infers the core power distribution and thermal margins by processing reactor coolant data, signals from excore neutron flux detectors, and input from redundant reed switch assemblies that indicates CEA position. In this case, the CPCs assume a minimum core power of 20% RTP. This threshold is set at 20% RTP because the power range excore neutron flux detection system is inaccurate below this power level. If power distribution or other parameters are perturbed as a result of an AOO, the high local power density or low DNBR trips in the RPS initiate a reactor trip prior to exceeding fuel design limits.

T_q

The limits on the ASI, F_{xy}, and T_Q represent limits within which the LHR and DNBR algorithms are valid. These limits are obtained directly from the initial core or reload analysis. 6

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of operation and AOOs (Ref. 4). The power distribution and CEA insertion and alignment LCOs preclude core power distributions that violate the following fuel design criteria:

a. During a LOCA, peak cladding temperature must not exceed 2200°F (Ref. 5),

b. During a loss of flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a DNB condition (Ref. 4), 1
Refs. 6 and 7

c. During a CEA ejection accident, the fission energy input to the fuel must not exceed 280 cal/gm (Ref. [5]), and 3
Refs. 8 and 9

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (Ref. [6]). 3
10

 1

T_q (Digital)
B 3.2.3 2

BASES

APPLICABLE SAFETY ANALYSES (continued)

Refs. 1, 4, and 5

The power density at any point in the core must be limited to maintain the fuel design criteria (Ref. 1). This result is accomplished by maintaining the power distribution and reactor coolant conditions so that the peak LHR and DNB parameters are within operating limits supported by the accident analysis (Ref. 2) with due regard for the correlations between measured quantities, the power distribution, and uncertainties in the determination of power distribution. 1

5

Fuel cladding failure during a LOCA is limited by restricting the maximum linear heat generation rate (LHGR) so that the peak cladding temperature does not exceed 2200°F (Ref. 1). Peak cladding temperatures exceeding 2200°F cause severe cladding failure by oxidation due to a Zircaloy water reaction. 1

T_q

The LCOs governing LHR, ASI, and RCS ensure that these criteria are met as long as the core is operated within the ASI and F_{xy} limits specified in the COLR, and within the T_Q limits. The latter are process variables that characterize the three dimensional power distribution of the reactor core. Operation within the limits of these variables ensures that their actual values are within the range used in the accident analyses. 6

Fuel cladding damage does not normally occur from conditions outside the limits of these LCOs during normal operation. However, fuel cladding damage could result if an accident or AOO occurs due to initial conditions outside the limits of these LCOs. The potential for fuel cladding damage exists because changes in the power distribution can cause increased power peaking and correspondingly increased local LHRs.

T_q

T_Q satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii). 6

LCO

The power distribution LCO limits are based on correlations between power peaking and certain measured variables used as inputs to the LHR and DNBR operating limits. The power distribution LCO limits are provided in the COLR.

T_q

The limitations on the T_Q are provided to ensure that design operating margins are maintained. T_Q > 0.10 is not expected. If it occurs, the actions to be taken ensure that operation is restricted to only those conditions required to identify the cause of the tilt. It is necessary to explicitly account for power asymmetries because the radial peaking factors used in the core power distribution calculations are based on an untilted power distribution. 6

T_q ~~(Digital)~~ 2
B 3.2.3

BASES

APPLICABILITY

Power distribution is a concern any time the reactor is critical. The power distribution LCOs, however, are only applicable in MODE 1 above 20% RTP. The reasons these LCOs are not applicable below 20% RTP are:

a. The incore neutron detectors that provide input to the COLSS, which then calculates the operating limits, are inaccurate due to the poor signal to noise ratio that they experience at relatively low core power levels.

b. As a result of this inaccuracy, the CPCs assume a minimum core power of 20% RTP when generating LPD and DNBR trip signals. When the core power is below this level, the core is operating well below its thermal limits and the resultant CPC calculated LPD and DNBR trips are highly conservative.

ACTIONS

<u>A.1 and A.2</u>

T_q

If the measured ~~T_Q~~ is greater than the ~~T_Q~~ allowance used in the CPCs but ≤ 0.10, nonconservative trip setpoints may be calculated. Required Action A.1 restores ~~T_Q~~ to within its specified limits by repositioning the CEAs, and the reactor may return to normal operation. A Completion Time of 2 hours is sufficient time to allow the operator to reposition the CEAs because significant radial xenon redistribution does not occur within this time.

If the ~~T_Q~~ cannot be restored within 2 hours, the ~~T_Q~~ allowance in the CPCs must be adjusted, per Required Action A.2, to be equal to or greater than the measured value of ~~T_Q~~ to ensure that the design safety margins are maintained.

If T_q is > 0.10 due to a dropped CEA, Required Action B.3 must be completed if power reduction commences prior to restoring T_q to ≤ 0.10.

7

<u>B.1, B.2, and B.3</u>

if T_q is > 0.10 due to a reason other than a dropped CEA,

Required Actions B.1, B.2, and B.3 are modified by a Note that requires all subsequent actions be performed if power reduction commences prior to restoring ~~T_Q~~ ≤ 0.10. This requirement ensures that corrective action is taken before unrestricted power operation resumes.

If the measured ~~T_Q~~ > 0.10, THERMAL POWER is reduced to ≤ 50% RTP within 4 hours. The 4 hours allows enough time to take action to restore ~~T_Q~~ prior to reducing power and limits the probability of operation with a power distribution out of limits. Such actions include performing SR 3.2.3.2, which provides a value of ~~T_Q~~ that can be used in subsequent actions.

6

2

BASES

ACTIONS (continued)

Also in the case of a tilt generated by a CEA misalignment, the 4 hours allows recovery of the CEA misalignment, because a measured T_Q > 0.10 is not expected. If it occurs, continued operation of the reactor may be necessary to discover the cause of the tilt. Operation then is restricted to only those conditions required to identify the cause of the tilt. It is necessary to explicitly account for power asymmetries because the radial power peaking factors used in the core power distribution calculation are based on an untilted power distribution.

T_q

6

If the measured T_Q is not restored to within its specified limits, the reactor continues to operate with an axial power distribution mismatch. Continued operation in this configuration may induce an axial xenon oscillation, which results in increased LHGRs when the xenon redistributes. If the measured T_Q cannot be restored to within its limit within 4 hours, reactor power must be reduced. Reducing THERMAL POWER to < 50% RTP within 4 hours provides an acceptable level of protection from increased power peaking due to potential xenon redistribution while maintaining a power level sufficiently high enough to allow the tilt to be analyzed.

a radial

9

The Linear Power Level - High trip setpoints are reduced to ≤ 55% RTP to ensure that the assumptions of the accident analysis regarding power peaking are maintained. After power has been reduced to ≤ 50% RTP, the rate and magnitude of changes in the core flux are greatly reduced. Therefore, 16 hours is an acceptable time period to allow for reduction of the Linear Power Level - High trip setpoints, Required Action B.2. The 16 hour Completion Time allowed to reduce the Linear Power Level - High trip setpoints is required to perform the actions necessary to reset the trip setpoints.

THERMAL POWER is restricted to 50% RTP until the measured T_Q is restored to within its specified limit by correcting the out of limit condition. This action prevents the operator from increasing THERMAL POWER above the conservative limit when a significant T_Q has existed, but allows the unit to continue operation for diagnostic purposes.

T_q

6

The Completion Time of Required Action B.3 is modified by a Note governing subsequent power increases. After a THERMAL POWER increase following restoration of T_Q operation may proceed provided the measured T_Q is determined to remain within its specified limit at the increased THERMAL POWER level.

1

2

BASES

ACTIONS (continued)

The provision to allow discontinuation of the Surveillance after verifying that T_Q ≤ 0.10 is within its specified limit at least once per hour for 12 hours or until T_Q is verified to be within its specified limit at a THERMAL POWER ≥ 95% RTP provides an acceptable exit from this action after the measured T_Q has been returned to an acceptable value.

T_q 6

C.1

If the measured T_Q cannot be restored or determined within its specified limit, core power must be reduced. Reduction of core power to < 20% RTP ensures that the core is operating within its thermal limits and places the core in a conservative condition based on the trip setpoints generated by the CPCs, which assume a minimum core power of 20% RTP. Six hours is a reasonable time to reach 20% RTP in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

Continuous monitoring of the measured T_Q by the incore nuclear detectors is provided by the COLSS. A COLSS alarm is annunciated in the event that the measured T_Q exceeds the value used in the CPCs.

T_q 6

With the COLSS out of service, the operator must calculate T_Q and verify that it is within its specified limits. The 12 hour Frequency is sufficient to identify slowly developing T_Q's before they exceed the limits of this LCO. Also, the 12 hour Frequency prevents significant xenon redistribution.

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SR 3.2.3.2

Verification that the COLSS T_Q alarm actuates at a value less than the value used in the CPCs ensures that the operator is alerted if T_Q approaches its operating limit. The 31 day Frequency for performance of this SR is consistent with the historical testing frequency of reactor protection and monitoring systems. The Surveillance Frequency for testing protection systems was extended to 92 days by CEN 327. Monitoring systems were not addressed in CEN 327; therefore, this Frequency remains at 31 days.

or equal to 7 T_q 6

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INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 8

---Reviewer's Note---
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 5

2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.3.3

Independent confirmation of the validity of the COLSS calculated T_Q ensures that the COLSS accurately identifies T_Q's.

T_q 6

INSERT 1

The 31 day Frequency for performance of this SR is consistent with the historical testing frequency of reactor protection and monitoring systems. The Surveillance Frequency for testing protection systems was extended to 92 days by CEN 327. Monitoring systems were not addressed in CEN 327; therefore, this Frequency remains at 31 days.

TSTF-425-A

REFERENCES

1. FSAR, Section [15].
2. FSAR, Section [6].
3. CE-1 Correlation for DNBR.
4. 10 CFR 50.46, Appendix A, GDC 10.
5. 10 CFR 50.46.
6. 10 CFR 50, Appendix A, GDC 26.

U Chapter 1 3 4 10

6. UFSAR, Section 4.4.1.1.
7. UFSAR, Table 15.0-8.
8. UFSAR, Section 15.4.3.2.
9. UFSAR, Section 15.10.4.3.2.

1

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INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 8

--Reviewer's Note--
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 5

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.3 BASES, AZIMUTHAL POWER TILT (T_q)

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

2. The headings for ISTS 3.2.3 Bases include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

3. The ISTS Bases contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

4. The reference to 10 CFR 50.46 Appendix A, GDC 10 is being corrected to 10 CFR 50 Appendix A, GDC 10. The GDC's are located in 10 CFR 50 Appendix A and 10 CFR 50.46 does not contain an Appendix A.

5. This "Reviewers Note" is being deleted. The Reviewers Note is for the NRC reviewer during the NRC review and will not be part of the plant specific SONGS ITS.

6. Changes are made to use correct punctuation, correct typographical errors or to make corrections consistent with the Writers Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01.

7. Changes made to be consistent with changes made to the Specification.

8. The Bases words changed by TSTF-425 have been modified to state "The Frequency is controlled under the Surveillance Frequency Control Program." The Surveillance Frequency Control Program provides the details for how to change the Frequencies, thus the TSTF-425 words concerning operating experience, equipment reliability, and plant risk are not always true for each of the Frequencies.

9. Azimuthal tilt is a radial power distribution asymmetry, not an axial power distribution asymmetry. Azimuthal tilt is a measure of how one radial quadrant's power is different than another radial quadrant's power. Therefore, this has been corrected.

Attachment 1, Volume 5, Rev. 0, Page 89 of 144

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.3, AZIMUTHAL POWER TILT (T_q)

There are no specific No Significant Hazards Considerations for this Specification.

Attachment 1, Volume 5, Rev. 0, Page 91 of 144

ATTACHMENT 4

ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

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

ITS

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.4 3.2.4 Departure From Nucleate Boiling Ratio (DNBR)

LCO 3.2.4 LCO 3.2.4 The DNBR shall be maintained by one of the following methods:

a. Maintaining Core Operating Limit Supervisory System (COLSS) calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and either one or both control element assembly calculators (CEACs) are OPERABLE);

b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the allowance specified in the COLR (when COLSS is in service and neither CEAC is OPERABLE);

c. Operating within limits as specified in the COLR using any operable core protection calculator (CPC) channel (when COLSS is out of service and either one or both CEACs are OPERABLE); or

d. Operating within limits as specified in the COLR using any operable CPC channel (when COLSS is out of service and neither CEAC is OPERABLE).

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A — A. ~~With COLSS in service and the~~ COLSS calculated core power ~~exceeding the COLSS calculated core power operating~~ [not within] limit.	A.1 Restore the DNBR to within limit.	1 hour

A03

(continued)

ITS

A01

B.1 Determine trend in DNBR.
AND
B.2.1 With an adverse trend, restore DNBR to within limits.
OR

A02

M01

DNBR
3.2.4

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION B	B. ~~With COLSS not in service and DNBR outside the COLR specified limits using any OPERABLE CPC channel~~. [DNBR outside the region of acceptable operation when COLSS is out of service]	~~B.1 Initiate SR 3.2.4.1.~~ ~~AND~~ B.2 [.2] [With no adverse trend,] Restore DNBR to within limit.	[Once per] 15 minutes (A02) [1 hour] 4 hours (M01)
ACTION C	C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours (A03)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
Required Action B.1	SR 3.2.4.1 [Not used.] ~~-----NOTE----- Only required with COLSS not in service and DNBR not within specified limits using any CPC channel.~~ ~~Verify no adverse trend in DNBR.~~	~~15 minutes~~ (A02)

(continued)

ITS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
SR 3.2.4.2 SR 3.2.4.2	------------------NOTES-------------------- 1. Only ~~applicable~~ required to be met when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. ~~2. SR 3.0.4 is not applicable.~~ --- Verify DNBR, as indicated on any OPERABLE DNBR channel, is within the limit specified in the COLR.	A04 A05 ~~2 hours~~ In accordance with the Surveillance Frequency Control Program	LA01
SR 3.2.4.3 SR 3.2.4.3	Verify COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR.	~~31 days~~ In accordance with the Surveillance Frequency Control Program	LA01

Attachment 1, Volume 5, Rev. 0, Page 96 of 144

ITS

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.4 3.2.4 Departure From Nucleate Boiling Ratio (DNBR)

LCO 3.2.4 LCO 3.2.4 The DNBR shall be maintained by one of the following methods:

a. Maintaining Core Operating Limit Supervisory System (COLSS) calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and either one or both control element assembly calculators (CEACs) are OPERABLE);

b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the allowance specified in the COLR (when COLSS is in service and neither CEAC is OPERABLE);

c. Operating within limits as specified in the COLR using any operable core protection calculator (CPC) channel (when COLSS is out of service and either one or both CEACs are OPERABLE); or

d. Operating within limits as specified in the COLR using any operable CPC channel (when COLSS is out of service and neither CEAC is OPERABLE).

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A — A. ~~With COLSS in service and the~~ COLSS calculated core power ~~exceeding the COLSS calculated core power operating~~ [not within] limit.	A.1 Restore the DNBR to within limit.	1 hour

A03

(continued)

Attachment 1, Volume 5, Rev. 0, Page 97 of 144

ITS

A01

B.1 Determine trend in DNBR.
AND
B.2.1 With an adverse trend, restore DNBR to within limits.
OR

A02 M01

DNBR
3.2.4

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION B: B. ~~With COLSS not in service and DNBR outside the COLR specified limits using any OPERABLE CPC channel~~. [DNBR outside the region of acceptable operation when COLSS is out of service]	~~B.1 Initiate SR 3.2.4.1.~~ ~~AND~~ B.2 [.2] [With no adverse trend,] Restore DNBR to within limit.	[Once per] 15 minutes (A02) [1 hour] 4 hours (M01)
ACTION C: C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to ≤ 20% RTP.	6 hours (A03)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Required Action B.1: SR 3.2.4.1 [Not used.] ~~-------------------NOTE-------------------- Only required with COLSS not in service and DNBR not within specified limits using any CPC channel. ---~~ ~~Verify no adverse trend in DNBR.~~	~~15 minutes~~ (A02)

(continued)

ITS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.2.4.2 SR 3.2.4.2	----------NOTES---------- 1. Only ~~applicable~~ required to be met when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. ~~2. SR 3.0.4 is not applicable.~~ -------------------- Verify DNBR, as indicated on any OPERABLE DNBR channel, is within the limit specified in the COLR.	A04 A05 ~~2 hours~~ In accordance with the Surveillance Frequency Control Program LA01
SR 3.2.4.3 SR 3.2.4.3	Verify COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR.	~~31 days~~ In accordance with the Surveillance Frequency Control Program LA01

DISCUSSION OF CHANGES
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

ADMINISTRATIVE CHANGES

A01 In the conversion of the San Onofre Nuclear Generating Station (SONGS) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 3.0, "Standard Technical Specifications Combustion Engineering Plants" (ISTS) and additional approved Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.2.4 Required Action B.1 requires initiation of SR 3.2.4.1. CTS SR 3.2.4.1 requires verifying no adverse trend in DNBR every 15 minutes. The SR contains a Note that modifies the SR to make it only applicable with COLSS out of service and DNBR outside limits as indicated by any CPC channel. ITS 3.2.4 Action B.1 requires the DNBR trend to be determined every 15 minutes and does not contain a SR to verify no adverse trend. This changes the CTS by deleting the SR and putting the requirements into the ACTIONS.

The application of CTS SR 3.2.4.1 along with the Note that modifies it is confusing and is more appropriately applied in the ACTIONS. The modified Completion Time is consistent with the current requirements. The proposed 15 minute Completion Time to determine the trend in DNBR is consistent with the CTS Surveillance Frequency. This change appropriately incorporates a confusing SR that should be a Required Action into the ACTIONS. This change does not alter any of the requirements required by CTS 3.2.4 and is therefore administrative.

A03 CTS 3.2.4 Condition A states, "With COLSS in service and the COLSS calculated core power exceeding the COLSS calculated core power operating limit." CTS 3.2.4 Condition B states, "With COLSS not in service and DNBR outside the COLR specified limits using any OPERABLE CPC channel." ITS 3.2.4 Condition A states, "COLSS calculated core power not within limit and ITS 3.2.4 Condition B states, "DNBR outside the region of acceptable operation when COLSS is out of service." This changes the CTS by a) just specifying COLSS calculated power is not within the limit (for when COLSS is in service) and stating that the LCO is not met (i.e., DNBR is not within the region of acceptable operation…) in the first part of the Condition (when COLSS is not in service).

This change rewords the Condition to be consistent with NUREG-1432 without changing the intent. This is an administrative change which clarifies the wording of the Condition to align with the adverse condition that exists. For Condition A, it is obvious that when COLSS calculated core power is not within the limit that COLSS is in service (since the Condition uses the term "COLSS calculated core power"). For Condition B, it is not necessary to state that the determination is made using a CPC channel, since this is already specified in the LCO statement.

Attachment 1, Volume 5, Rev. 0, Page 100 of 144

DISCUSSION OF CHANGES
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

A04 CTS SR 3.2.4.2 contains a Note (Note 1) which modifies the SR by making it only "applicable" when COLSS is out of service. ITS SR 3.2.4.2 revises Note 1 to be only "required to be met" when COLSS is out of service. This changes the CTS by clarifying what applicable means (i.e., not required to be met) based on the changes to Section 1.4.

TSTF-284 revised CTS Section 1.4 to add a discussion regarding the use of "met" and "perform" in SR Notes and adds examples to facilitate the use and application of SR Notes that utilize "met" and "perform." The TSTF also revises SR Notes, as necessary, to appropriately clarify the use of "met" and "perform" exceptions. The SONGS CTS do not contain this detail; however, various locations throughout the TS provide Notes with "met" and "perform" distinctions. This change does not change the intent of any SR Note. This proposed change will provide for better use, application, and understanding of this Note along with the changes to Section 1.4. This is an administrative change which clarifies and corrects exceptions that are unclear or have incorrect usage of "met" and "perform."

A05 CTS SR 3.2.4.2 contains the Note that SR 3.0.4 is not applicable. ITS SR 3.2.4.2 does not contain this Note. This changes the CTS by deleting this specific Note.

The purpose of the Note is to allow the plant to enter the MODE of Applicability without performing the required Surveillances. This change is acceptable because the CTS as well as ITS SR 3.2.4.2 remaining Note (first sentence), which states, "Only required to be met when COLSS is out of service," is written to allow entry into MODE 1 following a reactor startup. This serves the same purpose as the existing CTS Note 2 and is described in CTS and ITS SR 3.0.4. Thus the Note is redundant and has been deleted. This change is designated as administrative because it eliminates a CTS provision which is not required because it is already allowed by the SR.

MORE RESTRICTIVE CHANGES

M01 CTS 3.2.4 Required Action B.1 requires the initiation of SR 3.2.4.1 if the COLSS is out of service and any DNBR outside the COLR specified limits using any OPERABLE CPC channel. CTS SR 3.2.4.1 requires verification of no adverse trend in DNBR every 15 minutes. However, this is done to monitor DNBR, and no specific actions are required except to restore the DNBR to within limits in 4 hours, as stated in CTS 3.2.4 Required Action B.2. Under similar conditions, if an adverse trend is detected, ITS 3.2.4 Required Action B.2.1 requires restoration of the DNBR to within limits in 1 hour. If no adverse trend is detected, ITS Required Action B.2.2 continues to require the DNBR to be restored within 4 hours. This changes the CTS by requiring restoration of DNBR to within the limits in 1 hour if an adverse trend is detected, in lieu of the current 4 hours.

The purpose of ITS 3.2.4 Required Action B.2.1 is to require restoration of the DNBR to within limits in a time consistent with ITS 3.2.4 Required Action A.1, when an adverse trend in DNBR is detected. This change is acceptable because the unit will be allowed to operate for a shorter period of time (1 hour) if an

Attachment 1, Volume 5, Rev. 0, Page 101 of 144

DISCUSSION OF CHANGES
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

adverse trend is detected. This ensures that reductions in reactor power occur sooner when an adverse trend is detected. This change is designated as more restrictive because less time is allowed to restore DNBR to within limits when an adverse trend is detected with the COLSS not in service.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – Removal of LCO, SR, or other TS requirement to the LCS, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program)* CTS SR 3.2.4.2 requires verification that DNBR, as indicated on any OPERABLE DNBR channel, is within the limit specified in the COLR every 2 hours. CTS SR 3.2.4.3 requires verification that the COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR every 31 days. ITS SR 3.2.4.2 and ITS SR 3.2.4.3 are similar Surveillances, respectively, but specify the periodic Frequency as "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for the SRs and the Bases for the Frequencies to the Surveillance Frequency Control Program.

The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. In addition:

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program;

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1; and

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

The referenced document, NEI 04-10, Rev. 1, provides a detailed description of the process to be followed when considering changes to a Surveillance Frequency. NEI 04-10, Rev. 1, has been reviewed and approved by the NRC. Therefore, the process will not be discussed further here.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 and 1.177. Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times.

DISCUSSION OF CHANGES
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF). Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies.

Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

1. **The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.**

   10 CFR 50.36(c) provides that TS will include items in the following categories:

   "(3) *Surveillance requirements*. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

   This change proposes to relocate various Frequencies for the performance of the Surveillance Requirements to a licensee-controlled program using an NRC approved methodology for control of the Surveillance Frequencies. The Surveillance Requirements themselves will remain in TS. This is consistent with other NRC approved TS changes in which the Surveillance Frequencies are not under NRC control, such as Surveillances that are performed in accordance with the Inservice Testing Program or the Containment Leakage Rate Testing Program, where the Frequencies vary based on the past performance of the subject components. Thus, this proposed change meets criterion 1 above.

2. **The proposed change is consistent with the defense-in-depth philosophy.**

   As described in Position 2.2.1.1 of Regulatory Guide 1.174, consistency with the defense-in-depth philosophy is maintained if:

   - A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation;

   - Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided;

   - System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers);

Attachment 1, Volume 5, Rev. 0, Page 103 of 144

DISCUSSION OF CHANGES
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

- Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed;

- Independence of barriers is not degraded;

- Defenses against human errors are preserved; and

- The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

These defense-in-depth objectives apply to all risk-informed applications, and for some of the issues involved (e.g., no over-reliance on programmatic activities and defense against human errors), it is fairly straightforward to apply them to this proposed change. The use of the multiple risk metrics of CDF and LERF and controlling the change resulting from the implementation of this initiative would maintain a balance between prevention of core damage, prevention of containment failure, and consequence mitigation. Redundancy, diversity, and independence of safety systems are considered as part of the risk categorization to ensure that these qualities are not adversely affected. Independence of barriers and defense against common cause failures are also considered in the categorization. The improved understanding of the relative importance of plant components to risk resulting from the development of this program promotes an improved overall understanding of how the SSCs contribute to the plant's defense-in-depth.

3. **The proposed change maintains sufficient safety margins.**

   Conformance with this principle is assured since SSC design, operation, testing methods and acceptance criteria specified in the Codes and Standards or alternatives approved for use by the NRC, will continue to be met as described in the plant licensing basis (e.g., UFSAR, or Technical Specifications Bases). Also, the safety analysis acceptance criteria in the licensing basis (e.g., UFSAR, supporting analyses, etc.) are met with the proposed change.

4. **When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.**

   NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," will require that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

5. **The impact of the proposed change should be monitored using performance measurement strategies.**

   NEI 04-10 will require that changes in Surveillance Frequencies be monitored using performance management strategies.

Attachment 1, Volume 5, Rev. 0, Page 104 of 144

DISCUSSION OF CHANGES
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

Therefore, the proposed change is consistent with the guidance in Regulatory Guide 1.174.

This change is designated as a less restrictive removal of detail change because Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

None

Attachment 1, Volume 5, Rev. 0, Page 105 of 144

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

3.2 POWER DISTRIBUTION LIMITS

3.2.4 Departure From Nucleate Boiling Ratio (DNBR) (Digital) 3

LCO 3.2.4

LCO 3.2.4 The DNBR shall be maintained by one of the following methods:

a. Maintaining Core Operating Limit Supervisory System (COLSS) calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR (when COLSS is in service, and either one or both control element assembly calculators (CEACs) are OPERABLE),

b. Maintaining COLSS calculated core power less than or equal to COLSS calculated core power operating limit based on DNBR decreased by the allowance specified in the COLR (when COLSS is in service and neither CEAC is OPERABLE),

c. Operating within the region of acceptable operation of Figure 3.2.4-1 [limits as] specified in the COLR using any operable core protection calculator (CPC) channel (when COLSS is out of service and either one or both CEACs are OPERABLE), or 2

d. Operating within the region of acceptable operation of Figure 3.2.4-2 [limits as] specified in the COLR using any operable CPC channel (when COLSS is out of service and neither CEAC is OPERABLE).

Applicability

APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION A	A. COLSS calculated core power not within limit.	A.1 Restore the DNBR to within limit.	1 hour	
ACTION B, SR 3.2.4.1	B. DNBR outside the region of acceptable operation when COLSS is out of service.	B.1 [Determine trend in DNBR. AND	Once per 15 minutes]	4

U2/U3 CTS

DNBR (Digital) 3

3.2.4

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
ACTION B, SR 3.2.4.1		B.2.1	With an adverse trend, restore DNBR to within limit. OR	1 hour
		B.2.2	With no adverse trend, restore DNBR to within limit.	4 hours
ACTION C	C. Required Action and associated Completion Time not met.	C.1	Reduce THERMAL POWER to ≤ 20% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1

Not used.

		SURVEILLANCE	FREQUENCY
			5
SR 3.2.4.2	SR 3.2.4.1 2	-----------------------------NOTE----------------------------- Only required to be met when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. --- Verify DNBR, as indicated on all OPERABLE DNBR channels, is within the limit of Figure 3.2.4-1 or 3.2.4-2 of (specified in) the COLR, as applicable.	2 hours (2) TSTF-425-A
SR 3.2.4.3	SR 3.2.4.2 3	Verify COLSS margin alarm actuates at a THERMAL POWER level equal to or less than the core power operating limit based on DNBR.	31 days (5) TSTF-425-A

In accordance with the Surveillance Frequency Control Program

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

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

2. This deviation from the ISTS deletes reference to the COLR figure in LCO 3.2.4 parts c and d and from ISTS SR 3.2.4.1 (ITS SR 3.2.4.2). The new verbiage will only make reference to a specified limit in the COLR. This change is consistent with the CTS requirements. CTS 3.2.4 does not include a COLR Figure number; it just states that the limits are in the COLR. This is also consistent with all other COLR limits specified in the ISTS. In all cases, the ISTS just references the COLR; it does not specify the figure number of the plant specific COLR.

3. The headings for ISTS 3.2.4 include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

4. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

5. The SR number has been changed to be consistent with the SR number in the SONGS CTS. SCE has decided not to renumber the CTS to be consistent with the ISTS because by doing so would result in the unnecessary administrative burden of changing SR numbers in plant procedures. For this reason, "Not used" SR numbers are also maintained in the ITS.

Attachment 1, Volume 5, Rev. 0, Page 109 of 144

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

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.4 Departure from Nucleate Boiling Ratio (DNBR) (Digital) 3

BASES

BACKGROUND

The purpose of this LCO is to limit the core power distribution to the initial value assumed in the accident analyses. Specifically, operation within the limits imposed by this LCO either limits or prevents potential fuel cladding failures that could 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 accident, ejected control element assembly (CEA) accident, or other postulated accident requiring termination by a Reactor Protection [Protective] System (RPS) trip function. This LCO limits the amount of damage to the fuel cladding during an accident by ensuring that the plant is operating within acceptable conditions at the onset of a transient. 1

Methods of controlling the power distribution include:

a. Using full or part length CEAs to alter the axial power distribution,

b. Decreasing CEA insertion by boration, thereby improving the radial power distribution, and

c. Correcting off optimum conditions (e.g., a CEA drop or misoperation of the unit) that cause margin degradations.

The core power distribution is controlled so that, in conjunction with other core operating parameters (e.g., CEA insertion and alignment limits), the power distribution does not result in violation of this LCO. The limiting safety system settings and this LCO are based on the accident analysis (Refs. 1 and 2), so that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences (AOOs) and the limits of acceptable consequences are not exceeded for other postulated accidents.

Limiting power distribution skewing over time also minimizes the xenon distribution skewing, which is a significant factor in controlling axial power distribution.

Power distribution is a product of multiple parameters, various combinations of which may produce acceptable power distributions. Operation within the design limits of power distribution is accomplished by generating operating limits on the linear heat rate (LHR) and the departure from nucleate boiling (DNB).

3

BASES

BACKGROUND (continued)

4

Proximity to the DNB condition is expressed by the DNBR, defined as the ratio of the cladding surface heat flux required to cause DNB to the actual cladding surface heat flux. The minimum DNBR value during both normal operation and AOOs is [/] as calculated by the CE-1 Correlation (Ref. 3) and corrected for such factors as rod bows and grid spacers and it is accepted as an appropriate margin to DNB for all operating conditions.

1.31

There are two systems that monitor core power distribution online: the Core Operating Limits Supervisory System (COLSS) and the core protection calculators (CPCs). The COLSS and CPCs that monitor the core power distribution are capable of verifying that the LHR and DNBR do not exceed their limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating core power operating limits corresponding to the allowable peak LHR and DNBR. The CPCs perform this function by continuously calculating an actual value of DNBR and LPD for comparison with the respective trip setpoints.

A DNBR penalty factor is included in both the COLSS and CPC DNBR calculation to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by that assembly. Fuel assemblies that incur higher than average burnup experience a greater magnitude of rod bow. Conversely, fuel assemblies that receive lower than average burnup experience less rod bow. In design calculations for a reload core, each batch of fuel is assigned a penalty that is applied to the maximum integrated planar radial power peak of the batch. This penalty is correlated with the amount of rod bow that is determined from the maximum average assembly burnup of the batch. A single net penalty for the COLSS and CPCs is then determined from the penalties associated with each batch that comprises a core reload, accounting for the offsetting margins due to the lower radial power peaks in the higher burnup batches.

The COLSS indicates continuously to the operator how far the core is from the operating limits and provides an audible alarm when an operating limit is exceeded. Such a condition signifies a reduction in the capability of the plant to withstand an anticipated transient, but does not necessarily imply an immediate violation of fuel design limits. If the margin to fuel design limits continues to decrease, the RPS ensures that the specified acceptable fuel design limits are not exceeded during AOOs by initiating a reactor trip.

1

BASES

BACKGROUND (continued)

The COLSS continually generates an assessment of the calculated margin for LHR and DNBR specified limits. The data required for these assessments include measured incore neutron flux, CEA positions, and Reactor Coolant System (RCS) inlet temperature, pressure, and flow.

In addition to the monitoring performed by the COLSS, the RPS (via the CPCs) continually infers the core power distribution and thermal margins by processing reactor coolant data, signals from excore neutron flux detectors, and input from redundant reed switch assemblies that indicates CEA position. In this case, the CPCs assume a minimum core power of 20% RTP because the power range excore neutron flux detecting system is inaccurate below this power level. If power distribution or other parameters are perturbed as a result of an AOO, the high local power density or low DNBR trips in the RPS initiate a reactor trip prior to the exceeding of fuel design limits.

T_q

The limits on ASI, F_{xy}, and ~~T_Q~~ represent limits within which the LHR and DNBR algorithms are valid. These limits are obtained directly from the initial core or reload analysis. 6

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of normal operation or AOOs (Ref. 4). The power distribution and CEA insertion and alignment LCOs prevent core power distributions from reaching levels that violate the following fuel design criteria:

a. During a LOCA, peak cladding temperature must not exceed 2200°F (Ref. 5),

b. During a loss of flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a DNB condition (~~Ref. 4~~), 1
Refs. 6 and 7

c. During an ejected CEA accident, the fission energy input to the fuel must not exceed 280 cal/gm (~~Ref. 6~~), and 1
Refs. 8 and 9

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (Ref. ~~7~~). 1
10

Refs. 1, 4, and 5

The power density at any point in the core must be limited to maintain the fuel design criteria (~~Ref. 4~~). This is accomplished by maintaining the power distribution and reactor coolant conditions so that the peak LHR and DNB parameters are within operating limits supported by the accident analyses (Ref. 1) with due regard for the correlations between measured quantities, the power distribution, and uncertainties in the determination of power distribution. 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

5 Fuel cladding failure during a LOCA is limited by restricting the maximum linear heat generation rate so that the peak cladding temperature does not exceed 2200°F (Ref. 4). Peak cladding temperatures exceeding 2200°F may cause severe cladding failure by oxidation due to a Zircaloy water reaction. 1

T_q The LCOs governing LHR, ASI, and RCS ensure that these criteria are met as long as the core is operated within the ASI and F_{xy} limits specified in the COLR, and within the T_Q limits. The latter are process variables that characterize the three dimensional power distribution of the reactor core. Operation within the limits for these variables ensures that their actual values are within the range used in the accident analyses (Ref. 1). 6

Fuel cladding damage does not normally occur from conditions outside the limits of these LCOs during normal operation. However, fuel cladding damage could result if an accident or AOO occurs from initial conditions outside the limits of these LCOs. This potential for fuel cladding damage exists because changes in the power distribution can cause increased power peaking and correspondingly increased local LHRs.

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

LCO

The power distribution LCO limits are based on correlations between power peaking and certain measured variables used as inputs to the LHR and DNBR operating limits. The power distribution LCO limits are provided in the COLR.

With the COLSS in service and one or both of the control element assembly calculators (CEACs) OPERABLE, the DNBR will be maintained by ensuring that the core power calculated by the COLSS is equal to or less than the permissible core power operating limit based on DNBR calculated by the COLSS. In the event that the COLSS is in service but neither of the two CEACs is OPERABLE, the DNBR is maintained by ensuring that the core power calculated by the COLSS is equal to or less than a reduced value of the permissible core power operating limit calculated by the COLSS. In this condition, the calculated operating limit must be reduced by the allowance specified in the COLR.

BASES

LCO (continued)

In instances for which the COLSS is out of service and either one or both of the CEACs are OPERABLE, the DNBR is maintained by operating within the acceptable region specified in the COLR as shown in Figure 3.2.4-1, in the COLR, and using any OPERABLE CPC channel. Alternatively, when the COLSS is out of service and neither of the two CEACs is OPERABLE, the DNBR is maintained by operating within the acceptable region specified in the COLR for this condition as shown in Figure 3.2.4-2, in the COLR, and using any OPERABLE CPC channel. 2

With the COLSS out of service, the limitation on DNBR as a function of the ASI represents a conservative envelope of operating conditions consistent with the analysis assumptions that have been analytically demonstrated adequate to maintain an acceptable minimum DNBR for all AOOs. Of these, the postulated loss of flow transient is the most limiting. Operation of the core with a DNBR at or above this limit ensures that an acceptable minimum DNBR is maintained in the event of a loss of flow transient.

APPLICABILITY

Power distribution is a concern any time the reactor is critical. The power distribution LCOs, however, are only applicable in MODE 1 above 20% RTP. The reasons these LCOs are not applicable below 20% RTP are:

a. The incore neutron detectors that provide input to the COLSS, which then calculates the operating limits, are inaccurate due to the poor signal to noise ratio that they experience at relatively low core power levels.

b. As a result of this inaccuracy, the CPCs assume a minimum core power of 20% RTP when generating the local power density (LPD) and DNBR trip signals. When the core power is below this level, the core is operating well below the thermal limits and the resultant CPC calculated LPD and DNBR trips are highly conservative.

ACTIONS

A.1

Operating at or above the minimum required value of the DNBR ensures that an acceptable minimum DNBR is maintained in the event of a postulated loss of flow transient. If the core power as calculated by the COLSS exceeds the core power limit calculated by the COLSS based on the DNBR, fuel design limits may not be maintained following a loss of flow, and prompt action must be taken to restore the DNBR above its minimum Allowable Value. With the COLSS in service, 1 hour is a reasonable time for the operator to initiate corrective actions to restore the DNBR above its specified limit, because of the low probability of a severe transient occurring in this relatively short time.

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

If the COLSS is not available the OPERABLE DNBR channels are monitored to ensure that the DNBR is not exceeded. Maintaining the DNBR within this specified range ensures that no postulated accident results in consequences more severe than those described in the U FSAR, Chapter 15. A 4 hour Frequency is allowed to restore the DNBR limit to within the region of acceptable operation. This Frequency is reasonable because the COLSS allows the plant to operate with less DNBR margin (closer to the DNBR limit) than when monitoring with the CPCs. 1

When operating with the COLSS out of service there is a possibility of a slow undetectable transient that degrades the DNBR slowly over the 4 hour period and is then followed by an anticipated operational occurrence or an accident. To remedy this, the CPC calculated values of DNBR are monitored every 15 minutes when the COLSS is out of service. The 15 minute Frequency is adequate to allow the operator to identify an adverse trend in conditions that could result in an approach to the DNBR limit. Also, a maximum allowable change in the CPC calculated DNBR ensures that further degradation requires the operators to take immediate action to restore DNBR to within limits or reduce reactor power to comply with the Technical Specifications (TS). With an adverse trend, 1 hour is allowed for restoring DNBR to within limits if the COLSS is not restored to OPERABLE status. Implementation of this requirement ensures that reductions in core thermal margin are quickly detected and, if necessary, results in a decrease in reactor power and subsequent compliance with the existing COLSS out of service TS limits.

With no adverse trend, 4 hours is allowed for restoring the DNBR to within limits if the COLSS is not restored to OPERABLE status. This duration is reasonable because the Frequency of the CPC determination of DNBR has been increased, and, if operation is maintained steady, the likelihood of exceeding the DNBR limit during this period is not increased. The likelihood of induced reactor transients from an early power reduction is also decreased.

3

BASES

ACTIONS (continued)

C.1

If the DNBR cannot be restored or determined within the allowed times of Conditions A and B, core power must be reduced. Reduction of core power to < 20% RTP ensures that the core is operating within its thermal limits and places the core in a conservative condition based on trip setpoints generated by the CPCs, which assume a minimum core power of 20% RTP.

The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach 20% RTP from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1 2 — SR 3.2.4.1 Not used. 2

With the COLSS out of service, the operator must monitor the DNBR as indicated on any of the OPERABLE DNBR channels of the CPCs to verify that the DNBR is within the specified limits, shown in either Figure 3.2.4-1 or 3.2.4-2 of the COLR, as applicable. A 2 hour Frequency is adequate to allow the operator to identify trends in conditions that would result in an approach to the DNBR limit. 2

INSERT 1 — TSTF-425-A

This SR is modified by a Note that states that the SR is only required to be met when the COLSS is out of service. Continuous monitoring of the DNBR is provided by the COLSS, which calculates core power and core power operating limits based on the DNBR and continuously displays these limits to the operator. A COLSS margin alarm is annunciated in the event that the THERMAL POWER exceeds the core power operating limit based on the DNBR.

SR 3.2.4.2 3 2

Verification that the COLSS margin alarm actuates at a power level equal to or less than the core power operating limit, as calculated by the COLSS, based on the DNBR, ensures that the operator is alerted when operating conditions approach the DNBR operating limit. The 31 day Frequency for performance of this SR is consistent with the historical testing frequency of reactor protection and monitoring systems. The Surveillance Frequency for testing protection systems was extended to 92 days by CEN 327. Monitoring systems were not addressed in CEN 327; therefore, this Frequency remains at 31 days.

INSERT 1 — TSTF-425-A

 1

TSTF-425-A

INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 7

--Reviewer's Note--
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 5

3

BASES

REFERENCES

1. FSAR, Chapter [15].

U

2. FSAR, Chapter [6].

1 4

3. CE-1 Correlation for DNBR.

4. 10 CFR 50, Appendix A, GDC 10.

5. 10 CFR 50.46.

6. FSAR, Section [ ].

6. UFSAR, Section 4.4.1.1.
7. UFSAR, Table 15.0-8.
8. UFSAR, Section 15.4.3.2.
9. UFSAR, Section 15.10. 4.3.2.

1

10

7. 10 CFR 50, Appendix A, GDC 26.

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.4 BASES, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

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

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

3. The headings for ISTS 3.2.4 Bases include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

4. The ISTS Bases contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

5. This "Reviewers Note" is being deleted. The Reviewers Note is for the NRC reviewer during the NRC review and will not be part of the plant specific SONGS ITS.

6. Changes are made to use correct punctuation, correct typographical errors or to make corrections consistent with the Writers Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01.

7. The Bases words changed by TSTF-425 have been modified to state "The Frequency is controlled under the Surveillance Frequency Control Program." The Surveillance Frequency Control Program provides the details for how to change the Frequencies, thus the TSTF-425 words concerning operating experience, equipment reliability, and plant risk are not always true for each of the Frequencies.

Attachment 1, Volume 5, Rev. 0, Page 120 of 144

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.4, DEPARTURE FROM NUCLEATE BOILING RATIO (DNBR)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 5

ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

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

ITS

A01

3.2 POWER DISTRIBUTION LIMITS

3.2.5 3.2.5 AXIAL SHAPE INDEX (ASI)

LCO 3.2.5 LCO 3.2.5 ~~Core average~~ ASI shall be within the limits specified in the COLR.

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A	A. Core average ASI not within limits.	A.1 Restore ASI to within limits.	2 hours
ACTION B	B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 20% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.5.1	SR 3.2.5.1 ~~-----NOTE----- Only applicable when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. -----~~ Verify ~~core average~~ ASI is within limits ~~using any OPERABLE CPC channel~~.	In accordance with the Surveillance Frequency Control Program ~~12 hours~~

M01

LA01

M01

ITS

A01

ASI
3.2.5

3.2 POWER DISTRIBUTION LIMITS

3.2.5 — 3.2.5 AXIAL SHAPE INDEX (ASI)

LCO 3.2.5 — LCO 3.2.5 ~~Core average~~ ASI shall be within the limits specified in the COLR.

Applicability — APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A	A. Core average ASI not within limits.	A.1 Restore ASI to within limits.	2 hours
ACTION B	B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 20% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.5.1	SR 3.2.5.1 ~~-----NOTE----- Only applicable when COLSS is out of service. With COLSS in service, this parameter is continuously monitored. -----~~ (M01) Verify ~~core average~~ ASI is within limits ~~using any OPERABLE CPC channel~~. (M01)	~~12 hours~~ In accordance with the Surveillance Frequency Control Program (LA01)

DISCUSSION OF CHANGES
ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

ADMINISTRATIVE CHANGES

A01 In the conversion of the San Onofre Nuclear Generating Station (SONGS) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 3.0, "Standard Technical Specifications Combustion Engineering Plants" (ISTS) and additional approved Technical Specification Task Force (TSTF) travelers included in this submittal.

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

MORE RESTRICTIVE CHANGES

M01 CTS SR 3.2.5.1 requires verification that the core average ASI is within limits using any OPERABLE CPC channel. The SR is modified by a Note that states it is only applicable when the COLSS is out of service. The Note further states that with the COLSS in service, this parameter is continuously monitored. Thus the Note is stating that the SR is not required to be performed unless the COLSS is out of service. ITS SR 3.2.5.1 does not include this Note. It requires the verification of ASI to be within limits in accordance with the Surveillance Frequency Control Program (which initially will include the 12 hour Frequency), even when the COLSS is in service. Furthermore, the method to perform the CTS SR (i.e., the CPC channels) is not included in the ITS SR. This changes the CTS by requiring the ASI verification at all times and deletes the method to perform the verification.

The purpose of the SR is to verify the ASI is within the limits. This should be performed all the time, not just when the automatic method is not in service. This change is acceptable since it will ensure the operators are monitoring ASI readouts periodically to confirm there are no undetected failures within the automatic monitor. Since the SR is now performed using the COLSS or the CPCs, and the ITS Bases (Background section) clearly describes that these are the two methods for monitoring ASI online, there is no need to include the secondary method in the SR. This change is designated as more restrictive because the SR is required to be performed under more conditions in the ITS than in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 4 – Removal of LCO, SR, or other TS requirement to the LCS, UFSAR, ODCM, QAP, CLRT Program, IST Program, ISI Program, or Surveillance Frequency Control Program)* CTS SR 3.2.5.1 requires verification that core

DISCUSSION OF CHANGES
ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

average ASI is within limits using any OPERABLE CPC channel every 12 hours. ITS SR 3.2.5.1 is a similar Surveillance, but specifies the periodic Frequency as "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the 12 hour Frequency for the SR and the Bases for the Frequencies to the Surveillance Frequency Control Program.

The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. In addition:

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program;

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1; and

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

The referenced document, NEI 04-10, Rev. 1, provides a detailed description of the process to be followed when considering changes to a Surveillance Frequency. NEI 04-10, Rev. 1, has been reviewed and approved by the NRC. Therefore, the process will not be discussed further here.

The relocation of the specified Surveillance Frequencies to licensee control is consistent with Regulatory Guides 1.174 and 1.177. Regulatory Guide 1.177 provides guidance for changing Surveillance Frequencies and Completion Times. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to Regulatory Guide 1.174, which provides quantitative risk acceptance guidelines for changes to core damage frequency (CDF) and large early release frequency (LERF). Regulatory Guide 1.174 provides additional guidelines that have been adapted in the risk-informed methodology for controlling changes to Surveillance Frequencies.

Regulatory Guide 1.174 identifies five key safety principles to be met for all risk-informed applications and to be explicitly addressed in risk-informed plant program change applications.

1. **The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change.**

   10 CFR 50.36(c) provides that TS will include items in the following categories:

   "(3) *Surveillance requirements*. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality

Attachment 1, Volume 5, Rev. 0, Page 128 of 144

DISCUSSION OF CHANGES
ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

This change proposes to relocate various Frequencies for the performance of the Surveillance Requirements to a licensee-controlled program using an NRC approved methodology for control of the Surveillance Frequencies. The Surveillance Requirements themselves will remain in TS. This is consistent with other NRC approved TS changes in which the Surveillance Frequencies are not under NRC control, such as Surveillances that are performed in accordance with the Inservice Testing Program or the Containment Leakage Rate Testing Program, where the Frequencies vary based on the past performance of the subject components. Thus, this proposed change meets criterion 1 above.

2. **The proposed change is consistent with the defense-in-depth philosophy.**

As described in Position 2.2.1.1 of Regulatory Guide 1.174, consistency with the defense-in-depth philosophy is maintained if:

- A reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation;
- Over-reliance on programmatic activities to compensate for weaknesses in plant design is avoided;
- System redundancy, independence, and diversity are preserved commensurate with the expected frequency, consequences of challenges to the system, and uncertainties (e.g., no risk outliers);
- Defenses against potential common cause failures are preserved, and the potential for the introduction of new common cause failure mechanisms is assessed;
- Independence of barriers is not degraded;
- Defenses against human errors are preserved; and
- The intent of the General Design Criteria in 10 CFR Part 50, Appendix A is maintained.

These defense-in-depth objectives apply to all risk-informed applications, and for some of the issues involved (e.g., no over-reliance on programmatic activities and defense against human errors), it is fairly straightforward to apply them to this proposed change. The use of the multiple risk metrics of CDF and LERF and controlling the change resulting from the implementation of this initiative would maintain a balance between prevention of core damage, prevention of containment failure, and consequence mitigation. Redundancy, diversity, and independence of safety systems are considered

Attachment 1, Volume 5, Rev. 0, Page 129 of 144

DISCUSSION OF CHANGES
ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

as part of the risk categorization to ensure that these qualities are not adversely affected. Independence of barriers and defense against common cause failures are also considered in the categorization. The improved understanding of the relative importance of plant components to risk resulting from the development of this program promotes an improved overall understanding of how the SSCs contribute to the plant's defense-in-depth.

3. **The proposed change maintains sufficient safety margins.**

   Conformance with this principle is assured since SSC design, operation, testing methods and acceptance criteria specified in the Codes and Standards or alternatives approved for use by the NRC, will continue to be met as described in the plant licensing basis (e.g., UFSAR, or Technical Specifications Bases). Also, the safety analysis acceptance criteria in the licensing basis (e.g., UFSAR, supporting analyses, etc.) are met with the proposed change.

4. **When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.**

   NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," will require that changes in core damage frequency or risk are small and consistent with the intent of the Commission's Safety Goal Policy.

5. **The impact of the proposed change should be monitored using performance measurement strategies.**

   NEI 04-10 will require that changes in Surveillance Frequencies be monitored using performance management strategies.

Therefore, the proposed change is consistent with the guidance in Regulatory Guide 1.174.

This change is designated as a less restrictive removal of detail change because a Surveillance Frequency is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

None

Attachment 1, Volume 5, Rev. 0, Page 130 of 144

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

3.2 POWER DISTRIBUTION LIMITS

3.2.5 AXIAL SHAPE INDEX (ASI) (Digital) 2

LCO 3.2.5 LCO 3.2.5 ASI shall be within the limits specified in the COLR.

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 20% RTP.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A	A. Core average ASI not within limits.	A.1 Restore ASI to within limits.	2 hours
ACTION B	B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 20% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
SR 3.2.5.1	SR 3.2.5.1 Verify ASI is within limits.	12 hours (In accordance with the Surveillance Frequency Control Program)	TSTF-425-A

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

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

2. The headings for ISTS 3.2.5 include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

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

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.5 AXIAL SHAPE INDEX (ASI) (Digital) 2

BASES

BACKGROUND

The purpose of this LCO is to limit the core power distribution to the initial values assumed in the accident analysis. Operation within the limits imposed by this LCO either limits or prevents potential fuel cladding failures that could 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 accident, ejected control element assembly (CEA) accident, or other postulated accident requiring termination by a Reactor Protection [Protective] System (RPS) trip function. This LCO limits the amount of damage to the fuel cladding during an accident by ensuring that the plant is operating within acceptable conditions at the onset of a transient. 1

Methods of controlling the power distribution include:

a. Using full or part length CEAs to alter the axial power distribution,

b. Decreasing CEA insertion by boration, thereby improving the radial power distribution, and

c. Correcting off optimum conditions (e.g., a CEA drop or misoperation of the unit) that cause margin degradations.

The core power distribution is controlled so that, in conjunction with other core operating parameters (CEA insertion and alignment limits), the power distribution does not result in violation of this LCO. The limiting safety system settings are based on the accident analyses (Refs. 1 and 2), so that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences (AOOs) and the limits of acceptable consequences are not exceeded for other postulated accidents.

Minimizing power distribution skewing over time also minimizes xenon distribution skewing, which is a significant factor in controlling axial power distribution.

Power distribution is a product of multiple parameters, various combinations of which may produce acceptable power distributions. Operation within the design limits of power distribution is accomplished by generating operating limits on the linear heat rate (LHR) and the departure from nucleate boiling (DNB).

BASES

BACKGROUND (continued)

Proximity to the DNB condition is expressed by the departure from nucleate boiling ratio (DNBR), defined as the ratio of the cladding surface heat flux required to cause DNB to the actual cladding surface heat flux. The minimum DNBR value during both normal operation and AOOs is [/] 1.31 3 as calculated by the CE-1 Correlation (Ref. 3), and corrected for such factors as rod bow and grid spacers, and it is accepted as an appropriate margin to DNB for all operating conditions.

There are two systems that monitor core power distribution online: the Core Operating Limit Supervisory System (COLSS) or the core protection calculators (CPCs). The COLSS and CPCs monitor the core power distribution and are capable of verifying that the LHR and DNBR do not exceed their limits. The COLSS performs this function by continuously monitoring the core power distribution and calculating core power operating limits corresponding to the allowable peak LHR and DNBR. The CPCs perform this function by continuously calculating actual values of DNBR and local power density (LPD) for comparison with the respective trip setpoints.

A DNBR penalty factor is included in both the COLSS and CPC DNBR calculations to accommodate the effects of rod bow. The amount of rod bow in each assembly is dependent upon the average burnup experienced by that assembly. Fuel assemblies that incur higher than average burnup experience greater rod bow. Conversely, fuel assemblies that receive lower than average burnup experience less rod bow. In design calculations for a reload core, each batch of fuel is assigned a penalty that is applied to the maximum integrated planar radial power peak of the batch. This penalty is correlated with the amount of rod bow that is determined from the maximum average assembly burnup of the batch. A single net penalty for the COLSS and CPC is then determined from the penalties associated with each batch that comprises a core reload, accounting for the offsetting margins due to the lower radial power peaks in the higher burnup batches.

The COLSS indicates continuously to the operator how far the core is from the operating limits and provides an audible alarm if an operating limit is exceeded. Such a condition signifies a reduction in the capability of the plant to withstand an anticipated transient, but does not necessarily imply an immediate violation of fuel design limits. If the margin to fuel design limits continues to decrease, the RPS ensures that the specified acceptable fuel design limits are not exceeded for AOOs by initiating a reactor trip.

BASES

BACKGROUND (continued)

The COLSS continually generates an assessment of the calculated margin for LHR and DNBR specified limits. The data required for these assessments include measured incore neutron flux, CEA positions, and Reactor Coolant System (RCS) inlet temperature, pressure, and flow.

In addition to the monitoring performed by the COLSS, the RPS (via the CPCs) continually infers the core power distribution and thermal margins by processing reactor coolant data, signals from excore neutron flux detectors, and input from redundant reed switch assemblies that indicates CEA position. In this case, the CPCs assume a minimum core power of 20% RTP because the power range excore neutron flux detecting system is inaccurate below this power level. If power distribution or other parameters are perturbed as a result of an AOO, the high local power density or low DNBR trips in the RPS initiate a reactor trip prior to the exceeding of fuel design limits.

T_q

The limits on ASI, F_{xy}, and ~~T_Q~~ represent limits within which the LHR and DNBR algorithms are valid. These limits are obtained directly from the initial core or reload analysis. 5

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of operation or AOOs (Ref. 4). The power distribution and CEA insertion and alignment LCOs prevent core power distributions from reaching levels that violate the following fuel design criteria:

a. During a LOCA, peak cladding temperature must not exceed 2200°F (Ref. 5),

b. During a loss of flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a DNB condition (~~Ref. 4~~), 1
Refs. 6 and 7

c. During an ejected CEA accident, the fission energy input to the fuel must not exceed 280 cal/gm (~~Ref. 6~~), 1
Refs. 8 and 9

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (Ref. ~~7~~). 1
10

1, ,

The power density at any point in the core must be limited to maintain the fuel design criteria (Refs. 4 and 5). This is accomplished by maintaining the power distribution and reactor coolant conditions so that the peak LHR and DNB parameters are within operating limits supported by the accident analyses (Ref. 1) with due regard for the correlations among measured quantities, the power distribution, and uncertainties in the determination of power distribution. 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

Fuel cladding failure during a LOCA is limited by restricting the maximum linear heat generation rate (LHGR) so that the peak cladding temperature does not exceed 2200°F (Ref. 5). Peak cladding temperatures exceeding 2200°F may cause severe cladding failure by oxidation due to a Zircaloy water reaction.

The LCOs governing LHR, ASI, and RCS ensure that these criteria are met as long as the core is operated within the ASI and F_{xy} limits specified in the COLR, and within the T_q T_Q limits. The latter are process variables that characterize the three dimensional power distribution of the reactor core. Operation within the limits for these variables ensures that their actual values are within the range used in the accident analysis. 5

Fuel cladding damage does not normally occur from conditions outside these LCOs during normal operation. However, fuel cladding damage results when an accident or AOO occurs due to initial conditions outside the limits of these LCOs. This potential for fuel cladding damage exists because changes in the power distribution can cause increased power peaking and correspondingly increased local LHRs.

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

LCO

The power distribution LCO limits are based on correlations between power peaking and certain measured variables used as inputs to LHR and DNBR operating limits. The power distribution LCO limits are provided in the COLR.

The limitation on ASI ensures that the actual ASI value is maintained within the range of values used in the accident analysis. The ASI limits ensure that with T_q T_Q at its maximum upper limit, the DNBR does not drop below the DNBR Safety Limit for AOOs. 5

APPLICABILITY

Power distribution is a concern any time the reactor is critical. The power distribution LCOs, however, are only applicable in MODE 1 above 20% RTP. The reasons these LCOs are not applicable below 20% RTP are:

a. The incore neutron detectors that provide input to the COLSS, which then calculates the operating limits, are inaccurate due to the poor signal to noise ratio that they experience at relatively low core power levels.

2

BASES

APPLICABILITY (continued)

b. As a result of this inaccuracy, the CPCs assume a minimum core power of 20% RTP when generating the LPD and DNBR trip signals. When the core power is below this level, the core is operating well below the thermal limits and the resultant CPC calculated LPD and DNBR trips are strongly conservative.

ACTIONS

A.1

The ASI limits specified in the COLR ensure that the LOCA and loss of flow accident criteria assumed in the accident analyses remain valid. If the ASI exceeds its limit, a Completion Time of 2 hours is allowed to restore the ASI to within its specified limit. This duration gives the operator sufficient time to reposition the regulating or part length CEAs to reduce the axial power imbalance. The magnitude of any potential xenon oscillation is significantly reduced if the condition is not allowed to persist for more than 2 hours.

B.1

If the ASI is not restored to within its specified limits within the required Completion Time, the reactor continues to operate with an axial power distribution mismatch. Continued operation in this configuration induces an axial xenon oscillation, and results in increased LHGRs when the xenon redistributes. Reducing thermal power to ≤ 20% RTP reduces the maximum LHR to a value that does not exceed the fuel design limits if a design basis event occurs. The allowed Completion Time of 4 hours is reasonable, based on operating experience, to reduce power in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.5.1

The ASI can be monitored by both the incore (COLSS) and excore (CPC) neutron detector systems. The COLSS provides the operator with an alarm if an ASI limit is approached.

Verification of the ASI every 12 hours ensures that the operator is aware of changes in the ASI as they develop. A 12 hour Frequency for this Surveillance is acceptable because the mechanisms that affect the ASI, such as xenon redistribution or CEA drive mechanism malfunctions, cause slow changes in the ASI, which can be discovered before the limits are exceeded.

INSERT 1

TSTF-425-A

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TSTF-425-A

INSERT 1

The Frequency is controlled under the Surveillance Frequency Control Program. 6

---Reviewer's Note---
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 4

BASES

REFERENCES

U

1. FSAR, Chapter [15].

2. FSAR, Chapter [6].

1 3

3. CE-1 Correlation for DNBR.

4. 10 CFR 50, Appendix A, GDC 10.

5. 10 CFR 50.46.

6. FSAR, Section [ ].

6. UFSAR, Section 4.4.1.1.
7. UFSAR, Table 15.0-8.
8. UFSAR, Section 15.4.3.2.
9. UFSAR, Section 15.10. 4.3.2.

1

10 7. 10 CFR 50, Appendix A, GDC 26.

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.5 BASES, AXIAL SHAPE INDEX (ASI)

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

2. The headings for ISTS 3.2.5 Bases include the parenthetical expression "(Digital)." This identifying information is not included in the San Onofre Nuclear Generating Station (SONGS) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific ITS implementation. SONGS Units 2 and 3 are digital plants; therefore analog requirements and specific labels that identify a requirement is digital are not required.

3. The ISTS Bases contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

4. This "Reviewers Note" is being deleted. The Reviewers Note is for the NRC reviewer during the NRC review and will not be part of the plant specific SONGS ITS.

5. Changes are made to use correct punctuation, correct typographical errors or to make corrections consistent with the Writers Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01.

6. The Bases words changed by TSTF-425 have been modified to state "The Frequency is controlled under the Surveillance Frequency Control Program." The Surveillance Frequency Control Program provides the details for how to change the Frequencies, thus the TSTF-425 words concerning operating experience, equipment reliability, and plant risk are not always true for each of the Frequencies.

Attachment 1, Volume 5, Rev. 0, Page 142 of 144

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.5, AXIAL SHAPE INDEX (ASI)

There are no specific No Significant Hazards Considerations for this Specification.