Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

May 23, 2002
NOC-AE-02001246
10CFR50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
License Amendment Request
Proposed Revision to Relocate Shutdown Margin Limits From the
Technical Specifications to the Core Operating Limits Report And to
Modify Action Statements Consistent with NUREG-1431

Reference: 1. Letter, S. Head to U.S. Nuclear Regulatory Commission Document Control Desk, "Response to NRC Regulatory Issue Summary 2001-21," dated January 17, 2002.

Pursuant to 10 CFR 50.90, STP Nuclear Operating Company (STPNOC) requests the following amendment of Operating Licenses NPF-76 and NPF-80 for South Texas Project Units 1 and 2. The proposed change will modify the following Technical Specifications (TS):

3/4.1.1.1	"Shutdown Margin – T_{avg} Greater Than 200° F"
3/4.1.1.2	"Shutdown Margin – T_{avg} Less Than Or Equal To 200° F"
3/4.9.1	"Boron Concentration"
3/4.10.1	"Special Test Exception - Shutdown Margin"
3/4.10.6	"Special Test Exception – CET And RCS RTD Calibration Exemptions for 2RE03"
3/4.10.7	"Special Test Exception – DNB Parameters Surveillance Exemption for 2RE03"
6.9.1.6	"Core Operating Limits Report"

The proposed changes will relocate the Shutdown Margin limits to Core Operating Limits Report (COLR) and consolidate TS 3/4.1.1.1 and TS 3/4.1.1.2. These changes are consistent with the NRC-approved Industry/Technical Specification Task Force (TSTF) changes TSTF-9 and TSTF-136. These changes will allow the South Texas Project the flexibility to enhance plant operating margin and/or core design margins without the need for cycle-specific license amendment requests. In addition, STPNOC proposes to revise the action statement requirements of the Specifications to be consistent with the Westinghouse Improved Standard Technical Specifications, NUREG-1431. Also, two administrative changes will remove TS 3/4.10.6 and TS 3/4.10.7 that are historical and no longer needed.

A001

South Texas Project Nuclear Operating Company (STPNOC) has reviewed the proposed amendment pursuant to 10CFR50.92 and determined that it involves no significant hazards consideration. In addition, STPNOC has determined that the proposed amendment satisfies the criteria of 10CFR51.22(c)(9) for categorical exclusion from the requirement for an environmental assessment. The STP Plant Operations Review Committee and Nuclear Safety Review Board have reviewed and approved the proposed amendment.

In accordance with 10CFR50.91(b), STPNOC is notifying the State of Texas of this request for a license amendment by providing a copy of this letter and its attachments.

STP requests approval of the proposed change by May 31, 2003. Once approved, the amendment will be implemented within 30 days. This amendment request is one of the fourteen plant-specific submittals that STPNOC planned to submit in fiscal 2002 (Reference 1). Attachment 1 to this letter provides the No Significant Hazards Determination and Attachment 2 provides the TS pages marked up with the proposed changes. Attachment 3 provides the retyped TS pages. Attachment 4 and 5 include the proposed change to the Bases for TS 3.1.1.1 and a mark-up of the Core Operating Limits Report, provided for information.

There are no licensing commitments in this letter.

If there are any questions regarding the proposed amendment, please contact R. D. Piggott at (361) 972-7438 or me at (361) 972-8757.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 5/23/02

J. J. Sheppard
Vice President,
Engineering & Technical Services

RDP/

Attachments:

1. Licensee's Evaluation
2. Proposed Technical Specification Changes (Mark-up)
3. Proposed Technical Specification Pages (Re-Typed)
4. Proposed Technical Specification Bases (For Information)
5. Example of Core Operating Limits Report (Mark-up)

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ATTACHMENT 1

LICENSEE'S EVALUATION

LICENSEE'S EVALUATION

1.0 DESCRIPTION

STPNOC is proposing to amend Operating Licenses NPF-76 and NPF-80 for South Texas Project Units 1 and 2. The proposed changes will modify the following Technical Specifications:

3/4.1.1.1 "Shutdown Margin – T_{avg} Greater Than 200° F"
3/4.1.1.2 "Shutdown Margin – T_{avg} Less Than Or Equal To 200° F"
3/4.9.1 "Boron Concentration"
3/4.10.1 "Special Test Exception - Shutdown Margin"
3/4.10.6 "Special Test Exception – CET And RCS RTD Calibration Exemptions for 2RE03"
3/4.10.7 "Special Test Exception – DNB Parameters Surveillance Exemption for 2RE03"
6.9.1.6 "Core Operating Limits Report"

The proposed changes to relocate the Shutdown Margin limits to Core Operating Limits Report (COLR) and consolidate TS 3/4.1.1.1 and TS 3/4.1.1.2 are consistent with the NRC-approved Industry/Technical Specification Task Force (TSTF) changes TSTF-9 and TSTF-136. In addition, STPNOC proposes to revise the action statement requirements of the Specifications to be consistent with the Westinghouse Improved Standard Technical Specifications, NUREG-1431. Two administrative changes will remove TS 3/4.10.6 and TS 3/4.10.7 that are historical and no longer needed.

2.0 PROPOSED CHANGE

STPNOC proposes to make the following changes to Technical Specification 3/4.1.1.1, 3/4.1.1.2, 3/4.9.1, 3/4.10.1, 3/4.10.6, and 6.9.1.6:

No.	Page	Affected Section	Description of Change	Reason for Change
1	iv, ix	Index	Update Table of Contents as a result of proposed changes.	Update Table of Contents as a result of changes described below.
2	3/4 1-1	3.1.1.1 LCO	In accordance with TSTF-9 and NUREG 1431 the SHUTDOWN MARGIN will be specified in the Core Operating Limits Report (COLR) instead of TS Figure 3.1-1.	SHUTDOWN MARGIN (SDM) is a cycle specific variable, similar to other variables, such as, Moderator Temperature Coefficient, Rod Insertion Limits, Axial Flux Difference, Heat Flux Hot Channel Factor and Nuclear Enthalpy Rise Hot Channel Factor, all of which are currently contained in the COLR. There is an NRC approved methodology for the calculation of

No.	Page	Affected Section	Description of Change	Reason for Change
				required SDM. Relocating SDM to the COLR will provide core design and operational flexibility that can be used for improved fuel management and to solve plant specific issues. If the SDM limits were contained within the COLR, the core design could be finalized after shutdown, when the actual end of cycle burnup is known. This would save redesign effort, if the actual burnup differs from the projected value. Current reload design efforts and the resolution of plant specific issues are restricted by the guidelines with any change to SDM requiring a License Amendment Request (LAR).
3	3/4 1-1	3.1.1.1 LCO Applicability	Added Mode 5 to APPLICABILITY. In accordance with TSTF-136 and NUREG 1431, TSs 3.1.1.1 and 3.1.1.2 are combined. With the implementation of TSTF-9, in item 1 above, the two Specifications are now the same.	The LCOs, Actions and Surveillances are the same. This change combines the two Specifications and their applicability to make one SHUTDOWN MARGIN Specification. This eliminates unneeded and confusing duplication. Differences in the SHUTDOWN MARGIN above and below T_{avg} of 200° F will be addressed in the COLR.
4	3/4 1-1	3.1.1.1 Action	Replace the reference to the limits specified in Figure 3.1-1 with limits specified in the COLR.	See Item 2 above. The SHUTDOWN MARGIN limits in Figure 3.1-1 will be specified in the COLR.
5	3/4 1-1	3.1.1.1 Action	Change the ACTION statement from immediately initiate boration to initiate boration within 15 minutes.	"Immediately" in the TS Bases is considered to be 15 minutes for operator action to start boration to restore SDM. This change is consistent with NUREG-1431, Westinghouse Improved Standard Technical Specifications where the "immediately" is administratively changed to 15 minutes. This change is also consistent with the boron dilution accident analyses (UFSAR 15.4.6).
6	3/4 1-1	3.1.1.1 Action	Delete specific values for boration flow and concentration in the ACTION statement.	Action 3.1.1.1 provides instructions on restoring SDM with specific values of boron flow rate and boron concentration. The details for restoring SDM are informative, but the requirement of the specification is to maintain SDM. Thus, these

No.	Page	Affected Section	Description of Change	Reason for Change
				procedural details are not necessary for inclusion within the TS. This type of detail is included in plant procedures where the acceptable combination of boron concentration and flow rate for borating the RCS are provided. The boron concentration of 7000 ppm at a flow rate of 30 gpm will be added to the TS Bases 3/4.1.1.1 for the purpose of offering a specific example. This change is also consistent with NUREG-1431 where the boron flow rate and boron concentration are not specified in TS.
7	3/4 1-1	SR 4.1.1.1.1	Replace "greater than or equal to the limits as shown in Figure 3.1-1" to "within the limits specified in the COLR."	See Item 1 above. The SHUTDOWN MARGIN limits in Figure 3.1-1 will be specified in the COLR.
8	3/4 1-2	SR 4.1.1.1.1.d	Added Mode 5 to the applicability for this Surveillance Requirement. This requirement will account for SR 4.1.1.2.b that will be deleted with the deletion of TS 3.1.1.2.	In accordance with TSTF-136, TSs 3.1.1.1 and 3.1.1.2 are combined. This change combines the two Specifications and their applicability to make one SHUTDOWN MARGIN Specification. See Item 3 above.
9	3/4 1-3	Figure 3.1-1	Delete Figure 3.1-1, the Required SHUTDOWN MARGIN limits will be included in the COLR.	See Item 1 above. The SHUTDOWN MARGIN limits in Figure 3.1-1 will be specified in the COLR.
10	3/4 1-4 3/4 1-5	3.1.1.2 LCO 3.1.1.2 Action SR 4.1.1.2 a & b Figure 3.1-2	Delete TS 3/4.1.1.2 LCO, Action and, Surveillance Requirements. TS 3/4.1.1.2 is combined with TS 3/4.1.1.1.	The LCOs, Actions and Surveillances are the same. This change combines the two Specifications and their applicability to make one SHUTDOWN MARGIN Specification. Figure 3.1-2 will be included in the COLR. The associated Bases will be revised to reflect these changes. This change is consistent with TSTF-136 and NUREG-1431. See Item 3 and 8 above.
11	3/4 9-1	3.9.1 Action	Delete specific values for boration flow and concentration in the ACTION statement.	The details for restoring boron concentration are informative, but the requirement of the specification is to maintain the specific reactivity conditions for refueling operations. Thus, these procedural details are not necessary for inclusion within the TS. This type of detail is included in plant procedures which provides

No.	Page	Affected Section	Description of Change	Reason for Change
				acceptable methods of borating the RCS and refueling canal during refueling operations. The change is consistent with NUREG-1431 where the boron flow rate and boron concentration are not specified in TS. See also Item 6 above for similar change.
12	3/4 10-1	3.10.1 Action	Change the ACTION statement from immediately initiate boration to initiate boration within 15 minutes.	See Item 5 above.
13	3/4 10-1	3.10.1 Action a Action b	Delete specific values for boration flow and concentration in the ACTION statement.	The details for restoring boron concentration are informative, but the requirement of the specification is to maintain the SHUTDOWN MARGIN. This change is also consistent with NUREG-1431 where the boron flow rate and boron concentration are not specified. See Item 6 above.
14	3/4 10-6	3.10.6 3.10.7	Delete TS 3.10.6 & TS 3.10.7 LCOs, Actions and Surveillance Requirements. These Specifications are historical and no longer required.	These Specifications are historical, and no longer required.
15	6-21	6.9.1.6a 6.9.1.6b	Add an item to reflect the relocation of SHUTDOWN MARGIN to the COLR with reference to Specification 3.1.1.1.	See Item 2 above. Relocation of SHUTDOWN MARGIN to the COLR.

In summary, the proposed changes will relocate the Shutdown Margin limits to the Core Operating Limits Report and consolidate TS 3/4.1.1.1 and TS 3/4.1.1.2. These changes are consistent with the NRC-approved Industry/Technical Specification Task Force (TSTF) changes TSTF-9 and TSTF-136 and Westinghouse Improved Standard Technical Specifications, NUREG-1431, Revision 2. This will allow the South Texas Project the flexibility to enhance plant operating margin and/or core design margins without the need for cycle-specific license amendment requests. In addition, STPNOC proposes to revise the action statement requirements of the Specifications to be consistent with the Westinghouse Improved Standard Technical Specifications, NUREG-1431. Administrative changes will remove TS 3/4.10.6 and TS 3/4.10.7 that are historical and no longer needed.

The Technical Specification Bases for TS 3/4.1.1.1, Shutdown Margin will be revised to include a specific boron concentration and flow rate to restore SDM for the purpose of offering a specific example. In addition, an administrative change will also be made to

reflect the relocation of Shutdown Margin to the COLR and consolidation of TS 3/4.1.1.1 and TS 3/4.1.1.2.

3.0 BACKGROUND

System Description and UFSAR References:

The Limiting Condition for Operation (LCO) for Technical Specifications 3.1.1.1, 3.1.1.2, 3.9.1, and 3.10.1 assure that reactivity limits are maintained as required by the Updated Final Safety Analysis Report (UFSAR) and applicable design requirements. When the LCOs are not satisfied, the ACTIONs require emergency boration to restore Shutdown Margin (SDM) or refueling boron concentration within required limits. A sufficient SDM ensures that (1) the reactor can be made subcritical from all operating conditions, (2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and (3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SDM is a core design condition that is ensured during operation through control rod positioning and through the soluble boron concentration. The methods of boration control are provided in UFSAR 9.3.4, which describes the operation and design capabilities of the Chemical and Volume Control System (CVCS). The CVCS provides a number of functions for both normal plant operation purposes such as chemistry control or control of boron concentration for load follow and safe shutdown functions for boration. Methods of emergency boration are described in the USFAR 9.3.4. These methods include initiation of emergency boration by pumping from the Boric Acid Tanks (BAT) where boron concentration is maintained at 7000 ppm or from the refueling water storage tank (RWST), an independent source of borated water, containing a boron concentration of 2,800 - 3,000 ppm.

The STP Technical Requirements Manual (TRM) sections 3.1.2.1 - 3.1.2.7 identify the specific requirements for boration system water sources and boron injection flow paths for both operating and shutdown conditions. These requirements assure that the introduction of reactor coolant inventory is from either the BATs or RWST, where the boron concentration is greater than what would be required in the RCS for minimum SDM or refueling boron concentration. These parameters specified in the TRM provide acceptable margin to maintain subcritical operation.

Maintenance of the SDM ensures that postulated reactivity events will not damage the fuel. SDM requirements vary throughout core life as a function of fuel depletion, reactor coolant system (RCS) boron concentration, and RCS T_{avg}. In MODES 1 and 2, the most restrictive condition occurs at end-of-life, with T_{avg} at no load operating temperature, and is associated with a postulated steam line break accident (UFSAR 15.1.5) and resulting uncontrolled RCS cooldown. In the analysis of this accident, a minimum SDM of 1.3% $\Delta k/k$ is required to control the reactivity transient. The 1.3% $\Delta k/k$ SDM is the design

basis minimum for the 14-foot fuel using silver-indium-cadmium and/or Hafnium control rods (UFSAR Table 4.3-3).

In MODES 3, 4, and 5, the most restrictive condition occurs at beginning of life when the boron concentration is the greatest. In these modes, the required SDM is composed of a constant requirement and a variable requirement, which is a function of the RCS boron concentration. The constant SDM requirement of 1.3% Δk/k is based on an uncontrolled RCS cooldown from a steamline break accident. The variable SDM requirement is based on the results of the boron dilution accident analysis (UFSAR 15.4.6). The SDM is varied as a function of RCS boron concentration to guarantee a minimum of 15 minutes for operator action after a boron dilution alarm, prior to a loss of all SDM.

In Mode 6 (Refueling), the limitations on reactivity conditions ensure that the reactor will remain subcritical during core alterations, and a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the safety analyses. The value of 0.95 or less for K_{eff} includes a 1% Δk/k conservative allowance for uncertainties. Similarly, the boron concentration value of 2800 ppm or greater includes a conservative uncertainty allowance of at least 50 ppm boron. An uncontrolled boron dilution accident cannot occur in Mode 6. This accident is prevented by administrative controls (TS Surveillance 4.9.1.3) that require CVCS valves that could allow unborated water to reach the RCS to be locked closed.

Conditions and Circumstances for Proposing the Amendment

The proposed changes to relocate the SDM to the COLR and the administrative change to consolidate TS 3/4.1.1.1 and TS 3/4.1.1.2 are consistent with the NRC-approved Industry/Technical Specification Task Force (TSTF) changes TSTF-9 and TSTF-136. Since the proposed changes are applicable to STP, STPNOC elected to make application for the changes.

STPNOC has identified a need to revise the Action Statement requirements for emergency boration. STPNOC determined that the best alternative would be to adopt the Required Actions from the Westinghouse Standard Technical Specifications (NUREG-1431).

Additionally, administrative changes are proposed to remove Specifications TS 3/4.10.6 and TS 3/4.10.7 that are historical and no longer needed.

Since the application for revising the Action Statement requirements for emergency boration was already planned, it was logical to submit a single proposed change that would address all the changes to the Technical Specifications related to Boration Control.

4.0 TECHNICAL ANALYSIS

Relocation of the Shutdown Margin to the Core Operating Limits Report

The relocation of the SDM to the COLR will not change any requirements. The values for SDM will remain consistent with the UFSAR and will continue to provide their safety function through TS 3/4.1.1.1. Actions required to be taken when the SDM does not meet the limits will remain in the TS. SDM is a cycle specific variable, similar to other variables, such as, Moderator Temperature Coefficient, Rod Insertion Limits, Axial Flux Difference, all of which are currently contained in the COLR. Likewise, STPNOC uses an NRC approved methodology for the calculation of required SDM. (See Section 7.0, Reference 1)

Relocating SDM to the COLR will provide core design and operational flexibility that can be used for improved fuel management and to solve plant specific issues. If the SDM limits were contained within the COLR, the core design could be finalized after shutdown, when the actual end of cycle burnup is known. This would save redesign effort, if the actual burnup differs from the projected value. Current reload design efforts and the resolution of plant specific issues are restricted by the guidelines with any change to SDM requiring a License Amendment Request (LAR). Therefore, relocation of SDM to the COLR will conserve resources by reducing the number of LARs and associated NRC reviews.

Any changes to the COLR will be appropriately reviewed in accordance with the requirements of 10CFR50.59. A copy of the revised COLR will be sent to the NRC as required in Technical Specification 6.9.1.6.

Combination of Shutdown Margin Specifications

The proposed change to consolidate TS 3/4.1.1.1 and TS 3/4.1.1.2 is administrative. The LCO, Action, and Surveillance requirements are the same. This change combines the two Specifications and their applicability to make one Shutdown Margin Specification. This eliminates unneeded and confusing duplication. Differences in the SDM above and below T_{avg} of 200° F will be addressed in the COLR.

Revise Action Statements for Emergency Boration

Current STP Technical Specifications 3.1.1.1, 3.1.1.2, 3.9.1, and 3.10.1 require emergency boration at a rate of "greater than or equal to 30 gpm" with a concentration of "greater than or equal to 7000 ppm boron or equivalent" to meet the associated ACTION requirements. The proposed changes, which are based on Westinghouse Standard Technical Specifications (NUREG-1431), would remove these operational details from the Technical Specifications. It is the station's intent to include these values in Technical Specification Bases 3/4.1.1.1 for the purpose of offering a specific example.

The requirement of these Specifications is to maintain Shutdown Margin or refueling boron concentration within appropriate reactivity limits. The proposed change is less restrictive in that the boron flow rates and boron concentration requirements to restore shutdown margin or refueling boron concentration are removed from TS. In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. Since it is necessary to raise the boron concentration of the RCS as soon as possible, the boron concentration is required to be from sources of highly concentrated solution. Consideration should be given in adjusting the flow rate based on the core life. The most limiting conditions being at the beginning of the cycle when RCS boron concentration is highest. The boration parameters of 30 gpm and 7000 ppm represent typical values when the borated water source is the boric acid tanks which contains 7000 ppm boron. However, the refueling water storage tank, an acceptable alternative, contains between 2800 and 3000 ppm boron concentration, therefore higher flow rates are needed to provide an equivalent rate. These details are more appropriate in plant procedures. The proposed change will include these values in the TS Bases 3/4.1.1.1 for the purpose of offering a specific example. This change is consistent with NUREG-1431, Westinghouse Standard Technical Specifications, where the boron flow rate and boron concentration are not specified.

Currently, STP Technical Specifications 3.1.1.1 and 3.10.1 Action Statements require the "immediate" initiation of emergency boration. The proposed change revises the action statements to initiate boration within 15 minutes. As stated in the TS Bases, the boron dilution accident analyses (UFSAR 15.4.6) assume that operator actions to start boration will be within 15 minutes. This was determined to be adequate for an operator to correctly align and start the required systems and components and support the safety analysis. It is assumed that boration will be continued until the SDM requirements are met. This change is consistent with NUREG-1431, Westinghouse Standard Technical Specifications.

The proposed changes to the Technical Specifications will not affect the design basis for the shutdown margin or boration control systems as described in the UFSAR. There are no changes to the UFSAR safety analyses or assumptions regarding shutdown margin or reactivity controls.

In conclusion, the proposed changes relocate the Shutdown Margin limits to the COLR and consolidate SDM Specifications consistent with the NRC-approved Technical Specification Task Force changes. The values for SDM will remain consistent with the UFSAR and will continue to provide their safety function through the revised Specification. Changes also include revision of the action statement requirements to be consistent with the Westinghouse Improved Standard Technical Specifications, NUREG-1431. Finally, an administrative change will remove historical information.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Determination

Pursuant to 10 CFR 50.92, it has been determined that this proposed amendment involves no significant hazards consideration. This determination was made by applying the Nuclear Regulatory Commission established standards contained in 10CFR50.92. These standards assure that operation of South Texas Project in accordance with this request consider the following:

1) Will the change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change to relocate the Shutdown Margin limits to the Core Operating Limits Report does not change any requirements that are currently in place. No actual plant equipment or accident analyses will be affected by the proposed change. The Shutdown Margin limits in the COLR will continue to be controlled by the STP programs and procedures. The safety analysis addressed in the UFSAR will be examined with respect to changes in these limits, which are obtained using NRC-approved methodologies. Changes to the COLR will be conducted per the requirements of 10CFR50.59.

The proposed changes to modify the Specification action requirements changing the structure of the specifications to be more consistent with NUREG 1431, Westinghouse Improved Standard Technical Specifications have no technical impact. The changes clarify time requirements and remove details that remain consistent with the UFSAR safety analysis. The changes have no effect on the reactivity control systems to perform their design functions and involve no change to the accident analyses.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2) Will the change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes have no influence or impact on, nor do they contribute in any way to the probability or consequences of an accident. No safety-related equipment or safety function will be altered as a result of these proposed changes.

The SDM will continue to be calculated using the NRC-approved methods that will be submitted to the NRC. The Technical Specifications will continue to require operation within these reactivity limits.

The proposed change modifies the Specification action requirements but does not change the way the system is operated. When the limiting condition for operation is exceeded, the boration control system will continue to be operated in a manner consistent with the safety analyses. The details concerning boron flow rate and concentration that are removed from the Specifications will be added to the TS Bases for the purposes of providing an example.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3) Will the change involve a significant reduction in a margin of safety?

Response: No

The relocation of the Shutdown Margin limits to the COLR will not change any requirements. The values for SDM will remain consistent with the UFSAR and will continue to provide their safety function through the Shutdown Margin Specification. Actions required to be taken to restore SDM will remain in the TS. Therefore, the proposed change will not affect the limits on reactivity control, and will not permit operations that could result in exceeding these limits.

The proposed change modifies action requirements for restoring shutdown margin or refueling boron concentration. The combination of parameters currently in the Specification that are being removed discuss one means, where as several system lineups and boration sources have been evaluated in the safety analysis as acceptable to restore Shutdown Margin. Also, the time requirements for the action were modified to be consistent with the safety analysis assumptions. No actual accident analyses will be affected by these proposed changes. The proposed change will not affect reactivity control limits and will not permit operations that could result in exceeding these limits.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Conclusion

Based upon the analysis provided herein, the proposed amendments present no significant hazards consideration under the standards set forth in 10CFR50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

10CFR50, Appendix A, General Design Criterion (GDC) 26 requires that the reactivity control systems must be redundant and capable of maintaining the reactor core subcritical when shut down under cold conditions. Maintenance of the SDM ensures that postulated reactivity events will not damage the fuel. This has been analyzed in UFSAR Chapter 15. The reactivity control systems are designed to meet the requirements of GDC 26 where no changes to these systems are proposed therefore, these systems will continue to meet the existing regulatory requirements.

SDM satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii), an initial condition process variable periodically monitored to ensure that the unit is operating within the bounds of accident analysis assumptions. The revised Specification will continue to ensure that the SDM is maintained within acceptable limits that are bounded by the accident analyses, thus assuring conformance to 10CFR50.36. The COLR will contain the specific SDM limits resulting from NRC-approved methods. Therefore, the proposed change is in conformance with the requirements of 10CFR50.36.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10CFR51.22, an evaluation of this request has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10CFR51.22(c)(9) and (c)(10) of the regulations.

This request will have no adverse radiation impact upon the environment. It has been determined that the proposed changes involve:

1. No significant hazards consideration,

2. No significant change in the types, or significant increase in the amounts, of any effluents that may be released offsite, and

3. No significant increase in individual or cumulative occupational radiation exposures.

Therefore, this request for revision of the Technical Specifications meets the criteria of 10CFR51.22 for categorical exclusion from the requirement for an environmental assessment.

7.0 REFERENCES

1. WCAP 9272-P-A, Westinghouse Reload Safety Evaluation Methodology, July, 1985

2. NOC-AE-01001146, Proposed Amendment to South Texas Project Technical Specifications to Revise Administrative Control Requirements, dated November 5, 2001.

3. NOC-AE-01001142, Proposed Amendment to South Texas Project Technical Specifications to Relocate Various Specifications to the Technical Requirements Manual, dated October 24, 2001.

8.0 PRECEDENTS

As noted above, these changes are consistent with NRC-approved Industry/Technical Specification Task Force (TSTF) changes and/or are consistent with NUREG 1431 which have been implemented by a number of Westinghouse Plants.

ATTACHMENT 2

PROPOSED TECHNICAL SPECIFICATIONS CHANGES (MARK-UP)

Note to Reviewer: Pages iv, xi, and 6-21 included in the marked-up pages for this proposed amendment request, are also being proposed to be revised in accordance with separate amendment requests (See Attachment 1, References, Section 7.0).

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

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

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be ~~greater than or equal to the limit as shown in Figure 3.1-1~~ within the limits provided in the CORE OPERATING LIMITS REPORT (COLR).

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

ACTION:

With the SHUTDOWN MARGIN not within the limit ~~less than the limit as shown in Figure 3.1-1, immediately~~ initiate boration within 15 minutes and continue boration ~~at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or equivalent~~ until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be ~~greater than or equal to the limit as shown in Figure 3.1-1~~ within the limits specified in the COLR:

a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s);

b. When in MODE 2 with K_{eff} less than 1, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6;

c. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of Specification 4.1.1.1.1d below, with the control banks at the maximum insertion limit of Specification 3.1.3.6; and

*See Special Test Exceptions Specification 3.10.1.

SURVEILLANCE REQUIREMENTS (Continued)

d. When in MODE 3, ~~or~~ 4, or 5, at least once per 24 hours by consideration of the following factors:

1) Reactor Coolant System boron concentration,

2) Control rod position,

3) Reactor Coolant System average temperature,

4) Fuel burnup based on gross thermal energy generation,

5) Xenon concentration, and

6) Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within ± 1% Δk/k at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1d. above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 EFPD after each fuel loading. The provisions of Specification 4.0.4 are not applicable.

Relocated to COLR

(This page not used)

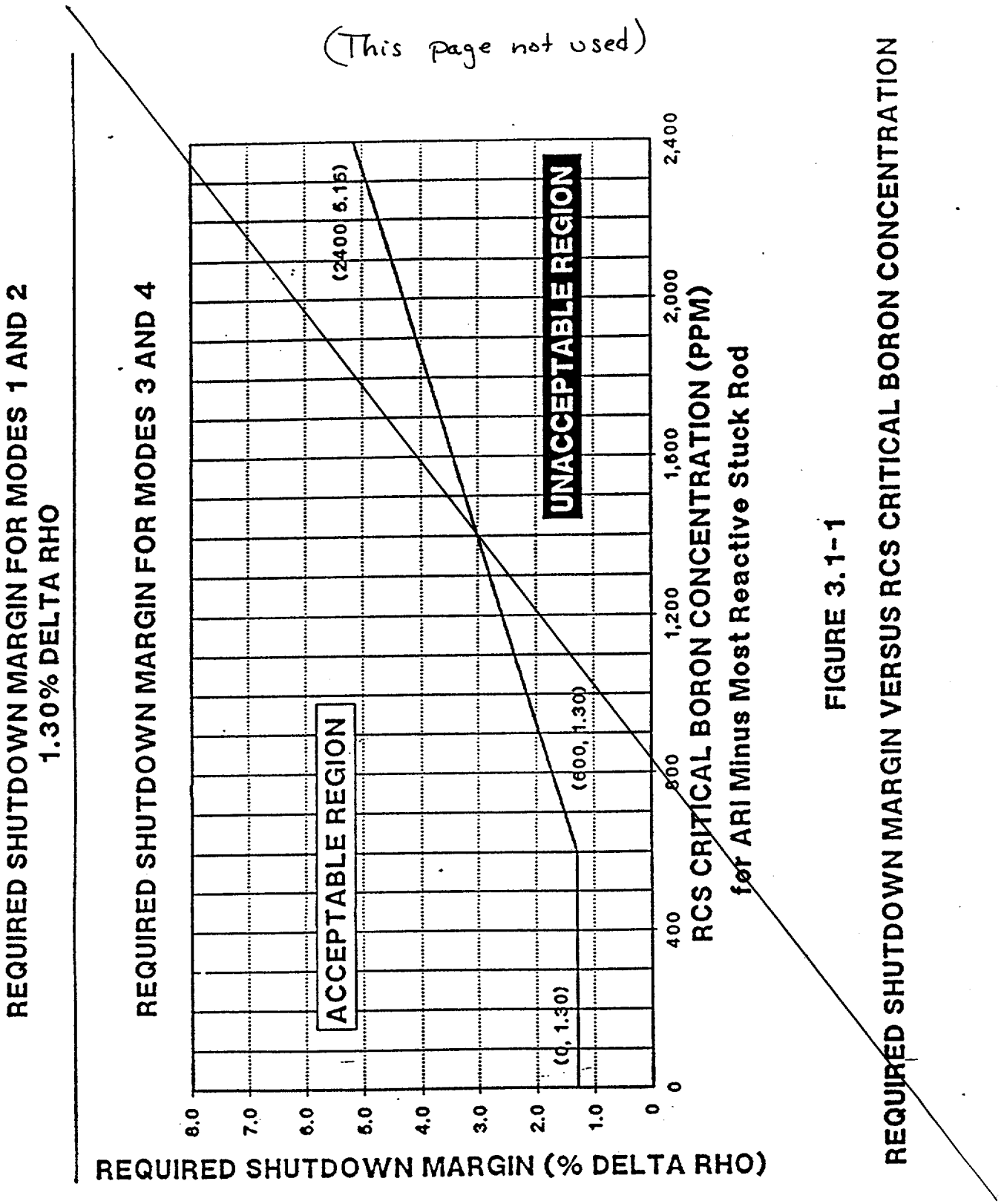

FIGURE 3.1-1

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

~~LIMITING CONDITION FOR OPERATION~~

3.1.1.2 (This specification not used) ~~The SHUTDOWN MARGIN shall be greater than or equal to the limit as shown in Figure 3.1-2.~~

~~APPLICABILITY: MODE 5.~~

~~ACTION:~~

~~With the SHUTDOWN MARGIN less than the limit as shown in Figure 3.1-2, immediately initiate and continue boration at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.~~

~~SURVEILLANCE REQUIREMENTS~~

~~4.1.1.2 The SHUTDOWN MARGIN shall be determined to be greater than or equal to the limit as shown in Figure 3.1-2:~~

~~a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s); and~~

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

~~1) Reactor Coolant System boron concentration,~~

~~2) Control rod position,~~

~~3) Reactor Coolant System average temperature,~~

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

~~5) Xenon concentration, and~~

~~6) Samarium concentration.~~

Relocated to COLR

(This page not used)

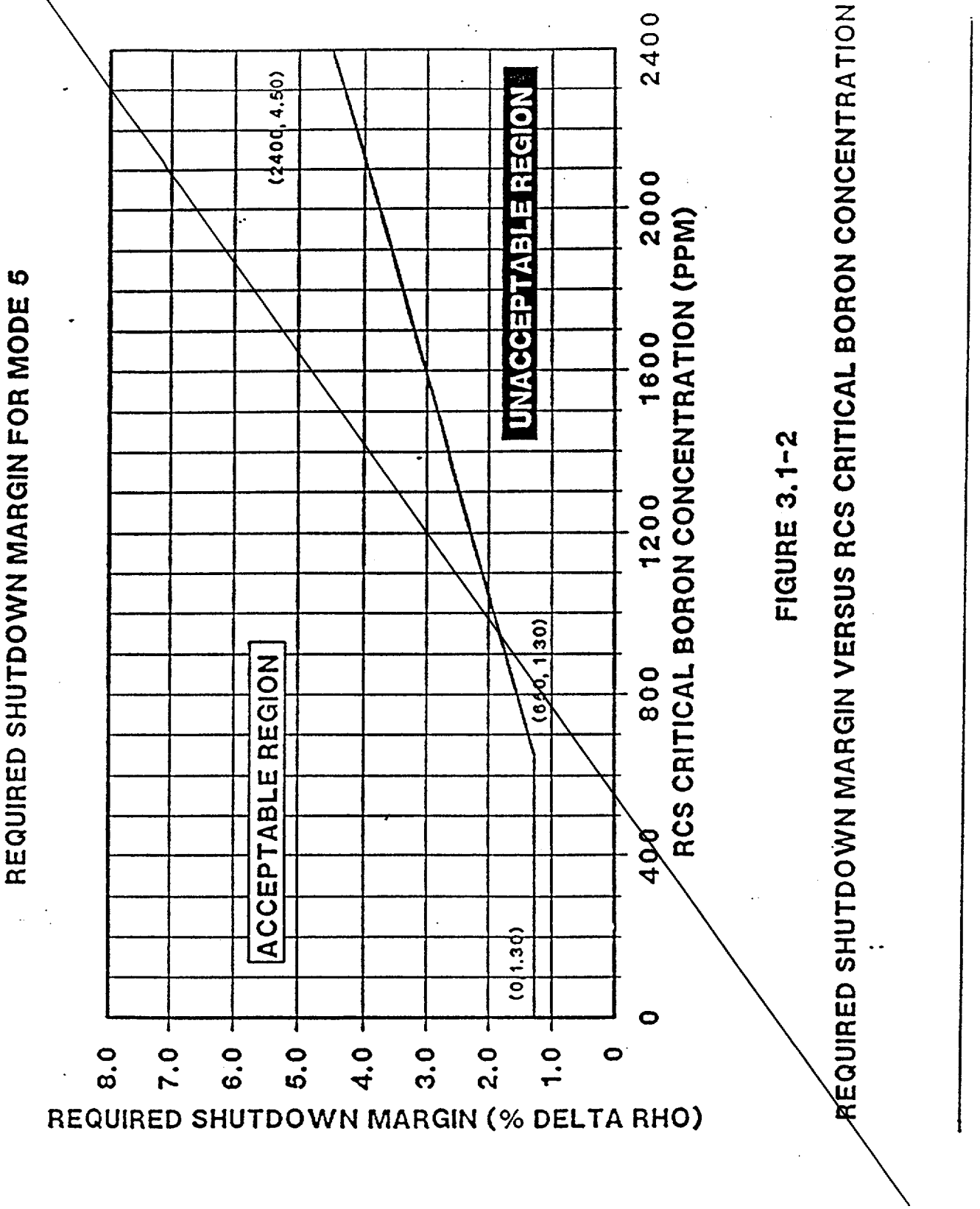

FIGURE 3.1-2

REQUIRED SHUTDOWN MARGIN VERSUS RCS CRITICAL BORON CONCENTRATION

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 The boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met; either:

a. A K_{eff} of 0.95 or less, or

b. A boron concentration of greater than or equal to 2800 ppm.

APPLICABILITY: MODE 6.*

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration ~~at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or its equivalent~~ until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 2800 ppm, whichever is the more restrictive.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full-length control rod in excess of 3 feet from its fully inserted position within the reactor vessel.

4.9.1.2 The boron concentration of the Reactor Coolant System and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

4.9.1.3 Valves FCV-110B, FCV-111B, CV0201A, and CV0221 shall be verified closed and secured in position by mechanical stops or by removal of air or electrical power at least once per 31 days.

---

*The reactor shall be maintained in MODE 6 whenever fuel is in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

3/4.10 SPECIAL TEST EXCEPTIONS

3/4.10.1 SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.10.1 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of control rod worth and SHUTDOWN MARGIN provided reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s).

APPLICABILITY: MODE 2.

ACTION:

a. With any full-length control rod not fully inserted and with less than the above reactivity equivalent available for trip insertion, ~~immediately~~ initiate boration within 15 minutes and continue boration ~~at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or its equivalent~~ until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all full-length control rods fully inserted and the reactor subcritical by less than the above reactivity equivalent, ~~immediately~~ initiate boration within 15 minutes and continue boration ~~at greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or its equivalent~~ until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

SURVEILLANCE REQUIREMENTS

4.10.1.1 The position of each full-length control rod either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each full-length control rod not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position within 24 hours prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

3/4.10 SPECIAL TEST EXCEPTIONS

~~3/4.10.6 CET AND RCS RTD CALIBRATION EXEMPTIONS FOR 2RE03~~

~~LIMITING CONDITION FOR OPERATION~~

3.10.6 (This specification not used) ~~The limitations of Specifications 3.3-2 Table 3.3-3 items 5.f and 9.b, 3.3.3.5 Table 3.3-9 Instrument items 3a, 3b and 10, 3.3.3.6 Table 3.3-10 items 2, 3, 12 and 15, 3.4.9.3 and 3.0.3 as it may apply to any of these items may be suspended until completion of the calibration procedure for the Core Exit Thermocouples and the Reactor Coolant System Resistance Temperature Detectors provided the RCS boron concentration is maintained greater than the refueling K_{eff} = 0.95 value.~~

~~APPLICABILITY: This Specification is effective ONLY for Unit 2 refueling outage 2RE03 while in MODES 3, 4, and 5.~~

~~ACTION~~

~~With RCS boron concentration less than the refueling K_{eff} = 0.95 value immediately initiate and continue boration at a greater than or equal to 30 gpm of a solution containing greater than or equal to 7000 ppm boron or equivalent until RCS boron concentration is greater than or equal to the refueling K_{eff} = 0.95 value.~~

~~SURVEILLANCE REQUIREMENTS~~

~~4.10.6.1 a. Verify the Core Exit Thermocouples and the Reactor Coolant System Resistance Temperature Detectors calibration procedure is completed and the minimum required instruments are declared OPERABLE prior to entering MODE 2.~~

~~b. The boron concentration of the RCS shall be determined by Chemical analysis at least once per 24 hours.~~

3/4 10 SPECIAL TEST EXCEPTIONS

~~3/4.10.7 DNB PARAMETERS SURVEILLANCE EXEMPTION FOR 2RE03~~

~~LIMITING CONDITION FOR OPERATION~~

3.10.7 (This specification not used) ~~The Surveillance Requirement of 4.2.5.3 to perform a precision heat balance to determine RCS flow at least once per 18 months is suspended for Unit 2 until the precision RCS heat balance flow measurement can be completed after entering MODE 1 after 2RE03 provided Reactor Power is maintained less than or equal to 75% RTP.~~

~~APPLICABILITY: This Specification is effective ONLY for Unit 2 cycle 4 while in MODE 1 until the requirements of 4.2.5.3 are met.~~

~~ACTION:~~

~~With Reactor Power greater than 75% RTP, restore Reactor Power to less than or equal to 75% RTP immediately.~~

~~SURVEILLANCE REQUIREMENTS~~

~~4.10.7.1 Verify Reactor Power is less than or equal to 75% RTP every 4 hours until the precision heat balance RCS flow verification is complete.~~

MONTHLY OPERATING REPORTS

6.9.1.5 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the PORVs or safety valves, shall be submitted on a monthly basis to the Director, Office of Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the Regional Administrator of the Regional Office of the NRC, no later than the 15th of each month following the calendar month covered by the report.

CORE OPERATING LIMITS REPORT

6.9.1.6.a Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT before each reload cycle, or any part of a reload cycle for the following:

1. Safety limits for thermal power, pressurizer pressure, and the highest operating loop coolant temperature (T_{avg}) for Specification 2.1,

2. Limiting Safety System Settings for Reactor Coolant Flow-Low Loop design flow, Overtemperature ΔT, and Overpower ΔT setpoint parameter values for Specification 2.2,

3. SHUTDOWN MARGIN limits for Specification 3/4.1.1.1,

~~3.~~4. Moderator Temperature Coefficient BOL and EOL limits, and 300 ppm surveillance limit for Specification 3/4.1.1.3,

~~4.~~5. Shutdown Bank Insertion Limit for Specification 3/4.1.3.5,

~~5.~~6. Control Bank Insertion Limits for Specification 3/4.1.3.6,

~~6.~~7. Axial Flux Difference limits and target band for Specification 3/4.2. 1,

~~7.~~8. Heat Flux Hot Channel Factor, K(Z), Power Factor Multiplier, and (F_{xy}^{RTP}) for Specification 3/4.2.2,

~~8.~~9. Nuclear Enthalpy Rise Hot Channel Factor, and Power Factor Multiplier for Specification 3/4.2.3, and

~~9.~~10. DNB related parameters for Reactor Coolant System T_{avg} Pressurizer Pressure, and the Minimum Measured Reactor Coolant System Flow for Specification 3/4.2.5.

The CORE OPERATING LIMITS REPORT shall be maintained available in the Control Room.

6.9.1.6.b The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in:

1. WCAP 9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July, 1985 (W Proprietary).

(Methodology for Specification 3.1.1.1 – Shutdown Margin, Methodology for Specification 3.1.1.3 - Moderator Temperature Coefficient, 3.1.3.5 - Shutdown Rod Insertion Limit, 3.1.3.6 - Control Bank Insertion Limits, 3.2.1 - Axial Flux Difference, 3.2.2 - Heat Flux Hot Channel Factor, 3.2.3 - Nuclear Enthalpy Rise Hot Channel Factor, and 3.2.5 - DNB Parameters.)

ATTACHMENT 3

PROPOSED TECHNICAL SPECIFICATION PAGES (RE-TYPED)

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be within the limits provided in the CORE OPERATING LIMITS REPORT (COLR).

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

ACTION:

With the SHUTDOWN MARGIN not within the limit initiate boration within 15 minutes and continue boration until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be within the limits specified in the COLR:

a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s);

b. When in MODE 2 with K_{eff} less than 1, within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6;

c. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of Specification 4.1.1.1.1d below, with the control banks at the maximum insertion limit of Specification 3.1.3.6; and

*See Special Test Exceptions Specification 3.10.1.

SURVEILLANCE REQUIREMENTS (Continued)

d. When in MODE 3, 4, or 5, at least once per 24 hours by consideration of the following factors:

1) Reactor Coolant System boron concentration,

2) Control rod position,

3) Reactor Coolant System average temperature,

4) Fuel burnup based on gross thermal energy generation,

5) Xenon concentration, and

6) Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within ± 1% Δk/k at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1d. above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 EFPD after each fuel loading. The provisions of Specification 4.0.4 are not applicable.

(This page not used)

3.1.1.2 (This specification not used)

(This page not used)

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 The boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met; either:

a. A K_{eff} of 0.95 or less, or

b. A boron concentration of greater than or equal to 2800 ppm.

APPLICABILITY: MODE 6.*

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 2800 ppm, whichever is the more restrictive.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full-length control rod in excess of 3 feet from its fully inserted position within the reactor vessel.

4.9.1.2 The boron concentration of the Reactor Coolant System and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

4.9.1.3 Valves FCV-110B, FCV-111B, CV0201A, and CV0221 shall be verified closed and secured in position by mechanical stops or by removal of air or electrical power at least once per 31 days.

---

*The reactor shall be maintained in MODE 6 whenever fuel is in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

3/4.10 SPECIAL TEST EXCEPTIONS

LIMITING CONDITION FOR OPERATION

3.10.1 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of control rod worth and SHUTDOWN MARGIN provided reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s).

APPLICABILITY: MODE 2.

ACTION:

a. With any full-length control rod not fully inserted and with less than the above reactivity equivalent available for trip insertion, initiate boration within 15 minutes and continue boration until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all full-length control rods fully inserted and the reactor subcritical by less than the above reactivity equivalent, initiate boration within 15 minutes and continue boration until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

SURVEILLANCE REQUIREMENTS

4.10.1.1 The position of each full-length control rod either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.1.2 Each full-length control rod not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position within 24 hours prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

3.10.6 (This specification not used)

3.10.7 (This specification not used)

MONTHLY OPERATING REPORTS

6.9.1.5 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the PORVs or safety valves, shall be submitted on a monthly basis to the Director, Office of Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the Regional Administrator of the Regional Office of the NRC, no later than the 15th of each month following the calendar month covered by the report.

CORE OPERATING LIMITS REPORT

6.9.1.6.a Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT before each reload cycle, or any part of a reload cycle for the following:

1. Safety limits for thermal power, pressurizer pressure, and the highest operating loop coolant temperature (T_{avg}) for Specification 2.1,

2. Limiting Safety System Settings for Reactor Coolant Flow-Low Loop design flow, Overtemperature ΔT, and Overpower ΔT setpoint parameter values for Specification 2.2,

3. SHUTDOWN MARGIN limits for Specification 3/4.1.1.1,

4. Moderator Temperature Coefficient BOL and EOL limits, and 300 ppm surveillance limit for Specification 3/4.1.1.3,

5. Shutdown Bank Insertion Limit for Specification 3/4.1.3.5,

6. Control Bank Insertion Limits for Specification 3/4.1.3.6,

7. Axial Flux Difference limits and target band for Specification 3/4.2. 1,

8. Heat Flux Hot Channel Factor, K(Z), Power Factor Multiplier, and (F_{xy}^{RTP}) for Specification 3/4.2.2,
9. Nuclear Enthalpy Rise Hot Channel Factor, and Power Factor Multiplier for Specification 3/4.2.3, and

10. DNB related parameters for Reactor Coolant System T_{avg} Pressurizer Pressure, and the Minimum Measured Reactor Coolant System Flow for Specification 3/4.2.5.

The CORE OPERATING LIMITS REPORT shall be maintained available in the Control Room.

6.9.1.6.b The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in:

1. WCAP 9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July, 1985 (W Proprietary).

(Methodology for Specification 3.1.1.1 – Shutdown Margin, Methodology for Specification 3.1.1.3 - Moderator Temperature Coefficient, 3.1.3.5 - Shutdown Rod Insertion Limit, 3.1.3.6 - Control Bank Insertion Limits, 3.2.1 - Axial Flux Difference, 3.2.2 - Heat Flux Hot Channel Factor, 3.2.3 - Nuclear Enthalpy Rise Hot Channel Factor, and 3.2.5 - DNB Parameters.)

ATTACHMENT 4

PROPOSED TECHNICAL SPECIFICATIONS BASES
(For Information only)

Note to Reviewer: STPNOC will submit actual pages to the NRC under a separate submittal when the changes described in the enclosed License Amendment Request are approved by the NRC.

3/4.1.1.1 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that: (1) the reactor can be made subcritical from all operating conditions, (2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and (3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS $T_{avg.}$ In MODES 1 and 2, the most restrictive condition occurs at EOL, with T_{avg} at no load operating temperature, and is associated with a postulated steam line break accident and resulting uncontrolled RCS cooldown. In the analysis of this accident, a minimum SHUTDOWN MARGIN OF 1.3%, $\Delta k/k$ is required to control the reactivity transient. The 1.3% $\Delta k/k$ SHUTDOWN MARGIN is the design basis minimum for the 14-foot fuel using silver-indium-cadmium and/or Hafnium control rods (Ref. FSAR Table 4.3-3). Accordingly, the SHUTDOWN MARGIN requirement for MODES 1 and 2 is based upon this limiting condition and is consistent with FSAR safety analysis assumptions. In MODES 3, 4, and 5, the most restrictive condition occurs at BOL, when the boron concentration is the greatest. In these modes, the required SHUTDOWN MARGIN is composed of a constant requirement and a variable requirement, which is a function of the RCS boron concentration. The constant SHUTDOWN MARGIN requirement of 1.3% $\Delta k/k$ is based on an uncontrolled RCS cooldown from a steamline break accident. The variable SHUTDOWN MARGIN requirement is based on the results of a boron dilution accident analysis, where the SHUTDOWN MARGIN is varied as a function of ARI N–1 Critical Boron Concentration, to guarantee a minimum of 15 minutes for operator action after a boron dilution alarm, prior to a loss of all SHUTDOWN MARGIN.

When SHUTDOWN MARGIN limits are not met the ACTION requires operators to initiate boration. In the determination of the required combination of boration flow rate and boron concentration, there is no unique requirement that must be satisfied. The boron concentration source shall be greater than the required SHUTDOWN MARGIN boron concentration. Higher source boron concentration and higher flow rates will restore SHUTDOWN MARGIN quicker. The boration parameters of 30 gpm and 7000 ppm represent typical values when the borated water source is the boric acid tanks.

ATTACHMENT 5

PROPOSED EXAMPLE OF CORE OPERATING LIMITS REPORT (MARK-UP)

(For Information only)

B1362484

G0906

Example

Nuclear Operating Company

SOUTH TEXAS
UNIT 1 CYCLE 11

CORE OPERATING LIMITS REPORT

October 2001

Edited by

C. A. Olson
J. E. Skutch

APPROVED: _____
J. J. Akers, Manager
Core Analysis B

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Nuclear Fuel
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Pittsburgh, Pennsylvania 15230

Attachment to CAB-01-289, Rev. 1

1.0 CORE OPERATING LIMITS REPORT

Revision 1 changes to this report are shown in bold and italic font.

This Core Operating Limits Report for STPEGS Unit 1 Cycle 11 has been prepared in accordance with the requirements of Technical Specification 6.9.1.6. The core operating limits have been developed using the NRC-approved methodologies specified in Technical Specification 6.9.1.6.

The Technical Specifications affected by this report are:

1)	2.1	SAFETY LIMITS
2)	2.2	LIMITING SAFETY SYSTEM SETTINGS
3) 4	3/4.1.1.3	MODERATOR TEMPERATURE COEFFICIENT LIMITS
4) 5	3/4.1.3.5	SHUTDOWN ROD INSERTION LIMITS
5) 6	3/4.1.3.6	CONTROL ROD INSERTION LIMITS
6) 7	3/4.2.1	AFD LIMITS
7) 8	3/4.2.2	HEAT FLUX HOT CHANNEL FACTOR
8) 9	3/4.2.3	NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR
9) 10	3/4.2.5	DNB PARAMETERS
3)	3/4.1.1.1	SHUTDOWN MARGIN

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented below.

2.1 SAFETY LIMITS (Specification 2.1):

2.1.1 The combination of THERMAL POWER, pressurizer pressure, and the highest operating loop coolant temperature (T_{avg}) shall not exceed the limits shown in Figure 1.

2.2 LIMITING SAFETY SYSTEM SETTINGS (Specification 2.2):

2.2.1 The Loop design flow for Reactor Coolant Flow-Low is 98,000 gpm.

2.2.2 The Over-temperature ΔT and Over-power ΔT setpoint parameter values are listed below:

Over-temperature ΔT Setpoint Parameter Values

τ_1 measured reactor vessel ΔT lead/lag time constant, τ_1 = 8 sec
τ_2 measured reactor vessel ΔT lead/lag time constant, τ_2 = 3 sec
τ_3 measured reactor vessel ΔT lag time constant, τ_3 = 0 sec
τ_4 measured reactor vessel average temperature lead/lag time constant, τ_4 = 28 sec
τ_5 measured reactor vessel average temperature lead/lag time constant, τ_5 = 4 sec
τ_6 measured reactor vessel average temperature lag time constant, τ_6 = 0 sec
K_1 Overtemperature ΔT reactor trip setpoint, K_1 = 1.14
K_2 Overtemperature ΔT reactor trip setpoint T_{avg} coefficient, K_2 = 0.028/°F
K_3 Overtemperature ΔT reactor trip setpoint pressure coefficient, K_3 = 0.00143/psig
T′ Nominal full power T_{avg}, T′ ≤ 592.0 °F
P′ Nominal RCS pressure, P′ = 2235 psig
$f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range neutron ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that;

(1) For $q_t - q_b$ between -70% and +8%, $f_1(\Delta I)$ = 0, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER;

(2) For each percent that the magnitude of $q_t - q_b$ exceeds -70%, the ΔT Trip Setpoint shall be automatically reduced by 0.0% of its value at RATED THERMAL POWER.

(3) For each percent that the magnitude of $q_t - q_b$ exceeds +8%, the ΔT Trip Setpoint shall be automatically reduced by 2.65% of its value at RATED THERMAL POWER.

Over-power ΔT Setpoint Parameter Values

τ_1 measured reactor vessel ΔT lead/lag time constant, τ_1 = 8 sec
τ_2 measured reactor vessel ΔT lead/lag time constant, τ_2 = 3 sec
τ_3 measured reactor vessel ΔT lag time constant, τ_3 = 0 sec
τ_6 measured reactor vessel average temperature lag time constant, τ_6 = 0 sec
τ_7 Time constant utilized in the rate-lag compensator for T_{avg}, τ_7 = 10 sec
K_4 Overpower ΔT reactor trip setpoint, K_4 = 1.08
K_5 Overpower ΔT reactor trip setpoint T_{avg} rate/lag coefficient, K_5 = 0.02/°F for increasing average temperature, and K_5 = 0 for decreasing average temperature
K_6 Overpower ΔT reactor trip setpoint Tavg heatup coefficient K_6 = 0.002/°F for T > T″ and, K_6 = 0 for T ≤ T″
T″ Indicated full power T_{avg}, T″ ≤ 592.0 °F
$f_2(\Delta I)$ = 0 for all (ΔI)

2.3 SHUTDOWN MARGIN (Specification 3.1.1.1):

INSERT "A"

CORE OPERATING LIMITS REPORT
INSERT "A"

2.3 <u>SHUTDOWN MARGIN</u> (Specification 3.1.1.1):

The SHUTDOWN MARGIN shall be:

2.3.1 Greater than 1.3% $\Delta\rho$ for MODES 1 and 2*
* See Special Test Exception 3.10.1

2.3.2 Greater than the limits in Figure 2 for MODES 3 and 4

2.3.3 Greater than the limits in Figure 3 for MODE 5.

*

2.4 **MODERATOR TEMPERATURE COEFFICIENT (Specification 3.1.1.3):**

2.4.1 The BOL, ARO, MTC shall be less positive than the limits shown in Figure 2.4

2.4.2 The EOL, ARO, HFP, MTC shall be less negative than -6.12×10^{-4} $\Delta k/k/°F$.

2.4.3 The 300 ppm, ARO, HFP, MTC shall be less negative than -5.36×10^{-4} $\Delta k/k/°F$ (300 ppm Surveillance Limit).

where: BOL stands for Beginning-of-Cycle Life,
EOL stands for End-of-Cycle Life,
ARO stands for All Rods Out,
HFP stands for Hot Full Power (100% RATED THERMAL POWER)
HFP vessel average temperature is 592 °F.

2.5 **ROD INSERTION LIMITS (Specification 3.1.3.5 and 3.1.3.6):**

2.5.1 All banks shall have the same Full Out Position (FOP) of at least 250 steps withdrawn but not exceeding 259 steps withdrawn.

2.5.2 The Control Banks shall be limited in physical insertion as specified in Figure 2.5

2.5.3 Individual Shutdown bank rods are fully withdrawn when the Bank Demand Indication is at the FOP and the Rod Group Height Limiting Condition for Operation is satisfied (T.S. 3.1.3.1).

2.6 **AXIAL FLUX DIFFERENCE (Specification 3.2.1):**

2.6.1 AFD limits as required by Technical Specification 3.2.1 are determined by CAOC Operations with an AFD target band of +5, -10%.

2.6.2 The AFD shall be maintained within the ACCEPTABLE OPERATION portion of Figure 2.6, as required by Technical Specifications.

2.7 **HEAT FLUX HOT CHANNEL FACTOR (Specification 3.2.2):**

2.7.1 $F_Q^{RTP} = 2.55$.

2.7.2 K(Z) is provided in Figure 2.7.

2.7.3 The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) within specific core planes shall be:

2.7.3.1 Less than or equal to 2.102 for all core planes containing Bank "D" control rods, and

2.7.3.2 Less than or equal to the appropriate core height-dependent value from Table 1 for all unrodded core planes.

2.7.3.3 $PF_{xy} = 0.2$.

These F_{xy} limits were used to confirm that the heat flux hot channel factor $F_Q(Z)$ will be limited by Technical Specification 3.2.2 assuming the most-limiting axial power distributions expected to result for the insertion and removal of Control Banks C and D during operation, including the accompanying variations in the axial xenon and power distributions, as described in WCAP-8385. Therefore, these F_{xy} limits provide assurance that the initial conditions assumed in the LOCA analysis are met, along with the ECCS acceptance criteria of 10 CFR 50.46.

For Unit 1 Cycle 11, the L(Z) penalty is not applied (i.e., L(Z) = 1.0 for all core elevations).

2.7 8 **ENTHALPY RISE HOT CHANNEL FACTOR (Specification 3.2.3):**

2.7 8 .1 WITHOUT RCS Loop-specific Temperature Calibrations:

Standard Fuel[1]	$F_{\Delta H}^{RTP}$ = ***1.46***
VANTAGE 5H / RFA Fuel[2]	$F_{\Delta H}^{RTP}$ = 1.53

WITH RCS Loop-specific Temperature Calibrations:

Standard Fuel	$F_{\Delta H}^{RTP}$ = ***1.49***
VANTAGE 5H / RFA Fuel	$F_{\Delta H}^{RTP}$ = 1.557

2.7 8 .2 ***Standard Fuel*** / VANTAGE 5H / RFA Fuel $PF_{\Delta H}$ = 0.3

2.8 9 **DNB PARAMETERS (Specification 3.2.5):**

2.8 9 .1 The following DNB-related parameters shall be maintained within the following limits:[3]

a. Reactor Coolant System T_{avg}, ≤ 595 °F[4],
b. Pressurizer Pressure, > 2200 psig[5],
c. Minimum Measured Reactor Coolant System Flow ≥ 403,000 gpm[6].

3.0 REFERENCES

3.1 Letter from R. A. Wiley (Westinghouse) to Dave Hoppes (STPNOC), "Unit 1 Cycle 11 Core Operating Limits Report," 01TG-G-085, ***Rev. 1*** (ST-UB-NOC-01002182, ***Rev. 1***), ***October*** 2001.

3.2 NUREG-1346, Technical Specifications, South Texas Project Unit Nos. 1 and 2.

3.3 STPNOC Calculation ZC-7035, Rev. 1, "Loop Uncertainty Calculation for RCS T_{avg} Instrumentation," October 19, 1998.

3.4 STPNOC Calculation ZC-7032, Rev. 3, "Loop Uncertainty Calculation for Narrow Range Pressurizer Pressure Monitoring Instrumentation," June 27, 2001.

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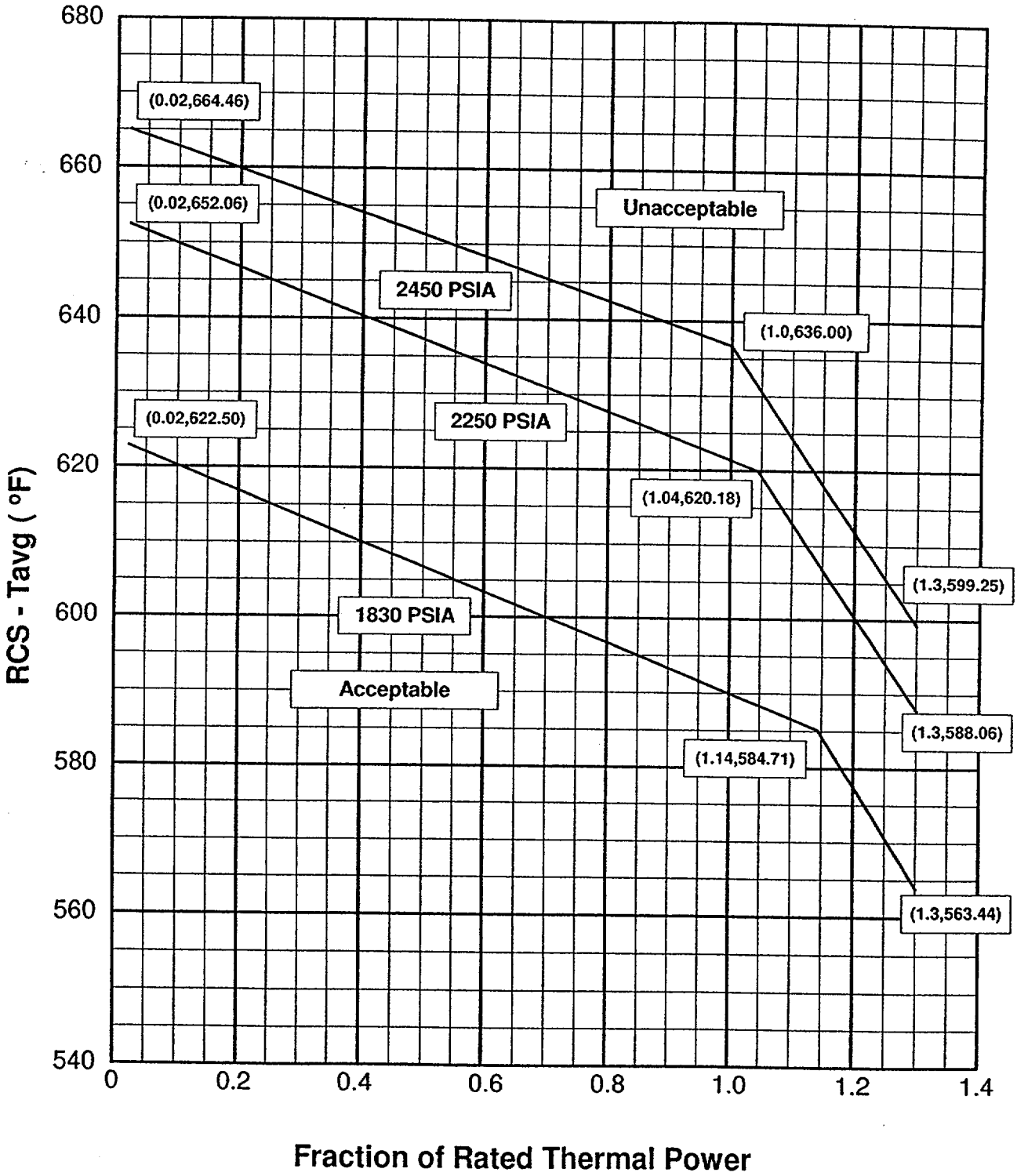
1 ***Applies to Region 5.***
2 ***Applies to Regions 10A, 11A, 11B, 12A, 13A and 13B.***
3 A discussion of the processes to be used to take these readings is provided in the basis for Technical Specification 3.2.5.
4 Includes a 1.9 °F measurement uncertainty.
5 Limit not applicable during either a Thermal Power ramp in excess of 5% of RTP per minute or a Thermal Power step in excess of 10% RTP. Includes a 10.7 psi measurement uncertainty as read on the QDPS display per Reference 3.4.
6 Includes a 2.8% flow measurement uncertainty.

Figure 1

Reactor Core Safety Limits – Four Loops in Operation



~~REQUIRED SHUTDOWN MARGIN FOR MODES 1 AND 2~~
~~1.30% DELTA RHO~~

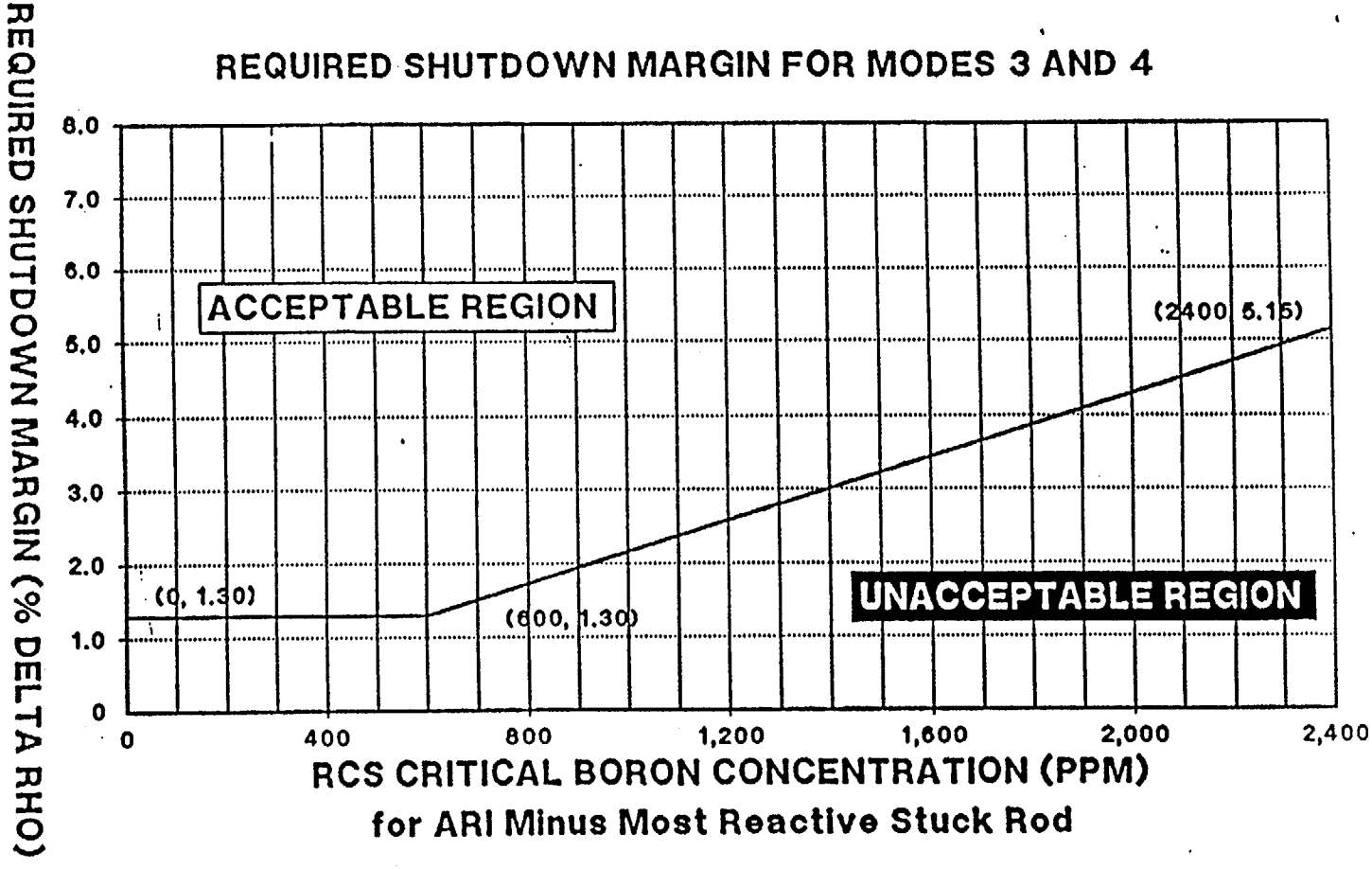


Figure 2

~~FIGURE 3.1-1~~

REQUIRED SHUTDOWN MARGIN VERSUS RCS CRITICAL BORON CONCENTRATION

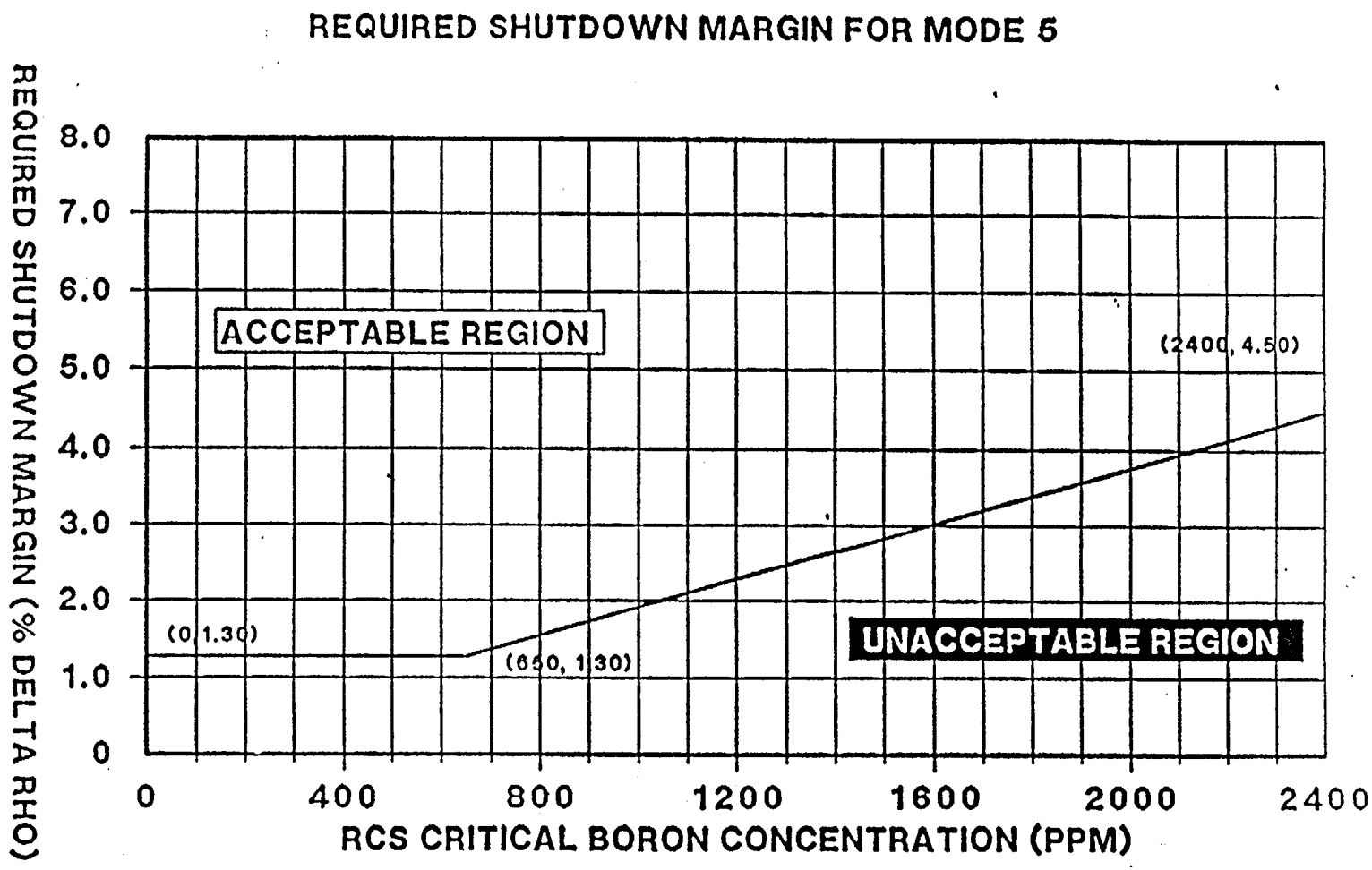


Figure 3

~~FIGURE 3.1-2~~

REQUIRED SHUTDOWN MARGIN VERSUS RCS CRITICAL BORON CONCENTRATION

Figure 2 4

MTC versus Power Level

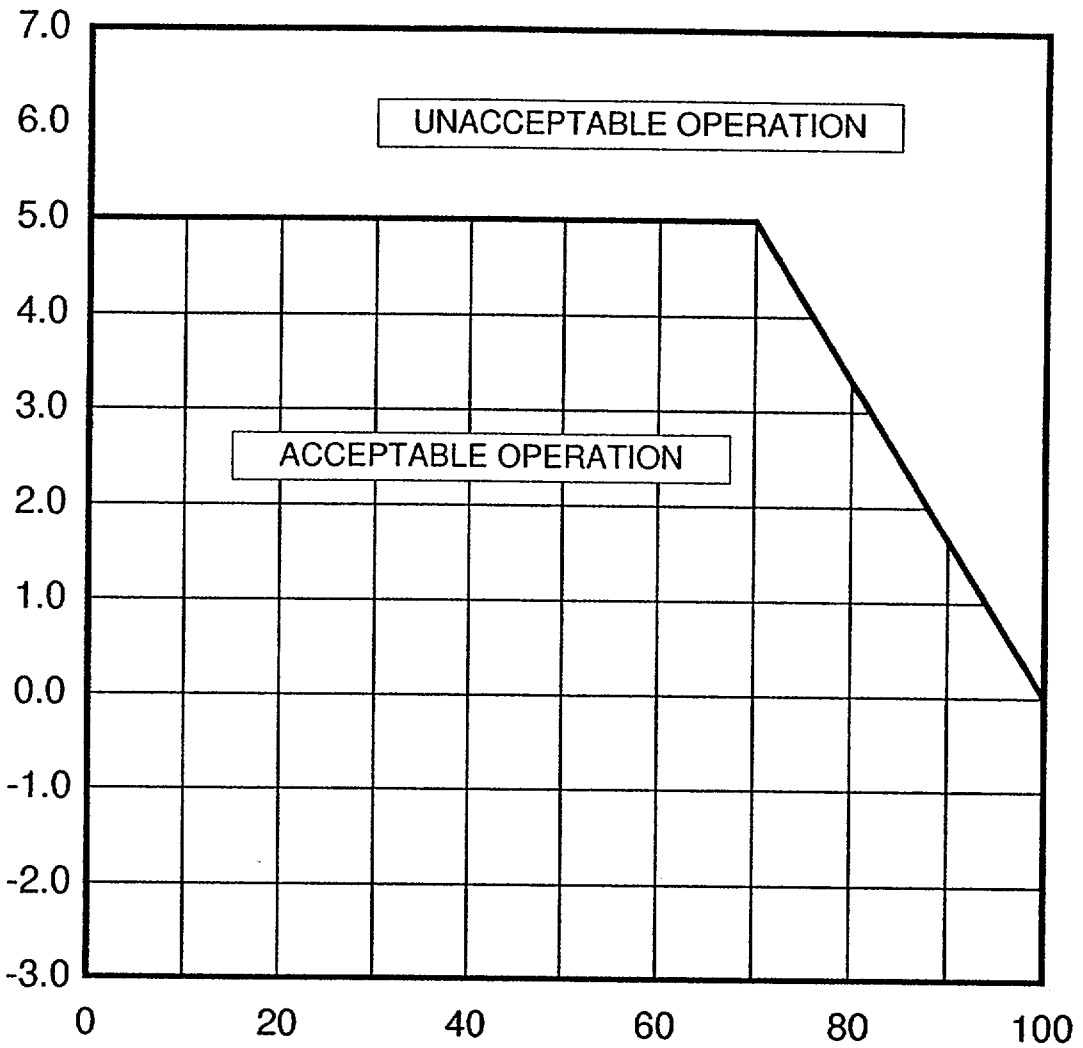


Figure 3.5

Control Rod Insertion Limits versus Power Level

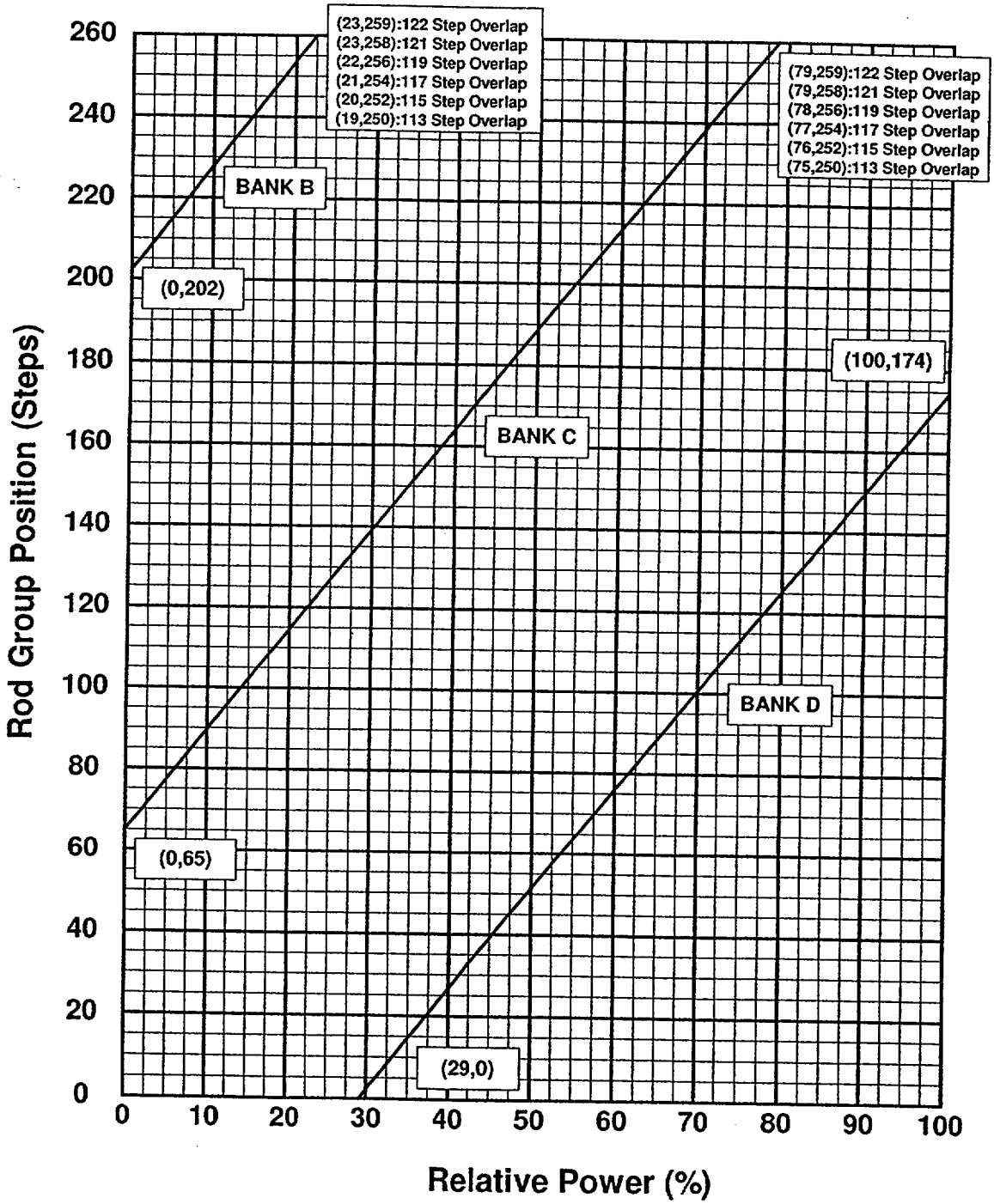


Figure 6

AFD Limits versus Rated Thermal Power

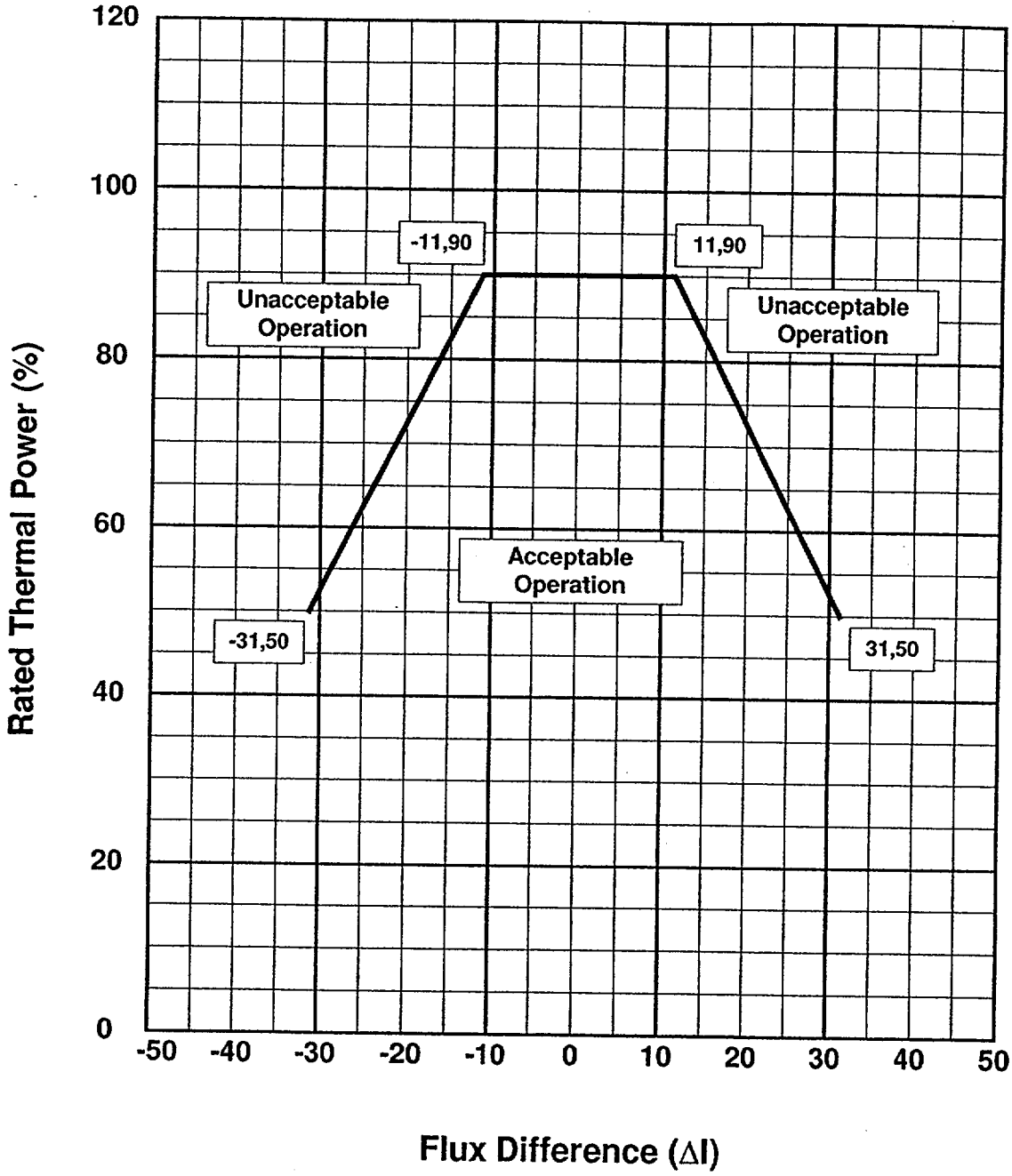


Figure 7

K(Z) – Normalized $F_Q(Z)$ versus Core Height

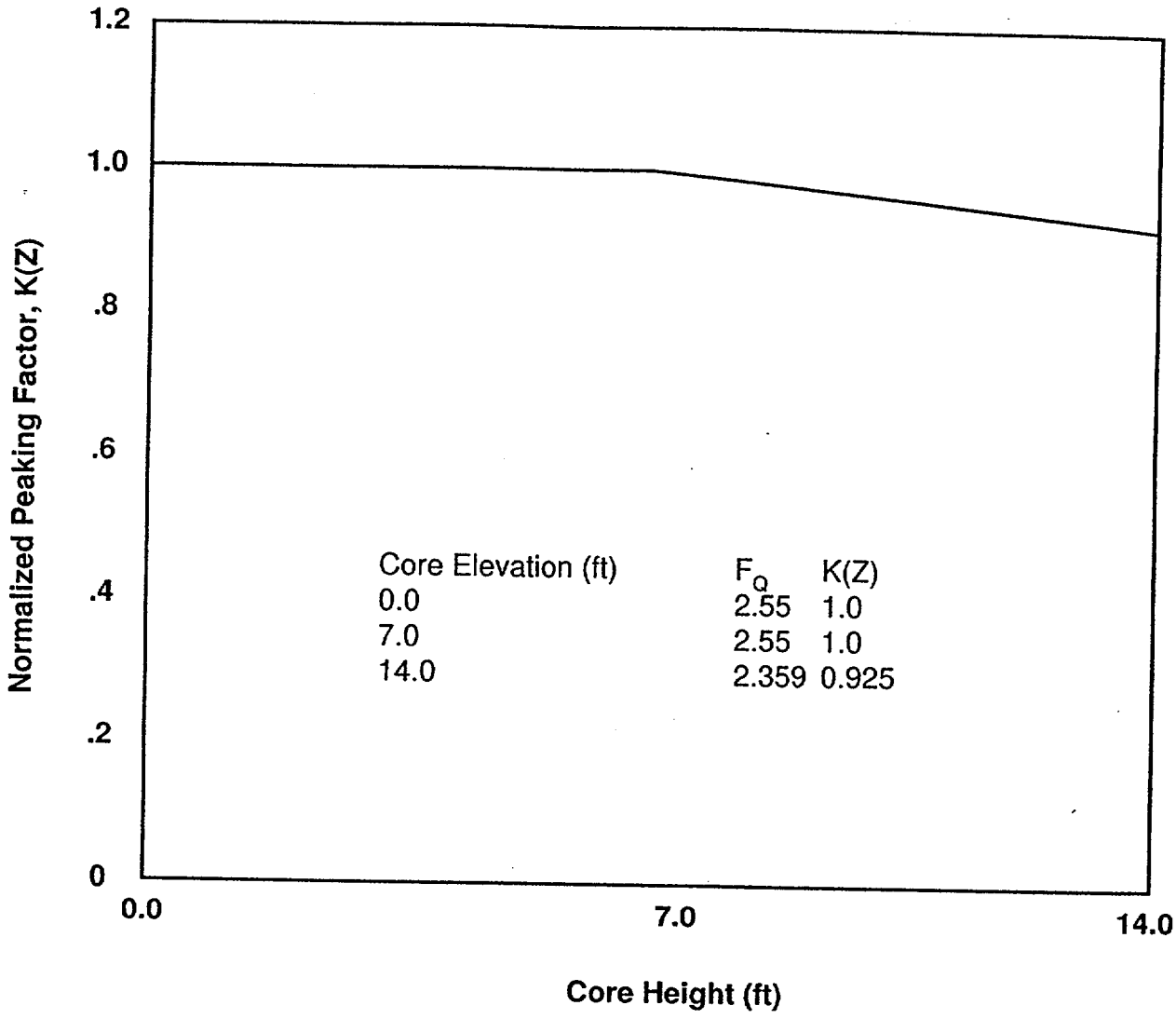


Table 1

Unrodded F_{xy} for Each Core Height* For Cycle Burnups Less Than 9000 MWD/MTU

Core Height (Ft.)	Unrodded F_{xy}	Core Height (Ft.)	Unrodded F_{xy}
14.00	5.123	6.80	1.948
13.80	4.303	6.60	1.932
13.60	3.482	6.40	1.920
13.40	2.661	6.20	1.909
13.20	2.291	6.00	1.898
13.00	2.061	5.80	1.894
12.80	2.096	5.60	1.895
12.60	2.092	5.40	1.894
12.40	2.082	5.20	1.896
12.20	2.057	5.00	1.900
12.00	2.027	4.80	1.907
11.80	2.007	4.60	1.916
11.60	2.002	4.40	1.924
11.40	2.002	4.20	1.929
11.20	2.001	4.00	1.933
11.00	1.999	3.80	1.933
10.80	1.994	3.60	1.926
10.60	1.990	3.40	1.922
10.40	1.986	3.20	1.915
10.20	1.985	3.00	1.901
10.00	1.985	2.80	1.886
9.80	1.986	2.60	1.854
9.60	1.988	2.40	1.816
9.40	1.989	2.20	1.774
9.20	1.990	2.00	1.755
9.00	1.991	1.80	1.744
8.80	1.994	1.60	1.740
8.60	1.999	1.40	1.735
8.40	2.007	1.20	1.744
8.20	2.016	1.00	1.780
8.00	2.024	0.80	1.933
7.80	2.032	0.60	2.351
7.60	2.030	0.40	2.901
7.40	2.006	0.20	3.451
7.20	1.980	0.00	4.001
7.0	1.962		

* For Unit 1 Cycle 11, the L(Z) penalty is not applied (i.e., L(Z) = 1.0 for all core elevations).

Table 2

Unrodded F_{xy} for Each Core Height*
For Cycle Burnups Greater Than or Equal to 9000 MWD/MTU

Core Height (Ft.)	Unrodded F_{xy}	Core Height (Ft.)	Unrodded F_{xy}
14.00	5.186	6.80	2.125
13.80	4.443	6.60	2.122
13.60	3.665	6.40	2.112
13.40	2.858	6.20	2.101
13.20	2.456	6.00	2.088
13.00	2.180	5.80	2.075
12.80	2.153	5.60	2.063
12.60	2.109	5.40	2.051
12.40	2.082	5.20	2.041
12.20	2.072	5.00	2.031
12.00	2.053	4.80	2.023
11.80	2.035	4.60	2.016
11.60	2.031	4.40	2.006
11.40	2.034	4.20	1.995
11.20	2.036	4.00	1.982
11.00	2.038	3.80	1.970
10.80	2.039	3.60	1.958
10.60	2.040	3.40	1.947
10.40	2.040	3.20	1.936
10.20	2.038	3.00	1.924
10.00	2.037	2.80	1.911
9.80	2.036	2.60	1.879
9.60	2.039	2.40	1.852
9.40	2.045	2.20	1.841
9.20	2.053	2.00	1.831
9.00	2.057	1.80	1.820
8.80	2.059	1.60	1.813
8.60	2.060	1.40	1.827
8.40	2.065	1.20	1.815
8.20	2.074	1.00	1.822
8.00	2.085	0.80	2.066
7.80	2.096	0.60	2.542
7.60	2.105	0.40	3.117
7.40	2.114	0.20	3.656
7.20	2.121	0.00	4.121
7.00	2.125		

* For Unit 1 Cycle 11, the L(Z) penalty is not applied (i.e., L(Z) = 1.0 for all core elevations).