3/4.2.5 DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB-related parameters shall be maintained within the following limits:

a. Reactor Coolant System T_{avg} $\leq$ ~~576.6°F~~ 577.5 °F

b. Pressurizer Pressure $\geq$ ~~2209~~ psig*, and 2205 psig

c. Reactor Coolant System Flow $\geq$ ~~277,900~~ gpm 275,000 gpm

APPLICABILITY: MODE 1.

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5.1 Each of the parameters shown above shall be verified to be within its limits at least once per 12 hours.

4.2.5.2 The RCS flow rate indicators shall be subjected to a CHANNEL CALIBRATION at least once per 18 months.

4.2.5.3 The RCS flow rate shall be demonstrated by measurement once per 18 months.

*Limit not applicable during either a THERMAL POWER ramp in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step in excess of 10% of RATED THERMAL POWER.

3/4.2.4 QUADRANT POWER TILT RATIO

The QUADRANT POWER TILT RATIO limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during STARTUP testing and periodically during power operation.

The limit of 1.02, at which corrective action is required, provides DNB and linear heat generation rate protection with x-y plane power tilts. A limit of 1.02 was selected to provide an allowance for the uncertainty associated with the indicated power tilt.

The 2-hour time allowance for operation with a tilt condition greater than 1.02 but less than 1.09 is provided to allow identification and correction of a dropped or misaligned control rod. In the event such action action does not correct the tilt, the margin for uncertainty on F_Q (Z) is reinstated by reducing the maximum allowed power by 3% for each percent of tilt in excess of 1.

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the movable incore detectors or incore thermocouple map are used to confirm that the normalized symmetric power distribution is consistent with the QUADRANT POWER TILT RATIO. The incore detector monitoring is done with a full incore flux map or two sets of four symmetric thimbles. The two sets of four symmetric thimbles is a unique set of eight detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, N-8.

3/4.2.5 DNB PARAMETERS

The limits on the DNB-related parameters assure that each of the parameters are maintained within the normal steady-state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR above the applicable design limits throughout each analyzed transient. The indicated T_{avg} value of ~~576.6~~ 577.5°F and the indicated pressurizer pressure value of ~~2209~~ 2205 psig correspond to analytical limits of ~~578.2~~ 579.2°F and 2185 psig respectively, with allowance for measurement uncertainty.

The indicated RCS flow value of ~~277,900~~ 275,000 gpm corresponds to an analytical limit of 268,500 gpm which is assumed to have a ~~3.5%~~ 2.6% measurement uncertainty. The above measurement uncertainty estimates assume that these instrument (without venturi fouling) channel outputs are averaged to minimize the uncertainty.

The 12-hour periodic surveillance of these parameters through instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation.

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
DNB Parameters, Limiting Condition for Operation

ATTACHMENT 2

SAFETY ANALYSIS

INTRODUCTION

Pursuant to the requirements in 10 CFR 50.92, each application for amendment to an operating license must be reviewed to determine if the modification involves a significant safety hazard. The proposed amendment, as defined in this report, has been reviewed and deemed not to involve a significant safety hazard based on the evaluation that follows.

This proposed amendment describes the following subjects:

1. Revision of Section 3/4.2.5, Power Distribution Limits, DNB Parameters, reflecting revised indicated values;

   (a) RCS flow changing from ≥277,900 gpm to ≥275,000 gpm,
   (b) RCS Tavg changing from ≤576.6 °F to ≤577.5 °F,
   (c) Pressurizer pressure changing from ≥2209 psig to ≥2205 psig.

   These revisions are due to;

   (a) reduction of the uncertainties associated with the measurement of RCS flow,
   (b) the use of Eagle 21 digital process rack equipment for the treatment of Hot Leg and Cold Leg temperature, and
   (c) the replacement and respanning of the pressurizer pressure transmitters.

2. Revision of the Bases Section 3/4.2.5, Power Distribution Limits, DNB Parameters, to reflect the changes noted in (1) above.

BACKGROUND

In order to increase the operating margins associated with the DNB limits, the changes to the Technical Specifications shown in Attachment 1 are being proposed by Florida Power and Light. The proposed revisions involve either;

a) reducing the uncertainties associated with the measurements of various parameters,
b) use of upgraded process instrumentation equipment, or
c) use of upgraded transmitters.

By improving procedures and replacement of instrumentation, it has been possible to provide additional operational margin to the limits associated with the measurement and indication of RCS flow, Tavg and pressurizer pressure.

The limits on the DNB-related parameters assure that each of the parameters is maintained within the normal steady-state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been demonstrated adequate to maintain the required minimum DNBR above the applicable design limits throughout each analyzed transient.

In conjunction with the RTD bypass elimination effort (which includes the use of digital process rack equipment for temperature related protection functions), and RPS/ESF Setpoint changes, Florida Power and Light Company is replacing the pressurizer pressure transmitters associated with the protection functions of Technical Specifications Section 2.2, Limiting Safety System Settings and Section 3/4.3.2, Engineered Safety Features Actuation System Instrumentation. With this equipment change, revision to the indicated limits on the DNB-related parameters is required. All of the limits have been recalculated with the use of the NRC approved Westinghouse Setpoint Methodology.

The methodology used is the "square root of the sum of the squares" which has been used in other Westinghouse reports. This technique, or others of a similar nature, have been used in WCAP-10395, Statistical Evaluation of LOCA Heat Source Uncertainty, and WCAP-8567, Improved Thermal Design Procedure. WCAP-8567 is approved by the NRC noting acceptability of statistical techniques for the application requested. Also, various ANSI, American Nuclear Society, and Instrument Society of America standards approve the use of probabilistic and statistical techniques in determining safety-related setpoints (specifically ANSI/ANS Standard 58.4-1979, "Criteria for Technical Specifications for Nuclear Power Stations," and ISA Standard S67.04, 1987, "Setpoints for Nuclear Safety-Related Instrumentation Used in Nuclear Power Plants"). The methodology used in this report is essentially the same as that used for V. C. Summer in August, 1982; approved via NUREG-0717, Supplement No. 4, "Safety Evaluation Report related to the Operation of Virgil C. Summer Nuclear Station, Unit No. 1," Docket No. 50-395, August 1982.

IMPACT OF THE PROPOSED TECHNICAL SPECIFICATION CHANGE ON THE FINAL SAFETY ANALYSIS REPORT

A review of the FSAR safety analyses was performed to assess the effects of the proposed Technical Specification changes and determine the need for re-analysis. Based on the review performed, re-analysis is not required. The assumptions for the various analyses are noted in Table 1.

TABLE 1

Basis/Parameter	Tavg	Pressure	RCS Flow
LOCA analyses	574.2 °F	2235 psig	268,500 gpm
Non-LOCA Analyses	579.2 °F	2185 psig	268,500 gpm
Controller Uncertainty	± 5.0 °F	± 50 psig	N/A
Indication Uncertainty	± 1.7 °F	± 20 psig	+ 2.6 % flow
Current Tech Spec Limit	576.6 °F	2209 psig	277,900 gpm
Proposed Tech Spec Limit	577.5 °F	2205 psig	275,000 gpm

An evaluation of the events which could be potentially impacted by the proposed Technical Specification changes was performed and is presented below.

Non-LOCA Safety Analyses

RCS Flow

The current indication limit for RCS flow measurement uncertainty is based on the NRC mandated value of 3.5% based on Turkey Point Units 3 and 4 not providing a justification for a smaller value. This is the standard approach used by the Staff for such circumstances and has been determined to be acceptable by the Staff. With the removal of the RTD bypass manifolds, Westinghouse has performed an uncertainty calculation to determine the RCS flow measurement uncertainty based on revised plant procedures, techniques and the modified plant configuration. This calculation is specific to Turkey Point Units 3 and 4 and reflects the instrumentation and techniques utilized at these plants. The RCS flow measurement uncertainty calculated is 2.6% flow (without venturi fouling). Use of this calculated measurement uncertainty maintains the assumption of the safety analyses with regards to RCS flow, i.e., verification that RCS flow is greater than or equal to the thermal design flow. Decreasing the reactor coolant system flow measurement uncertainty from 3.5% to 2.6% does not affect the non-LOCA safety analyses. This decrease in uncertainty allows the flow requirement of T.S. 3/4.2.4 to be reduced to 275,000 gpm from the current technical Specification value of 277,900 gpm, while

maintaining the current analytical thermal design flow limit of 268,500 gpm. The analytical limit of 268,500 gpm is used in the safety analyses.

Since the proposed change does not affect the flow used in the safety analyses, the proposed change to the flow Technical Specification is consistent and acceptable with respect to the non-LOCA safety analyses.

TAVG

The revised indicated value of 577.5 °F for Tavg did not require a change in the analysis assumptions. The analytic value assumed in the non-LOCA safety analyses remains 579.2 °F for Tavg. The change from the analytic value of 578.2 °F for Tavg quoted on the current Technical Specification Bases to the current analytic value of 579.2 °F was previously evaluated as part of the RPS/ESF Setpoints and RTD bypass elimination proposed license amendments which are currently under NRC review. The current indication limit for Tavg (576.6 °F) is based on the accuracy of the Rod Control system utilizing analog process equipment throughout the control channel instrumentation. With the removal of the RTD bypass manifolds, digital process equipment has been installed for temperature related protection functions. This digital equipment converts the RTD output to a digital signal which is processed for protection functions. The digital signal is then converted back to an analog signal for processing by the analog control system. The utilization of both analog and digital process equipment, along with increasing the number of Hot Leg RTDs utilized, results in an increase in the uncertainty (+/- 1.0 °F) of the Tavg Rod Control system. The increase in the control system uncertainty has been factored into the Safety Analysis as a revised initial condition. The Median Signal Selector has been utilized for the determination of the appropriate loop indicated Tavg for control system use. The Median Signal Selector satisfies the requirements of IEEE 279 with regards to control/protection system interaction. Thus, the conclusions of the various affected safety analyses are maintained.

Pressurizer Pressure

The revised indicated value of 2205 psig for pressurizer pressure does not require a change in the analytical value. The analytic value assumed in the non-LOCA safety analyses remains 2185 psig. This represents an uncertainty of +/- 50 psi on initial pressurizer pressure. The current indication limit for pressurizer pressure (2209 psig) is based on the accuracy of the Pressurizer Pressure Control System and the use of protection channel transmitters for indication in the control room. The input signal is currently generated by a Rosemount 1153GD9 transmitter with an instrument span of 800 psig. Turkey Point Units 3 and 4 are upgrading the protection channel transmitters

to Rosemount 1154SH transmitters with an instrument span of 1000 psig. The control channel transmitters will remain as Rosemount 1153GD9 transmitters with a respanning of the instrument channel to 1000 psig. Both of these modifications result in a change to the indication limit. Uncertainty calculations have been performed for the modifications; the increased instrument span for the control channel results in an increased control system uncertainty. This increased uncertainty has been previously evaluated or assumed in the non-LOCA safety analyses as a revised initial condition, therefore, the conclusions of the various affected safety analyses remain valid.

LOCA Safety Analyses

The effect of the proposed changes on the results of the following LOCA related accident analyses was considered:

1. Large Break LOCA	FSAR Chapter 14.3.2
2. Small Break LOCA	FSAR Chapter 14.3.2
3. Blowdown Reactor Vessel and Loop Forces	FSAR Chapter 14.3.3
4. Post-LOCA Long-term Core Cooling Subcriticality	FSAR Chapter 14.3.2
5. Hot Leg Switchover to Prevent Potential Boron Precipitation	FSAR Chapter 6.2

The results of the evaluation indicate that no adverse effect on the FSAR results for any of the analyses given above is expected. This conclusion is based upon the fact that only the uncertainties associated with each of the DNB Technical Specification related parameters: RCS Tavg, pressurizer pressure, and RCS flow, have changed while the initial conditions for the accident analyses remain unchanged.

While the uncertainties associated with the RCS average temperature have changed by +/- 1 °F from that "typically" assumed (+/- 4 °F) acceptable from the perspective of the LOCA related transients, any effect of the increased uncertainty is expected to be negligible. Furthermore, the uncertainty associated with the pressurizer pressure remains unchanged while the uncertainty associated with the RCS flow has been reduced from 3.5% to 2.6%. However, since the safety analyses basis thermal design flow remains unchanged at a value of 268,500 gpm, the results of the LOCA related accident analyses remain unchanged.

The evaluations presented above demonstrate that the results and conclusions of the safety analyses used to license the current operation of Turkey Point Units 3 and 4 remain valid after consideration of the proposed changes to the DNB Parameters Technical Specification.

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
DNB Parameters, Limiting Condition for Operation

ATTACHMENT 3

NO SIGNIFICANT HAZARDS DETERMINATION

The standards used to arrive at a determination that a request for amendment involves a no significant hazards consideration are included in the Commission's regulations, 10 CFR 50.92, which states that no significant hazards considerations are involved if the operations of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated or (3) involve a significant reduction in the margin of safety. Each standard for each parameter is discussed on the following pages.

RCS FLOW

1. **Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.**

   The current indication limit for RCS flow measurement uncertainty is based on the NRC mandated value of 3.5% based on Turkey Point Units 3 and 4 not providing a justification for a smaller value. This is the standard approach used by the Staff for such circumstances and has been determined to be acceptable by the Staff. With the removal of the RTD bypass manifolds, Westinghouse has performed an uncertainty calculation to determine the RCS flow measurement uncertainty based on revised plant procedures, techniques and the modified plant configuration. This calculation is specific to Turkey Point Units 3 and 4 and reflects the instrumentation and techniques utilized at these plants. The RCS flow measurement uncertainty calculated is 2.6% flow (without venturi fouling). Use of this calculated measurement uncertainty maintains the assumption of the safety analyses with regards to RCS flow, i.e., verification that RCS flow is greater than or equal to the thermal design flow. Since the RCS flow analysis assumption is not changed, the conclusions of the various affected safety analyses remain valid. Therefore, revision of the indication limit to reflect the modified procedures, techniques and plant configuration does not increase the probability or consequences of the affected accidents previously analyzed.

   In summary, the revised indication limit continues to preserve the initial conditions of the plant safety analyses. Therefore, the results and conclusions of the

analyses are consistent with those performed previously. Therefore, the proposed change does not affect the probability or consequences of accidents previously analyzed.

2. **Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident previously evaluated.**

   The revised RCS flow value (275,000 gpm) reflects the removal of the RTD bypass manifolds, which is currently under NRC review, and measurement of Hot Leg and Cold Leg temperatures in a precise manner. Since the value noted preserves the verification of the measured RCS flow greater than or equal to thermal design flow, no new or different kind of accidents from that previously evaluated are created.

   In summary, the revision reflects changes in plant design currently under NRC review and previously approved calculational methods. No new or different accidents from those previously evaluated have been created as a result of these revisions.

3. **Use of the modified specification would not involve a significant reduction in the margin of safety.**

   The indication limit for measured RCS flow (275,000 gpm) maintains the initial condition for flow assumed in the safety analyses, i.e., RCS flow in the plant is verified to be greater than or equal to thermal design flow (268,500 gpm). The measurement uncertainty is calculated consistent with other plants using Westinghouse Setpoint Methodology. Therefore, the margin to safety is not reduced for this parameter.

   In summary, the proposed revision to the Turkey Point Units 3 and 4 Technical Specifications explicitly reflects plant modifications currently under NRC review, (e.g., RTD Bypass Elimination proposed license amendment) and previously approved Westinghouse uncertainty calculational methodology. The revision maintains the margin of safety previously defined in the current Technical Specifications by use of the same calculational approach and by maintaining the safety analyses assumptions and conclusions. The revised value provides increased operational margin through improved accuracy in instrumentation and measurement techniques without reduction in the previously defined margin to safety.

Tavg

1. **Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.**

   The current indication limit for Tavg (576.6 °F) is based on the accuracy of the Rod Control System utilizing analog process equipment throughout the control channel instrumentation. With the removal of the RTD bypass manifolds, digital process equipment has been installed for temperature related protection functions. This digital equipment converts the RTD output to a digital signal which is processed for protection functions. The digital signal is then converted back to an analog signal for processing by the analog control system. The utilization of both analog and digital process equipment, along with increasing the number of Hot Leg RTDs utilized, results in a change in the uncertainty (+/- 1.0 °F) of the Tavg Rod Control System. The increase in the control system uncertainty has been previously factored into the safety analyses as a revised initial condition. The Median Signal Selector has been utilized for the determination of the appropriate loop indicated Tavg for control system use. The Median Signal Selector satisfies the requirements of IEEE 279 with regards to control/protection system interaction. Thus, the conclusions of the various affected safety analyses are maintained. Therefore, revision of the indication limit to reflect the modified plant configuration and process instrumentation does not increase the probability or consequences of the affected accidents previously analyzed.

   In summary, the revised indication limit (577.5 °F) continues to preserve the initial conditions of the plant safety analyses. Thus, the results and conclusions of the analyses are consistent with those performed previously. Therefore, the proposed change does not affect the probability or consequences of accidents previously analyzed.

2. **Operation of the facility in accordance with the proposed amendment would not create the possibility of a new of different kind of accident previously evaluated.**

   The proposed revision maintains the assumptions made in the safety analyses performed to reflect the installation of the upgraded equipment and thus does not create the possibility of a new or different kind of accident.

The revised indicated Tavg value (577.5 °F) reflects the inclusion of a digital to analog process instrumentation interface. The additional instrument uncertainties present as a result of this interface have been determined and incorporated into the safety analyses assumptions. The conclusions of these analyses remain unchanged. Control/protection interaction has been addressed by the utilization of the Median Signal Selector for selection of the appropriate Tavg channel for control. Use of the Median Signal Selector assures selection of the appropriate Tavg channel even after a single Tavg channel failure and precludes the need for action by the protection system. This satisfies the requirements of IEEE 279. Based on this design feature and the continued validation of the safety analyses conclusions, no new or different kind of accidents from those previously evaluated are created.

In summary, the revision reflects changes in plant design currently under NRC review and previously approved calculational methodology. No new or different kind of accidents from those previously evaluated have been created as a result of these revisions.

3. **Use of the modified specification would not involve a significant reduction in the margin of safety.**

The indication limit for Tavg is based on the accuracy of the Rod Control System and the indication uncertainty in the control room. This limit maintains the initial condition for Tavg assumed in the safety analyses (579.2 °F). The revised Rod Control System accuracy and the revised indication uncertainty have been evaluated and the conclusions of the affected safety analyses remain unchanged. Therefore, the margin to safety is not reduced for this parameter.

In summary, the proposed revision to the Turkey Point Units 3 and 4 Technical Specifications explicitly reflects plant modifications currently under NRC review (i.e., RTD Bypass Elimination proposed license amendment), and previously approved uncertainty calculational methodology. The revision maintains the margin to safety previously defined in the current Technical Specifications by use of the same calculational approach and by maintaining the safety Analyses assumptions and conclusions. The revised value provides increased operational margin through improved accuracy in instrumentation and measurement techniques without reduction in the previously defined margin to safety.

Pressurizer Pressure

1. **Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.**

The current indication limit for pressurizer pressure (2209 psig) is based on the accuracy of the Pressurizer Pressure Control System and use of protection channel transmitters for indication in the control room. The input signal is currently generated by a Rosemount 1153GD9 transmitter with an instrument span of 800 psig. Turkey Point Units 3 and 4 are upgrading the protection channel transmitters to Rosemount 1154SH transmitters with an instrument span of 1000 psig. The control channel transmitters will remain as Rosemount 1153GD9 transmitters with a respanning of the instrument channel to 1000 psig. Both of these modifications result in a change to the indication limit. Uncertainty calculations have been performed for the modifications; the increased instrument span for the control channel results in an increased control system uncertainty. This increased uncertainty has been previously factored into the safety analyses as a revised initial condition. The conclusions of the various affected safety analyses are maintained. Utilization of the revised indication uncertainty, reflecting the use of the Rosemount 1154SH transmitters, preserves this initial condition assumption. The Rosemount 1154SH transmitters are similar in design to the 1153GD9, thus no significant increase in the probability of an accident previously evaluated has been determined. Since the conclusions of the safety analyses are maintained, no increase in the consequences of an accident previously evaluated has been determined.

In summary, the revised indication limit (2205 psig) continues to preserve the initial conditions of the plant safety analyses. Therefore, the results and conclusions of the analyses are consistent with those performed previously. Thus, the proposed change does not affect the probability or consequences of accidents previously analyzed.

2. **Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident previously evaluated.**

The proposed revision maintains the assumptions made in the safety and transient analyses performed to reflect the installation of the upgraded equipment and thus does not create the possibility of a new or different kind of accident. The revised indicated pressurizer Pressure value (2205 psig) reflects the transmitter replacement and respanning of the protection channels, used for control room indication, and the respanning of the control channel. The additional instrument uncertainties presented as a result of the channel respanning have been determined and previously incorporated into the initial condition assumptions of the safety analyses. The conclusions for these analyses remain unchanged. Control/protection interaction has been addressed by separation of the control and protection channels, i.e., no shared components, which addresses the requirements of IEEE 279. The design of the protection system replacement transmitters is similar to the present transmitters, thus no new or different kind of accidents from that previously evaluated are created.

In summary, the revision reflects changes in plant design currently under NRC review and previously approved calculational methods. No new or different accidents from those previously evaluated have been created as a result of these revisions.

3. **Use of the modified specification would not involve a significant reduction in the margin of safety.**

The proposed changes maintain a margin of safety consistent with that used to determine the original indicated values for the parameters noted, i.e., the same calculational methodology was used for both limits.

The indication limit for pressurizer pressure (2205 psig) is based on the accuracy of the Pressurizer Pressure Control System and the indication uncertainty in the control room. This limit maintains the initial condition for pressure assumed in the safety analyses (2185 psig). The revised control system accuracy and the revised indication uncertainty have been previously evaluated and the conclusions of the affected safety analyses remain unchanged. Therefore, the margin to safety is not reduced for this parameter.

In summary, the proposed revision to the Turkey Point Units 3 and 4 Technical Specifications explicitly reflects previously approved uncertainty calculational methodology. The revision maintains the margin of safety previously defined in the current Technical Specifications by using the same calculational approach and maintaining the safety

analyses assumptions and conclusions. The revised value provides increased operational margin through improved accuracy in instrumentation and measurement techniques without reduction in the previously defined margin of safety.

Based on the above, it has been determined that the proposed amendment request does not,

(1) involve a significant increase in the probability or consequences of an accident previously evaluated,

(2) create the probability of a new or different kind of accident from any accident previously evaluated, or

(3) involve a significant reduction in the margin of safety;

and therefore, does not involve any significant safety hazards consideration.