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SOUTHERN COMPANY
Energy to Serve Your World℠

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

VOGTLE ELECTRIC GENERATING PLANT
REQUEST TO REVISE TECHNICAL SPECIFICATIONS
REVISION TO SURVEILANCE REQUIREMENTS 3.3.1.2 AND 3.3.1.3

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.90, Southern Nuclear Operating Company (SNC) proposes to revise Vogtle Electric Generating Plant (VEGP) Unit 1 and Unit 2 Technical Specifications (TS) Surveillance Requirement SR 3.3.1.2 for the Nuclear Instrumentation System (NIS) Power Range daily surveillance. When operating above 15% Rated Thermal Power (RTP), the Technical Specifications require the adjustment of the Power Range channel(s) when the absolute difference between Power Range indicated power and secondary side calorimetric power is greater than 2% RTP. Compliance with this requirement may result in a non-conservative channel calibration during reduced power operations. The proposed change to SR 3.3.1.2 will resolve this undesirable condition by requiring adjustment of the NIS Power Range channel(s) only when the calorimetric calculated power exceeds the Power Range indicated power by more than + 2% RTP. In addition, the format of SR 3.3.1.3 is being revised to be consistent with the format of the proposed change to SR 3.3.1.2.

In the interim, to ensure compliance with the Technical Specifications and conformance with the safety analyses, Vogtle has implemented administrative controls.

A TSTF Standard Technical Specification Change Traveler (TSTF-371-A, Revision 1) for the proposed changes to SR 3.3.1.2 and SR 3.3.1.3 for Westinghouse (NUREG-1431) plants has been approved by the NRC on April 2, 2002. The changes proposed for VEGP are consistent with those in the traveler with exceptions to the Bases changes due to plant-specific uncertainty analyses, hardware, and operating practices.

Enclosure 1 provides the basis for the proposed change. Pursuant to 10 CFR 50.92, Enclosure 2 demonstrates that the proposed change does not involve a significant hazards consideration. Enclosure 3 contains a mark-up of the affected pages from the current VEGP Technical Specifications and Bases. Enclosure 4 contains the typed version of the

A001

revised Technical Specification and Bases pages. SNC has determined that the proposed license amendment will not significantly affect the quality of the environment.

SNC requests that this amendment be approved by June 30, 2004.

Mr. J. T. Gasser states that he is a Vice President of Southern Nuclear Operating Company and is authorized to execute this oath on behalf of the Southern Nuclear Operating Company. To the best of his knowledge and belief, the facts set forth in this letter are true.

This letter contains no NRC commitments. If you have any questions, please advise.

Respectfully submitted,

Jeffrey T. Gasser

Sworn to and subscribed before me this 15th day of December 2003.

Notary Public

My commission expires: 11/10/06

JTG/RJF/daj

Enclosures: 1. Basis for Change Request
2. 10 CFR 50.92 Significant Hazards Evaluation
3. Marked-Up Technical Specification and Bases Pages
4. Typed Revised Technical Specification and Bases Pages

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Mr. L. C. Barrett, Commissioner – Department of Natural Resources

ENCLOSURE 1

VOGTLE ELECTRIC GENERATING PLANT
REQUEST TO REVISE TECHNICAL SPECIFICATIONS
REVISION TO SURVEILANCE REQUIREMENTS 3.3.1.2 AND 3.3.1.3

BASIS FOR PROPOSED CHANGE

Proposed Change

In accordance with the requirements of 10 CFR 50.90, Southern Nuclear Operating Company (SNC) proposes to revise Vogtle Electric Generating Plant (VEGP) Unit 1 and Unit 2 Technical Specifications (TS) Surveillance Requirement SR 3.3.1.2 for the Nuclear Instrumentation System (NIS) Power Range daily surveillance. When operating above 15% Rated Thermal Power (RTP), the Technical Specifications require the adjustment of the Power Range channel(s) when the absolute difference between Power Range indicated power and secondary side calorimetric power is greater than 2% RTP. Compliance with this requirement may result in a non-conservative channel calibration during reduced power operations. The proposed change to SR 3.3.1.2 will resolve this undesirable condition by requiring adjustment of the NIS Power Range channel(s) only when the calorimetric calculated power exceeds the Power Range indicated power by more than + 2% RTP. In addition, the format of SR 3.3.1.3 is being revised to be consistent with the format of the proposed change to SR 3.3.1.2.

Basis for Proposed Change

BACKGROUND

Westinghouse Technical Bulletin ESBU-TB-92-14-R1, "Decalibration Effects Of Calorimetric Power Measurements On The NIS High Power Reactor Trip At Power Levels Less Than 70% RTP," dated February 6, 1996, identified potential effects of decalibrating the NIS Power Range channels at part-power operation. The decalibration may occur due to the increased uncertainty of the secondary side power calorimetric when performed at part power. When NIS channel indication is reduced to match calculated power, the decalibration results in a non-conservative bias. The proposed change to the Technical Specifications removes the requirement to adjust the NIS Power Range channels when the indicated power is greater than the calorimetric calculated power by an absolute difference of > 2% RTP.

Westinghouse Technical Bulletin 92-14, "Instrumentation Calibration At Reduced Power," dated January 18, 1993, was revised as a result of Westinghouse's review of ABB-CE Infobulletin 94-01, "Potential Nonconservative Treatment Of Power Measurement Uncertainty," dated June 21, 1994. Both bulletins addressed the potential decalibration effects on NIS Power Range indications and reactor trip setpoints due to increased uncertainties associated with secondary side power calorimetric measurements performed at low power levels. After review of the ABB-CE bulletin, Westinghouse determined that further information and clarification would be advisable and issued ESBU-TB-92-14-R1.

The primary error contributor to the instrument uncertainty for a secondary side power calorimetric measurement is the feedwater flow measurement, which is typically a ΔP measurement across a feedwater venturi. While the measurement uncertainty remains constant in ΔP as power decreases, when translated into flow, the uncertainty increases as a square term. Thus, a 1% flow error at 100% power can approach a 10% flow error at 30% RTP even though the ΔP error has not changed. ESBU-TB-92-14-R1 depicted how the potential effects of this error increase at lower power levels. In the example presented for a 10% error in secondary side power calorimetric, the NIS power range could be sufficiently biased in the non-conservative direction to preclude a reactor trip within the assumptions of the safety analyses. For Vogtle, this event is the Rod Withdrawal from 10% RTP.

There are six recommendations in the revised bulletin. Recommendation Nos. 1 - 5 are in concert with VEGP practices and procedures. However, Recommendation No. 6 suggests that if the NIS Power Range indicates a higher power than the secondary side power calorimetric measurement at power levels below approximately 70%, the Power Range channel(s) should not be adjusted. This recommendation is in conflict with the VEGP Technical Specifications Power Range daily Surveillance Requirement, which requires channel adjustment whenever the absolute difference is > 2% above 15% RTP.

In response to ESBU-TB-92-14-R1, VEGP has implemented the following administrative controls: for power levels between 28% RTP and 78% RTP, the NIS PR High Neutron Flux High Setpoint is adjusted to 90% RTP; and for power levels below 28% RTP, the NIS PR High Neutron Flux High Setpoint is adjusted to 50% RTP. This action is an interim solution that replaces Recommendation No. 6 of ESBU-TB-92-14-R1 and thereby obviates the conflict with the Technical Specifications. A TSTF Standard Technical Specification Change Traveler (TSTF-371-A, Revision 1) for the proposed changes to SR 3.3.1.2 and SR 3.3.1.3 for Westinghouse (NUREG-1431) plants has been approved by the NRC on April 2, 2002. For the long-term solution, VEGP proposes to implement the changes described in this TSTF.

At VEGP, the interim controls result in the following negative impacts:

1. For calorimetric power determinations at reduced power, the NIS PR High Neutron Flux High Setpoint reactor trip bistables must be set to a reduced value.

2. Subsequently, when operating power levels are increased, power ascension delays can result while the NIS PR High Neutron Flux High Setpoint reactor trip bistables are reset.

3. The additional NIS PR bistable adjustments increase wear on the instrumentation.

Administrative controls will not be eliminated. VEGP will continue to implement administrative controls in accordance with the proposed revised Bases to SR 3.3.1.2. However, since the proposed surveillance change will preclude unnecessary adjustments of the NIS Power Range channels, the above operational challenges will be reduced.

Technical Specifications and Bases Changes

NOTE 1 of SR 3.3.1.2 is being deleted. The instruction for when the adjustment of the power range channel output is required is being added to the surveillance statement. Adjustment will only be required if the calorimetric heat balance calculation results exceed the power range channel output by more than +2% RTP.

The Bases for SR 3.3.1.2 is being modified to describe the issues associated with performing power range channel output adjustments based on a calorimetric power measurement at part power. The Bases will include a description of the administrative controls required if the power range channel output is to be adjusted in the decreasing power direction due to a part-power calorimetric power measurement. The Bases changes proposed for VEGP are consistent with those in TSTF-371-A, Revision 1, with exceptions due to plant-specific uncertainty analyses, hardware, and operating practices.

The format of SR 3.3.1.3 is being changed to be consistent with that proposed for SR 3.3.1.2. NOTE 1 of SR 3.3.1.3 is being deleted and will be included in the surveillance statement. The Bases for SR 3.3.1.3 are being revised to reflect this change.

Operational and Safety Analyses Considerations

When gain adjustments are performed on a power escalation, the NIS PR daily surveillance results in the NIS channel reflecting the calorimetric calculated power with increasing accuracy up to approximately 100% RTP. When gain adjustments are performed at steady-state 100% RTP conditions, the NIS PR daily surveillance will adjust the PR channel for variations in indicated power due to changes in core power distributions with increasing burnup. Normally, adjustment of the NIS channel indicated power in the decreasing power direction will be performed for operational reasons, such as when operating at 100% RTP to restore operational margin to trip.

To ensure that the Power Range High Neutron Flux High Setpoint reactor trip signal will be generated prior to the safety analysis limit of 118% RTP, should operating conditions require that indicated power be decreased to match calculated calorimetric power based on data obtained below 50% RTP, VEGP operating procedures will continue to specify that the PR High Neutron Flux High reactor trip setpoint be reduced. The proposed VEGP Bases change includes the following administrative control requirements:

1. Adjust the setpoint of the Power Range Neutron Flux – High bistables to ≤90% RTP for a calorimetric power determined below 50% RTP, and to ≤75% RTP for a calorimetric power determined below 20% RTP when: 1) the power range channel output is adjusted in the decreasing power direction due to a part-power calorimetric or 2) for a post-refueling startup.

2. Before the Power Range Neutron Flux – High bistables are reset to the nominal value in Table 3.3.1-1 of Specification 3.3.1, the power range channel adjustment must be confirmed based on a calorimetric performed at a power level ≥50% RTP.

ANALYSIS

The purpose of this analysis is to assess the impact of the proposed NIS Power Range surveillance change on the licensing basis and demonstrate that the change will not adversely affect the subsequent safe operation of the plant.

NIS Power Range Indication and RTS Functions

When operating above 15% RTP, each Power Range channel is normalized (i.e., calibrated) daily to match the thermal power calculation results based on the secondary heat balance (i.e., calorimetric) as required by SR 3.3.1.2. The calibration is accomplished by adjusting the gain of each channel summing amplifier such that the indicated power matches the calorimetric power. The amplifier output (0% to 120% RTP) provides the input signals to the associated channel reactor trip, permissive and control interlock bistables, and the associated power indicators. Therefore, the proposed change to the NIS Power Range daily surveillance potentially impacts the PR power indications, RTS functions, control system functions, and miscellaneous alarm functions. These functions include: High Flux High, High Flux Low, and High Positive Rate Reactor Trips; Permissives P-8, P-9, and P-10; Control Interlock C-2 (i.e., PR High Flux Rod Stop); automatic Reactor Control System nuclear power input; PR Channel Deviation; and N-16 Leakage Detection System alarms.

Reactor power is monitored by the plant operators to ensure that the unit is operated within the limits of the Facility Operating License and safety analyses. The revision to the criteria for implementation of the daily surveillance will have a conservative effect on the PR channel indication (i.e., indicated power will be greater than actual power). With regard to the core safety limits, reactor power is one of four operating parameters with uncertainties explicitly used in the Revised Thermal Design Procedure (RTDP). The RTDP and safety analyses assume a reactor power uncertainty of ± 2% RTP. VEGP-specific calculations presented in WCAP-12462 demonstrate that the secondary side power calorimetric measurement uncertainty at full power conditions is less than the RTDP assumption. Since the VEGP-specific uncertainty calculation is not invalidated by the proposed PR surveillance method change, the RTDP and safety analyses reactor power uncertainty assumption of ± 2% RTP continues to be a bounding allowance for the core safety limits and safety analyses. Therefore, the NIS Power Range indications are not adversely impacted by the proposed change.

VEGP-specific calculations have been performed for the following Power Range RTS functions: High Neutron Flux High Setpoint and High Neutron Flux Low Setpoint Reactor Trips. The calculation assumptions account for the daily PR calibration specified by the Technical Specifications. The setpoint uncertainty calculations demonstrate conservative margin between the associated Technical Specifications nominal trip setpoints and, when applicable, the corresponding safety analysis limits. Since the daily calibration will continue to be performed and the maximum non-conservative error (i.e., when indicated power is less than calorimetric power) will be ≤ 2% RTP, the PR setpoint calculations, setpoints, and applicable safety analysis

limits are not affected by the surveillance change. With respect to the PR High Positive Rate Trip (VEGP has deleted the PR High Negative Rate Trip), this trip function is generated by time-delay relative-comparison circuits. As such, the NIS PR rate trip is not affected by the proposed change. One potential non-conservative impact on the NIS RTS functions is evaluated herein. If the channel indication is greater than the calorimetric power during a unit shutdown, the proposed change could delay the reset of Permissive P-10. Reset of P-10 (≈ 8% RTP) is required to enable the PR High Neutron Flux Low Setpoint and IR High Neutron Flux reactor trips which afford reactor protection for uncontrolled reactivity excursions from subcritical and low power (i.e., < 10% RTP). It is unlikely that a subcritical condition would be achieved before P-10 would reset. Nevertheless, if indicated power is greater than calorimetric power by a sufficient magnitude (resulting in subcriticality without P-10 reset), the time duration until P-10 reset would be very short. During this brief time interval, the PR High Neutron Flux High Setpoint reactor trip would provide core protection, as demonstrated by event-specific analyses. Diverse protection is also afforded by the PR High Positive Rate, OTΔT, and OPΔT reactor trips. Therefore, the Power Range RTS functions are not adversely affected by the proposed change.

The Power Range input functions to the Reactor Control System are: Control Interlock C-2 (i.e., PR High Flux Rod Stop), which blocks automatic and manual control rod withdrawal; and the nuclear power input signal to the power mismatch circuits associated with automatic reactor coolant system temperature control. These are control system functions that are not required for safety (FSAR Section7.7). Nevertheless, the proposed PR surveillance change continues to limit the maximum allowed non-conservative calibration error; therefore, the change will not adversely impact the NIS Power Range control system functions.

Miscellaneous alarm functions also use input signals from the NIS Power Range channel(s). The functions are: PR Channel Deviation, Quadrant Power Tilt Ratio (QPTR), and N-16 Leakage Detection System. The Channel Deviation and QPTR alarms are generated by comparison of the PR channel output signals. In that these are relative comparisons between channels, these alarm functions are not adversely affected by the proposed daily calibration change.

The N-16 Leakage Detection System associated with steam line radiation monitor RE-724 may be impacted by the proposed change since the proposed calibration change allows indicated power to be greater than calorimetric power. When greater than 16 % power, the N-16 Leakage Detection System provides a continuous trend of the estimated "power-corrected" primary-to-secondary leak rate and it generates control room alarms if the leak rate increases above specified threshold levels. The nuclear power signal is provided from the Power Range nuclear instrumentation. A potential non-conservative impact on the leakage detection system is acceptable based on the following:

1. The N-16 Leakage Detection System is a non-safety-related indication system that is considered to be an operational aid.

2. Other radiation monitors, such as the steam jet air ejector and steam generator blowdown monitors, provide diverse continuous primary-to-secondary leakage indication.

3. Reactor Coolant System leakage is periodically monitored by performance of the surveillance tests required by the Technical Specifications.

4. Actual primary-to-secondary leak rates are determined by radiochemistry analysis in accordance with plant procedures.

5. Normally, when operating at or near full power, the Power Range nuclear instrumentation will be adjusted on a daily basis to match indicated power with calorimetric power. This plant practice results in the optimum channel calibration.

LOCA and LOCA-Related Analyses

The following LOCA and LOCA-related analyses are not adversely affected by the proposed modification of NIS Power Range daily surveillance: large and small break LOCA, reactor vessel and loop LOCA blowdown forces, post-LOCA long-term core cooling subcriticality, post-LOCA long-term core cooling minimum flow, and hot leg switchover to prevent boron precipitation. The proposed modification does not affect the normal plant operating parameters, the safeguards systems actuation or accident mitigation capabilities important to LOCA mitigation, or the assumptions used in the LOCA-related accidents. The surveillance change does not create conditions more limiting than those assumed in these analyses. In addition, the proposed modification does not affect the Steam Generator Tube Rupture (SGTR) analysis methodology or assumptions, and it does not alter the SGTR event analysis results.

Non-LOCA Related Analyses

The non-LOCA safety analyses presented in Chapter 15 of the FSAR are not adversely affected by the proposed NIS Power Range surveillance modification. This modification does not affect normal plant operating parameters, accident mitigation capabilities, the assumptions used in the non-LOCA transients, or create conditions more limiting than those enveloped by the current non-LOCA analyses. Therefore, the conclusions presented in the FSAR remain valid.

Mechanical Components and Systems

The surveillance modification as described does not affect the reactor coolant system component integrity or the ability of the system to perform its intended safety function. The modification as described does not affect the integrity of a plant auxiliary fluid system or the ability of the auxiliary systems to perform their design functions.

I&C Protection and Control Systems

With the specific exception of the NIS Power Range reactor trip and indication functions, the proposed NIS Power Range daily surveillance change does not directly or indirectly involve additional electrical systems, components, or instrumentation considerations. Direct effects as well as indirect effects on equipment important to safety have been considered. Indirect effects include conditions or activities which involve non-safety-related electrical equipment which may affect Class 1E, PAMS, or plant control electrical equipment. Consideration has been given to seismic and environmental qualification, design and performance criteria per IEEE standards, functional requirements, and plant Technical Specifications.

The proposed change does not affect the plant normal operating design transients, margin to trip analysis, or low temperature overpressure protection system.

An evaluation herein determined that the proposed surveillance modification will ensure the performance of the NIS Power High Neutron Flux High Setpoint reactor trip function consistent with the safety analysis assumptions. Deletion of the requirement to adjust the NIS Power Range channel(s) when indicated power is greater than calorimetric calculated power allows the channel(s) to not be adjusted in the non-conservative direction at part power. This allowance prevents the introduction of an error that has not been accounted for in the setpoint uncertainty calculations and the safety analyses associated with the NIS Power Range High Neutron Flux High Setpoint reactor trip function. If indicated power is decreased to match a part-power calorimetric performed below 50% RTP, plant administrative controls ensure the PR High Neutron Flux High Setpoint is reduced accordingly. Thus, the proposed modification does not have a potential for adversely affecting the safety-related function of I&C systems.

RTS and ESFAS Setpoints

With the specific exception of the NIS Power Range indication and reactor trip functions, the proposed modification to the Power Range daily surveillance does not affect the Reactor Trip System (RTS) or the Engineered Safety Feature Actuation System (ESFAS) setpoints. This proposed modification does not change the current trip setpoints or instrument operability requirements identified in the Technical Specifications. The modification should ensure the operability of the NIS Power Range reactor trip at part-power conditions after normalization at 100% RTP conditions consistent with the safety analysis assumptions. Therefore, the proposed modification has no effect on the RTS and ESFAS safety functions.

Other Safety-Related Areas and Analyses

The following safety-related areas and analyses are not affected by the proposed surveillance modification: Containment Integrity Analyses (Short Term/Long Term LOCA Release), Main Steamline Break (MSLB) Mass and Energy Release, Radiological Analyses, Probabilistic Risk Assessment, and Emergency Response Procedures.

Conclusion

Based on the above, the proposed change can be implemented without adverse impact to the VEGP design basis safety analyses, Power Range functions, or the subsequent safe operation of the plant.

ENCLOSURE 2

VOGTLE ELECTRIC GENERATING PLANT
REQUEST TO REVISE TECHNICAL SPECIFICATIONS
REVISION TO SURVEILANCE REQUIREMENTS 3.3.1.2 AND 3.3.1.3

10 CFR 50.92 SIGNIFICANT HAZARDS EVALUTION

Proposed Change

In accordance with the requirements of 10 CFR 50.90, Southern Nuclear Operating Company (SNC) proposes to revise Vogtle Electric Generating Plant (VEGP) Unit 1 and Unit 2 Technical Specifications (TS) Surveillance Requirement SR 3.3.1.2 for the Nuclear Instrumentation System (NIS) Power Range daily surveillance. When operating above 15% Rated Thermal Power (RTP), the Technical Specifications require the adjustment of the Power Range channel(s) when the absolute difference between Power Range indicated power and secondary side calorimetric power is greater than 2% RTP. Compliance with this requirement may result in a non-conservative channel calibration during reduced power operations. The proposed change to SR 3.3.1.2 will resolve this undesirable condition by requiring adjustment of the NIS Power Range channel(s) only when the calorimetric calculated power exceeds the Power Range indicated power by more than + 2% RTP. In addition, the format of SR 3.3.1.3 is being revised to be consistent with the format of the proposed change to SR 3.3.1.2.

Pursuant to 10 CFR 50.92, Southern Nuclear Operating Company (SNC) has reviewed the proposed change to determine if a significant hazards consideration is involved. The proposed change, as defined below, has been reviewed and deemed not to involve any significant hazards considerations as defined in 10 CFR 50.92. The basis for this determination follows.

Evaluation

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change to SR 3.3.1.2 does not significantly increase the probability or consequences of an accident previously evaluated in the FSAR. This modification does not directly initiate an accident. The consequences of accidents previously evaluated in the FSAR are not adversely affected by this proposed change because the change to the NIS Power Range channel adjustment requirement ensures the conservative response of the channel even at part power levels. The proposed change to SR 3.3.1.3 is to change the format to be consistent with the format of the proposed change to SR 3.3.1.2.

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

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change to SR 3.3.1.2 does not create the possibility of a new or different kind of accident than any accident already evaluated in the FSAR. No new accident

scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. The proposed Technical Specifications change does not challenge the performance or integrity of any safety-related systems. The proposed change to SR 3.3.1.3 is to change the format to be consistent with the format of the proposed change to SR 3.3.1.2.

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

3. Does the proposed change involve a significant reduction in the margin of safety?

   The proposed change to SR 3.3.1.2 does not involve a significant reduction in a margin of safety. The proposed change does require a revision to the criterion for implementation of Power Range channel adjustment based on secondary power calorimetric calculation; however, the change does not eliminate any RTS surveillances or alter the frequency of surveillances required by the Technical Specifications. The revision to the criterion for implementation of the daily surveillance will have a conservative effect on the performance of the NIS Power Range channel, particularly at part power after normalization at 100% RTP conditions. The nominal trip setpoints specified by the Technical Specifications and the safety analysis limits assumed in the transient and accident analysis are unchanged. The margin of safety associated with the acceptance criteria for any accident is unchanged. The proposed change to SR 3.3.1.3 is to change the format to be consistent with the format of the proposed change to SR 3.3.1.2.

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

Conclusion

Based on the preceding evaluation, Southern Nuclear has determined that the proposed change meets the requirements of 10 CFR 50.92(c) and does not involve a significant hazards consideration.

Environmental Evaluation

Southern Nuclear has evaluated the proposed changes and determined the the changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed changes is not required.

ENCLOSURE 3

VOGTLE ELECTRIC GENERATING PLANT
REQUEST TO REVISE TECHNICAL SPECIFICATIONS
REVISION TO SURVEILANCE REQUIREMENTS 3.3.1.2 AND 3.3.1.3

MARKED-UP TECHNICAL SPECIFICATION AND BASES PAGES

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	---NOTES--- 1. Adjust NIS channel to be consistent with calorimetric power if absolute difference is > 2% RTP. 2. Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output. power range channel output. Adjust power range channel output if calorimetric heat balance calculation results exceed power range channel output by more than +2 % RTP.	24 hours
SR 3.3.1.3	---NOTES--- 1. Adjust NIS channel if absolute difference is ≥ 3%. 2. Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of the incore detector measurements to (NIS) AFD. Nuclear Instrumentation System	31 effective full power days (EFPD)

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1 (continued)

outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the NIS channel output every 24 hours. If the calorimetric exceeds the NIS channel output by > 2% RTP, the NIS is not declared inoperable, but must be adjusted. If the NIS channel output cannot be properly adjusted, the channel is declared inoperable.

Two Notes modify SR 3.3.1.2. The first Note indicates that the NIS channel output shall be adjusted consistent with the calorimetric results if the absolute difference between the NIS channel output and the calorimetric power is > 2% RTP. The second Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 12 hours is allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are inaccurate.

The Frequency of every 24 hours is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate the change in the absolute difference between NIS and heat balance calculated powers rarely exceeds 2% in any 24 hour period.

In addition, control room operators periodically monitor redundant indications and alarms to detect deviations in channel outputs.

power range

more than +

power range channel

heat balance results

Consistent with the calorimetric heat balance results.

power range

Add Insert

that a difference between

calorimetric

calculation and the power range channel output of more than +2% RTP is not expected

(continued)

INSERT FOR BASES TO SR 3.3.1.2

If the calorimetric is performed at part power (<50% RTP), adjusting the power range channel indication in the increasing direction will assure a reactor trip below the safety analysis limit of 118% RTP. Making no adjustment to the power range channel in the decreasing power direction due to a part-power calorimetric assures a reactor trip consistent with the safety analyses.

This allowance does not preclude making indication power adjustments, if desired, when the calorimetric heat balance calculation is less than the power range channel output. To provide close agreement between indicated and calorimetric power and to preserve operating margin, the power range channels are normally adjusted when operating at or near full power during steady-state conditions. However, discretion must be exercised if the power range channel output is adjusted in the decreasing power direction due to a part-power calorimetric (<50% RTP). This action may introduce a non-conservative bias at higher power levels which may result in an NIS reactor trip above the safety analysis limit of 118% RTP. The cause of the potential non-conservative bias is the decreased accuracy of the calorimetric at reduced power conditions. The primary error contributor to the instrument uncertainty for a secondary side power calorimetric measurement is the feedwater flow measurement which is typically a ΔP measurement across a feedwater venturi. While the measurement uncertainty remains constant in ΔP as power decreases, when translated into flow, the uncertainty increases as a square term. Thus a 1% flow error at 100% RTP can approach a 10% error at 30% RTP even though the ΔP error has not changed. An evaluation of extended operation at part-power conditions would conclude that it is prudent to administratively adjust the setpoint of the Power Range Neutron Flux – High bistables to ≤90% RTP for a calorimetric power determined below 50% RTP, and to ≤75% RTP for a calorimetric power determined below 20% RTP when: 1) the power range channel output is adjusted in the decreasing power direction due to a part-power calorimetric; or 2) for a post-refueling startup.

Before the Power Range Neutron Flux – High bistables are reset to the nominal value in Table 3.3.1-1 of Specification 3.3.1, the power range channel adjustment must be confirmed based on a calorimetric performed at a power level ≥50% RTP.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This surveillance is primarily performed to verify the f(AFD) input to the overtemperature ΔT function.

~~Two Notes modify SR 3.3.1.3. Note 1 indicates that the excore NIS channel shall be adjusted to be consistent with the core average axial offset if the absolute difference is ≥ 3%. Note 2~~ The Note clarifies that the Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP.

Axial offset is the difference between the power in the top half of the core and the bottom half of the core expressed as a fraction (percent) of the total power being produced by the core. Mathematically, it is expressed as:

$$AO = 100 \times \frac{(Flux_T - Flux_B)}{(Power)(Flux_T + Flux_B)}$$

where $Flux_T$ = neutron flux at the top of the core, and

$Flux_B$ = neutron flux at the bottom of the core

The relationship between AFD and axial offset is:

$$AFD = AO \times (Power(\%)/100)$$

AFD as displayed on the main control board and as determined by the plant computer use inputs from the power range NIS detectors which are located outside the reactor vessel. Axial offset is measured using incore detectors.

The surveillance assures that the AFD as displayed on the main control board and as determined by the plant computer is within 3% of the AFD as calculated from the axial offset equation. Agreement is required so that the reactor is operated within the bounds of the safety analysis regarding axial power distribution.

(continued)

ENCLOSURE 4

VOGTLE ELECTRIC GENERATING PLANT
REQUEST TO REVISE TECHNICAL SPECIFICATIONS
REVISION TO SURVEILANCE REQUIREMENTS 3.3.1.2 AND 3.3.1.3

TYPED REVISED TECHNICAL SPECIFICATION AND BASES PAGES

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	-----NOTES----- Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. ---------- Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculation results exceed power range channel output by more than +2% RTP.	24 hours
SR 3.3.1.3	-----NOTES----- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. ---------- Compare results of the incore detector measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 3%.	31 effective full power days (EFPD)

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1 (continued)

outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the power range channel output every 24 hours. If the calorimetric heat balance results exceed the power range channel output by more than +2% RTP, the power range channel is not declared inoperable, but must be adjusted consistent with the calorimetric heat balance results. If the power range channel output cannot be properly adjusted, the channel is declared inoperable.

If the calorimetric is performed at part power (< 50% RTP), adjusting the power range channel indication in the increasing direction will assure a reactor trip below the safety analysis limit of 118% RTP. Making no adjustment to the power range channel in the decreasing power direction due to a part-power calorimetric assures a reactor trip consistent with the safety analyses.

This allowance does not preclude making indication power adjustments, if desired, when the calorimetric heat balance calculation is less than the power range channel output. To provide close agreement between indicated and calorimetric power and to preserve operating margin, the power range channels are normally adjusted when operating at or near full power during steady-state conditions. However, discretion must be exercised if the power range channel output is adjusted in the decreasing power direction due to a part-power calorimetric (< 50% RTP). This action may introduce a nonconservative bias at higher power levels which may result in an NIS reactor trip above the safety analysis limit of 118% RTP. The cause of the potential nonconservative bias is the decreased accuracy of the calorimetric at reduced power conditions. The primary error

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.3.1.2 (continued)

contributor to the instrument uncertainty for a secondary side power calorimetric measurement is the feedwater flow measurement which is typically a ΔP measurement across a feedwater venturi. While the measurement uncertainty remains constant in ΔP as power decreases, when translated into flow, the uncertainty increases as a square term. Thus a 1% flow error at 100% RTP can approach a 10% error at 30% RTP even though the ΔP error has not changed. An evaluation of extended operation at part-power conditions would conclude that it is prudent to administratively adjust the setpoint of the Power Range Neutron Flux – High bistables to ≤ 90% RTP for a calorimetric power determined below 50% RTP, and to ≤ 75% RTP for a calorimetric power determined below 20% RTP when: 1) the power range channel output is adjusted in the decreasing power direction due to a part-power calorimetric; or 2) for a post-refueling startup.

Before the Power Range Neutron Flux – High bistables are reset to the nominal value in Table 3.3.1-1 of Specification 3.3.1, the power range channel adjustment must be confirmed based on a calorimetric performed at a power level ≥ 50% RTP.

The Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 12 hours is allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are inaccurate.

The Frequency of every 24 hours is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate that a difference between the calorimetric heat balance calculation and the power range channel output of more than +2% RTP is not expected in any 24 hour period.

In addition, control room operators periodically monitor redundant indications and alarms to detect deviations in channel outputs.

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. If the NIS channel cannot be properly readjusted, the channel is declared

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

inoperable. This surveillance is primarily performed to verify the (AFD) input to the overtemperature ΔT function.

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This surveillance is primarily performed to verify the f(AFD) input to the overtemperature ΔT function.

The Note clarifies that the Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP.

Axial offset is the difference between the power in the top half of the core and the bottom half of the core expressed as a fraction (percent) of the total power being produced by the core. Mathematically, it is expressed as:

$$AO = 100 \times \frac{(Flux_T - Flux_B)}{(Power)(Flux_T + Flux_B)}$$

where $Flux_T$ = neutron flux at the top of the core, and

$Flux_B$ = neutron flux at the bottom of the core

The relationship between AFD and axial offset is:

$$AFD = AO \times (Power(\%)/100)$$

AFD as displayed on the main control board and as determined by the plant computer use inputs from the power range NIS detectors which are located outside the reactor vessel. Axial offset is measured using incore detectors.

The surveillance assures that the AFD as displayed on the main control board and as determined by the plant computer is within 3% of the AFD as calculated from the axial offset equation. Agreement is required so that the reactor is operated within the bounds of the safety analysis regarding axial power distribution.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

The Frequency of every 31 EFPD is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Also, the slow changes in neutron flux during the fuel cycle can be detected during this interval.

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT every 31 days on a STAGGERED TEST BASIS. This test shall verify OPERABILITY by actuation of the end devices.

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independence test for bypass breakers is included in SR 3.3.1.13. The bypass breaker test shall include a local shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested every 31 days on a STAGGERED TEST BASIS, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the incore channels. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore detector measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This surveillance is primarily performed to verify the f(AFD) input to the overtemperature ΔT function.

Two Notes modify SR 3.3.1.6. Note 1 states that this Surveillance is required only if reactor power is > 75% RTP and that 7 days is allowed for performing the first surveillance after reaching 75% RTP. Note 2 states that neutron detectors are excluded from the calibration.

The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT every 92 days.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be within the Allowable Values specified in Table 3.3.1-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7.

This Surveillance Requirement is modified by two Notes that apply only to the Source Range instrument channels. Note 1 requires that the COT include verification that interlocks P-6 and P-10 are in the required state for the existing unit

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

conditions. Note 2 provides a 4 hour delay in the requirement to perform this surveillance for source range instrumentation when entering Mode 3 from Mode 2. This Note allows a normal shutdown to proceed without delay for the performance of this SR to meet the applicability requirements in Mode 3. This delay allows time to open the RTBs in Mode 3 after which this SR is no longer required to be performed. If the unit is to be in Mode 3 with the RTBs closed for greater than 4 hours, this surveillance must be completed prior to the expiration of the 4 hours.

The Frequency of 92 days is justified in Reference 7.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except the frequency is prior to reactor startup. This SR is not required to be met when reactor power is decreased below P-10 (10% RTP) or when MODE 2 is entered from MODE 1 during controlled shutdowns. The Surveillance is modified by a Note that specifies this surveillance can be satisfied by the performance of a COT within 31 days prior to reactor startup. This test ensures that the NIS source range, intermediate range, and power range low setpoint channels are OPERABLE prior to taking the reactor critical.

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. Since this SR applies to RCP undervoltage and underfrequency relays, setpoint verification requires elaborate bench calibration and is accomplished during the CHANNEL CALIBRATION.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.10

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology for some instrument functions, and the need to perform this Surveillance for some instrument functions under the conditions that apply during a plant outage and the potential for an unplanned plant transient if the Surveillance were performed at power. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.

SR 3.3.1.10 is modified by a Note stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months. This SR is modified by a Note that states that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the power range neutron detectors includes a normalization of the detectors based on a power calorimetric and flux map performed above 75% RTP. The CHANNEL CALIBRATION for the source range neutron detectors includes obtaining the detector preamp discriminator curves and evaluating those curves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.11 (continued)

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.

SR 3.3.1.12

SR 3.3.1.12 is the performance of a COT of RTS interlocks every 18 months.

The Frequency is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a TADOT of the Manual Reactor Trip and the SI Input from ESFAS. This TADOT is as described in SR 3.3.1.4, except that the test is performed every 18 months.

The manual reactor trip TADOT shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the manual reactor trip function. This test shall also verify the OPERABILITY of the Bypass breaker trip circuit(s), including the automatic undervoltage trip.

The Frequency is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.13 (continued)

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the turbine stop valve closure Turbine Trip Functions. This TADOT is as described in SR 3.3.1.4, except that this test is performed after each entry into MODE 3 for a unit shutdown and prior to exceeding the P-9 interlock trip setpoint. Note 1 states that this Surveillance is not required if it has been performed within the previous 31 days. Note 2 states that verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test ensures that the reactor trip on turbine trip Function is OPERABLE prior to entering the Mode of Applicability (above the P-9 power range neutron flux interlock) for this instrument function. The frequency is based on the known reliability of the instrumentation that generates a reactor trip after the turbine trips, and has been shown to be acceptable through operating experience.

SR 3.3.1.15

SR 3.3.1.15 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in FSAR, Chapter 16 (Ref. 8). Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment reaches the required functional state (i.e., control and shutdown rods fully inserted in the reactor core).

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer function set to one or with the time constants set to their nominal value. The results must be compared to properly defined acceptance criteria. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.15 (continued)

Response time may be verified by actual response time tests in any series of sequential, overlapping, or total channel measurements; or by the summation of allocation sensor, signal processing, and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable resonse time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) using vendor engineering specifications. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 10), provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 11), provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.15 (continued)

times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.3.1.15 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

SR 3.3.1.16

SR 3.3.1.16 is the performance of a COT for the low fluid oil pressure portion of the Turbine Trip Functions as described in SR 3.3.1.7 except that the Frequency is after each entry into MODE 3 for a unit shutdown and prior to exceeding the P-9 interlock trip setpoint. The surveillance is modified by two Notes. Note 1 states that the surveillance may be satisfied if performed within the previous 31 days. Note 2 states that verification of the setpoint is not required. Performance of this test ensures that the reactor trip on turbine trip function is OPERABLE prior to entering the Mode of Applicability (above the P-9 power range neutron flux interlock) for this instrument function. The frequency is based on the known reliability of the instrumentation that generates a reactor trip after the turbine trips, and has been shown to be acceptable through operating experience.

REFERENCES

1. FSAR, Chapter 7.

(continued)

BASES

REFERENCES (continued)

2. FSAR, Chapter 6.

3. FSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. WCAP-11269, Westinghouse Setpoint Methodology for Protection Systems; as supplemented by:

   - Amendments 34 (Unit 1) and 14 (Unit 2), RTS Steam Generator Water Level – Low Low, ESFAS Turbine Trip and Feedwater Isolation SG Water Level – High High, and ESFAS AFW SG Water Level – Low Low.

   - Amendments 48 and 49 (Unit 1) and Amendments 27 and 28 (Unit 2), deletion of RTS Power Range Neutron Flux High Negative Rate Trip.

   - Amendments 60 (Unit 1) and 39 (Unit 2), RTS Overtemperature ΔT setpoint revision.

   - Amendments 57 (Unit 1) and 36 (Unit 2), RTS Overtemperature and Overpower ΔT time constants and Overtemperature ΔT setpoint.

   - Amendments 43 and 44 (Unit 1) and 23 and 24 (Unit 2), revised Overtemperature and Overpower ΔT trip setpoints and allowable values.

   - Amendments 104 (Unit 1) and 82 (Unit 2), revised RTS Intermediate Range Neutron Flux, Source Range Neutron Flux, and P-6 trip setpoints and allowable values.

   - Amendments 127 (Unit 1) and 105 (Unit 2), revised Overtemperature ΔT trip setpoint to limit value of the compensated temperature difference and revised the modifier for axial flux difference.

   - Amendments 128 (Unit 1) and 106 (Unit 2), revised Overtemperature ΔT and Overpower ΔT trip setpoints to increase the fundamental setpoints K_1 and K_4, and to modify coefficients and dynamic compensation terms.

7. WCAP-10271-P-A, Supplement 1, May 1986.

8. FSAR, Chapter 16.

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BASES

REFERENCES (continued)

9. Westinghouse Letter GP-16696, November 5, 1997.

10. WCAP-13632-P-A Revision 2, "Elimination of Periodic Sensor Response Time Testing Requirements," January 1996.

11. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," October 1998.

12. WCAP-14333-P-A, Rev. 1, October 1998.

13. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.