3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be ≤ 1.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPTR not within limit.	A.1 Limit ~~Reduce~~ THERMAL POWER to ≥ 3% ~~from~~ below RTP for each 1% of QPTR > 1.00.	2 hours
	AND A.2.1 Perform SR 3.2.4.1.	Once per 12 hours ~~thereafter~~
	AND	
	A.~~2~~3 Perform SR 3.2.1.1 and SR 3.2.2.1.	~~24 hours~~ AND Once per 7 days thereafter
	AND 4 A.~~3~~ Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.	Prior to increasing THERMAL POWER above the limit of Required Action A.1 and A.2.2
	AND	

(continued)

A.2.2 Limit THERMAL POWER to ≥ 3% below RTP for each 1% QPTR > 1.00

NOTE
For performances of Required Action A.2.2, the Completion Time is measured from the completion of SR 3.2.4.1.

2 hours

WOG-02 C.9, R1 ADDED A.2

6

NOTE
Required Action A.6 must be completed whenever Required Action A.5 is implemented

5

Within 24 hours after achieving equilibrium conditions with THERMAL POWER limited by Required Actions A.1 and A.2.2

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ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.5 --------NOTE-------- Perform Required Action A.5 only after Required Action A. is completed. (4) ----------	
	(10) Calibrate excore detectors to show ~~zero~~ QPTR = 1.00	Prior to increasing THERMAL POWER above the limit of Required Action A.1 and A.2.2 LCV-0603-I
	AND A.6 --------NOTE-------- Perform Required Action A.6 only after Required Action A. is completed. (5) ----------	-----NOTE----- Only one of the following Completion Times, whichever becomes applicable first, must be met. ----------
	Perform SR 3.2.1.1 and SR 3.2.2.1. WOG-02 C.1	Within 24 hours after reaching RTP (7) OR Within 48 hours after increasing THERMAL POWER above the limit of Required Action A.1 and A.2.2 LCV-0603-I
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 50% RTP.	4 hours

PSE — for the duration of operation in accordance with Condition A of this LCO,

BASES

ACTIONS A.4 (continued)

PSE — ~~gross~~ radial power distribution that requires an investigation and evaluation that is accomplished by examining the ~~incore~~ power distribution. Specifically, the core peaking factors ~~and the quadrant tilt~~ must be evaluated because they are the factors that best characterize the core power distribution. This re-evaluation is required to ensure that, before increasing THERMAL POWER to above the limit of Required Action A.1, the reactor core conditions are consistent with the assumptions in the safety analyses.

using the incore detectors

(peaking factors)

and will remain so after the return to RTP

INSERT FOR REQUIRED ACTION A.4

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and A.2.2

A.5

For tilted condition caused by power reduction, allowing time to pass may permit QPTR to return to ≤ 1.02, thus avoiding the need to recalibrate the power range detectors

PSE TSC

of 1.00

If the QPTR has exceeded the 1.02 limit and a re-evaluation of the safety analysis is completed and shows that safety requirements are met, the excore detectors are recalibrated to show a ~~zero~~ QPTR prior to increasing THERMAL POWER to above the limit of Required Action A.1. This is done to detect ~~any~~ subsequent ~~significant~~ changes in QPTR.

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and A.2.2

A.5 recalibrated to 1.00

Required Action ~~A.3.2~~ is modified by a Note that states that the QPTR is not ~~zeroed out~~ until after the re-evaluation of the safety analysis has determined that core conditions at RTP are within the safety analysis assumptions (i.e., Required Action ~~A.3.1~~). This Note is intended to prevent any ambiguity about the required sequence of actions.

A.4

A.5 QPTR recalibrated to 1.00 A.6

Once ~~the flux tilt~~ is ~~zeroed out~~ (i.e., Required Action ~~A.3.2~~ is performed), it is acceptable to return to full power operation. However, as an added check that the core power distribution at RTP is consistent with the safety analysis assumptions, Required Action ~~A.3.3~~ requires verification that $F_Q(Z)$ and $F^N_{\Delta H}$ are within their specified limits within 24 hours of reaching RTP. As an added precaution, if the core power does not reach RTP within 24 hours, but is increased slowly, then the peaking factor surveillances must be performed within 48 hours of the time when the ascent to power was begun. These Completion Times are intended to allow adequate time to increase THERMAL POWER to above the limit of Required Action A.1, while not

and A.2.2 LCV-0603-1

(continued)

PSE

INSERT FOR REQUIRED ACTION A.4
BASES PAGE B 3.2-45

However, if prior to performing SR 3.2.1.1 and SR 3.2.2.1, QPTR is restored to within the limit, either due to prior completion of Required Actions or due to core performance characteristics that result in the QPTR out-of-limit condition correcting itself, Required Action A.3 and any other Required Actions would no longer apply because Condition A of LCO 3.2.4 would be exited in accordance with LCO 3.0.2 due to restoration of full compliance with LCO 3.2.4

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If it is determined that a sustained change in the radial power distribution has occurred, and Required Action A.3 has been completed with satisfactory results, an increase in THERMAL POWER above the limit of Required Action A.1 may be appropriate. The necessary sequence of Required Actions, beginning with Required A.4, would be as follows prior to increasing THERMAL POWER above the limit of Required Action A.1

and A.2.2

and A.2.2

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1. Verify by the reevaluation of the safety analyses that after the sustained change in radial power distribution, the core conditions remain within the assumptions of the safety analyses and will remain so after return to RTP (Required Action A.4), and

2. Recalibrate the power range detectors to reset QPTR to 1.00 (Required Action A.5).

If these actions are completed with satisfactory results, THERMAL POWER may be increased above the limit of Required Action A.1. After power is increased, the peaking facto. re again verified to be within limits. Upon the satisfactory completion of Required Action A.6, Condition A of LCO 3.2.4 can be exited.

and A.2.2

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BASES

LCO (continued)

a. No operations are permitted that would dilute the RCS boron concentration, therefore maintaining the margin to criticality. Boron reduction is prohibited because a uniform concentration distribution throughout the RCS cannot be ensured when in natural circulation; and

b. Core outlet temperature is maintained at least 10°F below saturation temperature, so that no vapor bubble may form and possibly cause a natural circulation flow obstruction.

Note 2 allows one RHR loop to be inoperable for a period of up to 2 hours, provided that the other RHR loop is OPERABLE and in operation. This permits periodic surveillance tests to be performed on the inoperable loop during the only time when such testing is safe and possible.

TSC

Note 3 requires that the secondary side water temperature of each SG be less than [50]°F above each of the RCS cold leg temperatures before the start of a reactor coolant pump (RCP) ~~with an RCS cold leg temperature ≤ [275]°F~~. This restriction is to prevent a low temperature overpressure event due to a thermal transient when an RCP is started.

during Mode 5 with the RCS loops filled.

Note 4 provides for an orderly transition from MODE 5 to MODE 4 during a planned heatup by permitting removal of RHR loops from operation when at least one RCS loop is in operation. This Note provides for the transition to MODE 4 where an RCS loop is permitted to be in operation and replaces the ~~heat removal~~ RCS circulation function provided by the RHR loops. — WOG-22 C.11

Additional requirements for an SG to be available as a heat sink are:
a. RCS loops and reactor pressure vessel filling and venting complete; and
b. RCS pressure maintained >100 psig since the most recent filling and venting.

RHR pumps are OPERABLE if they are capable of being powered and are able to provide flow if required. An OPERABLE SG can perform as a heat sink when it has an adequate water level and is OPERABLE in accordance with the Steam Generator Tube Surveillance Program.

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PSE

APPLICABILITY

In MODE 5 with RCS loops filled, this LCO requires forced circulation of the reactor coolant to remove decay heat from the core and to provide proper boron mixing. One loop of RHR provides sufficient circulation for these purposes. However, one additional RHR loop is required to be OPERABLE,

(continued)

INSERT FOR PAGE
B 3.3-53

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:

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

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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.

1.1 Definitions (continued)

CHANNEL CHECK

A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.

CHANNEL OPERATIONAL TEST (COT)

A COT shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify the ~~OPERABILITY~~ of required alarm, interlock, ~~display,~~ and trip functions. The COT shall include adjustments, as necessary, of the required alarm, interlock, and trip setpoints so that the setpoints are within the required range and accuracy.

(3)

CORE ALTERATION

BWR 05
C3

CORE ALTERATION shall be the movement of any fuel, sources, reactivity control components, or other ~~components affecting reactivity~~ within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

CORE OPERATING LIMITS REPORT (COLR)

(CI-0603-I) → 5.6.5

(4)

The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification ~~5.9.1.6~~. ~~Plant~~ Unit operation within these limits is addressed in individual Specifications.

DOSE EQUIVALENT I-131

DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ~~[Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites," or those listed in~~ Table E-7 of Regulatory Guide 1.109, Rev. 1, NRC, 1977.

(continued)

1.1 Definitions

and the nominal PORV setpoints for the cold overpressure protection system

PHYSICS TESTS (continued)

c. Otherwise approved by the Nuclear Regulatory Commission.

PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification ~~5.9.1.7.~~ ~~Plant~~ Unit operation within these operating limits is addressed in individual specifications. ~~LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," and LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System."~~

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5.6.6

(5) (6)

QUADRANT POWER TILT RATIO (QPTR)

QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.

RATED THERMAL POWER (RTP)

RTP shall be a total reactor core heat transfer rate to the reactor coolant of ~~[2893]~~ 3565 MWt.

REACTOR TRIP SYSTEM (RTS) RESPONSE TIME

The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

SHUTDOWN MARGIN (SDM)

SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

a. All rod cluster control assemblies (RCCAs) are fully inserted except for the single RCCA of highest reactivity worth, which is assumed to be fully withdrawn; ~~and~~ with any RCCA not capable of being fully inserted, the reactivity worth of the RCCA must be accounted for in the determination of SDM; and

BWR-18 C.2

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform COT.	92 days
SR 3.3.8.2	Perform CHANNEL CALIBRATION.	18 months

---NOTE---
Not required to be performed prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3.

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BASES

SURVEILLANCE REQUIREMENTS

The HFASA channels are subject to a COT and a CHANNEL CALIBRATION.

SR 3.3.8.1

SR 3.3.8.1 requires the performance of a COT every 92 days to ensure that each channel of the HFASA and its setpoint are OPERABLE. This test shall include verification that the HFASA setpoint is less than or equal to 2.3 times background. The frequency of 92 days is consistent with the requirements for the source range channels.

SR 3.3.8.2

SR 3.3.9.2 requires the performance of a CHANNEL CALIBRATION every 18 months. This test verifies that each channel responds to a measured parameter within the necessary range and accuracy. It encompasses the entire instrument loop, including the sensor. The frequency is based on operating experience and consistency with the typical industry refueling cycle.

REFERENCES

1. FSAR, Chapter 15.4.6.

This Surveillance Requirement is modified by a Note that provides a 4-hour delay in the requirement to perform this surveillance for the HFASA instrumentation upon entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without delay for the performance of the surveillance to meet the applicability requirements in MODE 3.

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CHAPTER 5.0 ADMINISTRATIVE CONTROLS
INSERTS

INSERT 21
TO PAGE 5.0-21
5.6.6 PTLR

~~LCO 3.4.3 "RCS Pressure and Temperature Limits"~~
~~LCO 3.4.12 "Cold Overpressure Protection Systems"~~

The RCS pressure and temperature limits for Unit 1 shall be those previously reviewed and approved by the NRC in Amendment No. 87 to Facility Operating License NPF-68. The RCS pressure and temperature limits for Unit 2 shall be those previously reviewed and approved by the NRC in Amendment No. 65 to Facility Operating License NPF-81. The acceptability of the P/T and COPS limits are documented in NRC Letter, "Vogtle Electric Generating Plant, Units 1 and 2 - Acceptance for Referencing of Pressure Temperature Limits Report," February 12, 1996. Specifically, the limits and methodology are described in the following documents:

1. Amendment No. 87 to Facility Operating License No. NPF-68, Vogtle Electric Generating Plant, Unit 1, June 8, 1995.

2. Amendment No. 65 to Facility Operating License No. NPF-81, Vogtle Electric Generating Plant, Unit 2, June 8, 1995.

3. Letter from C. I. Grimes, NRC, to R. A. Newton, Westinghouse Electric Corporation, "Acceptance for Referencing of Topical Report WCAP-14040, Revision 1, 'Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves,'" October 16, 1995.

4. Letter from C. K. McCoy, Georgia Power, to U. S. Nuclear Regulatory Commission, Attention: Document Control Desk, "Vogtle Electric Generating Plant, Pressure and Temperature Limits Report." Enclosures 1 and 2, January 26, 1996.

d. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluence period and for any revision or supplement thereto.

5.6 Reporting Requirements (continued)

5.6.4 Monthly Operating Reports

Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the pressurizer power operated relief valves or pressurizer safety valves, shall be submitted on a monthly basis no later than the 15th of each month following the calendar month covered by the report.

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

INSERT 19 →

~~The individual specifications that address core operating limits must be referenced here.~~

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

INSERT 20 →

~~Identify the Topical Report(s) by number, title, date, and NRC staff approval document, or identify the staff Safety Evaluation Report for a plant specific methodology by NRC letter and date.~~

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

LCV-0603-I

a. RCS pressure and temperature limits for heat up, cooldown, ~~low temperature~~ operation, criticality, and hydrostatic

(continued)

The power operated relief valve lift settings required to support the Cold Overpressure Protection Systems (COPS) shall be established and documented in the PTLR for the following:
LCO 3.4.12 "Cold Overpressure Protection Systems"

5.6 Reporting Requirements

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

testing as well as heatup and cooldown rates shall be established and documented in the PTLR for the following:
~~[The individual specifications that address RCS pressure and temperature limits must be referenced here.]~~
LCO 3.4.3 "RCS Pressure and Temperature (P/T) Limits"

b. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents: [Identify the NRC staff approval document by date.]

c. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluence period and for any revision or supplement thereto.

INSERT 21

Reviewers' Notes: The methodology for the calculation of the P-T limits for NRC approval should include the following provisions:

1. The methodology shall describe how the neutron fluence is calculated (reference new Regulatory Guide when issued).

2. The Reactor Vessel Material Surveillance Program shall comply with Appendix H to 10 CFR 50. The reactor vessel material irradiation surveillance specimen removal schedule shall be provided, along with how the specimen examinations shall be used to update the PTLR curves.

3. Low Temperature Overpressure Protection (LTOP) System lift setting limits for the Power Operated Relief Valves (PORVs), developed using NRC-approved methodologies may be included in the PTLR.

4. The adjusted reference temperature (ART) for each reactor beltline material shall be calculated, accounting for radiation embrittlement, in accordance with Regulatory Guide 1.99, Revision 2.

5. The limiting ART shall be incorporated into the calculation of the pressure and temperature limit curves in accordance with NUREG-0800 Standard Review Plan 5.3.2, Pressure-Temperature Limits.

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(continued)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.6 Recirculation Fluid pH Control System

LCO 3.5.6 The Recirculation Fluid pH Control System shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Recirculation Fluid pH Control System inoperable.	A.1 Restore system to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.6.1 Perform a visual inspection of the Recirculation Fluid pH Control System and verify the following: a) Three storage baskets are in place, and b) have maintained their integrity, and c) ~~the each~~ basket ~~is filled with~~ contain a total of ≥ 11,484 (220 cubic feet) and ≤ 14,612 pounds (260 cubic feet) of trisodium phosphate crystals.	18 months LCV-0603-I