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January 24, 2001

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

Subject: River Bend Station - Unit 1
Docket No. 50-458
License No. NPF-47
License Amendment Request (LAR 2000-21), "Low Power Set Point Limit"

File Nos.: G9.5, G9.42

RBEXEC-006
RBF1-01-0011
RBG-45611

Gentlemen:

In accordance with 10CFR50.90, Entergy Operations, Inc. (EOI) hereby applies for an amendment of Facility Operating License No. NPF-47 for the River Bend Station (RBS). This request consists of an administrative change to the limit on the Low Power Setpoint Limit (LPSP) specified by Technical Specifications 3.1.3 "Control Rod OPERABILITY," 3.1.6 "Control Rod Pattern," and 3.3.2.1 "Control Rod Block Instrumentation." This change is consistent with work previously submitted to the NRC by the Boiling Water Reactor Owners Group and General Electric (GE) under Amendment 17 to GE Licensing Topical Report NEDE-24011-P-A dated August 15, 1986 and accepted by the NRC December 27, 1987. RBS could implement upon startup from Refueling Outage RF-10, currently planned for the fall of 2001, if approved as requested. EOI requests that the effective date of the change be within 60 days of approval.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that this change involves no significant hazards considerations. The bases for these determinations are included in the attached submittal. Attachment 1 provides a description of the proposed changes and the associated justification (including the determination of no significant hazard consideration). Attachment 2 contains marked-up Technical Specification pages reflecting the amendment being requested. Attachment 3 contains marked-up Technical

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Specification Bases pages reflecting the amendment being requested. Attachment 4 provides General Electric (GE) Nuclear Energy reports GE-NE-A71-00019-01, "Reduction of Low Power Setpoint for River Bend Station Rod Pattern Control System." GE-NE-A71-00019-01 contains information that is proprietary to GE. Consistent with the proprietary information notice provided in the preface of the report, General Electric requests the information provided by the report be withheld from public disclosure pursuant to 10 CFR 2.790(a)(4).

This request has been reviewed and approved by the RBS Facility Review Committee and the Safety Review Committee. There are no new commitments contained in this submittal.

If you have any questions regarding this request or require additional information, please contact Mr. Barry Burmeister of the RBS Nuclear Safety and Licensing staff at 225-381-4148.

Pursuant to 28 U.S.C.A. Section 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 24, 2001

Randall K. Edington

Very truly yours,

R. K. Edington
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River Bend Station
Docket No. 50-458
License No. NPF-47

Enclosures

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ATTACHMENT 1

TO

LETTER NO. RBG-45611

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

AFFECTED TECHNICAL SPECIFICATIONS

Technical Specifications: 3.1.3 "Control Rod OPERABILITY",
3.1.6 "Control Rod Pattern", and
3.3.2.1 "Control Rod Block Instrumentation".

BACKGROUND

Mitigating systems and procedures have been implemented to limit the incremental worth of control rods during startup and shutdown in order to limit the consequences of a postulated rod drop accident. For RBS, these mitigating systems and procedures include the Rod Withdrawal Limit (RWL) function, the Rod Pattern Control (RPC) function, and the Banked Position Withdrawal Sequence (BPWS). These systems and procedures prescribe sequences of control rod movement that involve a series of controlled rod moves. The implementation of the rod pattern control systems and procedures has an economic, safety and human factors impact on plant operations.

When the Control Rod Drop Accident (CRDA) analysis methodology was first developed, the power level above which a CRDA was inconsequential was determined to be 10% of rated power. Since then, the NRC has required the analytically determined low power setpoint (LPSP), be conservatively set at 20% of rated power.

This proposed change reduces the low power setpoint of the rod pattern control system from the current 20% of rated power to 10% of rated power. This change has the potential for improving the economic, safety and human factors aspects of power operations, by reducing the complexity of rod pattern controls.

DESCRIPTION

The RPC provides a control rod monitoring function that enforces the adherence to established startup, shutdown and low power level control rod movement sequences. The RPC prevents inadvertent deviation from the predetermined BPWS sequences by initiating rod select, rod withdrawal, and rod insert block signals as required. Operation of the RPC is intended from 100% control rod density to the LPSP, which is set so that the resultant peak fuel enthalpy, due to the postulated rod drop accident, is equal to or less than 280 cal/gm. For operation below the LPSP, systems are provided so that the design limit of 280 cal/gm is not exceeded for the design basis accident. Conformance to the 280 cal/gm design limit also ensures that the 10 CFR Part 100 offsite dose criteria will not be exceeded for the design basis accident. CRDA results from BPWS plants such as RBS have been statistically analyzed and, in all cases, it was shown that the resultant peak fuel enthalpy is much less than the 280 cal/gm design limit. The radiological effect of a CRDA was evaluated for new GE fuel product lines as part of the GESTAR licensing process. Therefore, the radiological effect following a CRDA for all current GE fuel design is demonstrated to be bounded by the guidelines set forth in 10CFR100.

The BPWS enforces adherence to certain constraints applied to control rod movement between 100% control rod density and the LPSP. In particular, the control rods are assigned to specific groups for which the sequence of rod movement is controlled by the RPCS. The BPWS allows the first 25% of the control rods to be withdrawn continuously from the fully inserted to the fully withdrawn position. The second 25% of the control rods to be withdrawn are banked to axial notch positions with the stipulation that all rods within a group must be withdrawn to their designated banked position before proceeding to the next banked position. Once 50% of the control rods to be withdrawn is attained, the remaining control rods are withdrawn within the restrictions for generic BPWS sequences.

Below the LPSP, the mitigating systems and procedures are used to limit the consequences of a postulated CRDA. This involves the complex and time consuming process of a series of controlled control rod moves. Therefore, the reduction in the LPSP of the RPCS has the potential of simplifying the process and has an economic, safety and human factors impact on plant operations.

The information in this LAR provides the detailed justification required in support of the establishment of the analytical LPSP at 10% of rated power for the RPC system at River Bend Station, in particular, the constraints imposed by the RPCS are not required above 10% of rated core thermal power. The conservatism inherent in the current analysis methodology provides the technical support required for this proposed change. Therefore, substantial margins will still exist after the proposed LPSP setpoint reduction has been incorporated.

The intrinsic analytical conservatism in conjunction with the economic, safety and human factors benefits of reducing the number of required operator actions, demonstrate that the analytical LPSP can be established at 10% of rated power (RTP) while maintaining adequate safety margin.

JUSTIFICATION FOR PROPOSED CHANGE

Justification for restoring the LPSP to 10% of rated power is as follows:

a. The summary of rod drop excursion results presented in generic analyses (NEDO-10527 and NEDO-10527 Addendum) demonstrate that a CRDA above 10% of rated power will always result in peak fuel enthalpies less than 280 cal/gm (assuming the worst single operator error). These results employed conservative Technical Specification scram times and a 3.11 ft/sec rod drop velocity. This generic analysis also included the effect of axial gadolinia distributions. In addition, it presents an analysis where the maximum control rod worth at the most reactive point in the operating cycle (mid-cycle) was combined with the worst CRDA conditions from the beginning of cycle. The results indicate, that even for this worst case scenario, the resultant peak fuel enthalpy will always be less than 280 cal/gm (worst single operator error) above 5% power. Thus, it is conservative to bypass the rod pattern control system above 10% of rated power.

b. GE (Reference 10 in the attached GE report) provides further support of the 10% power setpoint. This report states that "Above approximately 10% power, the CRDA cannot exceed 280 cal/gm because of the prompt Doppler feedback in the power range and the impossibility of achieving high rod reactivity worth with the relatively low rod density, even with erroneous rod patterns."

c. The new models, which include moderator reactivity feedback (Reference 9 in the attached GE report), provide additional justification for the 10% of rated power LPSP. These methods indicate that the existence of any steam flow (i.e., power) will result in the CRDA results remaining below the design basis limit. Therefore, a LPSP limit of 10% is extremely conservative relative to the new models.

d. An additional justification for the 10% LPSP is the impact on plant operation. The reduction of the LPSP will greatly reduce the number of operator actions required during plant startup and shutdown and therefore, reduce potential operator errors. The decrease in required operator actions will also result in the following:

1. Reduced challenges to the reactor protection system by increasing the rapid power reduction capability in response to plant transients, without scramming. As discussed in the GE report, approval of this change will lead to reduced reactor vessel cycling and thus increased plant safety.

2. Reduced control rod maneuverability restrictions during a partial scram or ATWS event improves the operator's capability to perform an orderly reactor shutdown, which results in increased plant safety.

3. Increased capacity factor (and cost savings) by reducing startup and shutdown times and lessening required scram recoveries. This capability arises from increased flexibility in use of control rods to reduce power.

4. Better capability to optimize target rod patterns and improve operating thermal margin instead of minimizing control rod worth at unnecessarily high power levels.

5. As discussed in the GE report, the restrictions imposed by the BPWS can also unnecessarily limit the stability margin that can be achieved during reactor operations.

RBS Specific Technical Specification (TS) Changes are justified as follows:

TS LCO 3.1.3.D

Out of sequence control rods may increase the potential reactivity worth of a dropped control rod during a CRDA. At power levels below the LPSP, the BPWS enforces the adherence to certain constraints applied to rod movement between 100% control rod density and the LPSP in order to limit incremental control rod worth. Therefore, if two or more inoperable control rods are not in compliance with BPWS and not separated by at least two operable control rods, this LCO must be entered to restore compliance with the BPWS. The proposed change revises the LPSP from 20% to 10% rated power. It does not affect the required operator action or the completion time of such action. GE evaluation demonstrates that because of

existing intrinsic analytical converatisms, the LPSP can be established at 10% of rated power while maintaining adequate safety margin. Below the proposed new LPSP, the RPC will continue to enforce the BPWS.

TS LCO 3.1.6

The BPWS enforces the adherence to a predetermined rod movement pattern, ensuring that it is consistent with the CRDA methodology. The RPC provides control rod blocks to enforce the required control rod sequence and is required to be operating at the LPSP. As a requirement for this LCO, the control rod pattern is verified to be in compliance with the BPWS at a 24 hour frequency, ensuring the assumptions of the CRDA analyses are met.

The proposed change revises the setpoint from 20% of rated power to 10% of rated power because the inherent converatisms in the current analysis methodology and because substantial margins will still exist after the reduction of the low power setpoint. GE evaluation demonstrates that the intrinsic analytical converatisms can be established at 10% of rated power while maintaining adequate safety margin. There is no change in the required action and completion time for this LCO action. Therefore, the function and performance of the LCO are not affected by this change.

TS Table 3.3.2.1-1

The proposed change revises the LPSP from 20% to 10% of rated power. The LPSP is set so that the resultant peak fuel enthalpy due to the postulated rod drop accident, is equal to or less than 280 cal/gm, ensuring compliance with 10CFR100 offsite dose criteria. GE generic analysis demonstrates the radiological effect following a CRDA for all current GE fuel designs are within the guidelines set forth in 10CFR100. The change in LPSP does not affect the intended function of the RPC and the required BPWS sequences and therefore, the RPC will continue to ensure the site compliance with 10CFR100.

TS SR3.3.2.1.4

This SR is required to be performed to verify the proper operation of the RPC. This SR is not required to be performed until 1 hour after thermal power is less than 20% rated power. The proposed change revises the setpoint from 20% to 10% rated power. It does not affect the surveillance frequency or the reliability of the RPC. The attached report demonstrates that the revised LPSP is acceptable at a value of 10% because the converatisms inherent in the current analysis methodology provides the technical and safety margin justifications for this change.

TS SR3.3.2.1.5

The LPSP is the point at which the RPCS switches between the RPC and RWL function. Periodic verification that it is within the allowable value is required every 92 days. The proposed change affects only the minimum allowable value. Specifically, it is changed from 20% to 10%. However, it does not affect the allowable upper limit, which still remains at 35% of rated power, nor does it affect the surveillance frequency. The attached report demonstrates that the analytical LPSP can be established at a minimum of 10% of rated power while maintaining adequate safety margin. Therefore, the proposed change does not affect the function and reliability of the RPC.

ENVIRONMENTAL IMPACT CONSIDERATION

EOI has reviewed this request against the criteria of 10CFR51.22 for environmental considerations. The request does not affect any system discharging radwaste to the environment or monitoring any such discharge. Also, the request does not adversely affect any system designed to monitor or isolate gaseous radioactive effluents release to the environment. Therefore, the request does not involve a significant hazards consideration, does not significantly increase the types or quantity of effluent that may be released offsite, and does not significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, EOI concludes that the proposed change meets the criteria given in 10CFR51.22 (c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

NO SIGNIFICANT HAZARDS CONSIDERATION

Energy Operations, Inc. is proposing that the River Bend Station Operating License be amended to change the limit on the Low Power Setpoint Limit (LPSP) specified by Technical Specifications 3.1.3 "Control Rod OPERABILITY", 3.1.6 "Control Rod Pattern", and 3.3.2.1 "Control Rod Block Instrumentation".

An evaluation of the proposed change has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR50.92(c). A discussion of these standards as they relate to this amendment request follows:

(1) The proposed changes do not significantly increase the probability or consequences of an accident previously evaluated.

The proposed change revises the setpoint from 20% to 10% rated power and does not affect the function, reliability or required surveillance frequency of the RPC set forth in the Technical Specification. It does not constitute a safety significant change to the plant design or operation since the RPC and associated BPWS will continue to ensure site compliance with 10CFR100.

The RPC limits the incremental worth of control rods during reactor startup and shutdown. The BPWS allows continuous withdrawal from fully inserted to the fully withdrawn position for the first 25% of control rod density. The change in LPSP does not affect any of the parameters or conditions that contribute to initiation of the control rod drop accident since it is not the precursor of the accident. On this basis, change in the low power setpoint will not increase the probability of an accident previously evaluated.

The low power setpoint of the RPC is set so that the resultant peak fuel enthalpy due to the postulated rod drop accident shall be equal to or less than 280 cal/gm. For operation below the LPSP, systems are provided so that the design limit of 280 cal/gm is not exceeded for the design basis accident. Conformance to the 280 cal/gm design limit also ensures that the 10CFR100 offsite dose criteria will not be exceeded for the design basis accident. GE generic analysis demonstrates the radiological effect following a CRDA for all current GE fuel design is within the guidelines set forth in 10CFR100. No River Bend specific analysis is necessary. On these bases, the proposed LPSP reduction does not significantly change the consequences of an accident previously evaluated.

(2) The request does not create the possibility of occurrence of a new or different kind of accident from any accident previously evaluated.

The LPSP is set so that the resultant peak fuel enthalpy due to the postulated rod drop accident at power levels below the LPSP, shall be equal to or less than 280 cal/gm, ensuring compliance with 10CFR100 offsite dose criteria. The proposed change implements the reduction in LPSP from 20% to 10% of rated power without the addition of new hardware.

The change in LPSP does not affect any of the parameters or conditions that contribute to initiation of any accident since the LPSP is not the precursor of any accident. The LPSP is the point at which the RPCS switches between the RPC and RWL function. Periodic verification that it is within the allowable value is required. The proposed change does not affect the function and the reliability of the RPC, or the required surveillance frequency of Technical Specification LCO. Furthermore, the reduction in setpoint can be implemented without the addition of new hardware. On this basis, reduction in the low power setpoint does not create the possibility of occurrence of a new or different accident.

(3) The request does not involve a significant reduction in margin of safety.

Below the LPSP, mitigating systems and procedures are used to limit the consequences of a postulated CRDA. These involve a time consuming process of a series of controlled rod moves or steps. The setpoint change has the potential to impact the margin of safety and as such, a series of evaluations and under the worst case scenario were performed for a CRDA.

NEDO-10527 demonstrates that a CRDA at or above 10% of rated power will always result in peak fuel enthalpies less than 280 cal/gm. These results assumed the worst single operator error, conservative Technical Specification scram times and rod drop velocity. This generic analysis also included the effect of core and fuel cycle design parameters such as the axial gadolinia distributions. The results indicate, that even for this worst case scenario, the resultant peak fuel enthalpy will always be less than 280 cal/gm, ensuring conformance with guidelines set forth in 10CFR100. Additional vendor analyses show that "Above approximately 10% power, the RDA cannot exceed 280 cal/gm because of the prompt Doppler feedback in the power range and the impossibility of achieving high rod reactivity worth with the relatively low rod density, even with erroneous rod patterns." Finally, the new models, which include moderator reactivity feedback, provide additional justification for the 10% of rated power LPSP. These methods indicate that the existence of any steam flow (i.e., power) will result in the CRDA results remaining below the design basis limit.

Therefore, a LPSP limit of 10% is conservative relative to the new models. On these bases, the proposed reduction in the LPSP does not change the margin of safety significantly.

ATTACHMENT 2

TO

LETTER NO. RBG-45611

PROPOSED TECHNICAL SPECIFICATION MARK-UPS

LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2	Disarm the associated CRD.	4 hours
D. ---------NOTE--------- Not applicable when THERMAL POWER > 10% RTP. ---------- Two or more inoperable control rods not in compliance with banked position withdrawal sequence (BPWS) and not separated by two or more OPERABLE control rods.	D.1	Restore compliance with BPWS.	4 hours
	OR		
	D.2	Restore control rod to OPERABLE status.	4 hours
E. Required Action and associated Completion Time of Condition A, C, or D not met. OR Nine or more control rods inoperable.	E.1	Be in MODE 3.	12 hours

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Rod Pattern

LCO 3.1.6 OPERABLE control rods shall comply with the requirements of the banked position withdrawal sequence (BPWS).

APPLICABILITY: MODES 1 and 2 with THERMAL POWER ≤ 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more OPERABLE control rods not in compliance with BPWS.	A.1 --------NOTE-------- Affected control rods may be bypassed in Rod Action Control System (RACS) in accordance with SR 3.3.2.1.9. ---------- Move associated control rod(s) to correct position.	8 hours
	OR	
	A.2 Declare associated control rod(s) inoperable.	8 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1.4	----------NOTE---------- Not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. ---------- Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.2.1.5	Calibrate the low power setpoint trip units. The Allowable Value shall be > 10% RTP and ≤ 35% RTP.	92 days
SR 3.3.2.1.6	Verify the RWL high power Function is not bypassed when THERMAL POWER is > 68.2% RTP.	92 days
SR 3.3.2.1.7	Perform CHANNEL CALIBRATION.	184 days
SR 3.3.2.1.8	----------NOTE---------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. ---------- Perform CHANNEL FUNCTIONAL TEST.	18 months
SR 3.3.2.1.9	Verify the bypassing and movement of control rods required to be bypassed in Rod Action Control System (RACS) is in conformance with applicable analyses by a second licensed operator or other qualified member of the technical staff.	Prior to and during the movement of control rods bypassed in RACS

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Rod Pattern Control System			
a. Rod withdrawal limiter	(a)	2	SR 3.3.2.1.1 SR 3.3.2.1.6 SR 3.3.2.1.9
	(b)	2	SR 3.3.2.1.2 SR 3.3.2.1.5 SR 3.3.2.1.7 SR 3.3.2.1.9
b. Rod pattern controller	1[(c)],2	2	SR 3.3.2.1.3 SR 3.3.2.1.4 SR 3.3.2.1.5 SR 3.3.2.1.7 SR 3.3.2.1.9
2. Reactor Mode Switch – Shutdown Position	(d)	2	SR 3.3.2.1.8

(a) THERMAL POWER greater than the HPSP.

(b) THERMAL POWER > 35% RTP and less than or equal to the HPSP.

(c) With THERMAL POWER ≤ 10% RTP.

(d) Reactor mode switch in the shutdown position.

ATTACHMENT 3

TO

LETTER NO. RBG-45611

PROPOSED TECHNICAL SPECIFICATION BASES MARK-UPS

(FOR INFORMATION ONLY)

LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

BASES

ACTIONS (continued)

D.1 and D.2

Out of sequence control rods may increase the potential reactivity worth of a dropped control rod during a CRDA. At ≤ 20% RTP, the generic banked position withdrawal sequence (BPWS) analysis (Ref. 7) requires inserted control rods not in compliance with BPWS to be separated by at least two OPERABLE control rods in all directions, including the diagonal. Therefore, if two or more inoperable control rods are not in compliance with BPWS and not separated by at least two OPERABLE control rods, action must be taken to restore compliance with BPWS or restore the control rods to OPERABLE status. A Note has been added to the Condition to clarify that the Condition is not applicable when > 20% RTP since the BPWS is not required to be followed under these conditions, as described in the Bases for LCO 3.1.6. The allowed Completion Time of 4 hours is acceptable, considering the low probability of a CRDA occurring.

E.1

If any Required Action and associated Completion Time of Condition A, C, or D are not met or nine or more inoperable control rods exist, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours. This ensures all insertable control rods are inserted and places the reactor in a condition that does not require the active function (i.e., scram) of the control rods. The number of control rods permitted to be inoperable when operating above 20% RTP (i.e., no CRDA considerations) could be more than the value specified, but the occurrence of a large number of inoperable control rods could be indicative of a generic problem, and investigation and resolution of the potential problem should be undertaken. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	Control rod patterns analyzed in Reference 2 follow the banked position withdrawal sequence (BPWS) described in Reference 8. The BPWS is applicable from the condition of all control rods fully inserted to 10% RTP (Ref. 1). For the BPWS, the control rods are required to be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions (e.g., between notches 08 and 12). The banked positions are defined to minimize the maximum incremental control rod worths without being overly restrictive during normal plant operation. The generic BPWS analysis (Ref. 8) also evaluated the effect of fully inserted, inoperable control rods not in compliance with the sequence, to allow a limited number (i.e., eight) and distribution of fully inserted, inoperable control rods. Rod pattern control satisfies the requirements of Criterion 3 of the NRC Policy Statement.
LCO	Compliance with the prescribed control rod sequences minimizes the potential consequences of a CRDA by limiting the initial conditions to those consistent with the BPWS. This LCO only applies to OPERABLE control rods. For inoperable control rods required to be inserted, separate requirements are specified in LCO 3.1.3, "Control Rod OPERABILITY," consistent with the allowances for inoperable control rods in the BPWS.
APPLICABILITY	In MODES 1 and 2, when THERMAL POWER is ≤ 10% RTP, the CRDA is a Design Basis Accident (DBA) and, therefore, compliance with the assumptions of the safety analysis is required. When THERMAL POWER is > 10% RTP, there is no credible control rod configuration that results in a control rod worth that could exceed the 280 cal/gm fuel damage limit during a CRDA (Ref. 1). In MODES 3, 4, and 5, since the reactor is shut down and only a single control rod can be withdrawn from a core cell containing fuel assemblies, adequate SDM ensures that the consequences of a CRDA are acceptable, since the reactor will remain subcritical with a single control rod withdrawn.

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

With one or more OPERABLE control rods not in compliance with the prescribed control rod sequence, action may be taken to either correct the control rod pattern or declare the associated control rods inoperable within 8 hours. Noncompliance with the prescribed sequence may be the result of "double notching," drifting from a control rod drive cooling water transient, leaking scram valves, or a power reduction to ≤ 10% RTP before establishing the correct control rod pattern. The number of OPERABLE control rods not in compliance with the prescribed sequence is limited to eight to prevent the operator from attempting to correct a control rod pattern that significantly deviates from the prescribed sequence. When the control rod pattern is not in compliance with the prescribed sequence, all control rod movement should be stopped except for moves needed to correct the control rod pattern, or scram if warranted.

Required Action A.1 is modified by a Note, which allows control rods to be bypassed in Rod Action Control System (RACS) to allow the affected control rods to be returned to their correct position. This ensures that the control rods will be moved to the correct position. A control rod not in compliance with the prescribed sequence is not considered inoperable except as required by Required Action A.2. OPERABILITY of control rods is determined by compliance with LCO 3.1.3; LCO 3.1.4, "Control Rod Scram Times"; and LCO 3.1.5, "Control Rod Scram Accumulators." The allowed Completion Time of 8 hours is reasonable, considering the restrictions on the number of allowed out of sequence control rods and the low probability of a CRDA occurring during the time the control rods are out of sequence.

B.1 and B.2

If nine or more OPERABLE control rods are out of sequence, the control rod pattern significantly deviates from the prescribed sequence. Control rod withdrawal should be suspended immediately to prevent the potential for further deviation from the prescribed sequence. Control rod insertion to correct control rods withdrawn beyond their allowed position is allowed since, in general, insertion of control rods has less impact on control rod worth than

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

withdrawals have. Required Action B.1 is modified by a Note that allows the affected control rods to be bypassed in RACS in accordance with SR 3.3.2.1.9 to allow insertion only.

With nine or more OPERABLE control rods not in compliance with BPWS, the reactor mode switch must be placed in the shutdown position within 1 hour. With the reactor mode switch in shutdown, the reactor is shut down, and therefore does not meet the applicability requirements of this LCO. The allowed Completion Time of 1 hour is reasonable to allow insertion of control rods to restore compliance, and is appropriate relative to the low probability of a CRDA occurring with the control rods out of sequence.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

The control rod pattern is verified to be in compliance with the BPWS at a 24 hour Frequency, ensuring the assumptions of the CRDA analyses are met. The 24 hour Frequency of this Surveillance was developed considering that the primary check of the control rod pattern compliance with the BPWS is performed by the RPC (LCO 3.3.2.1). The RPC provides control rod blocks to enforce the required control rod sequence and is required to be OPERABLE when operating at $\leq$ 10% RTP.

REFERENCES

1. NEDE-24011-P-A, "GE Standard Application for Reactor Fuel, GESTAR II" (latest approved revision).

2. USAR, Section 15.4.9.

3. NUREG-0979, "NRC Safety Evaluation Report Related to the Final Design Approval of the GESSAR II BWR/6 Nuclear Island Design, Docket No. 50-447," Section 4.2.1.3.2, April 1983.

4. NUREG-0800, "Standard Review Plan," Section 15.4.9, "Radiological Consequences of Control Rod Drop Accident (BWR)," Revision 2, July 1981.

(continued)

BASES

BACKGROUND (continued)

The purpose of the RPC is to ensure control rod patterns during startup are such that only specified control rod sequences and relative positions are allowed over the operating range from all control rods inserted to 10% RTP. The sequences effectively limit the potential amount and rate of reactivity increase during a CRDA. The RPC, in conjunction with the RCIS, will initiate control rod withdrawal and insert blocks when the actual sequence deviates beyond allowances from the specified sequence. The rod block logic circuitry is the same as that described above. The RPC also uses the turbine first stage pressure to determine when reactor power is above the power at which the RPC is automatically bypassed (Ref. 1).

With the reactor mode switch in the shutdown position, a control rod withdrawal block is applied to all control rods to ensure that the shutdown condition is maintained. This function prevents criticality resulting from inadvertent control rod withdrawal during MODE 3 or 4, or during MODE 5 when the reactor mode switch is required to be in the shutdown position. The reactor mode switch has two channels, with each providing inputs into a separate rod block circuit. A rod block in either circuit will provide a control rod block to all control rods.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Rod Withdrawal Limiter

The RWL is designed to prevent violation of the MCPR SL and the cladding 1% plastic strain fuel design limit that may result from a single control rod withdrawal error (RWE) event. The analytical methods and assumptions used in evaluating the RWE event are summarized in Reference 2. A statistical analysis of RWE events was performed to determine the MCPR response as a function of withdrawal distance and initial operating conditions. From these responses, the fuel thermal performance was determined as a function of RWL allowable control rod withdrawal distance and power level.

The RWL satisfies Criterion 3 of the NRC Policy Statement. Two channels of the RWL are available and are required to be OPERABLE to ensure that no single instrument failure can preclude a rod block from this Function. The RWL high power function channels are OPERABLE when control rod withdrawal is limited to no more than two notches. The RWL low power function channels are OPERABLE when control rod withdrawal is limited to no more than four notches. An exception to the rod withdrawal limits is possible for a single control rod that is selected, subsequently inserted, to be withdrawn back to its original position without a rod block and withdrawn 1 or 2 feet beyond its original position

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.b. Rod Pattern Controller (continued)

The Rod Pattern Controller Function satisfies Criterion 3 of the NRC Policy Statement. Since the RPC is a backup to operator control of control rod sequences, only a single channel would be required OPERABLE to satisfy Criterion 3 (Ref. 6). However, the RPC is designed as a dual channel system and will not function without two OPERABLE channels. Required Actions of LCO 3.1.3, "Control Rod OPERABILITY," and LCO 3.1.6 may necessitate bypassing individual control rods in the Rod Action Control System (RACS) to allow continued operation with inoperable control rods or to allow correction of a control rod pattern not in compliance with the BPWS. The individual control rods may be bypassed as required by the conditions, and the RPC is not considered inoperable provided SR 3.3.2.1.9 is met.

Compliance with the BPWS, and therefore OPERABILITY of the RPC, is required in MODES 1 and 2 with THERMAL POWER ≤ 10% RTP. When THERMAL POWER is > 10% RTP, there is no possible control rod configuration that results in a control rod worth that could exceed the 280 cal/gm fuel damage limit during a CRDA. In MODES 3 and 4, all control rods are required to be inserted in the core. In MODE 5, since only a single control rod can be withdrawn from a core cell containing fuel assemblies, adequate SDM ensures that the consequences of a CRDA are acceptable, since the reactor will be subcritical.

2. Reactor Mode Switch—Shutdown Position

During MODES 3 and 4, and during MODE 5 when the reactor mode switch is required to be in the shutdown position, the core is assumed to be subcritical; therefore, no positive reactivity insertion events are analyzed. The Reactor Mode Switch—Shutdown Position control rod withdrawal block ensures that the reactor remains subcritical by blocking control rod withdrawal, thereby preserving the assumptions of the safety analysis.

The Reactor Mode Switch—Shutdown Position Function satisfies Criterion 3 of the NRC Policy Statement.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1.9

LCO 3.1.3 and LCO 3.1.6 may require individual control rods to be bypassed in RACS to allow insertion of an inoperable control rod or correction of a control rod pattern not in compliance with BPWS. With the control rods bypassed in the RACS, the RPC will not control the movement of these bypassed control rods. Individual control rods may also be required to be bypassed to allow continuous withdrawal for determining the location of leaking fuel assemblies, adjustment of control rod speed, or control rod scram time testing. To ensure the proper bypassing and movement of those affected control rods, a second licensed operator or other qualified member of the technical staff must verify the bypassing and movement of these control rods is in conformance with applicable analyses. Compliance with this SR allows the RPC and RWL to be OPERABLE with these control rods bypassed.

REFERENCES

1. USAR, Section 7.6.1.7.

2. USAR, Section 15.4.2.

3. NEDE-24011-P-A, "General Electric Standard Application for Reload Fuel" (latest approved revision).

4. "Modifications to the Requirements for Control Rod Drop Accident Mitigating Systems," BWR Owners Group, July 1986.

5. NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.

6. NRC SER, Acceptance of Referencing of Licensing Topical Report NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel, Revision 8, Amendment 17," December 27, 1987.

7. NEDC-30851-P-A, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

8. GE-NE-A71-00019-01 "REDUCTION OF LOW POWER SET POINT FOR RBS ROD PATTERN CONTROL SYSTEM," MAY 1996.

ATTACHMENT 4

TO

LETTER NO. RBG-45611

General Electric Report

LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

General Electric Company

AFFIDAVIT

I, George B. Stramback, being duly sworn, depose and state as follows:

(1) I am Project Manager, Regulatory Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GE proprietary report GE-NE-A71-00019-01, *Reduction of Low Power Setpoint for River Bend Station Rod Pattern Control System,* Class III (GE Proprietary Information), dated March 1997. The proprietary information is delineated by bars marked in the margin adjacent to the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because it contains detailed results of analytical models, methods and processes, including computer codes, which GE has developed, obtained NRC approval of, and applied to perform evaluations of the impact of reactivity excursions and the control rod drop accident for the BWR.

The development and approval of the BWR reactivity excursions and control rod drop accident computer codes used in this analysis was achieved at a significant cost, on the order of half a million dollars, to GE.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 17th day of November 2000.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 17th day of November 2000.

Notary Public, State of California

VICKY D. SCHROER
Commission # 1224251
Notary Public - California
Santa Clara County
My Comm. Expires Jun 12, 2003