Entergy Operations

Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150
Tel 601-437-2800

April 21, 1993

U.S. Nuclear Regulatory Commission
Mail Station P1-37
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Control Rod Drive Surveillance Testing Per NUREG-1434
Proposed Amendment to the Operating License (PCOL-92/08)

GNRO-93/00036

Gentlemen:

Entergy Operations, Inc. is submitting by this letter a proposed amendment to the Grand Gulf Nuclear Station (GGNS) Operating License. The proposed amendment revises the requirement for control rod testing to increase the "notch testing" surveillance interval for partially withdrawn control rods from once per 7 days to once per 31 days. The current weekly surveillance imposes undue hardship on the plant and operating personnel due to unnecessary down-power maneuvers and control rod manipulations. The proposed changes are consistent with the requirements stipulated in the Improved Standard Technical Specifications, NUREG-1434, Rev. 0.

Attachment 2 provides a detailed description of the proposed changes, justification, and the No Significant Hazards Considerations. Attachment 3 is a copy of the marked-up TS and TS bases pages, and Attachment 4 is an information copy of the proposed TS.

In accordance with the provisions of 10CFR50.4, the signed original of the requested amendment is enclosed. This amendment request has been reviewed and accepted by the Plant Safety Review Committee and the Safety Review Committee.

230053

A001 1/1

Based on the guidelines in 10CFR50.92, Entergy Operations has concluded that this proposed amendment involves no significant hazards considerations. Attachment 2 details the basis for this determination.

Yours truly,

C. R. Hutchinson
Vice President, Operations GGNS

WEL/mtc
attachments: 1. Affirmation per 10CFR50.30
2. GGNS PCOL-92/08
3. Mark-up of Affected Technical Specification Pages
4. Proposed Technical Specifications Pages - Information Only

cc: Mr. R. H. Bernhard (w/a)
Mr. H. W. Keiser (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. H. L. Thomas (w/o)

Mr. Stewart D. Ebneter (w/a)
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 2900
Atlanta, Georgia 30323

Mr. P. W. O'Connor, Project Manager (w/2)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 13H3
Washington, D.C. 20555

Dr. Alton B. Cobb (w/a)
State Health Officer
State Board of Health
P.O. Box 1700
Jackson, Mississippi 39205

Attachment 1 to GNRO93/00036
Page 1 of 1

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-29

DOCKET NO. 50-416

IN THE MATTER OF

MISSISSIPPI POWER & LIGHT COMPANY
and
SYSTEM ENERGY RESOURCES, INC.
and
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
and
ENTERGY OPERATIONS, INC.

AFFIRMATION

I, C. R. Hutchinson, being duly sworn, state that I am Vice President, Operations GGNS of Entergy Operations, Inc.; that on behalf of Entergy Operations, Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this application for amendment of the Operating License of the Grand Gulf Nuclear Station; that I signed this application as Vice President, Operations GGNS of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information and belief.

C. R. Hutchinson

STATE OF MISSISSIPPI
COUNTY OF CLAIBORNE

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 21st day of April, 1993.

(SEAL)

Elizabeth L. Lang
Notary Public

My commission expires:

December 28, 1995

G9303161 - 4

PROPOSED CHANGE TO THE OPERATING LICENSE

CONTROL ROD DRIVE SURVEILLANCE INTERVALS

(GGNS PCOL 92/08)

A. SUBJECT: Control Rod Drive Surveillance Intervals

Technical Specification: 4.1.3.1.2.a

Affected Page: 3/4 1-4a

B. DISCUSSION:

This proposed amendment to the Grand Gulf Nuclear Station (GGNS) Technical Specifications (TS) requests a change to the TS 3/4.1.3, Control Rod Operability to revise Surveillance Requirement 4.1.3.1.2a to increase the surveillance interval for partially withdrawn control rods from once per seven days to once per 31 days. Fully withdrawn control rods will continue to be tested once per seven days. A note is also added clarifying that the surveillance is not required to be performed until 7 days (for fully withdrawn) or 31 days (for partially withdrawn) after the control rod is withdrawn and THERMAL POWER is greater than the LPSP.

For those control rods that are partially withdrawn, the current control rod drive (CRD) Surveillance 4.1.3.1.2.a must be performed with reactor power below approximately 92% power due to fuel thermal limit considerations. Since GGNS is essentially a base-load unit operating at 100% power, reactor power must be reduced every other week for several hours specifically to meet this surveillance requirement. The remaining weekly control rod testing is performed in conjunction with a power reduction to perform testing (required every 14 days) on the turbine overspeed protection system (TS 3/4.3.9). The power reduction to perform the weekly CRD surveillance represents approximately 3100 Mw-hrs annually in lost electrical generation.

The proposed surveillance will continue to assure control rod operability while relieving operating personnel of the burden of reactor power changes and excessive control rod manipulations during power operations.

C. JUSTIFICATION:

The current Grand Gulf Nuclear Station (GGNS) Technical Specification (TS) for control rod operability (TS 3/4.1.3) assures that the minimum SHUTDOWN MARGIN is maintained, the control rod scram times are consistent with those used in the accident, non-accident and transient analyses, and the potential effects of the rod withdrawal accident and rod withdrawal error are limited [Reference 1]. The surveillance requirements for the control rod drives include verifying each withdrawn control rod is capable of moving at least one notch once per seven days when operating above the low power setpoint of the Rod Pattern Control System (RPCS). This surveillance (4.1.3.1.2.a) provides a means of identifying control rods that are immovable as a result of excessive friction or mechanical interference and provides a means of identifying problems with the rod position indicating system (surveillance requirement 4.1.3.5.b). This testing is performed once per seven days.

The proposed amendment increases the surveillance interval for partially withdrawn control rods from once per seven days to once per 31 days. The surveillance is normally performed by inserting each withdrawn control rod one notch and

withdrawing it to its original position. As an alternate, the surveillance is performed as control rods are moved in conjunction with a control rod pattern adjustment or sequence exchange.

This proposed change is consistent with the Technical Specification Improvement Program and References 3 and 4. Other requirements for control rod operability in the Improved Technical Specifications (ITS) do not provide operational constraints more restrictive than the GGNS TS for those control rods found to be immovable as a result of excessive friction or mechanical interference. In fact, the ITS is less restrictive. The GGNS TS requires an inoperable control rod to be returned to OPERABLE status within 48 hours or HOT SHUTDOWN is required within the next 12 hours. The improved specifications [Reference 4] allow continued operation provided SHUTDOWN MARGIN can be demonstrated and no more than one withdrawn control rod is stuck.

Industry data on control rod drive reliability indicates an extremely low failure rate for failures detected during the weekly surveillance testing. It is believed that less than five control rods that would not fully insert upon a scram due to excessive friction or mechanical interference have been detected. Reference 5 analyzed CRD system failure data reported to the Nuclear Plant Reliability Data System (NPRDS) and from other sources. The CRD mechanism (CRDM) accounted for only 23% of the NPRDS reported failures on the control rod drive system. Grand Gulf experience with control rod drive mechanisms also indicates high degree of reliability. No problems have been identified at GGNS due to a control rod being immovable due to excessive friction or mechanical interference.

Based on five failures and 35 BWRs operating an average of 15 years each, and assuming 170 control rods per plant, the failure rate per rod is approximately 1.1E-6/week. The effect of the proposed surveillance is to extend the surveillance interval by three weeks for approximately 43 of the 193 control rods. Therefore, the increased likelihood of an undetected rod drive failure can be estimated as follows:

(43 rods/month*3 weeks*1.1E-6 failures/rod-week) = 1.4E-4 failures/month

This is an extremely low number. To illustrate its significance, only one control rod failure would be expected to go undetected due to the proposed Tech Spec change during 1/1.4E-4 months, or 595 years of operation at GGNS. Therefore, based on actual CRDM operating experience, the proposed surveillance interval is adequate to maintain a high level of safety and reliability. This testing provides an adequate surveillance of control rod insertion capability [Reference 4]. The requirement to notch test all withdrawn control rods if a rod is immovable due to excessive friction or mechanical interference (i.e., stuck) is retained. This provides adequate assurance that the cause of a stuck control rod is not of generic concern.

D. NO SIGNIFICANT HAZARDS CONSIDERATIONS:

Surveillance requirement 4.1.3.1.2.a is revised to increase the surveillance interval for partially withdrawn control rods from once per seven days to once per 31 days. Fully withdrawn control rods will continue to be tested once per seven days. A note is also added clarifying that the surveillance is not required to be performed until 7 days (for

fully withdrawn) or 31 days (for partially withdrawn) after the control rod is withdrawn and THERMAL POWER is greater than the Low Power Setpoint (LPSP).

The Commission has provided standards for determining whether a no significant hazards consideration exists as stated in 10CFR50.92(c). A proposed amendment to an operating license involves a no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

Entergy Operations Inc. has evaluated the no significant hazards considerations in its request for a license amendment. In accordance with 10CFR50.91(a), Entergy Operations Inc. is providing the analysis of the proposed amendment against the three standards in 10CFR50.92(c). A description of the no significant hazards considerations determination follows:

1. The proposed change does not significantly increase the probability or consequences of an accident previously evaluated.

   The current and proposed surveillance requirements for the control rod drives include verifying each withdrawn control rod is capable of moving at least one notch once per seven days when operating above the low power setpoint of the Rod Pattern Control System (RPCS). This surveillance (4.1.3.1.2.a) provides a means of identifying control rods that are immovable as a result of excessive friction or mechanical interference and provides a means of identifying problems with the rod position indicating system (Surveillance Requirement 4.1.3.5.b).

   No safety-related equipment or function will be altered as a result of this change. The proposed amendment only increases the surveillance interval for partially withdrawn control rods from once per seven days to once per 31 days. Based on the demonstrated reliability of the control rod drive (CRD) system at Grand Gulf Nuclear Station (GGNS) and similar facilities, the ability of the CRD scram function to reliably control reactivity changes during abnormal operational transients is not compromised. This change has no influence or impact on the probability of any accident or malfunction evaluated in the GGNS Updated Final Safety Analysis Report (UFSAR) [Reference 2]. No accident or malfunctions evaluated are affected; therefore, the consequences of these have not significantly increased.

   Based on the above, the proposed change does not significantly increase the probability or consequences of any accident previously evaluated.

2. The proposed change would not create the possibility of a new or different kind of accident from any previous analyzed.

   Extending the surveillance to 31 days has no influence on, nor does it contribute in any way, to the possibility of a new or different kind of accident or malfunction from those previously analyzed. The method of performing the surveillance is not changed. No new accident modes are created by extending the surveillance interval

from 7 days to 31 days. As stated above, no safety-related equipment or safety functions are altered as a result of this change.

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

3. The proposed change does not involve a significant reduction in a margin of safety.

   The proposed change does not alter the requirement that all control rods be OPERABLE in OPERATIONAL CONDITIONS 1 and 2. The proposed change does not change those required actions if a control rod is inoperable. The revised surveillance in conjunction with other control rod surveillances continues to maintain the reliability and availability of the scram function as well as the required shutdown margin. Technical Specifications will continue to require the majority of the control rods to be tested once per seven days. The margin of safety provided by the current TS is not affected by increasing the surveillance interval to 31 days.

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

Based on the above evaluation, operation in accordance with the proposed amendment involves no significant hazards considerations.

E. REFERENCES:

1. Grand Gulf Nuclear Station Unit 1 Technical Specifications and Bases, Updated through Amendment 101.

2. Grand Gulf Nuclear Station Final Safety Analysis Report, Updated through Revision 4, Chapters 4 and 15.

3. NEDC-31681, BWR Owners' Group Improved BWR Technical Specifications - BWR/6, April 1989.

4. NUREG 1434, Standard Technical Specifications, General Electric BWR/6 Plants, Revision 0, dated September 29, 1992.

5. NUREG/CR-5699, Aging and Service Wear of Control Rod Drive Mechanisms for BWR Nuclear Plants, Draft issued August 1991.

MARKED-UP TECHNICAL SPECIFICATIONS PAGES

CONTROL ROD DRIVE SURVEILLANCE INTERVALS

(GGNS PCOL 92/08)