



**ENTERGY**

Entergy Operations, Inc.  
P.O. Box 756  
Port Gibson, MS 39150  
Tel: 601-437-6406

February 26, 1993

**W. T. Cottle**  
Vice President  
Operations  
Grand Gulf Nuclear Station

U.S. Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
Exemption to 10CFR50 Appendix J - Control Rod Drive System

GNRO-93/00019

Gentlemen:

Entergy Operations, Inc. is submitting by this letter a proposed exemption to the requirements of 10CFR50, Appendix J. The proposed exemption is intended to support the containment integrated leak rate test (ILRT) planned for our sixth refueling outage (RF06) and subsequent performances of this test. RF06 is scheduled to begin on October 8, 1993. The proposed exemption will allow the control rod drive (CRD) system pump discharge header penetration into containment to be left in service during the ILRT, thus reducing personnel radiation exposure and outage length while preserving an equivalent level of safety.

The Attachment to this letter provides a detailed description of the proposed exemption, justification and the special circumstances identified. Based on the guidelines in 10CFR50.12, Entergy Operations has concluded the proposed exemption is supported by the attached information. Entergy Operations requests a permanent exemption in this regard which would apply throughout the operating lifetime of the facility.

Entergy Operations requests NRC approval of the proposed exemption by August 31, 1993.

Yours truly,

*W. T. Cottle*

WTC/WEL/mtc

attachment: Request for Exemption from 10CFR Part 50, Appendix J

cc: (See Next Page)

9303050084 930226  
PDR ADOCK 05000416  
P PDR

G930205i/SNLICFLR - 1

AD17

February 26, 1993  
GNRO-93/00019  
Page 2 of 3

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

Mr. Stewart D. Ebnetter (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

Request for Exemption from 10 CFR50

Appendix J, Section III.A.1.(d)

Control Rod Drive System Penetration Configuration During Type A Tests

---

A. DESCRIPTION OF REQUESTED EXEMPTION

Entergy Operations, Inc. (Entergy) hereby applies for exemption from the requirements of 10CFR Part 50, Appendix J, Section III.A.1.(d) for Grand Gulf Nuclear Station. This exemption is to apply only to the Control Rod Drive (CRD) pump discharge penetration into the containment (penetration No. 33) during Type A testing (Integrated Leak Rate Testing (ILRT)). Appendix J, Section III.A.1.(d) requires that the portions of fluid systems that are part of the reactor coolant pressure boundary and open to the containment post-accident be vented and drained to assure they will be exposed to containment air test pressure. This exemption for CRD penetration No. 33 would permit the CRD system to be left in its normal operating configuration with a CRD pump running during the ILRT.

B. JUSTIFICATION FOR THE REQUESTED EXEMPTION

10CFR50.12(a) allows the Commission to grant specific exemptions from the requirements of its regulations provided certain standards are met. These are: (1) the exemptions are authorized by law, will not present undue risk to the public health and safety, and are consistent with the common defense and security; and (2) special circumstances are present as defined by any of the situations described in Section 50.12(a)2, paragraphs (i) through (iv).

Entergy has evaluated the requested exemption in accordance with the above criteria. The request meets requirements of 10CFR50.12 and should therefore be granted. Entergy presents the following analyses in support of this Appendix J exemption application:

1. 50.12(a)(1) - Exemption Criteria

- a. The exemption is authorized by law. Entergy is currently authorized to operate GGNS Unit 1 pursuant to License No. NPF-29 issued in accordance with the Atomic Energy Act as amended. The NRC is empowered to grant an exemption to a regulation it has promulgated<sup>1</sup>, and since no other prohibition of law exists to preclude the activities which would be permitted by this exemption, the exemption is authorized by law.
- b. The exemption will not present undue risk to the public health and safety. Entergy has analyzed the potential effects of the proposed exemption as follows:

With the CRD system in its operating configuration with a CRD pump running during the ILRT, the CRD system provides filtered water to the Hydraulic Control Units (HCUs) and the reactor vessel to maintain the CRD system full of water. This is essentially the normal

---

<sup>1</sup>See: United States v. Allegheny-Ludlum Steel Corp., 406 U.S. 742 (1972)

configuration for the CRD system during outage periods and poses no undue risk to the public health and safety during the ILRT.

The proposed exemption would allow a penetration valve lineup configuration that deviates from that required by Appendix J, III.A.1.(d); however, the leakage associated with this penetration as determined by Type C testing conducted during the same refueling outage will be added as a penalty to the Type A test 95% upper confidence level (UCL) results. This penalty will be determined using the "minimum pathway leakage" methodology. The Staff has recognized this approach is acceptable in numerous instances<sup>2</sup> where Type A tests have failed. In fact, the Staff has adopted the formal position that where excessive leakage paths are identified during the Type A test that result in failure of the Type A test, the path may be isolated and the Type A test completed provided the sum of the post-repair leakage and the Type A test results meet the Appendix J allowable leakage rate (0.75 La). The resulting overall integrated leakage rate is required to meet the allowable values as specified in Appendix J and the Technical Specifications. Therefore, the actions proposed by the requested exemption ensure that the total containment leakage volume will not exceed that assumed in the accident analyses and that the added conservatism built into the Technical Specifications limits is preserved. Therefore, the risk to the public health and safety remains unchanged.

Entergy concludes that granting this exemption does not pose an undue risk to public health and safety.

- c. The exemption is consistent with the common defense and security. This exemption allows for continued safe operation of Grand Gulf Nuclear Station. Thus, Entergy concludes that the exemption is consistent with the common defense and security.

2. 50.12(a)(2) - Existence of Special Circumstances

Entergy submits the following special circumstances which exist surrounding this application for exemption:

Para.(i) - Application of the regulation conflicts with other rules or requirements. As discussed in more detail below, the special nature and complexity of the CRD system venting process, the large number of CRD lines to be vented and their location in a contaminated radiation area combine to create unnecessary personnel radiation exposure. Strict application of the Appendix J requirements in this case conflict with the As Low As Reasonably Achievable (ALARA) principles as specified in 10CFR20.1(c) and also conflict with the recent increased emphasis on

---

<sup>2</sup> e.g. USNRC to Mr. O. D. Kingsley, Jr., USNRC Inspection report No. 50-416/85-42, dated December 27, 1985.

radiation protection programs required starting in 1994 under 10CFR20.1101. Therefore, granting of the proposed exemption is essential for the application of the radiation protection principles basic to realizing occupational doses as low as reasonably achievable.

Para.(ii) – Application of the regulation...is not necessary to achieve the underlying purpose of the rule. The purpose of 10CFR50 Appendix J as described in its introduction is to "assure that (a) leakage through the primary reactor containment and systems and components penetrating primary containment shall not exceed allowable values as specified in the Technical Specifications or associated bases..." The proposed exemption would allow a penetration valve lineup configuration that deviates from that required by Appendix J, III.A.1.(d); however, the leakage associated with this penetration as determined by Type C testing conducted during the same refueling outage will be added as a penalty to the Type A test 95% upper confidence level (UCL) results. This penalty will be determined using the "minimum pathway leakage" methodology. The use of this method assures the addition of an equivalent leakage to that anticipated during the ILRT. Additionally, any increases in containment sump, reactor water, or suppression pool levels during the course of the Type A test are also taken as a penalty to the Type A 95% UCL test results. The resulting overall integrated leakage rate is required to meet the allowable values as specified in Technical Specification 3.6.1.2. Therefore, the actions proposed by the requested exemption satisfy the underlying purpose of Appendix J.

Para.(iii) – Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted. The CRD system requires restoration following Type C testing on penetration No. 33, hydraulic control unit maintenance and CRD mechanism maintenance. This activity is performed to support CRD friction testing and scram time testing prior to vessel assembly and hydrostatic testing of the reactor coolant system, respectively. Appendix J, paragraph III.A.1.(d), requires the CRD system to be exposed to the containment atmosphere by venting and draining the system on both sides of the penetration during the ILRT. Because the ILRT is performed near the end of the outage following hydrostatic testing, recovering the CRD system from the ILRT requires a second CRD system restoration. CRD system recovery from the ILRT with penetration No. 33 vented per Appendix J represents a significant effort and drain on critical path resources to vent the system piping and CRD mechanisms (CRDMs). The CRD system recovery is estimated to take 72 hours based on the 75 hours expended for this activity following the last ILRT during RFO3. It is estimated that approximately 24 hours of this would be on the critical path.

A major portion of the CRD system recovery effort consists of venting each of the 193 CRD insert/withdraw lines and mechanisms to remove trapped air. Prior to venting, the venting procedure requires a drain hose be connected to the high point vent valves for a control rod's insert and

withdraw lines and routed to the radwaste system. The vent valves are opened while insert and withdraw signals are applied to the control rod. The rod is then stroked several times from its full-in to full-out position. This procedure is repeated for each control rod until all air is purged from the system. Because the high point vent valves for the CRD insert and withdrawal lines are located in a contaminated overhead area, this activity results in radiation exposure to workers and the potential for personnel contamination. Although the general area exposure rates are relatively low (~2.5 mR/hr), Entergy estimates the total dose to operators and other support personnel to be 0.400 man-rem for this activity. Entergy believes the radiation exposure during this venting evolution and the potential for personnel contamination to be an unnecessary burden on company resources and plant personnel.

Despite the venting procedures utilized, introducing relatively large volumes of air into the CRD hydraulic system increases the potential of damaging control rod drive mechanism (CRDM) seals during the outage recovery. If a scram signal occurs with a control rod withdrawn, air trapped in the hydraulic system can cause damage to the CRDM seals. Replacement of these seals requires removal and rework of the CRDM. This operation results in significant radiation exposure for those technicians involved and could significantly delay plant startup from the refueling outage. Based on CRDM work performed during RFO5, Entergy estimates the radiation doses for CRDM seal rework at 0.475 man-rem per mechanism. With the CRD system in its normal operating configuration during the ILRT, this extensive and time consuming rework can be avoided.

Entergy believes the activities associated with the CRD system restoration following the ILRT, the resulting radiation exposure, the potential for personnel contamination, and the potential for equipment damage and associated rework represent a burden significantly in excess of that contemplated when Appendix J, paragraph III.A.1.(d) was adopted. Thus, the proposed exemption is most suited to meeting the intent of the regulation without imposing undue hardship.

Based on the above, Entergy Operations, Inc. requests that an exemption from 10CFR50, Appendix J, paragraph III.A.1.(d) be granted for GGNS as described herein.